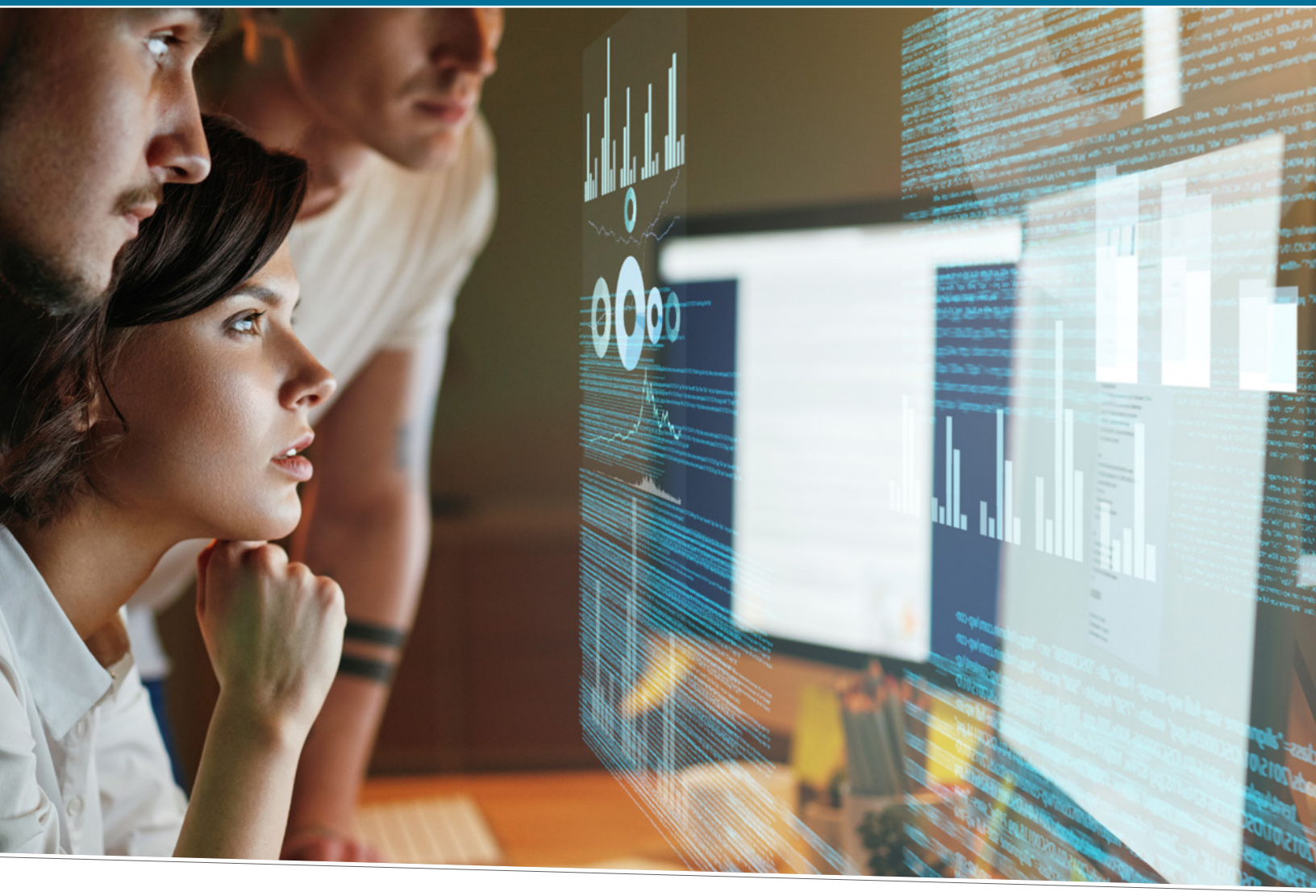


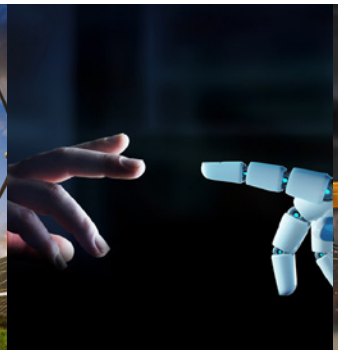
THE MIDDLE GEORGIA INNOVATION PROJECT

INNOVATION PERFORMANCE AND GAP ANALYSIS REPORT

Part 2: Technical and Gap Analysis

March 2021




THE MIDDLE GEORGIA INNOVATION PROJECT

INNOVATION PERFORMANCE AND GAP ANALYSIS REPORT

Part 2: Technical and Gap Analysis

This report presents the technical results and outcomes from Task 2 of The Middle Georgia Innovation Project. The objective of Task 2 was to perform an innovation performance and gap analysis of the Middle Georgia region in two parts. The first part is an in-depth look at the potential for innovation in Middle Georgia by examining comparable case studies in Georgia, Alabama, Tennessee and Ohio. The second part examines the technical results and data that indicate both gaps and opportunities for innovation in Middle Georgia compared to the regional and local case studies. The combined parts of the second report represent the second of three reports for The Middle Georgia Innovation Project.

More information on The Middle Georgia Innovation Project can be sourced at
https://lab2.future-iq.com/middle-georgia-innovation/

March 2021

Report Prepared by:

future→iQ®
Create **Future Intelligence**®

This report was prepared under contract with the Middle Georgia Regional Commission, as fiscal agent for The Middle Georgia Innovation Project, with financial support from the Office of Local Defense Community Cooperation, U.S. Department of Defense. The content reflects the views of The Middle Georgia Innovation Project and does not necessarily reflect the views of the Office of Local Defense Community Cooperation, U.S. Department of Defense.

Middle Georgia ECONOMIC ALLIANCE · Georgia INNOVATION | AEROSPACE · Houston Development Authority Be Houston. · MGRC Middle Georgia Regional Commission · ROBINS AIR FORCE BASE 21ST CENTURY PARTNERSHIP

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The results of this study indicate that the core counties of the Middle Georgia region have a spectacular capacity for innovation. This capacity can be leveraged with intentional actions to expand the innovation ecosystem throughout the Middle Georgia region.

1.0 INTRODUCTION

This report is meant to be a companion report to Part 1 of The Middle Georgia Innovation Project's Innovation Performance and Gap Analysis Report. It explores the current state of innovation indicators in the Middle Georgia region and compares that data with case studies known to have active and energized innovation environments. The majority of the data in this report is sourced from the U.S. Economic Development Administration's StatsAmerica – Innovation 2.0 website at Indiana University's Indiana Business Research Center (*http://www.statsamerica.org/ii2/overview.aspx*). The data underlying Innovation 2.0 was compiled in 2016 from many different years and a wide range of data, and it should be noted that a new iteration of innovation data is scheduled to be released later in 2021.

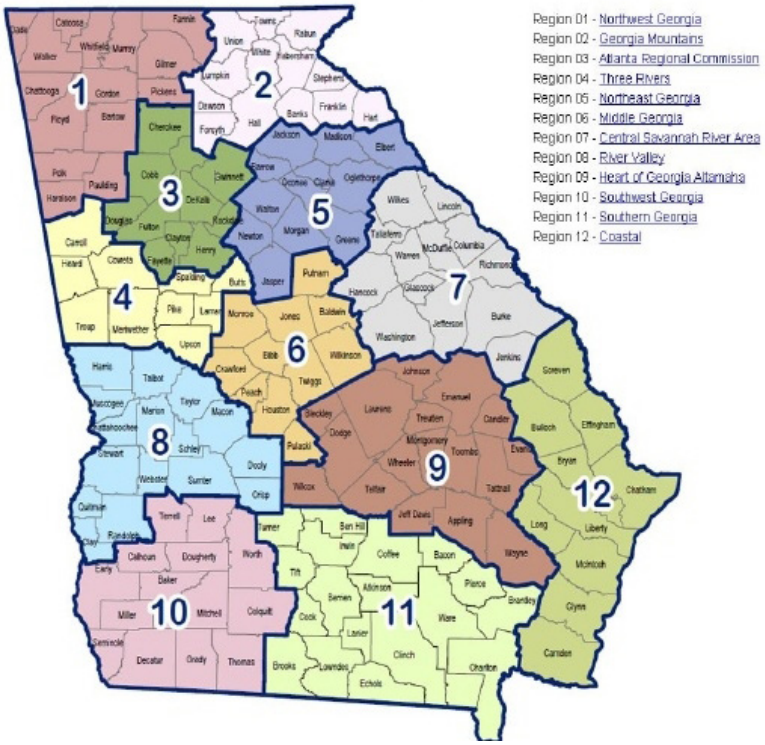
Middle Georgia has reason to be excited about the results of this study. Whereas overall, the Middle Georgia region may lag behind the specific counties of the case studies identified, the data in this report shows that the core counties of the Middle Georgia region have comparable to better innovation capacity than most of the case studies. These results are important building blocks for development of Middle Georgia's innovation roadmap in the next phase of this project.

Identifying gaps and opportunities in the innovation ecosystem is a significant step in the process of determining strategies that will move the region towards its preferred vision, 'Center-Georgia United'.

2.0 ANALYSIS LOGIC – ORGANIZATION OF REPORT

The analysis of this report is organized in five primary sections and is intended to provide a thorough examination of the technical aspects of existing innovation in the Middle Georgia region. The report also provides comparable data of the case studies highlighted in Part 1 of the Innovation Performance and Gap Analysis Report. The specific sections of this report are:

- **Introduction:** Section 1 explains the purpose of this report, and how it compliments Part 1 of the Innovation Performance and Gap Analysis Report.
- **Analysis Logic – Organization of Report:** Section 2 outlines the framework of the report.
- **Middle Georgia – Overview and County Snapshot:** Section 3 examines population, growth, demographic , employment and new business in the Middle Georgia region.
- **Industry Cluster Analysis:** Section 4 examines eight industry clusters previously identified as having significant concentrations in the Middle Georgia region. This section will explore industry trends including employment trends, gross domestic product, average wage, winning industries, top employers, fast growth firms, unemployment rates and industry location quotients in the region.
- **Innovation Trends and Index:** Section 5 will examine innovation trends and indices for the 11 counties of Middle Georgia. The section will also include data for the innovation indices for the 6 case study counties explored in part one of the Innovation Performance and Gap Analysis Report. Innovation trends will include STEM degrees and university R&D expenditures. The innovation indices will include an innovation index by counties, human capital and knowledge creation core index, business dynamics index, business profile index, employment and productivity index, and economic well-being index.



The Middle Georgia region is positioned to be a centralized 'go to' location in the State of Georgia. The region can leverage its geography, the presence of the Base, and its reasonable cost of living to attract both businesses and talent to the area.

3.0 MIDDLE GEORGIA – OVERVIEW AND COUNTY SNAPSHOT

This section describes the socio-demographic characteristics of the region and includes the analysis of population, racial distribution of people in regions, household income, per capita income, poverty level, employment opportunities, cost of living, land, and energy use.

The Middle Georgia region is defined in this study as an 11 county region that includes Baldwin, Macon-Bibb, Crawford, Jones, Monroe, Peach, Twiggs, Pulaski, Wilkinson, Putnam and Houston counties. These counties are either in the Macon-Warner Robins-Fort Valley Combined Statistical Area (CSA) and the Milledgeville Micropolitan Statistical Area, with Wilkinson County belonging to no metro area. The Macon-Warner Robins-Fort Valley CSA consists of the Macon MSA, the Warner Robins Micropolitan Area, and the Fort Valley Micropolitan Area.

To properly create a benchmarking system, we compared the Middle Georgia region (and its constituents) to the state of Georgia and the United States. The majority of the data used in this section are 5-year annual estimates for the year 2018.

Middle Georgia* Demographics and Economics Summary

Population (2010)	482,082
Population (2018)	495,486
Median Age	38.7 years
Workforce Participation Rate	57.7%
Median Household Income	$44,730
Median Home Value	$117,145
Population Below Poverty Line	20.9%
Home Ownership Rate	69.8%
Major Occupations	Management, business, science, and arts occupations Sales and office occupations
Major Industries	Educational services, and health care and social assistance Retail trade Public administration

**Middle Georgia consists of Baldwin, Macon-Bibb, Crawford, Jones, Monroe, Peach, Twiggs, Pulaski, Wilkinson, Putnam & Houston counties*
Source: 2000 Decennial Census; 2010 - 2018 5-Year American Community Survey; Projections extrapolated from Decennial Census

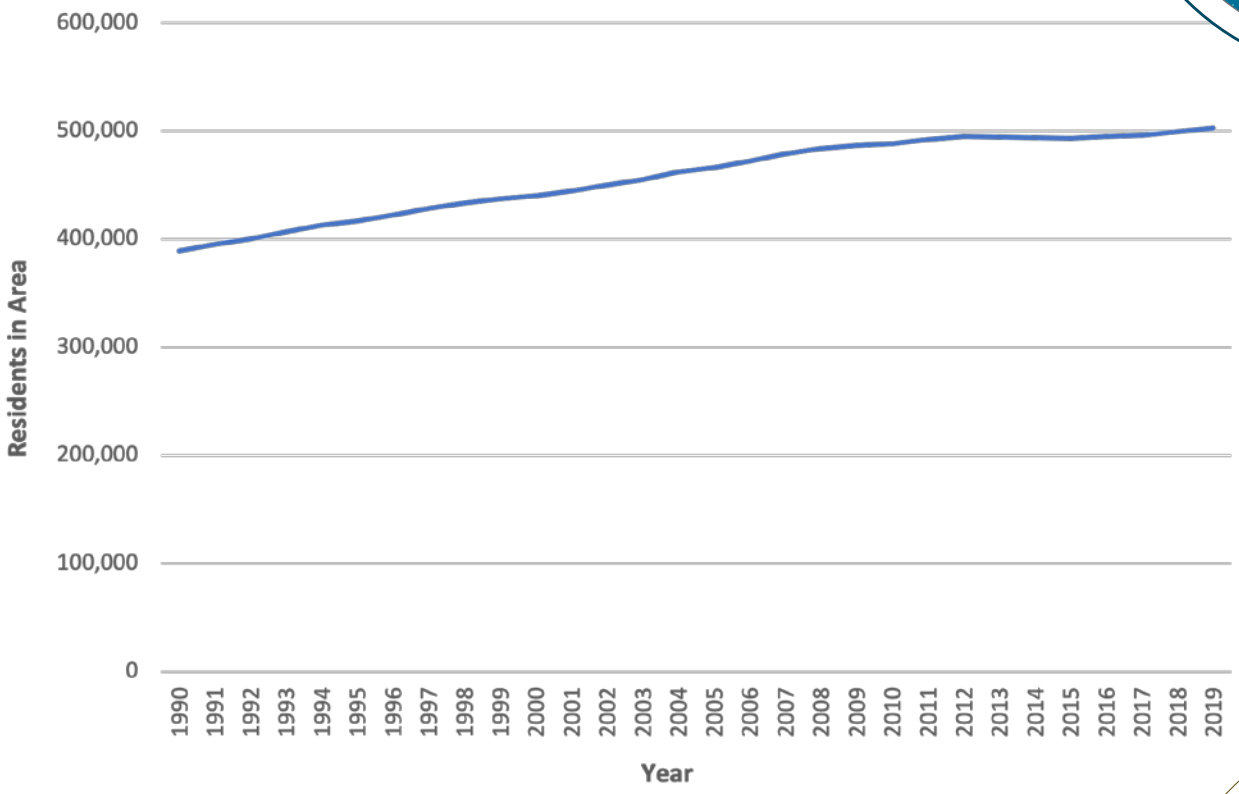
3.1 POPULATION AND GROWTH

3.1.1 POPULATION TREND (MIDDLE GEORGIA)

In 2019, the population of the Middle Georgia region was estimated to be 502,505 residents, with an average median age of 38.7 years. The region's population went through a significant increase between 1990 and 2000, and since then it has increased by an annual growth rate of 0.75%.

