CBAER

Center for Business Analytics and Economic Research

GEORGIA SOUTHERN UNIVERSITY

Economic Impact and Contribution Analysis
Fort Stewart–Hunter Army Airfield

Prepared for

Fort Stewart–Hunter Army Airfield

Prepared by

Center for Business Analytics and Economic Research

Georgia Southern University

May 20, 2021

This report was funded by Fort Stewart–Hunter Army Airfield with additional support provided by the Georgia Southern University EDA University Center.

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Executive Summary

This report was commissioned by the leadership at Fort Stewart and Hunter Army Airfield and conducted by the Center for Business Analytics and Economic Research (CBAER), a component of the Business Innovation Group at Georgia Southern University. The study is designed to analyze the current combined regional economic contribution of Fort Stewart and Hunter Army Airfield, located in Hinesville and Savannah, Georgia respectively. This report is a comprehensive analysis that estimates the current economic contribution made to the Savannah-Hinesville-Statesboro Combined Statistical Area (SHSCSA) region using multiple factors such as construction costs, operational expenses, retiree payments, tax payments, and as well as wages and salaries for employees. This study clearly indicates that military, veteran, personnel, and retirement spending related to the base has a considerable impact on the communities in which they are located as well as the entire Coastal Georgia region.

Some of the top-level findings of the report include:

- The combined installations contributed $4.99 billion in total economic output and $3.65 billion in total gross regional product to the SHSCSA for FY 2020. The two location support a combined 39,293 jobs within the region, which includes the 28,615 individuals whose work is directly linked to the installation and the 10,678 people who are employed by businesses that provide products or services that support base operations. This figure accounts for approximately 14.9 percent of the total employment opportunities in the region.
- The economic contribution of the military installation is largely driven by federal spending. Within the CBAER analysis, the most significant single contributing factor to the regional economy is personnel, including active-duty soldiers, civilian employees, and civilian contractors.
- Much of the economic impact occurs within the Hinesville Metropolitan Statistical Area, which is part of the combined SHSCSA. Within the Hinesville MSA, Fort Stewart accounted for $3.05 billion in economic output and $2.27 billion in total gross regional product. All this activity resulted in a total employment impact to the Hinesville MSA of 22,908 people, including 17,539 directly employed to support local operations.
- Within the Savannah MSA, military spending supported $1.94 billion in total economic output and $1.39 billion in gross regional product. The economic contribution of this area relies on Hunter Army Airfield operations and personnel commuting to work in Hinesville. This area accounts for 16,385 in total employment, with 11,076 being directly linked to operations.
- Included in the impact estimates are payments made to military retirees living in the SHSCSA. Retirees in the Hinesville MSA contributed $48.88 million in economic output and supported 353 jobs in the local area while those located in the Savannah MSA contributed $140.37 million to the economy.
- Local governments in the Savannah Hinesville Statesboro Combined Statistical Area collected $71.0 million in local taxes linked to the economic activity documented in this report. These local governments include counties, municipalities, and school/special taxing districts. Within the area property taxes accounted for $46.54 million and sales taxes covered $21.26 million.

Introduction

The United States has one of the best trained and equipped armed forces in the world and, since World War II, has been committed to developing a robust national defense capability. The U.S. armed services have played a significant role in this strategy, and funds spent to support the U.S. military have equipped each branch with capabilities to meet the challenges of the 21st century.

The primary mission of the U.S. military is to serve and protect the United States and its interests worldwide. In total, 1.3 million personnel are on active duty. From this total, 480,000 military personnel are in the Army, 333,000 are in the Navy, 328,000 are in the Air Force, 186,000 are in the Marine Corps, and 41,000 are in the Coast Guard.[1] Although some of these forces are stationed at bases located all over the globe, many serve at military bases within the United States. A secondary benefit created by the federal spending on defense is that some communities host military bases. For the communities and surrounding areas that are home to these military installations, these bases represent a substantial source of employment for the host community and a significant driver for economic development throughout the region.[2]

In southeast Georgia, military employment is a vital part of the economy due to three major installations in or near this area. These include Naval Submarine Base Kings Bay in Camden County; the Marine Corps Recruit Depot, Parris Island in Beaufort, South Carolina (Beaufort County); and Fort Stewart and Hunter Army Airfield in Hinesville (Liberty County) and Savannah, Georgia (Chatham County). The host communities for these installations have many active duty and civilian personnel living and working in these areas. Locally, this includes 4,981 active duty and civilian employees in Camden County, 11,929 in Beaufort County, and 23,028 shared between Chatham/Liberty Counties.[3]

This report will focus on Fort Stewart and Hunter Army Airfield, home to the 3rd Infantry Division. This is a mechanized infantry division and includes both air and ground units. It began service in 1917 as the United States entered World War I.[4] Fort Stewart is located in Liberty County and has 288,000 acres that support several fighting vehicles, gunnery ranges, helicopter ranges, and "three live-fire maneuver areas."[5] Hunter Army Airfield in Chatham County allows

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[1] Anonymous, 2019 Demographics Profile of the Military Community, Department of Defense, Deputy Assistant Secretary of Defense for Military Community and Family Policy, Retrieved from download.militaryonesource.mil/12038/MOS/Reports/2019-demographics-report.pdf

[2] Butler, Tara (2020) Defense Spending by State Fiscal Year 2018, office of economic Adjustment, U.S. Department of Defense, Retrieved from; www.oea.gov/sites/default/files/defense-spending-rpts/FY2018-Defense-Spending-by-State-Report_0_0.pdf

[3] *ibid*

[4] Anonymous, (July, 2008) A Summary History of the 3rd Infantry Division, Retrieved from http://www.militaryvetshop.com/History/3rdInfantry.html

[5] Anonymous, Fort Stewart Vision 2045 Capital Investment Strategy Capital Investment Strategy, U.S. Army

for supplies and personnel to move quickly due to the large runway and hangar spaces that support the largest aircraft used by the Army to mobilize equipment. Building on this history and footprint, "Fort Stewart and Hunter Army Airfield, Georgia has been focused on the core mission of housing, training, mobilizing, and deploying combat-ready units of the 3rd Infantry Division to execute a wide range of operations."[6]

One benefit of hosting the 3rd Infantry Division at Fort Stewart and Hunter Army Airfield has been the economic activity generated by the U.S. Army. These monetary contributions influence both the host communities and neighboring communities across the combined statistical area. For this study, the Savannah-Hinesville-Statesboro, GA Combined Statistical Area (SHSCSA) is the standard area. It includes the counties of Bulloch, Bryan, Effingham, Chatham, Liberty, Long, and Wayne. The analysis begins with an economic overview of the combined area and continues with a focus on the economic impact of Fort Stewart and Hunter Army Airfield on the SHSCSA, including both construction and operational efforts. These two factors will be modeled and discussed separately. Third, the research team will examine the economic implications linked to the retirees paid through Fort Stewart. This section will look at both the SHSCSA and a 14-county region. Finally, the team will examine the tax revenue generated by hosting a military base within the community.

Economic Overview

The economic contributions linked to Fort Stewart do not happen in isolation from the SHSCSA, the state of Georgia, and other parts of the United States. Instead, these regions are connected through the movement of goods and people. These linkages are beneficial because goods can be produced in the area best suited for their production. It also allows individuals to find a place that suits their employment needs or personal interests. The analysis began by examining defense spending across Georgia to confirm CBAER modeling assumptions and the data provided by Fort Stewart and Hunter Army Airfield.

During the federal fiscal year 2018, total defense spending in Georgia was 13th in the nation, based on contractor and payroll spending. The ranking includes work done by defense contractors and defense personnel. Statewide contract figures include funds spent on supplies and

Table 1: Defense Spending in Georgia FY 2018

Area of Spending	Spending*
Payroll	
…Civilian Pay	$2,400
…Military Active Duty Pay	$3,400
…National Guard & Reserve Pay	$600
Payroll Total	$6,400
Contract Spending	$7,300
Total Contract and Payroll Spending *(in $millions)*	**$13,700**

Source: U.S. Department of Defense Office of Economic Adjustment

[6] *Ibid*

equipment (53%), services (38%), research and development (5%), and construction (4%). Personnel payroll spending includes active duty (52%), civilian employees (27%), National Guard (11%), and reserve (10%). About two-thirds of these funds were spent on Army personnel due to the location of three large bases in Georgia.

This statewide spending has impacted the regional economy in the CSA, which is the second-largest population center in Georgia outside of the Atlanta area.[7] This region has a large and growing economy, with gross regional product increasing by 26.7 percent from 2015 to 2019. Several industrial sectors with strong growth include manufacturing, transportation and warehousing, and information.[8] Regional development is being driven by a wide range of economic activity, including the Georgia Ports Authority, internationally-recognized manufacturing companies like Gulfstream Aerospace Company, JCB Incorporated, and Great Dane, as well as a tourism economy that attracts visitors from across the United States.

As part of this analysis, the research team further subdivided the SHSCSA region into two parts. The Office of Management and Budget defines the CSA as having two metropolitan statistical areas (Hinesville and Savannah, Georgia) and two micropolitan statistical areas (Jesup, and Statesboro, Georgia). This breakdown of geographic units was a less than ideal way two show the economic contribution of Fort Stewart and Hunter Army Airfield. To overcome this limitation, the team chose to create a Savannah MSA+ and Hinesville MSA+ region, which added one micropolitan area to each metropolitan area; see Table 2 for a complete breakdown.

Table 2: MSA & Micropolitan Combinations for this Study

Wider Region	Counties	Cities
Savannah-Hinesville Statesboro, Georgia CSA	Bulloch, Bryan, Effingham, Chatham, Liberty, Long, and Wayne	Savannah, Statesboro, Hinesville, Richmond Hill, Ludowici, Jesup, Rincon
Savannah Metropolitan Statistical Area+	Bulloch, Bryan, Effingham, Chatham,	Savannah, Statesboro, Richmond Hill, Rincon
Hinesville Metropolitan Statistical Area+	Liberty, Long, and Wayne	Hinesville, Richmond Hill, Ludowici, Jesup

The cities provided in Table 2 are not meant to be an exhaustive list and were included as a reference point. Together, this community breakdown is used to define the regions for the remainder of the analysis.

Building on this information, the team has developed a brief regional statistical profile that profile includes variables focusing on measuring current value or provide context for the

[7] Augusta-Richmond County, GA-SC MSA, 608,980 population; Savannah-Hinesville-Statesboro, GA CSA 583,882 in population; Columbus-Auburn-Opelika, GA-AL, 485,590 in population; Macon-Bibb-Warner Robins, GA CSA, 415,405 in population

[8] JobsEQ, Data Explorer, GDP on March 3, 2021

economic contribution analysis. CBAER began with gross regional product to highlight recent economic performance. Next, the team used total population and working-age population to illustrate the potential size of the local labor pool. Then, a location quotient score was calculated for both public administration and the national security industry sectors. Together these factors illustrate the overall size of the regional economy.

Table 3: Total Regional 2019 GDP and Employment Statistics

	Georgia	Savannah-Hinesville Statesboro, GA CSA	Savannah Metropolitan Statistical Area+	Hinesville Metropolitan Statistical Area+
Gross Region Product				
Total Industry	$616,333.30	$27,817.10	$23,124.22	$4,692.88
Population				
Total Population	10,617,423	583,882	472,961	110,921
Working Age Population (18-64)	6,596,026	368,597	300,206	68,391
Employment				
Total Employed	4,741,191	254,891	212,891	42,815
Labor Force	5,072,766	273,186	227,766	45,186
Industry Location Quotient				
Public Admin. (NAICS 92)	1.00	1.23	1.09	2.21
National Security	1.60	2.21	0.98	10.84

Source: JobsEQ, April 2021; All dollars are in millions

The SHSCSA is a $27.8 billion economy, which is part of a state economy that reached $616 billion in 2019. In the SHSCSA for 2019, the area had 273,000 individuals in the labor force and 246,000 people employed. Those individuals in the labor force are either employed or are unemployed and looking for work. Data confirm the Savannah MSA+ is the largest single part within the SHSCSA, with Hinesville MSA+ having a smaller amount of current activity. At the same time, Hinesville MSA+ does have a larger military presence and will make a larger economic contribution to the SHSCSA analysis than the Savannah MSA+ area. The military presence is evident when examining the location quotients for this region.

Location quotient (LQ) measures a region's (county or state) level of specialization relative to a larger geographic area (i.e., United States). An LQ score represents an industry's share of regional employment divided by the same industry's share of national employment in that sector. For example, an LQ of 1.0 for the public administration sector means that the region and the nation are equally specialized in the public administration sector. In contrast, an LQ of 2.0 means that the area has a higher concentration of employment in the public administration

sector when compared to the rest of the nation.[9] This allows the research team to compare a larger economy to a smaller economy without being overwhelmed by the overall size of the variables being reported.

These economic factors illustrate that the SHSCSA community has a sizeable regional economy and the national security sector plays a leading role. The community also hosts an above-average number of veterans in the local population due, in part. to the previously noted presence of several large military bases in this community. Many of these veterans play an important part in the local labor pool; see Table 4 for details.

Table 4: Regional Veterans Population and Labor Force (aged 18–64)

	Georgia	SHSCSA	Savannah MSA+	Hinesville MSA+
Total Veterans (18–64)	370,348	33,923	22,959	10,964
Veterans Labor Forces	280,362	26,276	18,357	7,919
Veterans Labor Forces Participation Rate	75.7%	77.5%	80.0%	72.2%

Source: JobsEQ, April 2021

In the populations of the SHSCSA region are more than 34,500 military veterans between the ages of 18 and 64. This group currently makes up 9.8 percent of the total population region-wide although these figures do vary based on the part of the region being examined. The Savannah MSA includes 8.9 percent of the population as veterans between the ages of 18 and 64. In the Hinesville MSA, this figure grows to 22.3 percent. For the SHSCSA and most of the area, this figure surpasses the Georgia rate of 5.9 percent, which indicates that veterans are an important part of the regional economy.[10]

The other notable factor in the region is that the veteran labor force participation rate is above the state level, with the highest level in Savannah MSA+ with a lower level in the Hinesville MSA+. The labor force participation rate represents people in the given population who are employed. In this case, many of the veterans who choose to locate in this area are finding work, which increases the likelihood that other veterans might choose to locate in this area because organizations are already hiring from this demographic.