Outside of the growth surge in 2004, Middle Georgia's 11-county population has remained relatively stable since 2012.

Population Trend for Middle Georgia (1990-2019)



**Middle Georgia consists of Baldwin, Macon-Bibb, Crawford, Jones, Monroe, Peach, Twiggs, Pulaski, Wilkinson, Putnam & Houston counties*

Source: U.S. Census Bureau, 2000 & 2010 Decennial Census, Population Division

DataInsight

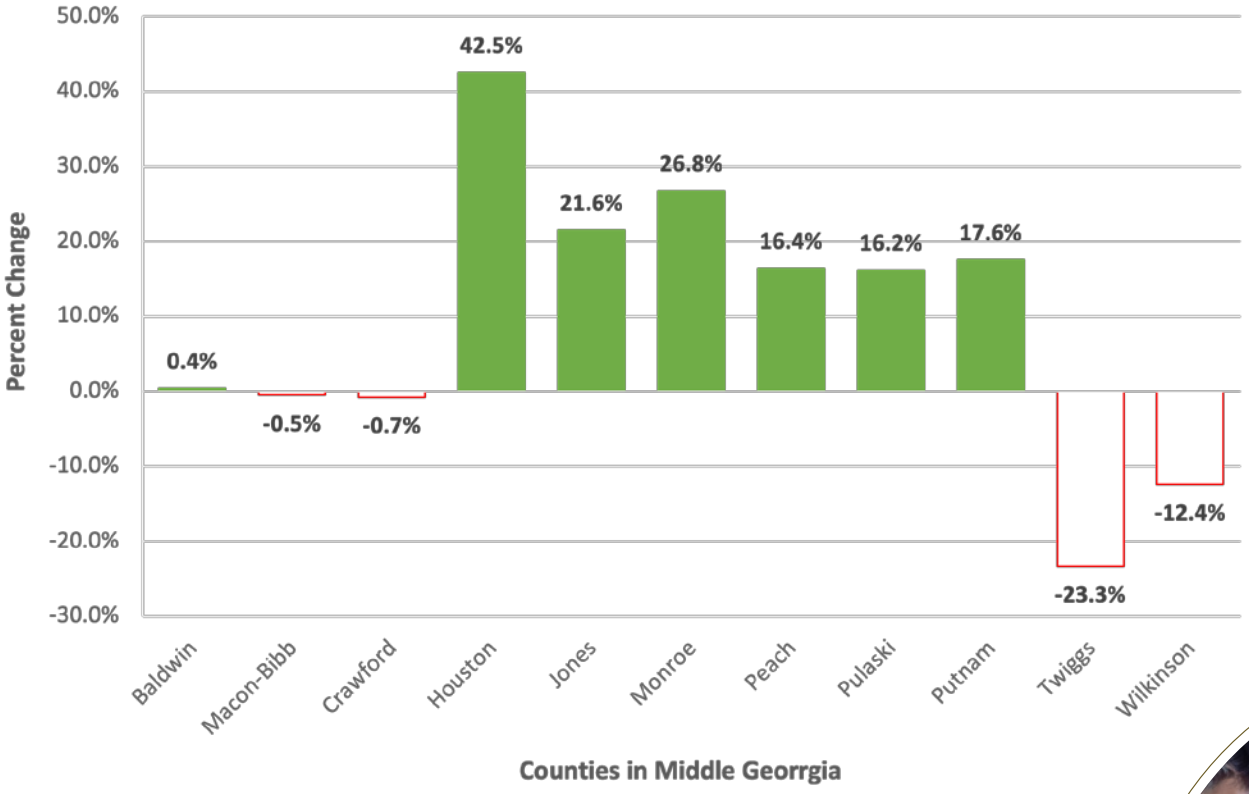
DATA INSIGHT:

- The Middle Georgia 11-county regional population increased from 440,121 in 2000 to 502,505 in 2019, growing by 14.0% over the 19 years.
- Middle Georgia's regional growth is less than the rest of the state of Georgia (29.7%).

3.1.2 POPULATION CHANGE (COUNTIES IN MIDDLE GEORGIA)

Population changes have not been uniform for the Middle Georgia 11-county region. The region's largest county, Houston, reported the highest and fastest population increase of 42.5% from 2000 to 2019. With a 23.3% population drop between 2000 and 2019, Twiggs County experienced the most significant population decline, followed by Wilkinson (12.4%). Twiggs, Wilkinson, Macon-Bibb, and Crawford were the only counties in the Middle Georgia region to lose population during the reference period.

Population by County in Middle Georgia (2018)



Source: U.S. Census Bureau, 2000 & 2010 Decennial Census, Population Division

DataInsight

DATA INSIGHT:

- Monroe County trailed Houston with the fastest growth in population with 26.8%, followed by Jones (21.6%) and Putnam (17.6%) counties. These counties were not equal in size with Houston County residents as they came close to 160,000 residents, whereas both Jones and Putnam counties populations were smaller than 30,000.
- Macon-Bibb County has the second-largest population in the Middle Georgia region and reported a decline in population (-0.5%).

3.2 DEMOGRAPHIC PROFILES

This report's demographic profile examines the racial distribution, per capita income and poverty levels of residents in the Middle Georgia region.

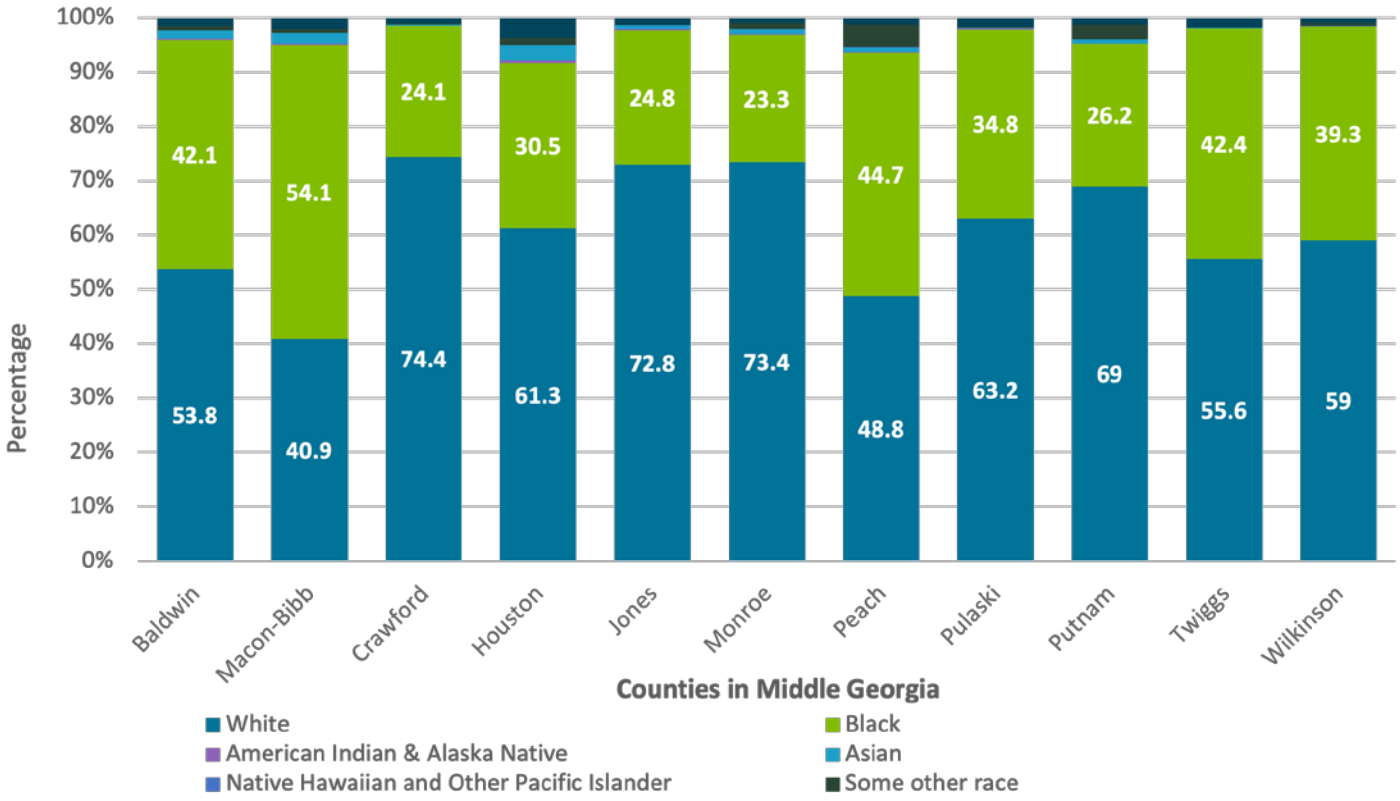
The difference between the counties in the Middle Georgia region varies significantly in their ethnic or racial composition.

3.2.1 RACIAL DISTRIBUTION

POPULATION BY RACE DISTRIBUTION

The majority of counties in the Middle Georgia region show that at least 9 of the 11 counties have more than half of the residents classified as White (Baldwin, Crawford, Houston, Jones, Monroe, Pulaski, Putnam, Twiggs, and Wilkinson). However, Macon-Bibb and Peach counties have less than 50% White residents.

Population by Race Distribution for Middle Georgia (2018)



Source: U.S. Census Bureau, 2018 5-Year American Community Survey

DataInsight

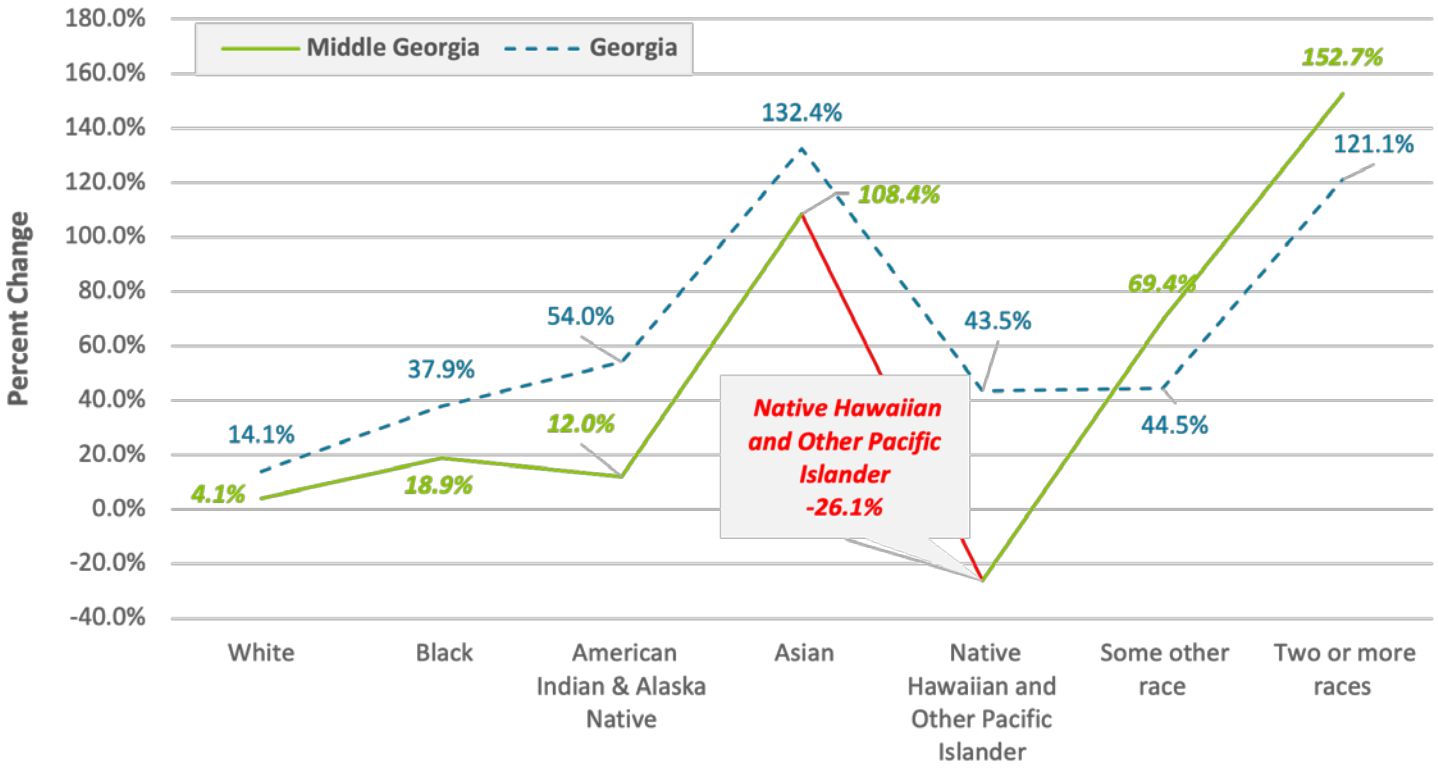
DATA INSIGHT:

- Macon-Bibb has the highest (54.1%) proportion of only Black or African American residents, followed by Peach County (44.7%), Twiggs (42.4%), and Baldwin (42.1%) counties. Crawford County has the least diversified population in comparison to the others.
- Among the four counties (Houston, Twiggs, Macon-Bibb, and Peach) with proximity to the Robins Air Force Base (RAFB), Peach County has a higher diversity rate, followed by Houston, Macon-Bibb, and Twiggs.

CHANGE IN ETHNIC MAKEUP

Racial geographical migration into the Middle Georgia region and Georgia was the lowest for the population classified as White, with a change of 4.1% and 14.1% respectively between 2000 and 2018.

Change in Ethnic Makeup for Middle Georgia (2018)



**Middle Georgia consists of Baldwin, Macon-Bibb, Crawford, Jones, Monroe, Peach, Twiggs, Pulaski, Wilkinson, Putnam & Houston counties*
Source: 2000 Decennial Census; 2018 5-Year American Community Survey

DataInsight

DATA INSIGHT:

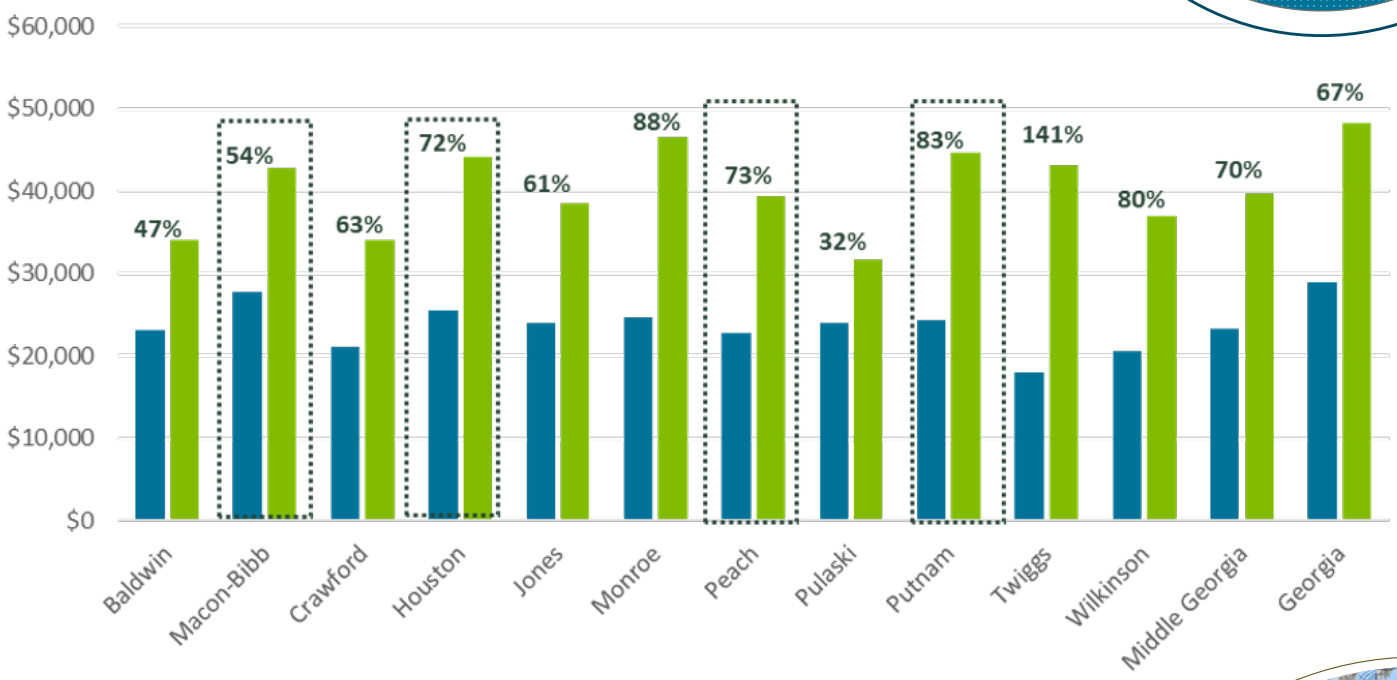
- Similarly, for both areas, the Asian population and individuals with two or more races showed a relatively high change in ethnic makeup that is greater than 100%. This change was the highest among all the races.
- Only the population classified as Native Hawaiian and Other Pacific Islander experienced a decline in population within the Middle Georgia region from 2000 to 2018.

3.2.2 PER CAPITA INCOME

Per Capita Income is a measure of the amount of money earned per person in a nation or geographic region. The Middle Georgia region's average per capita income in 2019 ($39,621) was lower than per capita income in Georgia ($48,236). Per capita income in Georgia increased by 67% from 2000 to 2019. Even though per capita income in most of the Middle Georgia region counties grew at a significant rate compared to the state of Georgia, the income per person was lower in Middle Georgia counties than in the state of Georgia.

Per capita income helps determine the average per-person income to evaluate the standard of living for a population.

Per Capita Income Change from 2000 to 2019 by Area



Source: FRED Economic Data – Annual Per Capita Personal Income by County

DataInsight

DATA INSIGHT:

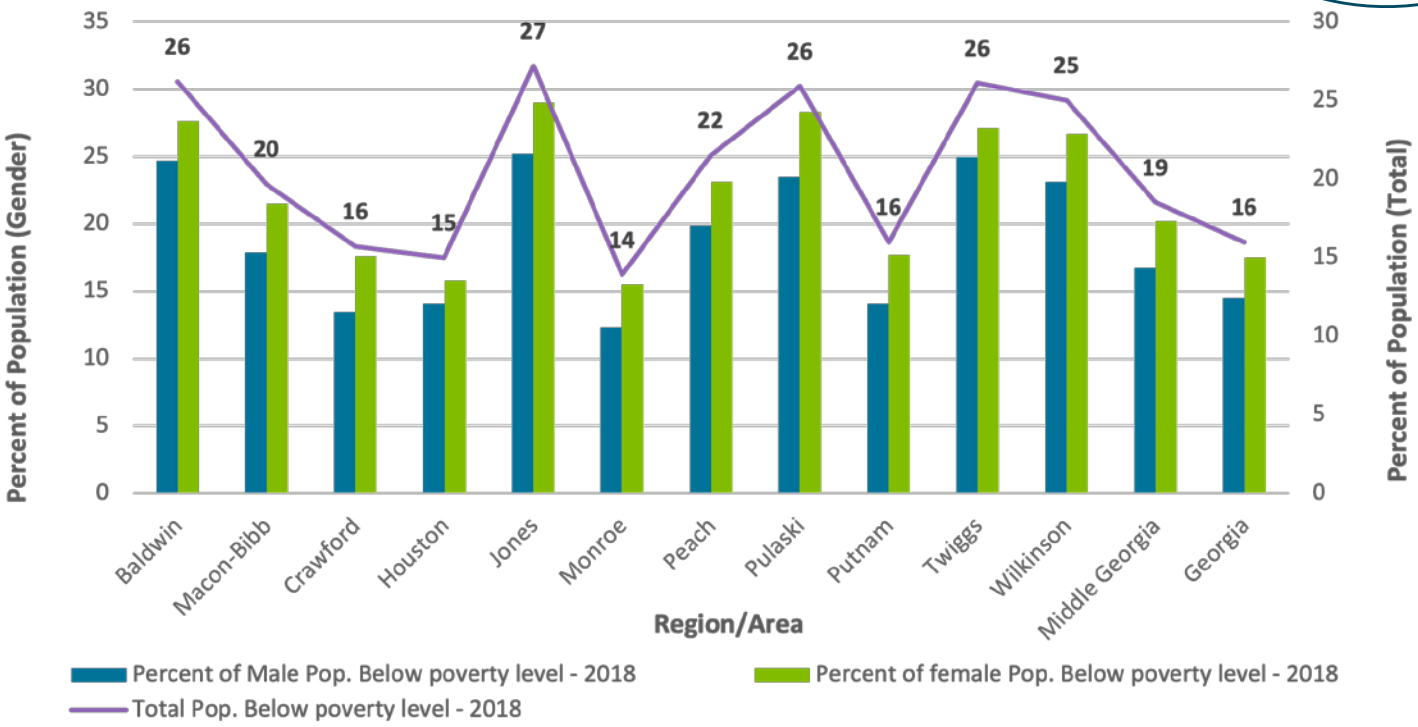
- Monroe County had the highest level of per capita income in the region in 2019 ($46,563), lower than the state of Georgia ($48,236), but higher than the average for Middle Georgia ($39,621). Pulaski County had the lowest per capita income ($31,603).
- Twiggs County had the largest rate of growth in per capita income of over 141.1% from 2000 to 2019. The Per capita income of Twiggs County was the lowest in the region in 2000, but its strong growth brought it to $43,163 in 2019.

3.2.3 POVERTY LEVEL

Poverty level is an economic measure used to determine the minimum level of income deemed adequate in a region or country. Jones County had the highest poverty rate (27%) of all counties in the 11-county Middle Georgia region, including Georgia (16%). The county has a male poverty rate of 25%, and a female poverty rate of 29%.

The percentage of the population below poverty level is determined by the total population below poverty level divided by the population for whom poverty status is determined.

Poverty Level by Region and Gender (2018)



**Middle Georgia consists of Baldwin, Macon-Bibb, Crawford, Jones, Monroe, Peach, Twiggs, Pulaski, Wilkinson, Putnam & Houston counties*

Source: 2018 5-Year American Community Survey

DataInsight

DATA INSIGHT:

- Monroe County had the lowest poverty rate of all counties in the Middle Georgia region (14%) followed by Houston (15%), Crawford and Putnam at 16% each.
- Male poverty rate was also the lowest for Monroe (12%) followed by Houston, Crawford and Putnam at 14% each. The female poverty rate was also lowest for Monroe and Houston at 16% with Putnam and Crawford at 18%.

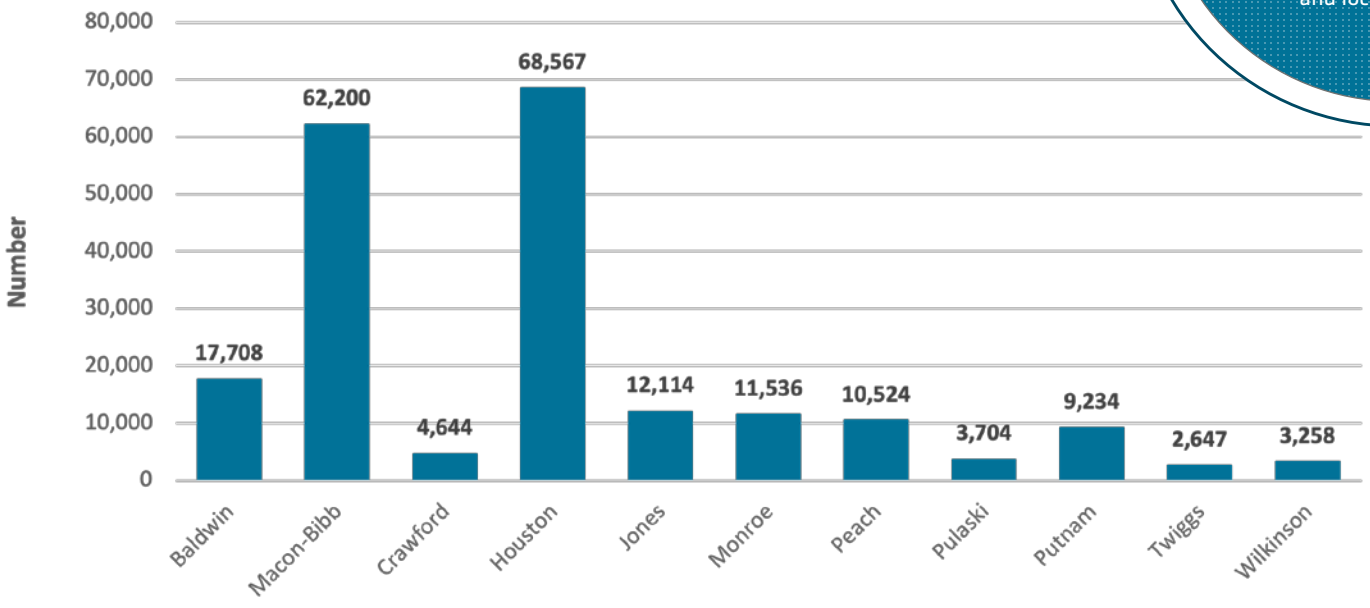
3.3 REGIONAL EMPLOYMENT PROFILE

3.3.1 EMPLOYMENT

How Middle Georgia's regional economy is developed will be a critical factor in the growth of innovation in the region. A pipeline of skilled workers will be important to both the Robins AFB and local businesses.

The following two data sets examine the status of employment in the Middle Georgia region. Houston County (68,567) had the largest number of employees in the region, followed by Macon-Bibb (62,200) and Baldwin (17,708) counties.