Modeling Process and IMPLAN Overview

The economic impact section of the report focuses on data provided by Fort Stewart and splits this information between the Liberty County and Chatham County locations. This division reflects how financial and personnel resources are typically allocated in the local community to meet the operational and readiness needs for the focus installation. The data provided cover

[9] "What Are Location Quotients (LQs)?" (2008, January 11). *Bureau of Economic Analysis*, retrieved from www.bea.gov/help/faq/478

[10] JobEQ, Population Profile on January 3, 2021

four basic categories: 1) personnel, 2) local operations/civilian contracts, 3) construction projects, and 4) payments made to retirees. The federal spending that supports this installation adds both financial resources in the form of wages paid and contractor spending. This relatively stable annual spending helps reduce the potentially volatile statewide business trends, which can lead to a more vibrant and economically diverse region.

When possible, the team independently confirmed the information provided by Fort Stewart. As part of this process, similar data were gathered from JobEQ (prepared by Chmura Economics & Analysis) and were compared to the direct data used in IMPLAN. This technique allowed the research team to ensure the direct economic contribution that is being made by Fort Stewart to be linked to recent economic conditions in the Savannah-Hinesville-Statesboro, GA Combined Statistical Area. The variables used for these comparisons are most often employment, wages paid/income, or regional GDP data. This method is possible because the IMPLAN model uses NAICS sectors, employment, and income data as part of the underlying structure of this model, which is also how JobsEQ reports its regional data. Performing this test adds clarity to the analysis and provides a wider perspective for the end-users of this report.

IMPLAN uses four variables to describe the economic contributions in the analysis: output, gross regional product, labor income, and employment. Each variable represents a different aspect of the impact the military base has on the regional economy. The output variable covers the value of industry production, which includes nets sales and inventory changes estimated by using annual production estimators embedded in IMPLAN.[11] Next is the gross regional product, in which the intermediate impact has been removed from the output category. Intermediate goods include the consumption of goods and services purchased from other industries or imported from outside the target area.[12] The third variable is labor income, which includes both employee compensation and proprietor's income and includes both wages paid and benefits provided to employees. The inputs used in the IMPLAN model include both factors.[13] The final variable is employment, which includes all full-time, part-time, and temporary labor.[14]

IMPLAN is one of the most widely used input/output models in assessing regional economic impacts. Developed as a partnership between the United States Forest Service and the Federal Emergency Management Agency in the mid-70's, this model became part of the University of Minnesota in order to handle updates to the existing software. The model was partially privatized in 1991 and now operates as a fully private company. Appendix A provides additional information on the data that IMPLAN uses to estimate economic activity, as well as how this model is structured.

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[11] IMPLAN, Output, retrieved from implanhelp.zendesk.com/hc/en-us/articles/115009668388-Output.
[12] IMPLAN, Value Added, retrieved from implanhelp.zendesk.com/hc/en-us/articles/115009498847-Value-Added.
[13] IMPLAN, Labor Income, retrieved from implanhelp.zendesk.com/hc/en-us/articles/115009668468-Labor-Income.
[14] IMPLAN, Employment, retrieved from implanhelp.zendesk.com/hc/en-us/articles/115009668668-Employment.

Overview Economic Impact

The economic impact analysis covers four areas: construction, personnel, operations, and payment to retirees. Each of these factors was treated as a unique part of the analysis and then modeled in each geographic area. The totals to use for this project are the listed total in the summary or the totals in the tables.

The impact analysis focuses on the economic contribution made by Fort Stewart to the regional economy. These economic contributions are made when local goods and services are purchased and when wages are paid to individuals employed/station at Fort Stewart. The only difference between a contribution analysis and an economic impact is the source of funds for the input goods. In an economic impact analysis, new funds or employees are entering the economy. By contrast, an economic contribution analysis focuses on existing funds or employment linked to a critical local industry. This means that the totals listed in the analysis are typically linked to economic activity. For example, building a new manufacturing facility that expands the local labor pool through the addition of new jobs and new goods being sold is an economic impact. In the case of the contribution analysis, if the new facility only replaces an existing facility and no new jobs are added, then the data entered into the IMPLAN model are already present in the targeted geographic area. This makes the outputs being analyzed an existing contribution to the regional economy.

Facility Operations Economic Contribution Summary

The combined economic contribution of base operations includes construction projects, personnel, and operational spending. This means that the majority of funds being modeled in this section are appropriated from Congress to the Department of Defense and are then distributed to this installation by the U.S. Army. Some of these funds were excluded from the analysis because they are not used and the local region. For example, purchasing armored vehicles was excluded while repair and maintenance expenditures were included because locally based personnel are often used for maintenance function, while armored vehicle production was removed because the vehicle is produced outside of this community.

Across the combined statistical area used in this analysis, Fort steward provided a major contribution to the regional economy during Fiscal Year 2020. This impact is discussed in this section and the remainder of the analysis as part of these geographic regions. This is possible because the installation is operating in both Hinesville and Savannah. In addition, some Hinesville-based personnel are living in the Savannah area and commuting into Hinesville when possible the team has attempted to account for this movement of individuals.

Table 5: SHSCSA - Total Economic Impacts Fort Stewart – Hunter Army Airfield*

	Output	Gross Regional Product	Labor Income	Employment
Direct	$3,480.95	$2,810.30	$2,040.50	28,615
Total	$4,801.84	$3,544.43	$2,395.26	37,933

**All dollars are in millions*

Overall, the operational side of Fort Stewart contributed $4.80 billion to the regional economy in total output. This output impact leads to an additional $3.54 billion in gross regional product spending. Together, this means that, without Fort Stewart, the regional economy would have to replace a significant amount of economic activity. Another area in which this contribution is noted is in labor income, which reached $3.95 billion. This equates to the total jobs linked to this facility, paying an average of $63,144 in salary and benefits in this area. After benefits are removed, the wages link to the installation are close to the regional median income of $55,744.[15]

Within the Hinesville MAS, Fort Stewart is a large generator of economic activity for this area. Table 6 shows the direct gross regional product is $1.8 billion, and direct labor income is $1.6 billion, further illustrating the major contribution being made by this facility.

Table 6: Hinesville MSA+ Total Economic Impacts*

	Output	Gross Regional Product	Labor Income	Employment
Direct	$2,286.67	$1,846.50	$1,316.12	17,539
Total	$2,997.62	$2,239.38	$1,491.20	22,555

**All dollars are in millions*

With direct employment of 17,539 for all economic activity linked to the base operations, the LQ scores for the national security sector is 15.50 in the Hinesville MSA. This illustrates military employment is well above national averages for this community. Examining other communities across Georgia with strong military connections, the research team confirmed that these facilities are major economic assets for host communities. In 2020, for example, Camden County, which is home to naval submarine base Kings Bay, had a location quotient score of 36.66, while Muskogee County, home of Fort Benning, had an LQ Score of 6.20 and Fort Gordon in Richmond County posted an LQ score of 4.72.[16] This also illustrates that communities with larger populations tend to have more diverse economies and are less dependent on military base operations. This facility also had a major impact on the Savannah area through both Hunter Army Airfield and commuters to Fort Stewart in Hinesville.