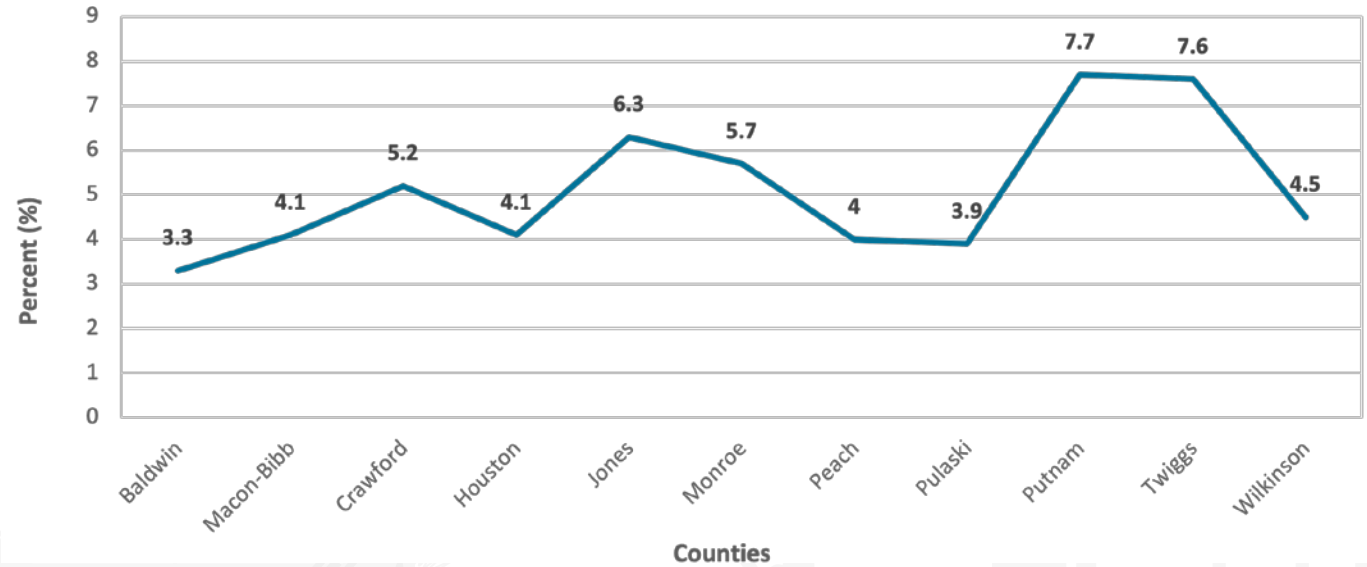
Number of Employees for Middle Georgia (2018)



Source: 2018 5-Year American Community Survey

Self-employment levels in Middle Georgia are highest in Putnam (7.7%) and Twiggs (7.6%) counties, and lowest in Baldwin County (3.3%).

Percent of Self-Employed in Middle Georgia (2018)

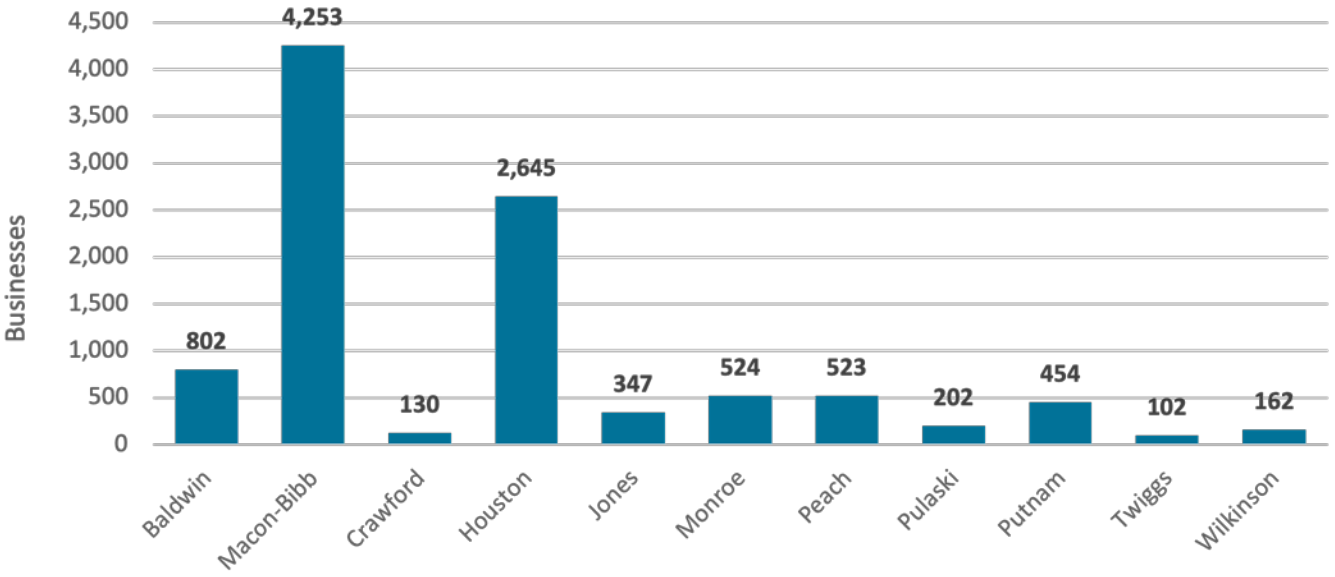


Source: 2018 5-Year American Community Survey

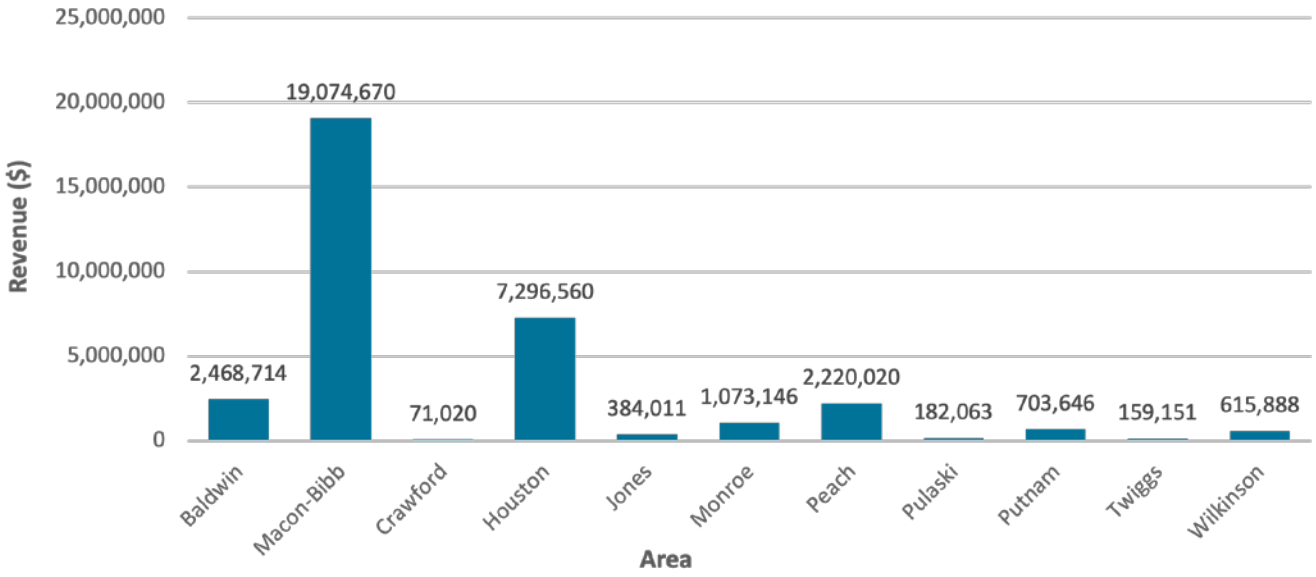
3.3.2 NEW BUSINESS

In 2018, Macon-Bibb County (4,523) had the largest average number of new establishments for employment creation in the Middle Georgia region, followed by Houston (2,645) and Baldwin (802) counties. The trend is similar for the average sales and revenue made by the firms on an annual basis, as illustrated in the chart below.

Average Annual Number of New Businesses in Middle Georgia (2018)



Average Sales and Revenue of Businesses in Middle Georgia ($1,000)



Source: 2018 5-Year American Community Survey

Previous study has positioned the Middle Georgia region as an area of strong digital capacity. This would support an initiative to develop the region as a 'Software Center of Excellence'.

4.0 INDUSTRY CLUSTER ANALYSIS

An industry cluster is a group of companies and industries that represents the entire value chain of a broadly defined industry. These clusters share the same geographic region and are interrelated by the markets they serve, the products they produce, as well as sharing similar suppliers and supported by similar trade/industry associations and educational institutions. These clusters of inter-related competitive companies and industries hold the greatest potential benefit for economic growth and wealth creation within the region given that clusters are the source of jobs, income, and export growth.

4.1 INDUSTRY CLUSTERS

In 2013, the Central Georgia Economic Development District developed the Central Georgia Regional Analysis that examined the region's demographics, economy, entrepreneurship, and innovation. The Middle Georgia Innovation Project intends to build on this previous study and advance the efforts to build the workforce and cultural environment needed to foster innovation in the Middle Georgia region.

Based upon literature and data collected for this project, eight significant industry clusters in Middle Georgia have been identified and are described below. The following information was sourced from the Georgia Department of Economic Development (GDEcD) website under the industry sections at *https://www.georgia.org/*.

- **Adaptive Maintenance and Manufacturing:** The state of Georgia is a national leader in advanced manufacturing, outpacing the U.S. in 10-year GDP growth in the manufacture of products including machinery, electrical equipment & components, and fabricated metals. According to the Georgia Department of Economic Development (GDEcD), the strength across multiple sectors in the manufacturing industry has resulted in a $61.1 billion output, and an abundant workforce of approximately 270,000 production workers. The state takes pride in its advanced workforce due to the presence of specific programs in place to meet the needs of advanced manufacturing companies. Several support systems such as the Georgia University System and the Technical College System of Georgia offering wide range of degrees and skills training that is dependent on advancing technologies. The Georgia Quick Start program is also a support system created by the state to help qualifying companies start up or expand manufacturing operations in the state. Manufacturing maintenance and sustainment is an emerging industrial capacity in Middle Georgia. This application is primarily focused on preventative maintenance in aerospace, industrial, advanced food processing, warehousing and distribution sectors.
- **Aerospace, Drones and Defense Applications:** The state of Georgia is first in the Aerospace Manufacturing Attractiveness according to rankings compiled by Pricewaterhouse Coopers in 2020. Several companies are attracted to Georgia because of its relatively low cost, business friendly policies, and its major international airport. The current aerospace companies in the state benefit from the synergies resulting from the diversity in the industry. The range of aerospace organizations in Georgia include manufacturing, Research & Development, Maintenance, Repair & Operations (MRO), transportation services, and cyber security operations. With the state's eight military bases and 7th in Department of Defense spending nationwide, defense companies in Georgia tend to benefit from the strong military presence in the state. The US government also has a strong presence in Middle Georgia mostly because of the Robins Air Force Base in Houston County.

- **Agriculture and Food Processing:** The agriculture and food processing industries are closely linked. One is the process of producing food, the other transforms the products into food or a form of food. Middle Georgia is home to an extensive logistics and supply chain infrastructure as well as access to premier cold chain storage facilities which are essential for agriculture and food processing companies to stay competitive and reach global customers.
- **Kaolin and Mining Companies:** Kaolin mining and extraction is one of the major industries within the Middle Georgia region. Kaolin is a white clay mineral used in household items (such as ceramics and incandescent lightbulbs), health and beauty products (such as toothpaste, cosmetics), in food products (such as food additives and a spray-coating on fruits and vegetables), as well as in coated paper products. The Kaolin mining industry within the Middle Georgia region has seen overseas competition from South America and Asia which has hampered growth. This is due to the competition's ability to pay lower wages and the difference in the environmental reclamation requirements as American industries.
- **Corrosion Testing:** The corrosion testing industry is also part of the maintenance and sustainment sectors emerging in the Middle Georgia region. Corrosion testing deals with mechanisms involved in material degradation in given environments and using that knowledge to develop a mitigation strategy against environment-induced failures. The strength and size of the state of Georgia and the Middle Georgia region manufacturing industry further highlights the importance of the corrosive testing sector.
- **Healthcare and Medical Devices:** The Healthcare and medical devices industry in the Middle Georgia region is one of its strong innovative ecosystems that foster a strong entrepreneurial culture and dynamic business environment. The health care industry in Middle Georgia is clustered around medical devices, insurance and health IT. Institutions in the region not only act as an essential workforce-supply mechanism but also fosters innovation and medical advancement through research centers and faculty collaborations.
- **Software and Data Engineering:** The Middle Georgia region has multiple organizations and institutions that have a history of software development or are emerging with a focus on cyber security. Cybersecurity or information technology security are the techniques for protecting computers, networks, programs and data from unauthorized access or attacks. There is a very logical opportunity for the emergence and expansion of this sector into broader commercial activity and economic diversification, especially building off the concentration of information security needs partly due to the presence of the Robin Air Force Base. Data engineering covers the transmission of region's valuable information into a format that is accessible to the end user. The region's ecosystem of data centers provides unbeatable service to companies with minimal risk of information disruption.
- **Logistics:** Logistics is the management of the flow of things between the point of origin and the point of consumption in order to meet requirements of customers or corporations. The full supply chain and logistics management ecosystem includes many companies from service providers (business consulting firms and third party providers), asset providers (planes, trains, trucks) and facilities (warehouses, airports, seaports). The physical location of the Middle Georgia region makes it a warehousing and distribution hub based upon its position. The region, and its central city Macon, lie strategically at the center of a triangle of the Port of Savannah, the Atlanta region, and the North-South interchange of Interstate 75 (I-75).

4.2 INDUSTRY TRENDS

Industry trends provide an important glimpse into regional, state and nation-wide economic development trajectories over time.