Table 7: Savannah MSA+ Total Economic Impacts*

	Output	Gross Regional Product	Labor Income	Employment
Direct	$1,194.29	$963.80	$724.37	11,076
Total	$1,804.22	$1,305.05	$904.06	15,378

**All dollars are in millions*

[15] JobsEq, Household Income, on January 7, 2021
[16] JobsEq, Industry Data, on January 7, 2021

The Savannah MSA had a total gross regional product contribution of $1.3 billion, followed by $904 million in labor income. Total employment for this region has reached 15,378 people. This total employment figure is slightly behind the entire manufacturing sector, that reached 17,445 jobs in 2020, and the transportation and warehousing sector, that hit 16,040 the same year. Overall, this level of employment put the regional contribution up toward the top employers for this region, indicating that the impacts are comparable to having another additional port facility or several major manufacturers enter the community.

Personnel Impact

The single largest factor driving regional economic contribution is personnel expenditures, which covers the outlays of active-duty military personnel and includes both officers and enlisted service members. Civilian employees hired by the Army or Department of Defense, who provide support services that allow the active duty service members to focus on their core functions and train for future missions, are also included in this section. The third category of personnel included is non-appropriated fund (NAF) employees. These workers focus on services that improve overall morale and readiness using funds generated by the activity and not appropriated by Congress. Activities such as the Army exchange service and morale, as well as welfare and recreation services are example of functions provided by NAF employees.[17]

Together, these local employees account for much of the economic impact of this facility. In total, spending on personnel accounts for 65 percent of the total impact.

Table 8: SHSCSA - Total Personnel Expenditures Economic Impacts*

	Output	Gross Regional Product	Labor Income	Employment
Direct	$2,323.78	$2,177.48	$1,712.03	21,193
Total	$3,136.69	$2,626.30	$1,928.00	27,240

**All dollars are in millions*

Due to the types of spending taking place, the induced (consumer to business) effects are a strong driver of the total impacts. In total, this round of spending accounts for 23 percent ($735.84 million) of the total output in the SHSCSA region. For gross regional product, the induced impact decline to 16 percent ($407.67 million) in total. This illustrates that, as the personnel covered by this section of the analysis spend their wages, this spending generates additional economic value for the community and supports 5,486 jobs in the combined statistical area. These induced effects lead to a total output impact of $3.14 billion and a gross regional product impact of $2.63 billion.

[17] Defense Civilian Personnel Advisory Service, Department of Defense, NAF Information, Retrieved on March 20, 2021, Retrieved from www.dcpas.osd.mil/BWN/NAFInformation

In the Hinesville MSA area, these impacts continue to positively drive additional consumer and business spending. Although the percentages are more restrained than for the total region, this region is providing 67 percent of the total SHSCSA impact.

Table 9: Hinesville MSA+ Total Personnel Expenditures Economic Impacts*

	Output	Gross Regional Product	Labor Income	Employment
Direct	$1,575.40	$1,466.65	$1,135.06	13,289
Total	$2,034.06	$1,719.88	$1,247.56	16,690

**All dollars are in millions*

Within this area, the induced spending equated to $408.05 million in output and $225.95 million in gross regional product. To put this spending into context, it supports 3,052 jobs in the region. Within the local economy, it is comparable to the employment level in the manufacturing industry, which had 3,466 jobs in 2020. Although the jobs in the IMPLAN analysis are spread throughout the economy, these induced jobs are a factor in regional economic development. Together the personnel impacts increase to 16,690 jobs supported and $1,719.88 billion in gross regional product.

While in the Savannah region, personnel spending and commuters make another strong contribution to the regional economy. This includes a contribution of $710.84 million into the direct local gross regional product.

Table 10: Savannah MSA+ Total Personnel Expenditures Economic Impacts*

	Output	Gross Regional Product	Labor Income	Employment
Direct	$748.38	$710.84	$576.97	7,904
Total	$1,102.64	$906.43	$680.44	10,550

**All dollars are in millions*

The induced spending segment in the analysis added $327.78 million in output to the local economy and $181.72 million in gross regional product. The induced spending also added $95.10 million to labor income. Overall, personnel spending is helping to support many different sectors across the regional economy. Together this spending supports 2,434 jobs and $906.43 million in gross regional product.

Operational Impact

The operational analysis focuses on spending used to support the ongoing mission of Fort Stewart and Hunter Army Airfield. This includes spending that covers annual needs, and the project categories used are personnel support, on-post housing, maintenance, service contracts, small business contracts, and Winn Army Community Hospital. The team sought to create a comprehensive analysis that covered the service member side of the operation and the civilian support services. All of the listed factors are included in the total findings listed in Table

11. In addition, the team worked to divide these categories into the different regions covered by this analysis. This allowed the impacts to be more targeted to each region, which made it possible to estimate the regional economic value being generated by this facility.

In the combined statistical area, the research team noted that, in this segment of the analysis, indirect (business-to-business) transactions played a more significant role in driving the total impact. While the induced transactions are still valuable in each geographic region, indirect spending is a leading source for secondary spending in this part of the analysis.

Table 11: SHSCMS Total Operational Expenditures Economic Impacts*

	Output	Gross Regional Product	Labor Income	Employment
Direct	$984.04	$554.00	$274.58	6,192
Total	$1,413.34	$794.26	$391.18	8,965

**All dollars are in millions*

For the operational impact, $260.58 million in indirect output were contributed to the local economy, and $168.72 million induced spending were linked to this economic contribution. In contrast, the contribution to gross regional product in indirect spending was $145.44 million, while it was $94.82 million from induced spending. Overall, this spending led to support for 2,773 jobs, with 1,526 in indirect jobs and 1,247 in induced jobs. These indirect and induced categories represent the normal types of spending that take place during the secondary transaction process. It is important to note that these categories are driven by the economic system being modeled and by the types of inputs used. Therefore, these secondary impacts are independent of each other across the different segments suggesting that indirect and induced expenditures should not be compared between personnel spending and operational analysis. While both categories are focusing on overall operations, each is modeled using different industrial sectors, making a comparison of these factors much less meaningful from an analytical standpoint.

The Hinesville MSA has been impacted by the operations of Fort Stewart. These operational activities do play a strong role in the overall economic impact, as Table 12 shows.

Table 12: Hinesville MSA+ Economic Impact of Operational Expenditures*

	Output	Gross Regional Product	Labor Income	Employment
Direct	$609.12	$339.12	$153.10	3,489
Total	$821.70	$456.29	$205.32	4,855

**All dollars are in millions*

The Hinesville MSA had an indirect economic output of $141.37 million and an induced effect of $71.22 million, while in the gross regional product category, the indirect impact was $77.42 million and $39.75 million in induced spending. This led to 1,366 jobs being added to the direct contribution with 831 from indirect and 535 in induced effects.

As noted in other segments of this analysis, the Savannah MSA also plays a role in the operations of this installation. The economic contributions linked to operations are having a larger impact in the induced segment in this Geographic area as a percent of the Savannah MSA total.

Table 13: Savannah MSA+ Economic Impact of Operational Expenditures*

	Output	Gross Regional Product	Labor Income	Employment
Direct	$374.92	$214.88	$121.48	2,703
Total	$591.63	$337.98	$185.86	4,110

**All dollars are in millions*

For the output variables, the indirect contributions reached $119.21 million and $97.51 million in induced spending. The gross regional product contributions hit $68.02 million for the indirect segment with $55.07 million linked to induced spending. These variables' impact on employment was 1,407, with 695 jobs connected to indirect spending and 713 linked to the induced effect.

Construction Spending Impacts

The construction impact covers funds spent with contractors during 2019 and 2020. This allowed the research team to cover many active projects—construction spending places to be difficult to model because an announced project can take several years to complete. Using the spending amounts from a two-year cycle allowed the research team to recognize that many projects are taking longer than one year to complete. This also allows the research team to use actual spending amounts instead of in average or a project-based method. Therefore, all of the spending listed in this analysis actually took place during the assigned time frame; see Table 14 for complete results for the combined statistical area region.

Table 14: SHSCSA - Total Construction Projects Economic Impact Fort Stewart – Hunter Army Airfield*

	Output	Gross Regional Product	Labor Income	Employment
Direct	$173.14	$78.82	$53.88	1,230
Total	$251.81	$123.86	$76.08	1,728

**All dollars are in millions*

Across the region, these projects added $78.82 million in direct impact and $123.87 million in total gross regional product. This led to a contribution of 1,230 direct jobs and 1,728 in total employment. These contracts support the construction industry and has a location quotient score of 0.87, which is slightly below the national employment level for this sector. The regional construction industry has a total employment of 12,300, over this time frame, projects linked to the base account for about 10 percent of total industry-wide employment.

Within the Hinesville MSA+ region, construction projects at Fort Stewart are a major driver of the local construction industry. These military construction projects help to fuel a construction industry (NACIS 22) that contribute about $118.00 million in gross regional product to the local economy. Table 15 lists the specific economic contribution linked to the outlined contractor spending.

Table 15: Hinesville MSA+ Construction Projects Economic Impact*

	Output	Gross Regional Product	Labor Income	Employment
Direct	$102.15	$40.74	$27.96	761
Total	$141.86	$63.22	$38.32	1,010

**All dollars are in millions*

In this area, gross regional product contributions were $40.74 million in direct contribution and $63.22 million in total. This led to a contribution of 761 indirect jobs and 1,728 in total employment. The regional construction industry (NAICS 22) has a total employment level of 1,577. When the direct employment impacts are compared, 776 in total employment accounts for 48 percent of the regional contraction employment, further illustrating that this base plays a significant role in the Hinesville MSA.

The construction industry in the Savannah MSA also received a boost from the construction activity linked to the installation. In total, the construction industry accounts for $967.14 million in gross regional product in this area. The well-developed construction industry is well placed to service the needs of this base.

Table 16: Savannah MSA+ - Construction Projects Economic Impact*

	Output	Gross Regional Product	Labor Income	Employment
Direct	$70.99	$38.08	$25.92	469
Total	$109.95	$60.65	$37.77	718

**All dollars are in millions*

The construction projects linked the base directly contributed $38.08 million to gross regional product, and it increased to $60.65 million when the indirect and induced figures are included. This led to a contribution of 469 indirect jobs, which is an increase of 718 in total employment. Overall, this is a small but significant part of the 10,700 total construction jobs in this area. Using direct construction jobs in the Savannah MSA, the total project was 4.4 percent.

Retiree Paid

Fort Stewart and Hunter Army Airfield manage retiree payments for many retirees across several states. The analysis will focus on payments made to Georgia-based retirees that live in a 15-county region that includes Appling, Bryan, Bulloch, Candler, Chatham, Effingham, Evans, Liberty, Long, McIntosh, Tattnall, Toombs, and Wayne counties. Using the 15-county region, the

research team Illustrates the wider impact linked to military retirees in South Georgia and highlights the impact of retirees on the focus CMSA counties.

Fort Stewart provided the retiree payments and the number of retirees to the research team by Fort Stewart. The data included the number of retirees and payments made to retirees at the zip code level for the 15 County region. Using this information, CBAER prepared an analysis that looked at all military retirees from all service branches and a second analysis that focused solely on service retirees from the U.S. Army. The analysis used a combined two years average of retiree payments for the IMPLAN modeled data. The years used were 2020 and 2019, which led to a total number of service-related retirees to be 11,373 for all services and 8,590 for the U.S. Army. These retirees receive a combined $297.4 Million in DoD retirement payments, with $225.7 million being paid to the U.S. Army retirees. Table 17 lists the number of retirees within the targeted geographic area and the amounts of payments that are being made to these retirees.

Table 17: Retirees with Payment Processed by Fort Stewart and Hunter Army Airfield

	DOD Retirement	Army Retirement	DOD Average Annual Payments	Army Average Annual Payments
Appling County	77	40	$1,643,259	$763,967
Bryan County	1,364	1,075	$42,018,798	$33,981,552
Bulloch County	413	238	$10,324,401	$5,940,199
Candler County	70	41	$1,650,708	$966,533
Chatham County	3786	2,425	$100,626,299	$64,395,856
Effingham County	796	420	$20,133,745	$10,618,366
Evans County	93	52	$2,244,957	$1,117,951
Liberty County	3,410	3,226	$87,228,843	$83,187,906
Long County	548	519	$13,090,514	$12,555,610
McIntosh County	124	64	$3,081,182	$1,617,034
Tattnall County	345	264	$7,135,211	$5,465,552
Toombs County	70	45	$1,592,375	$934,114
Wayne County	280	183	$6,678,165	$4,157,041
Combined Totals	**11,374**	**8,590**	**$297,448,458**	**$225,701,682**

Source: Department of Defense and Fort Stewart and Hunter Army Airfield

The economic effect of hosting many military retirees in this region adds an additional $297 million to the personal income figure. Unlike in other fields, some of these retirees are likely still within the working-age group, which means that many retirees go on to have civilian careers while still collecting their military pensions. This can produce a larger economic impact that is not captured in these figures.

To further illustrate the economic value of these retirees to their local communities, the team has generated a payment analysis using a per-retiree income statistic. This statistic compares the number of retirees to the total spending, which is comparable to per capita income. Comparing the typical retiree payments to per capita income provides a point of reference that demonstrates the potential value of these retirees to the local community.