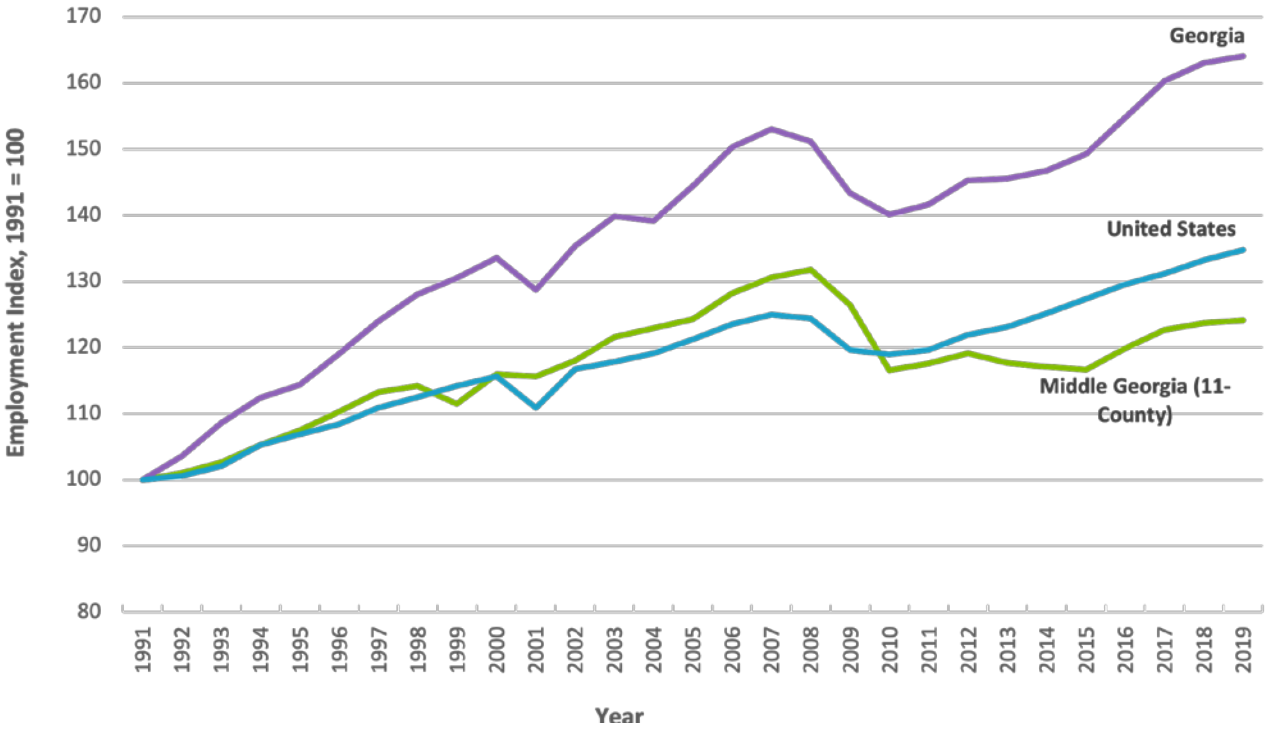
For the purposes of The Middle Georgia Innovation Project, industry trends are being analyzed through the lens of Industry 4.0 technologies to support the project's ultimate objective to develop the Middle Georgia region as a 'Software Center of Excellence'. This section looks at industry trends in terms of employment, gross product, average wage, high performance industries, top employers, fast growth firms, unemployment rate and industry location quotient.

4.2.1 EMPLOYMENT TRENDS

The graph below compares total employment trends from 1991 to 2019 in the United States, the state of Georgia and the 11 counties of Middle Georgia. The chart below in this section illustrates employment change in major industry sectors from 2010 to 2019.

TOTAL EMPLOYMENT INDEX

The growth in the employment numbers in the state of Georgia exceeded that of the United States significantly throughout the review period.



Total Employment Index, 1991 - 2019

Source: BLS, Local Area Unemployment Statistics(1991-2019), Quarterly Census of Employment and Wages(1991-2019)

DataInsight

DATA INSIGHT:

- The employment rate in the Middle Georgia region saw parallel growth with the United States from 1991 to 2006 at 15% and 17% respectively. After the recession in 2008, Middle Georgia lost the edge in employment with a lesser growth rate than the U.S.
- Middle Georgia employment increased by an annual growth rate of 0.5% but has had a lower growth than the state of Georgia and the United States, which together averaged 0.7% over the same 29-year period.

EMPLOYMENT CHANGE BY INDUSTRY SECTORS

Health Care and Social Assistance was the largest industry sector in the Middle Georgia region in terms of employment in 2019. This sector accounted for 36,479 employees or 16.8% of total employment and consists of federal, state, local, and military employees.

Employment Change by Major Industry Sectors, 2010-2019

	Middle Georgia (000)		Georgia	USA
Industry	2019 Employment	Percentage Change (2010 - 2019)		
Agriculture, Forestry, Fishing and Hunting	1,535	-2.9%	-14.3%	10.0%
Mining, Quarrying, and Oil and Gas Extraction	775	242.9%	16.4%	3.6%
Utilities	966	-17.4%	3.9%	0.5%
Construction	7,517	-2.9%	37.1%	34.5%
Manufacturing	18,933	13.8%	20.6%	11.2%
Wholesale Trade	4,546	-5.5%	10.8%	7.6%
Retail Trade	28,015	6.0%	19.0%	7.7%
Transportation and Warehousing	7,526	61.8%	41.7%	30.7%
Information	1,176	-38.3%	29.8%	5.1%
Finance and Insurance	11,317	20.5%	19.2%	9.8%
Real Estate and Rental and Leasing	2,385	19.3%	38.4%	18.7%
Professional, Scientific, and Technical Services	9,719	21.9%	23.5%	27.6%
Management of Companies and Enterprises	2,150	-36.2%	74.4%	29.8%
Administrative Support - Waste Management -Remediation Services	17,092	67.3%	43.0%	26.4%
Educational Services	21,814	-0.5%	4.1%	5.0%
Health Care and Social Assistance	36,479	14.1%	26.6%	27.1%
Arts, Entertainment, and Recreation	1,550	7.7%	50.4%	21.2%
Accommodation and Food Services	28,770	41.8%	45.2%	26.5%
Other Services (except Public Administration)	4,497	5.2%	23.5%	4.3%
Public Administration	10,774	-1%	5.3%	-0.9%

Source: BLS, Local Area Unemployment Statistics(1991-2019), Quarterly Census of Employment and Wages(1991-2019)

DataInsight

DATA INSIGHT:

- The second largest industry sector is the Accommodation and Food Services industry employing 28,770 employees and accounting for 13.2% of total employment for the year.
- Eight sectors in the Middle Georgia region suffered from decline from 2010 to 2019 with three in the double-digits, compared to one sector in the state of Georgia and the United States. For the region, the largest declines and rises were largely due to the service-producing sectors.

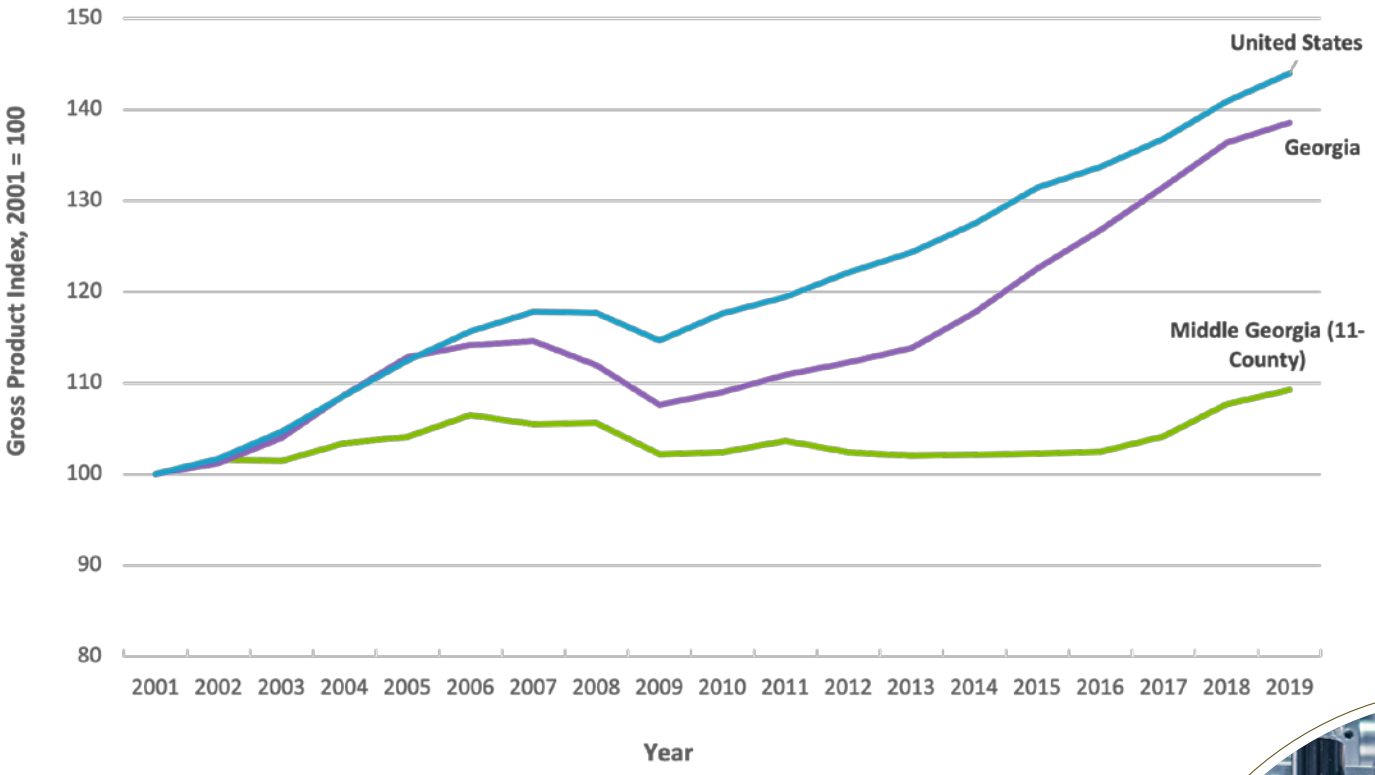
4.2.2 GROSS DOMESTIC PRODUCT (GDP)

Gross domestic product is the total value of all goods and services produced in a particular place in a particular year.

GROSS DOMESTIC PRODUCT INDEX

The state of Georgia has followed a similar trend to that of the United States in gross domestic product growth since 2009, whereas growth in the Middle Georgia region declined significantly relative to that of Georgia and the United States during the same time period.

Gross Product Index, 2001 - 2019



Source: Bureau of Economic Analysis (2001-2019)

DataInsight

DATA INSIGHT:

- After the recession of 2007-2009, Georgia's GDP grew at a far greater rate than that of the Middle Georgia region but at a lower rate than the United States.
- The Middle Georgia region suffered the most loss of gross domestic product during the recession of 2008-2009.

GROSS DOMESTIC PRODUCT CHANGE BY MAJOR INDUSTRY SECTORS

The Gross Domestic Product grew in 12 of the 20 major industry sectors in the Middle Georgia region from 2010 to 2019, compared to 19 (all but Public Administration) in Georgia and none in the United States.

Gross Product Change by Major Industry Sectors, 2010-2019

	Middle Georgia (000)		Georgia ($MIL)	USA ($MIL)
Industry	2019 GDP	Percentage Change (2010 - 2019)		
Public Administration	4,544,502	-2.4%	-0.6%	2.2%
Manufacturing	1,659,139	0.5%	16.4%	14.6%
Health Care and Social Assistance	1,812,987	17.6%	33.0%	25.0%
Retail Trade	1,269,528	8.7%	27.9%	24.2%
Finance and Insurance	1,278,834	9.8%	16.5%	12.4%
Real Estate and Rental and Leasing	2,810,104	31.6%	49.5%	22.3%
Professional, Scientific, and Technical Services	882,028	13.5%	42.2%	39.0%
Wholesale Trade	112,507	-78.3%	18.1%	15.3%
Construction	491,326	0.4%	35.4%	21.4%
Accommodation and Food Services	482,420	11.4%	20.7%	23.2%
Transportation and Warehousing	341,266	13.5%	21.6%	25.0%
Administrative Support - Waste Management -Remediation Services	467,866	41.0%	35.3%	28.8%
Other services (except Public Administration)	363,752	-8.8%	7.4%	8.1%
Information	612,621	93.2%	61.0%	65.8%
Utilities	711,219	-54.0%	11.8%	7.5%
Educational Services	178,710	-26.9%	5.2%	6.0%
Agriculture, Forestry, Fishing and Hunting	115,924	-3.5%	22.0%	25.7%
Management of Companies and Enterprises	283,386	53.1%	128.6%	59.6%
Arts, Entertainment, and Recreation	45,002	-15.2%	17.3%	27.1%
Mining, Quarrying, and Oil and Gas Extraction	388,293	-11.1%	9.3%	63.1%

Source: Bureau of Economic Analysis (2001-2019)

DataInsight

DATA INSIGHT:

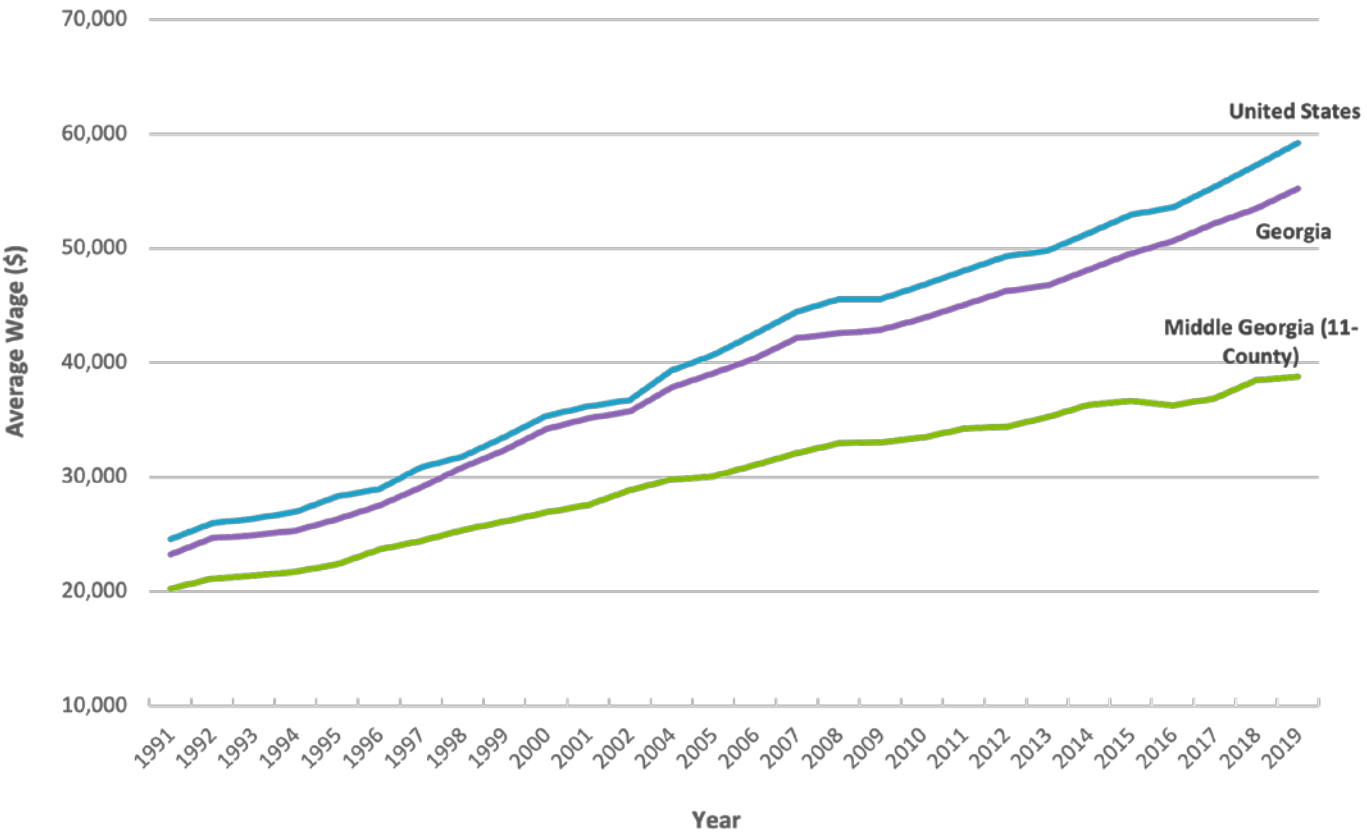
- Public Administration was the largest sector contributing to gross product in 2019 in the Middle Georgia region ($4.54 billion), accounting for 24.1% of total gross product. That same sector has declined by 2% over the period of 2010 - 2019. Federal government activity accounts for the majority of that sector and its growth.
- The second largest contributor to the GDP in 2019 was Real Estate and Rental and Leasing ($2.81 billion). The sector accounted for 14.9% of the Middle Georgia region gross product in 2019, and the output in this sector has increased by 31.6% since 2010.
- Healthcare and Social Assistance ($1.81 billion) was the third largest sector, it grew by 17.6% between 2010 and 2019.
- The Middle Georgia region lagged behind the growth rate of Georgia and the United States, with the Middle Georgia region only growing by 2% from 2010 to 2019, the United States by 22%, and Georgia by 28%.

4.2.3 AVERAGE WAGE

Wages are critical to the growth of local economies. Since 1996, the gap between the Middle Georgia region and the state of Georgia grew significantly. Simultaneously, the gap between Georgia and the United States widened most noticeably from 2007 to 2019.

AVERAGE WAGE DATA

Average Wage, 1991 - 2019



Source: BLS, Local Area Unemployment Statistics(1991-2019), Quarterly Census of Employment and Wages(1991-2019)

DataInsight

DATA INSIGHT:

- The average wage in the Middle Georgia region has been lower than in Georgia and the United States. By 2019, the average wage in the United States was $59,209, and the state of Georgia had an average wage of $55,263, while the Middle Georgia region had a lower average wage than both regions ($38,787).
- The Middle Georgia region lagged behind in wage growth in comparison to the state of Georgia and the United States. The average wage in the Middle Georgia region grew by 91% from 1991 to 2019, the state Georgia by 138%, and the United States by 141%.

AVERAGE WAGE CHANGE BY MAJOR INDUSTRY SECTORS

In the Middle Georgia region, average wages grew in all industry sectors between 2010 and 2019 except for Management of Companies and Enterprises (-11.5%). Total average wages grew in the Middle Georgia region by 22.2%, in Georgia by 22.1%, and in the United States by 24%.

Average Wage Change by Major Industry Sectors, 2010-2019

	Middle Georgia		Georgia	USA
Industry	2019 Average Wage	Percentage Change (2010 - 2019)		
Agriculture, Forestry, Fishing and Hunting	45,708	11.9%	22.7%	22.7%
Mining, Quarrying, and Oil and Gas Extraction	79,575	51.2%	26.5%	31.1%
Utilities	81,219	20.4%	20.6%	30.4%
Construction	53,507	33.6%	42.2%	17.2%
Manufacturing	55,214	6.9%	8.5%	21.6%
Wholesale Trade	59,507	31.4%	14.4%	12.2%
Retail Trade	28,510	21.7%	22.3%	14.7%
Transportation and Warehousing	37,871	2.7%	10.0%	22.6%
Information	48,183	8.6%	21.6%	31.2%
Finance and Insurance	56,609	18.5%	36.2%	28.7%
Real Estate and Rental and Leasing	45,949	86.0%	23.7%	22.4%
Professional, Scientific, and Technical Services	60,800	50.6%	20.5%	24.7%
Management of Companies and Enterprises	49,018	-11.5%	32.1%	28.5%
Administrative and Support and Waste Management and Remediation Services	37,781	34.9%	22.8%	22.5%
Educational Services	40,623	16.2%	22.6%	25.1%
Health Care and Social Assistance	38,275	12.4%	20.4%	24.7%
Arts, Entertainment, and Recreation	20,740	32.7%	4.6%	18.8%
Accommodation and Food Services	15,681	12.9%	21.3%	24.4%
Other Services (except Public Administration)	34,517	22.0%	23.3%	13.1%
Public Administration	34,788	14.4%	15.6%	25.1%

Source: BLS, Local Area Unemployment Statistics(1991-2019), Quarterly Census of Employment and Wages(1991-2019)

DataInsight

DATA INSIGHT:

- The sectors with the highest average wages in the Middle Georgia region were Utilities ($81,219), Mining, Quarrying, and Oil and Gas Extraction ($79,575), and Professional, Scientific, and Technical Services ($60,800). The average wage also grew in all three sectors between 2010 and 2019.
- The sectors with the highest growth rate for average wages in the Middle Georgia between 2010 and 2019 were Real Estate and Rental and Leasing (86%), Mining, Quarrying, and Oil and Gas Extraction (51.2%), and Professional, Scientific, and Technical Services (50.6%).

4.2.4 WINNING INDUSTRIES – TIER I

The analysis of the high performing industries explores 312 industry sectors to help identify which industries in the Middle Georgia region are outperforming others regionally. The data analyzed considered the NAICS 4-digit industries for greater depth and detail.

First tier high performing industries were identified by selecting industries based on the following criteria:

1. Percent Employment Change (2010 - 2019) > 1% – to show employment growth
2. Average Wage (2019) > $53,134.40 (15% more than total average wage for Middle Georgia) – to find industries that have livable wages
3. 2019 Employment > 500 – to find large employment industries

Source: Winning Industries – Tier I (pg. 26): https://engagedscholarship.csuohio.edu/cgi/viewcontent.cgi?article=1686&context=urban_facpub

HIGH PERFORMING INDUSTRIES TIER I: EMPLOYMENT AND AVERAGE WAGE

The table below shows the 16 industries that met the above criteria for Tier I High Performing Industries in the Middle Georgia region. All of the industries have employees greater than 500 in 2019 indicating that they are drivers of job creation and employment in the region. All together, these industries employed 37,936 individuals in 2019.

High Performing Industries (Tier I) in the Middle Georgia region in terms of Employment and Average Wage

		Employment				Average Wage			
NAICS Code	NAICS Description	2010	2019	Difference	% Change	2010	2019	Difference	% Change
2123	Nonmetallic Mineral Mining and Quarrying	157	590	433	276%	$51,411	**$80,199**	$28,788	56%
2362	Nonresidential Building Construction	748	953	205	27%	$51,668	$62,615	$10,946	21%
3222	Converted Paper Product Manufacturing	564	1,013	449	80%	$29,847	$54,890	$25,043	84%
3362	Motor Vehicle Body and Trailer Manufacturing	1,433	2,577	1,144	80%	$38,694	$58,842	$20,148	52%
4244	Grocery and Related Product Merchant Wholesalers	318	531	213	67%	$41,603	$64,604	$23,002	55%
4411	Automobile Dealers	2,096	2,611	515	25%	$42,043	$53,541	$11,498	27%
5241	Insurance Carriers	5,357	7,465	2,108	39%	$61,270	**$68,075**	$6,805	11%
5242	Agencies, Brokerages, and Other Insurance Related Activities	812	1,198	386	48%	$47,459	$55,316	$7,857	17%
5412	Accounting, Tax Preparation, Bookkeeping, and Payroll Services	1,137	1,203	66	6%	$40,583	$57,792	$17,210	42%
5415	Computer Systems Design and Related Services	1,195	1,903	708	59%	$60,422	**$94,977**	$34,555	57%
5416	Management, Scientific, and Technical Consulting Services	644	1,305	661	103%	$76,331	$68,304	-$8,027	-11%
6113	Colleges, Universities, and Professional Schools	2,738	4,268	1,530	56%	$46,325	$56,141	$9,816	21%
6211	Offices of Physicians	4,659	6,411	1,752	38%	$59,186	$61,411	$2,224	4%
6212	Offices of Dentists	1,260	1,299	39	3%	$47,421	$53,144	$5,723	12%
6216	Home Health Care Services	1,708	2,795	1,087	64%	$39,272	**$71,146**	$31,874	81%
6222	Psychiatric and Substance Abuse Hospitals	1,624	1,814	190	12%	$57,132	**$76,504**	$19,372	34%

Source: BLS, Local Area Unemployment Statistics, Quarterly Census of Employment andWages, 2019

DataInsight

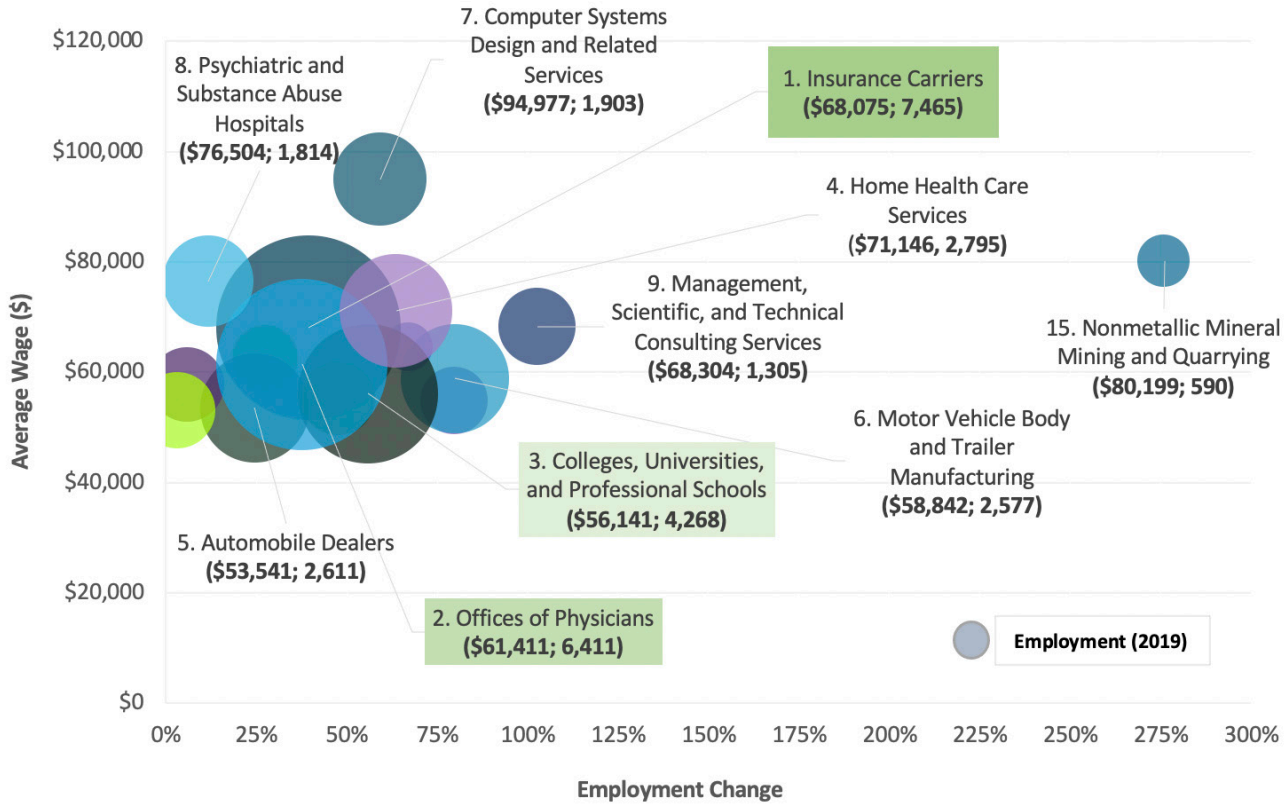
DATA INSIGHTS:

- The industries have an average wage of 15% greater ($53,134) than the average income ($46,204) in the Middle Georgia region. This suggests that they provide livable wages for their employees, and constantly experience growth in employment and wages except for the Management, Scientific, and Technical Consulting Services sector.
- The largest employer in 2019 was Insurance Carriers with 7,465 employees, which represented 19.7% of the Tier I employment in 2019. The highest paying industry in the region in 2019 was Computer Systems Design and Related Services with $94,977 as the average wage.