Table 18: Retirees Payment Comparison

	DOD Retiree Per Capita Income	Army Retiree Per Capita Income	Per Capita Income
Appling County	$21,341	$19,099	$35,514
Bryan County	$30,806	$31,611	$53,853
Bulloch County	$24,999	$24,959	$32,724
Candler County	$23,582	$23,574	$34,192
Chatham County	$26,579	$26,555	$48,294
Effingham County	$25,294	$25,282	$42,271
Evans County	$24,139	$21,499	$35,109
Liberty County	$25,580	$25,787	$37,424
Long County	$23,888	$24,192	$27,232
McIntosh County	$24,848	$25,266	$30,981
Tattnall County	$20,682	$20,703	$29,106
Toombs County	$22,748	$20,758	$37,143
Wayne County	$23,851	$22,716	$32,633
Combined Totals	**$26,152**	**$26,275**	**$41,751**

Source: DOD and Fort Stewart Hunter Army Airfield, JobEQ

Across the counties in the analysis, per retiree payments lagged behind per capita income in every county in this analysis. Several factors likely explained this lag for these retired service members. First, many retirees end up having a civilian career after their military service. In this case, their military pensions act as a floor for their wages. For those retirees who had fully opted out of the labor force, it does not cover other retirement benefits that might be received, including Social Security, another retirement savings plan, or Funds that individuals have saved outside of a retirement plan. This analysis does not include these other potential sources of income; however, it is highly likely that military retirees are adding even more economic value to their communities.

Next, the team used the total retiree payments as input data for the economic impact model IMPLAN. These data were entered into IMPLAN at the county level using as an increase to personal income. IMPLAN further adjusted this data by removing income taxes paid to federal and state government and general savings, leaving only funds that could be expanded within

the target geographic area. Listed in Table 19 is the overall impact this spending had on the selected 15 counites and the SHSCSA.

Table 19: Department of Defense Data Retirees

	Output	Gross Regional Product	Labor Income	Employment
15 County	$198.01	$114.16	$52.11	1,427
SHSCSA	$189.22	$109.54	$50.07	1,360

**All dollars are in millions*

Solely based on payments made to all Department of Defense service related retirees, economic output increased by $198 million, and a total of 1,427 jobs were linked to this spending. This impact only covers the consumer to business transactions linked to this spending. This is the most accurate way to categorize the retiree incomes impacts on the community.

Within the Hinesville MSA + community, DOD retirees accounted for $48.88 million in economic output, leading to $28.89 million in gross regional product. This spending further supported total employment of 353 and $9.87 million in labor income. The impact for the Savannah MSA+ region was significantly larger with $140.34 million in economic output and $80.65 million in gross regional product. The spending supported 1,007 jobs and $40.20 million in labor income.

Looking more closely at only the U.S. Army segment of the DOD retirees a substantial amount of economic value is still added to the region. This IMPLAN analysis followed the same methodology discussed for the DOD impacts. The outcome of the analysis is displayed in Table 20.

Table 20: U.S. Army Retirees

	Output	Gross Regional Product	Labor Income	Employment
15 County	$142.54	$82.23	$36.48	1,027
SHSCSA	$137.02	$79.33	$35.20	986

**All dollars are in millions*

Military retirees' spending in the 15 County region contributed $142.5 million to economic output and supported 1,027 jobs. This positive impact understates the value of retirees because it does not cover all of their sources of income. It demonstrates that hosting more military retirees in the local community does have positive economic benefits for the community.

Tax Impact Analysis

CBAER has developed an estimate of the taxes paid to the state of Georgia and aggregated total for all payments to local governments included in this SHSCSA region. These estimated tax revenues include both payments made by individuals and businesses in the form of sales,

real/personal property, and other licenses and fee payments. It was prepared using the IMPLAN model, and it is following the contribution analysis discussed in the facility operations section.

State Tax Analysis

The taxes discussed in this part of the analysis represent all taxes paid to the state of Georgia by companies and individuals covered by this report and include the direct, indirect, and induced contributions discussed in this IMPLAN analysis.

The taxes listed in Table 21 begin with taxes on production and the impact net of subsidies (TOPI). TOPI includes all sales and excise taxes, customs duties, motor vehicle licenses, and severance, and other taxes.[18] All tax subsidies have been removed from the analysis, and only the total TOPI figure is industry-specific, while household taxes in IMPLAN are paid at the place of residence and are included in employee compensation and proprietor's income. This means that, in addition to income earned as an employee, IMPLAN includes other forms of personal income, which include rental, dividend, interest, and retirement income, and capital gains. The IMPLAN model includes other forms of income as a regionally based weighted average derived from the amount of payment made in the region.[19]

The estimated taxes listed in Table 21 only cover the state of Georgia. Property taxes were removed from the analysis because the state no longer collects these taxes; see Table 21 for a complete breakdown of taxes covered.

[18] Clouse, Candi. (2020) Taxes on Production & Imports less Subsidies (TOPI), Glossary, IMPLAN Group, retrieved from implanhelp.zendesk.com/hc/en-us/articles/115009667528-Taxes-on-Production-Imports-less- Subsidies-TOPI-

[19] Clouse, Candi, (July 20, 2020) Taxes: Where's the Tax? Doing More in IMPLAN, Taxes. IMPLAN Group, retrieved from implanhelp.zendesk.com/hc/en-us/articles/360041584233-Taxes-Where-s-the-

Table 21: Georgia – Total Tax Collection Linked to Statewide Impacts*

	Tax on Production and Imports (TOPI)	Enterprises (Corporations)	Household Taxes	Total
TOPI: Sales Tax	$35.54			$35.54
TOPI: Property Tax				
TOPI: Motor Vehicle License	$0.71			$0.71
TOPI: Other Taxes	$1.35			$1.35
Corporate Profits Tax		$6.92		$6.92
Personal Tax: Income Tax			$33.19	$33.19
Personal Tax: Motor Vehicle License			$0.73	$0.73
Personal Tax: Personal Property Taxes			$0.09	$0.09
Personal Tax: Other Tax (Fish/Hunt)			$0.26	$0.26
Total	**$37.60**	**$6.92**	**$34.27**	**$78.79**

**Dollars in millions*

In total, the model estimates that businesses and individuals connected to this analysis have paid $78.79 million in taxes to the state of Georgia. As a comparison, the state of Georgia collected almost $27.5 billion in Fiscal Year 2020.[20] This tax collection number only includes taxes and fees paid to Georgia and excludes all federal funds provided to the state.

The statewide total, the direct sector, includes 60 percent of this total, while the indirect and induced segment includes the remaining 40 percent. The two largest areas being collected are sales and income taxes. The sales tax figures include both businesses and individuals because IMPLAN does not disaggregate for these groups.

For the taxes paid by households, which include income taxes, IMPLAN's definitions cover both taxes and fees paid. The personal property taxes included other big-ticket items, including boats, recreational vehicles, automobiles, etc. The model assumes that property taxes are paid in the tax production and imports segment of this analysis

Taxes Paid to Local Government

Although state taxes are an important assessment tool, local government tax collection can also be an important part of measuring the local impacts. The local tax analysis combines county, special districts/schools, and city taxes into one local government grouping. Notable differences exist between the state and local tax collection analyses. First, property taxes have been included because property taxes are one of the largest sources of revenue a for local

[20] Kanso, Danny. (January 2019) Overview of Georgia's 2020 Fiscal Year Budget, Georgia Budget & Policy Institute, retrieved from gbpi.org/wp-content/uploads/2020/05/2020budgetoverview-FINAL.pdf

government. Secondly, all income taxes have been removed from this analysis. In this part of Georgia, no local government collects these taxes, and they are not calculated by IMPLAN. In addition, the team followed the same geographic designations used in the preceding sections of this report.