HIGH PERFORMING INDUSTRIES TIER I: AVERAGE WAGE BY EMPLOYMENT CHANGE & LEVEL

The comparison between the average wage, employment level, and employment growth helps to identify industries in the region by the ratio of jobs created to employees' level of salary.

High Performing Industries Tier I: Average Wage by Employment Change and Employment Level



Source: BLS, Local Area Unemployment Statistics(1991-2019), Quarterly Census of Employment and Wages(1991-2019)

DataInsight

DATA INSIGHT:

- The industries with the largest employment include Insurance Carriers, Offices of Physicians, and Colleges, Universities, and Professional Schools. Although these three industries have the highest number of employees, the average wage ranges from $56,141 to $68,075 and is not part of the top five.
- Six industries (Nonmetallic Mineral Mining and Quarrying; Converted Paper Product Manufacturing; Motor Vehicle Body and Trailer Manufacturing; Grocery and Related Product Merchant Wholesalers; Management, Scientific, and Technical Consulting Services; Home Health Care Services) had employment growth greater than 61% (overall growth average of all Tier I industries).

4.2.5 WINNING INDUSTRIES – TIER II

The analysis of the high performing industries explores 312 industry sectors to help identify which industries in the Middle Georgia region are outperforming others regionally. The data analyzed considered the NAICS 4-digit industries for greater depth and detail.

Second tier high performing industries were selected based on the following criteria:

1. Percent Employment Change (2010 - 2019) > 1% – to show employment growth
2. Average Wage (2019) > $46,204 (total average wage for Middle Georgia) – to find industries that have livable wages
3. 2019 Employment > 250 – to find fairly large employment industries

Source: Criteria for Winning Industries – Tier II (Pg. 31): https://engagedscholarship.csuohio.edu/cgi/viewcontent.cgi?article=1686&context=urban_facpub

HIGH PERFORMING INDUSTRIES TIER II: EMPLOYMENT AND AVERAGE WAGE

The table below shows the 15 industries that met the above criteria for Tier II High Performing Industries in the Middle Georgia region. All the industries have employees greater than 250 in 2019 indicating that they are part of the drivers of job creation and employment in the region. All together, these industries employed 11,376 individuals in 2019.

High Performing Industries (Tier II) in the Middle Georgia region in terms of Employment and Average Wage

		Employment				Average Wage			
NAICS Code	NAICS Description	2010	2019	Difference	% Change	2010	2019	Difference	% Change
2371	Utility System Construction	351	484	133	38%	$34,509	$46,828	$12,319	36%
2389	Other Specialty Trade Contractors	671	769	98	15%	$38,132	$48,048	$9,916	26%
3119	Other Food Manufacturing	1,576	1,766	190	12%	$37,060	**$49,904**	$12,844	35%
3323	Architectural and Structural Metals Manufacturing	168	317	149	89%	$24,524	**$57,830**	$33,306	136%
3327	Machine Shops; Turned Product; and Screw, Nut, and Bolt Manufacturing	246	324	78	32%	$52,128	**$57,269**	$5,141	10%
4231	Motor Vehicle and Motor Vehicle Parts and Supplies Merchant Wholesalers	158	295	137	87%	$37,394	$48,583	$11,189	30%
4238	Machinery, Equipment, and Supplies Merchant Wholesalers	538	753	215	40%	$43,047	$49,610	$6,563	15%
4841	General Freight Trucking	842	1,054	212	25%	$38,293	$48,014	$9,721	25%
4842	Specialized Freight Trucking	403	888	485	120%	$38,580	$47,980	$9,400	24%
4921	Couriers and Express Delivery Services	395	710	315	80%	$29,106	$47,275	$18,169	62%
5313	Activities Related to Real Estate	337	431	94	28%	$35,248	$46,987	$11,739	33%
5411	Legal Services	1,035	1,103	68	7%	$33,796	$47,929	$14,133	42%
5417	Scientific Research and Development Services	92	429	337	366%	$67,860	**$73,112**	$5,252	8%
5611	Office Administrative Services	389	429	40	10%	$61,671	**$71,590**	$9,919	16%
6214	Outpatient Care Centers	1,416	1,624	208	15%	$41,983	$47,476	$5,494	13%

Source: BLS, Local Area Unemployment Statistics, Quarterly Census of Employment andWages, 2019

DataInsight

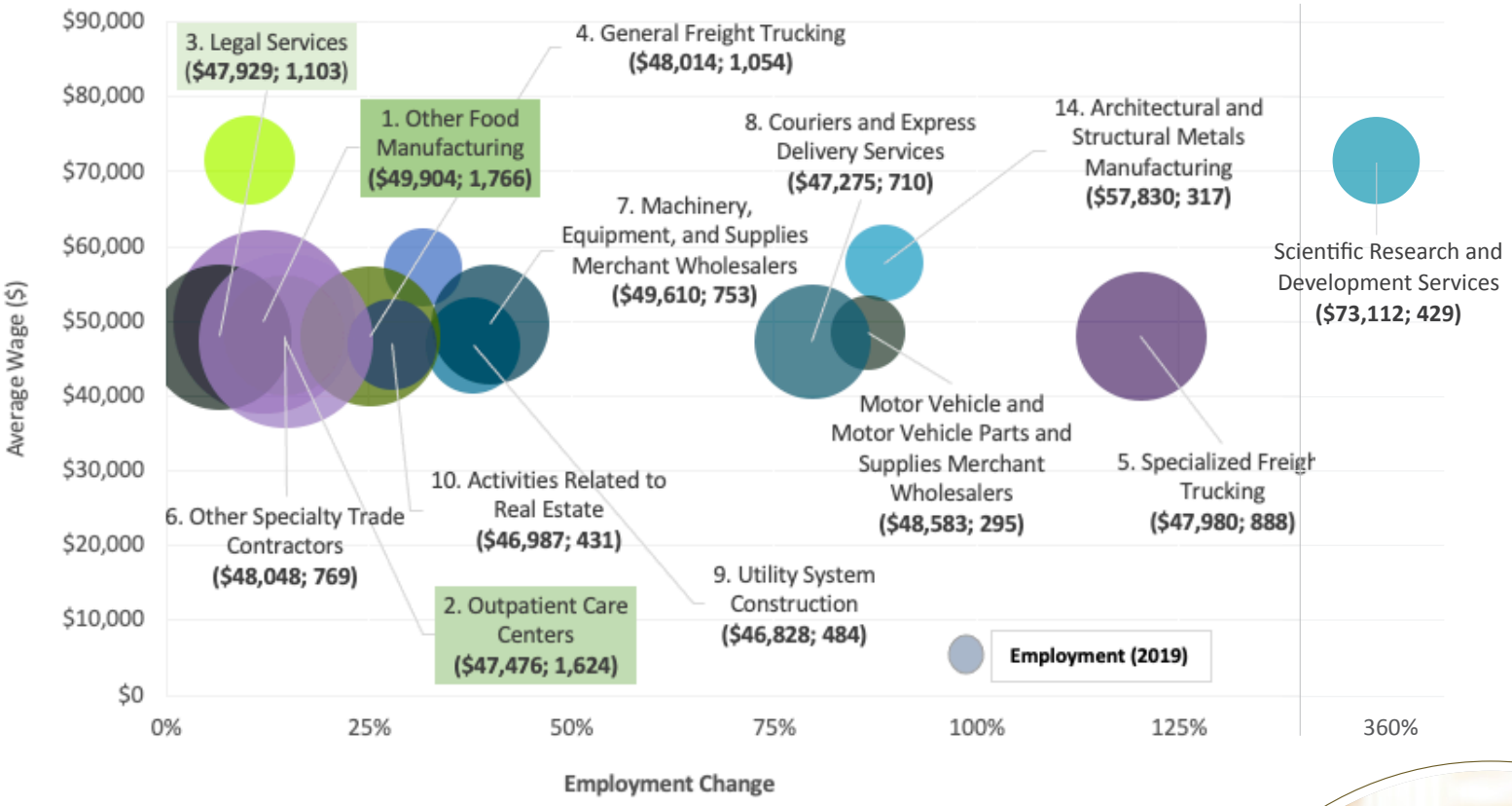
DATA INSIGHTS:

- Although the employment level the Tier II industries created is three times less than that of Tier I, the Tier II industries have an average wage greater than the average income ($46,204) in the Middle Georgia region. This suggests that they provide livable wages for their employees, and constantly experience growth in employment and wages.
- The largest employer in 2019 was the Other Food Manufacturing industry with 1,766 employees, which represented 15.5% of the Tier II employment in 2019. The highest paying industry in the region in 2019 for Tier II was Scientific Research and Development Services with $73,112 as the average wage.

HIGH PERFORMING INDUSTRIES TIER II: AVERAGE WAGE BY EMPLOYMENT CHANGE AND LEVEL

The comparison between the average wage, employment level, and employment growth helps to identify industries in the region by the ratio of jobs created to employees' level of salary.

High Performing Industries Tier II: Average Wage by Employment Change and Employment Level



Source: BLS, Local Area Unemployment Statistics(1991-2019), Quarterly Census of Employment and Wages(1991-2019)

DataInsight

DATA INSIGHT:

- The industries with the largest employment include Other Food Manufacturing, Outpatient Care Centers, and Legal Services. Although these three industries have the highest number of employees, the average wage which ranges from $47,476 to $49,904 is not part of the top three.
- Five industries (Architectural and Structural Metals Manufacturing; Motor Vehicle and Motor Vehicle Parts and Supplies Merchant Wholesalers; Specialized Freight Trucking; Couriers and Express Delivery Services; and Scientific Research and Development Services) had employment growth greater than 64% (overall growth average of all Tier II industries).

4.2.6 TOP EMPLOYERS

The table below highlights the largest private and public establishments with the greatest number of employments in the Middle Georgia Region.

In 2019, the top employment establishments in Middle Georgia account for 0.6% of the total employment level in the State of Georgia.

Top 25 Employers in the Middle Georgia Region, 2019

Rank	Company	County	Employees
1	Robins Air Force Base	Houston	24,500
2	GEICO	Macon-Bibb	4,939
3	Atrium Health - Navicent	Macon-Bibb	4,600
4	Houston Healthcare	Houston	2,675
5	Perdue Farms Inc.	Houston	2,267
6	Blue Bird Corp.	Peach	1900
7	Frito-Lay Inc.	Houston	1512
8	Coliseum Medical Center	Macon-Bibb	1200
9	YKK	Macon-Bibb	1147
10	Academy Sports & Outdoors/Distribution	Twiggs	800
11	BASF Corp.	Wilkinson	600
12	Tractor Supply Distribution	Macon-Bibb	600
13	Graphic Packaging International	Macon-Bibb	600
14	Northrop Grumman Corp.	Houston	500
15	Atrium Health - Navicent	Baldwin	500
16	Irving Tissue	Macon-Bibb	500
17	Kumho Tire	Macon-Bibb	450
18	Armstrong World Industries	Macon-Bibb	400
19	Graphic Packaging International	Houston	380
20	Georgia Power Co/Plant Scherer	Monroe	380
21	Pactiv Corp.	Macon-Bibb	350
22	Tyson Foods Distribution	Macon-Bibb	350
23	First Quality	Macon-Bibb	300
24	L.E. Schwartz & Son, Inc	Macon-Bibb	280
25	Cherokee Brick & Tile	Macon-Bibb	250

Source: Regional EDOs

DataInsight

DATA INSIGHT:

- The top 25 employers in the Middle Georgia region provided 51,980 total employments in 2019.
- The top 25 employers represent the major sources of employment for Middle Georgia: healthcare, insurance, logistics, manufacturing, public administration, agriculture, retail, media and natural resources (timber) related production.

4.2.7 FAST GROWTH FIRMS

The table below highlights the 2019 ranking of the private companies with the most proven track records in Middle Georgia and among the 5,000 fastest-growing private companies in the United States.

Fastest Growing Private Firms in Middle Georgia, by National Rank and Revenue Growth, 2018 - 2019

Rank	Name	Industry	County	City	Growth	Founded	Employees
2238	Langford Allergy	Health	Macon-Bibb	Macon	180%	2014	11 to 50
2378	BattlBox	Consumer Products & Services	Milledgeville	Baldwin	168%	2015	11 to 50
3319	ASP-America's Swimming Pool Company	Consumer Products & Services	Macon-Bibb	Macon	108%	2002	201 to 500
3466	LBA Ware	Software	Macon-Bibb	Macon	102%	2008	11 to 50
4153	Advanced Project Consulting	Government Services	Warner Robins	Houston	76%	2010	51 to 200

Note: Rank out of 5,000; Total employees may reflect those outside of Middle Georgia; Minimum revenue is $2Million in 2019
Source: www.inc.com

Langford Allergy

Provides medical treatment at 5 clinics for allergies, asthma, and immune deficiency patients.

BattlBox

Sells monthly subscription boxes of outdoor and survival gear for outdoor enthusiasts.

ASP

America's Swimming Pool Company runs a series of swimming pool servicing stores through its franchising operation. Serves over 400 cities and 22 states in the U.S. Helps families across the nation with maintenance, cleaning, repairs and installation for their swimming pools.

LBA Ware

Provides software to the mortgage industry which automates traditionally manual business processes.

Advanced Project

Provides professional services in the areas of engineering support services, aircraft sustainment, information management, and logistics support.

Of the 5,000 fastest-growing firms in the United States, five are in the Middle Georgia Region.