Local communities provide many of the services that make it possible for residents to call a community home. These services can be complex such as transportation planning or community planning/zoning, with long-lasting implications for local residents. In contrast, other services, including youth sports leagues or parks, can be overlooked by the public. All of these services do have a common need for revenue to fund their operations. For most government programs/services, this means taxes or user fees must be collected, and some of these taxes can be linked to other economic activities taking place in the area. This includes operating Fort Stewart and Hunter Army Airfield; within the combined statistical area, property taxes are the most significant source of revenue; see Table 22 for a breakdown of linked tax payments to the project.

Table 22: SHSCSA-Total Local Government Tax (County, City, and School) *

	Tax on Production and Imports	Household Taxes	Total
TOPI: Sales Tax	$21.26		$21.26
TOPI: Property Tax	$46.54		$46.54
TOPI: Motor Vehicle License	$0.00		$0.00
TOPI: Other Taxes	$1.80		$1.80
TOPI: Special Assessments	$0.09		$0.09
Corporate Profits Tax			
Personal Tax: Income Tax			
Personal Tax: Motor Vehicle License			
Personal Tax: Personal Property Taxes		$1.31	$1.31
Personal Tax: Other Tax (Fish/Hunt)			
Total	**$69.68**	**$1.31**	**$71.00**

*Dollars in millions

In total, spending linked to the installation and associated personnel contributed $71.00 million to local government revenue. This includes $21.26 million coming from business and individual sales taxes and $46.54 million coming from property taxes.

While the total SHSCSA region covers both MSA+ regions and illustrates the size of the local tax contribution, a closer look can further reveal the difference between the Hinesville MSA+ and the Savannah MSA+. Within Hinesville, MSA+ tax collections are driven by property and sales tax.

Table 23: Hinesville MSA+-Total Local Government Tax (County, City, and School) *

	Tax on Production and Imports	Household Taxes	Total
TOPI: Sales Tax	$11.13		$11.13
TOPI: Property Tax	$26.55		$26.55
TOPI: Motor Vehicle License	$0.00		$0.00
TOPI: Other Taxes	$0.84		$0.84
TOPI: Special Assessments	$0.02		$0.02
Corporate Profits Tax			
Personal Tax: Income Tax			
Personal Tax: Motor Vehicle License			
Personal Tax: Personal Property Taxes		$0.60	$0.60
Personal Tax: Other Tax (Fish/Hunt)			
Total	**$38.55**	**$0.60**	**$39.15**

*Dollars in millions

The installation and personnel spending in the Hinesville MSA+ contributed a total of $39.15 million to local revenue. This includes $11.13 million coming from business and individual sales taxes and $26.55 million coming from property taxes. The Savannah MSA+ region can also link some of their local tax collection to Fort Stewart and Hunter Army Airfield. Table 24 shows the findings from the tax analysis for this region.

Table 24: Savannah MSA+-Total Local Government Tax (County, City, and School)*

	Tax on Production and Imports	Household Taxes	Total
TOPI: Sales Tax	$10.12		$10.12
TOPI: Property Tax	$19.98		$19.98
TOPI: Motor Vehicle License	$0.00		$0.00
TOPI: Other Taxes	$0.96		$0.96
TOPI: Special Assessments	$0.07		$0.07
Corporate Profits Tax			
Personal Tax: Income Tax			
Personal Tax: Motor Vehicle License			
Personal Tax: Personal Property Taxes		$0.71	$0.71
Personal Tax: Other Tax (Fish/Hunt)			
Total	**$31.14**	**$0.71**	**$31.85**

**Dollars in millions*

The total spending linked to the installation and associated personnel in the Savannah MSA+ contributed $31.45. This includes $10.12 million coming from business and individual sales taxes and $19.83 million coming from property taxes.

Within the wider region, the Hinesville MSA+ accounts for 55 percent of local tax collection, and the Savannah MSA+ accounts for 45 percent of tax collection. The tax figures in this analysis are driven by both consumer/business spending and geographic location. Consumers/businesses spend funds where they can find the goods and services they need. In some cases, these goods can be purchased in the local area, and in others, they must be purchased from supplier outside of the community of residence. When out shopping occurs, sales tax revenue can go with it and be shifted to another community. This could be part of the issue in the Hinesville MSA+ because some consumers are making purchases outside of the local area. Some of these purchases are likely going to the Savannah MSA+ because this community has a larger retail market with more national brands.

The geographic factor is more likely impacting the property tax collection. Some personnel working at Fort Stewart choose to live outside of Liberty County. In the context of this analysis, that means that Savannah MSA+ is collecting more property taxes because individuals are choosing to commute. This can also drive additional sales tax spending because consumers tend to look for local options before traveling to another area.

Despite these differences, both communities' tax bases are benefitting from the presence of this installation. Due in part to the population, the contribution to the Hinesville MSA+ the area is larger on a per capita basis. Overall, both MSA's are a changed place because of the operations of Fort Stewart and Hunter Army Airfield.

Conclusion

This report has illustrated that Fort Stewart and Hunter Army Airfield have a substantial economic impact on the local and regional community. The combined installations support 37,933 jobs in the SHSCSA, which accounts for about 14.9 percent of the total employed persons for this area in 2020. Many of these employed persons are active-duty military personnel who are here to train for their next mission. Others are local civilian residents employed to support the troops as they prepare for future deployments. At the same time, a third group includes private-sector employees producing the products and services used by individuals who the U.S. Army directly employed in this analysis. These groups combine to drive the overall economic contribution of the military installations, translating into monetary benefits for the local communities and the broader region.

With nearly 15% of the region's workforce employed directly or indirectly by either Fort Stewart or Hunter Army Airfield, the importance of the military installation's contribution to the region's economy cannot be overstated. When U.S. Army spending on personnel, operations, construction, and retiree payments are combined, Fort Stewart and Hunter Army Airfield have a

total output contribution of $4.99 billion, translating to $3.65 billion in gross regional product for the Savannah-Hinesville-Statesboro Combined Statistical Area. Thus, in gross regional product terms, the combined statistical area is a $27,817.10 billion economy, which further shows that the impact of this region is well within the size of the regional economy. In addition, with nearly 11,374 military veterans and Department of Defense retirees living in the SHSCSA receiving more than $297.45 million in annual retirement benefits, continuing to attract veterans to the region will ensure a solid and stable financial base for the entire coastal region.

Labor income in the local SHSCSA reached $2,395.26 billion; this covers both wages and benefits paid to all employees. This consumer spending meant that income was available to be spent in the local area. In addition to supporting local economic activity, the spending also contributed to local governments through the collection of local taxes. In total, all local governments collected $71.0 million, which covers counties, municipalities, and school/special taxing districts. Most of these collected taxes came from sales and property taxes. This area sales taxes accounted for $21.26 million, and property taxes were $46.54 million.

As this report clearly demonstrates, the communities located in the SHSCSA are substantially impacted by the personnel, construction, and retirement spending by the military, military personnel, and retirees. For these cities and counties, it is important to maintain good working relationships with the base, as well as with state and federal legislators, to ensure that these facilities continue to be supported by federal funding.

Appendix A: IMPLAN Methodology

Input/output (I/O) models examine the relationships between different industrial sectors in a targeted geographic area. These sectors are typically interdependent based on the goods/services being produced and consumed.[21] The regions could include (but are not limited to) the United States, Grouping of States, One State, or Sub-State (County or City). These models are not forecasting models, which are designed to predict changing economic situations, rather, I/O models, including IMPLAN, assume that the economy is in a state of general equilibrium. When an analyst enters data into an input-output system, the economy is "shocked by the new action."

This shock to the model sets off a set of relationships between the different industrial sectors in the model. These relationships create changes in the equilibrium of the model. It is this change from the old equilibrium to new equilibrium that creates the economic impact.

The IMPLAN model follows this type of format. The general equilibrium in the model is defined using the Use Matrix and the Make Matrix with the Make Matrices being defined by the value of all commodities each industry produces making this matrix about the value of production, while the Use Matrices focuses on the commodity purchases each industry makes to produce its output. This means that the matrix is focusing on the industry outlays used for intermediate goods and services production.[22]

IMPLAN then links the structural matrix to the North American Industry Classification System (NAICS) codes. These codes organize the model into sectors of the economy that follow the NAICS codes. The codes determine how closely the economy will be examined. In general, the more specific the NAICS code, the more detailed the analysis. For example, NAICS Code 42 represents wholesale trade, which includes durable goods wholesalers, nondurable goods wholesalers, and wholesale electronic markets and agents and brokers. In contrast, NAICS Code 423220 represents a specific type of wholesale trade, home furnishing merchant wholesalers. Once the level of specificity is selected then the user can than select the targeted region.

Next, IMPLAN adds the regional purchase coefficient to the matrix calculation. This coefficient is the embedded estimate for total local demand of the study area. The coefficient is specific to each model's regional configuration.[23] It is important to the modeling process because it is how the model accounts for the local goods and services necessary to process one unit of output. It

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[21] Clouse, Candi. (2020). About IMPLAN, Economic Impact Report's Toolkit. IMPLAN Group, retrieved from implanhelp.zendesk.com/hc/en-us/articles/360044985833-About-IMPLAN.

[22] Anonymous. (2020). National Structural Matrix, From the Data Team, IMPLAN Group, retrieved from implanhelp.zendesk.com/hc/en-us/articles/115009674648-National-Structural-Matrix#:~:text=Rearranging%20the%20U.S.%20Make%20Matrix,to%20create%20a%20Byproducts%20Matrix.&text=Accepting%20the%20Byproducts%20Matrix%20now,)%2C%20distributed%20across%20the%20matrix.

[23] implanhelp.zendesk.com/hc/en-us/articles/115009499527-Regional-Purchase-Coefficient-RPC-.

also determines how many of the goods and services are produced locally, and what will need to be imported into the region.[24]

This coefficient is also useful in determining the amount of output in the regional configuration being studied. Inside IMPLAN, output is the base statistic used to calculate employment. This employment is total jobs and does not account for full-time, part-time, seasonal, or other types of employment. This follows the standard definitions used by the Bureau of Economic Analysis and Bureau of Labor Statistics.

Data Used in the IMPLAN Model

The data used in the IMPLAN model are collected from a variety of data sources. The most important federal data sources for IMPLAN come from the U.S. Department of Commerce. This department includes the U.S. Census Bureau and the Bureau of Economic Analysis. Other data come from the Bureau of Labor Statistics through the U.S. Department of Labor.

The major federal data sets that IMPLAN uses to develop the underlying model are

- U.S. Bureau of Labor Statistics, Census of Employment and Wages,
- U.S. Bureau of Economic Analysis, Regional Economic Accounts,
- U.S. Census Bureau, County Business Patterns, and
- U.S. Bureau of Economic Analysis, National Income and Product Accounts.[25]

Each of these data sets provides the IMPLAN model with reliable data. IMPLAN then synthesizes the information and develops appropriate equations to make the model function. In addition, IMPLAN fills in any gaps in these data using methods consistent with the common theory in this area, allowing IMPLAN data to be available at the zip code, county, metropolitan statistical area, state, and national level. It is produced on an annual basis and includes inter-county trade flow data and multi-regional analysis[26]

With these tools in place, the IMPLAN model produces three elements to in determine economic impact in the analysis.

Direct effects are the effects of the capital or labor directly being studied/entered in the modeling process. An example of a direct effect is the spending by visitors on goods and services within the targeted region.[27]

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[24] Anonymous. (2020). Regional Purchase Coefficients, Data Basics, IMPLAN Group, retrieved from implanhelp.zendesk.com/hc/en-us/articles/115009674588-Regional-Purchase-Coefficients.
[25] Anonymous. (2020). IMPLAN Data Source Overview, Economic Impact Report's Toolkit, retrieved from implanhelp.zendesk.com/hc/en-us/articles/360044458674-IMPLAN-Data-Source-Overview.
[26] *Ibid.*
[27] Anonymous. (2020). Glossary, Economic Impact Report's Toolkit, IMPLAN Group, retrieved from implanhelp.zendesk.com/hc/en-us/articles/360044986593-Glossary.

Indirect effects are the business-to-business transactions caused by the direct effects. For example, when a general contractor purchases supplies, the supplying vendors will use the revenue generated to restock inventory and to potentially hire additional employees.[28]

Induced effects are the effects linked to consumer-to-business transactions as employees spend after tax household income on goods and services. For example, when a person uses income earned on the job to pay rent or purchase a home.[29]

These efforts typically apply to four variables including output, employment, labor income and value added. Using these effects, the model produces several multipliers. Multipliers are a rate of change triggered by the increase or decrease made in the direct input. These are commonly expressed as using the amount of investment made to the rate of change, which typically means that, for every dollar spent in the target economy, 0.50¢ in economic activity is generated in the region. These changes then move through the economy multiple times and create changes to both sectors/variables directly affected and to other sectors/variables that support these changes.[30]

In general, for every input into a transaction, an amount over that transaction is generated. For example, if a visitor or employee buys lunch at a local restaurant, the amount of this purchase will be re-circulated in the economy. This happens when the business owner replaces the ingredients used in preparing lunch (the indirect effects) or hires an employee to prepare or serve the meal (induced effect). The receivers in this transaction become the next round's inputs, and, so, the cycle continues. The direct and indirect calculations make up the Type 1 multipliers in the IMPLAN model. This multiplier only examines the combination of direct, indirect and in effect impacts and are called the Type Social Accounting Matrix or Type SAM multipliers.

The Type 1 multiplier in IMPLAN only covers the direct and indirect impacts when considering a change in economic activity. While the Type SAM multipliers cover the direct effects, business to business and household spending transactions.[31] This means the Center for Business Analytics and Economic Research only uses SAM multipliers.

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[28] *Ibid.*
[29] *Ibid.*
[30] Clouse, Candi. (2020). Understanding Multipliers, Region Details: Behind the "i." IMPLAN Group, retrieved from implanhelp.zendesk.com/hc/en-us/articles/115009505707-Understanding-Multipliers.
[31] Clouse, Candi. (2020). Multipliers, Region Details: Behind the "i." IMPLAN Group, retrieved from implanhelp.zendesk.com/hc/en-us/articles/360037178313-Multipliers.