4.28 UNEMPLOYMENT RATE

In 2019, the unemployment rate for the Middle Georgia region (3.7%) was higher than the State of Georgia (3.4%) unemployment rate, but similar to that of the United States (3.7%).

Unemployment Rates for the Middle Georgia Region, State of Georgia, and United States, 2019

	Total Labor Force	Unemployed	Unemployment Rate
Baldwin	17,409	738	4.2%
Macon-Bibb	67,896	2,647	3.9%
Crawford	5,605	201	3.6%
Houston	70,345	2,340	3.3%
Jones	13,696	434	3.2%
Monroe	12,995	421	3.2%
Peach	11,826	483	4.1%
Pulaski	4,052	156	3.8%
Putnam	8,185	354	4.3%
Twiggs	2,878	156	5.4%
Wilkinson	3,959	151	3.8%
Middle Georgia	218,846	8,081	3.7%
Georgia	5,110,000	175,000	3.4%
United States	163,539,000	6,001,000	3.7%

Source: BLS, Local Area Unemployment Statistics(1991-2019), Quarterly Census of Employment and Wages(1991-2019)

DataInsight

DATA INSIGHT:

- Twiggs County had the highest unemployment rate in the Middle Georgia region (5.4%) while Jones and Monroe counties had the lowest rate (3.2%).
- Seven counties – Baldwin (4.2%), Macon-Bibb (3.9%), Peach (4.1%), Pulaski (3.8%), Putnam (4.3%), Twiggs (5.4%), and Wilkinson (3.8%) counties had unemployment rates higher than that of the state of Georgia (3.4%) and the United States (3.7%).

4.2.9 INDUSTRY LOCATION QUOTIENT

The location quotient (LQ) is an indicator of the self-sufficiency, or relative strength, of a particular industry. The metrics can be used to identify potential industries to focus innovation efforts. Areas with scores <0.9 have a relatively low employment level compared to the United States, those with scores from 0.9 to 1.10 have similar employment level relative to the United States, and those who have scores greater than 1.10 have more employment than the United States in that industry.

Location Quotient of Industry Employment for Counties in the Middle Georgia Region, 2019

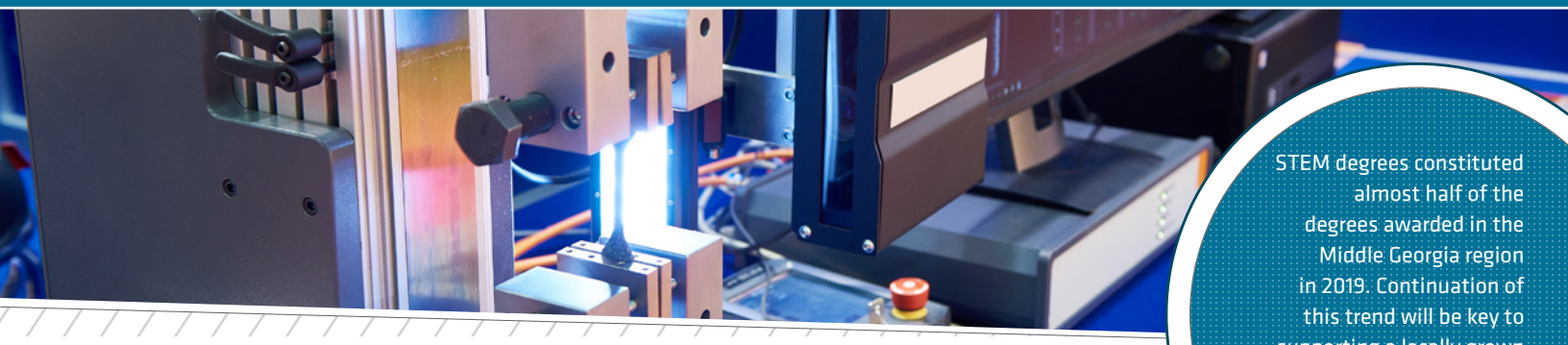
Industry	Baldwin	Macon-Bibb	Crawford	Houston	Jones	Monroe	Peach	Pulaski	Putnam	Twiggs	Wilkinson
Agriculture, Forestry, Fishing and Hunting		7.48	13.36	9.16	4.96	12.45	34.82	16.80	14.51	3.67	
Mining, Quarrying, and Oil and Gas Extraction						14.22					206.20
Utilities	7.03	38.75		44.44		85.47			7.79		
Construction	1.27	6.72	0.27	3.95	1.31	1.83	1.93	0.16	0.99	0.27	0.82
Manufacturing	0.73	3.72	0.07	4.25	0.05	0.45	1.87		0.35		0.11
Wholesale Trade	0.67	14.66	0.12	3.28	0.11	1.12	2.45	1.55	0.74		0.60
Retail Trade	0.86	4.40	0.04	2.78	0.19	0.29	0.45	0.12	0.28	0.03	0.07
Transportation and Warehousing	0.44	9.99		3.17	1.20	1.93	0.75	0.05	0.22	4.52	0.82
Information	2.58	26.51		11.33	0.63	1.10	1.56	1.73	1.99	0.59	1.69
Finance and Insurance	0.70	20.36	0.02	2.22	0.20	0.29	0.21	0.13	0.35	0.02	0.07
Real Estate and Rental and Leasing	3.59	36.20		18.93	0.46	1.10	2.06		1.61		
Professional, Scientific, and Technical Services	0.35	4.77	0.09	8.53	0.45	0.42	0.30	0.06	0.18	0.01	0.26
Management of Companies and Enterprises		59.31		2.53							
Administrative and Support and Waste Management and Remediation Services	1.11	6.29	0.03	3.86	0.14	0.46	0.65	0.06	0.37	0.02	2.74
Educational Services	1.57	4.60	0.19	2.85	0.50	0.45	0.79	0.11	0.37	0.10	0.12
Health Care and Social Assistance	0.60	3.49	0.03	1.51	0.17	0.13	0.13	0.18	0.17	0.03	0.03
Arts, Entertainment, and Recreation	7.13	18.70		19.29	2.76	2.96	1.14		1.41		
Accommodation and Food Services	0.93	4.37	0.01	3.72	0.18	0.37	0.49	0.14	0.27	0.02	0.01
Other Services (except Public Administration)	3.14	14.97	0.16	8.31	0.96	1.87	1.15	0.09	0.99	0.19	0.56
Public Administration	2.49	6.15	0.40	3.24	0.64	3.82	1.04	0.68	0.74	0.27	0.43
Relative to the US, more employment than one would expect.											
Relative to the US, less employment than one would expect.											
Relative to the US, similar employment.											

Source: BLS, Local Area Unemployment Statistics, Quarterly Census of Employment and Wages, 2019

DataInsight

DATA INSIGHTS:

- Majority of the counties in the Middle Georgia region have less employment relative to that of the United States based on their location quotients.
- All of the industries in Houston and Macon-Bibb counties have more employment levels when compared with that of the United States.
- Only the Agriculture, Forestry, Fishing and Hunting industry had higher employment levels than that of the U.S. in all the counties with data in the Middle Georgia region.
- Crawford County has the greatest number of industry employment levels relative to the Unites States, followed closely by Twiggs County.



STEM degrees constituted almost half of the degrees awarded in the Middle Georgia region in 2019. Continuation of this trend will be key to supporting a locally grown employment base for the development of a Software Center of Excellence in Middle Georgia.

5.0 INNOVATION TRENDS AND INDEX

5.1 INNOVATION TRENDS

Science, Technology, Engineering, and Mathematics (STEM) degrees are considered career paths that lead to a future in innovation and bring about competitive advantage in the present by growing everchanging technology in a global industrialized world. A region with strong STEM workforce is seen as one with unbridled potential for innovation which leads to the creation and development of new products to sustain the economy.

5.1.1 STEM DEGREES

The total number of STEM degrees awarded (6,886) represents 49.8% of all degrees awarded in the Middle Georgia region (13,817) in 2019.

STEM Degrees awarded by institutions in the Middle Georgia Region, 2019

Institution	Total Degrees Awarded	Total STEM Degrees Awarded	Physical Sciences	Engineering	Science & Engineering Technologies	Life Sciences	Math and Computer Sciences	Social Sciences & Psychology
Central Georgia Technical College	5,515	3,120	-	-	1,625	972	383	140
Georgia College & State University	1,766	629	40		27	334	86	142
Georgia Military College	1,992	650				397	101	152
Mercer University	2,578	1,372	26	197	1	851	35	262
Middle Georgia State University	1,334	739			122	365	183	69
Wesleyan College	194	102	-	1	5	39	2	55
Fort Valley State University	438	274	6		10	146	26	86
Total Degrees Awarded	**13,817**	**6,886**	**72**	**198**	**1,790**	**3,104**	**816**	**906**

Note: Degree awarded includes certificates, associate, bachelor's, master's, and doctoral degrees

Source: National Center for Education Statistics; National Science Foundation 2019

DataInsight

DATA INSIGHT:

- Of the institutions listed, Central Georgia Technical College and Mercer University (3,120 degrees and 1,372 degrees, respectively) represent 65% of STEM degrees awarded in the Middle Georgia region.
- Mercer University, the largest 4-year institution in the Middle Georgia region, awarded 1,372 degrees in STEM, and of those, 62% were in Life Sciences.
- Of all STEM degrees awarded by the Central Georgia Technical College, 83% (2,596) were in the certificate's category for programs less than one year in length.

5.1.2 UNIVERSITY RESEARCH AND DEVELOPMENT EXPENDITURES

Research and Development (R&D) expenditures in this sense are essentially funds that a University, College, or research center spends on developing new products or research into previously established innovation to enhance improvements.

Innovation requires strong partnerships and commitment to research and development. Sharing information and building stronger partnerships across sectors will help to create an innovation culture in Middle Georgia.

UNIVERSITY R&D EXPENDITURE IN MIDDLE GEORGIA

Total university R&D expenditures in the Middle Georgia region declined by 0.7% from 2012 to 2017.

University R&D Expenditure in Middle Georgia, 2012 – 2017 (Dollars in thousands)

Institution	2012	2013	2014	2015	2016	2017
Central Georgia Technical College	$0	$0	$0	$0	$0	$0
Georgia College & State University	$340	$393	$541	$774	$433	$271
Georgia Military College	$0	$0	$0	$0	$0	$0
Mercer University	$31,376	$28,892	$30,209	$32,838	$31,735	$29,447
Middle Georgia State University	$0	$0	$0	$0	$0	$0
Wesleyan College	$8,945	$8,120	$7,262	$7,223	$7,740	$8,945
Fort Valley State University	$3,665	$3,688	$4,547	$4,320	$5,138	$5,374

Source: National Science Foundation, 2017

DataInsight

DATA INSIGHT:

- Central Georgia Technical College, Georgia Military College, and Middle Georgia State University were the only institutions that recorded no university R&D expenditures from 2012 to 2017.
- The largest percentage decrease in expenditures during this time occurred at Georgia College & State University (20.3%) while the largest percentage increase occurred at Fort Valley State University (46.6%).

UNIVERSITY R&D BY SCIENCE TYPE IN MIDDLE GEORGIA

The Research and Development (R&D) expenditure targeted into different STEM areas helps to explain a region's innovation capacity and technological strength.

University R&D Expenditure by Science Type in Middle Georgia, 2017 (Dollars in thousands)

Institution	Total Amount Awarded	Physical Sciences	Engineering	Science and Engineering Technologies	Life Sciences	Math and Computer Sciences	Social Sciences And Psychology
Central Georgia Technical College	$0	$0	$0	$0	$0	$0	$0
Georgia College & State University	$271	$45	$0	$59	$103	$64	$0
Georgia Military College	$0	$0	$0	$0	$0	$0	$0
Mercer University	$29,447	$20	$23,942	$0	$5,172	$0	$18
Middle Georgia State University	$0	$0	$0	$0	$0	$0	$0
Wesleyan College	$8,945	$2,904	$0	$294	$2,167	$297	$1,177
Fort Valley State University	$5,374	$102	$0	$0	$5,085	$187	$0

Source: National Science Foundation, 2017

DataInsight

DATA INSIGHT:

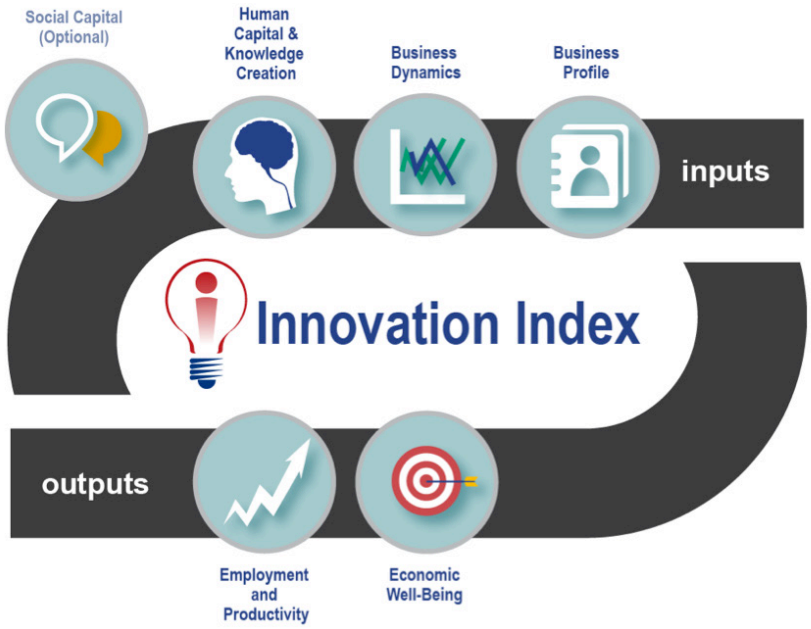
- The largest share of university R&D expenditures by science type in 2017 in the Middle Georgia region occurred in Engineering, which accounted for 54% of all University R&D expenditures for the region. Investment in Engineering all occurred at Mercer University.
- The second leading science type for university R&D expenditures occurred in Life Sciences ($12.5 million); with 41.3% derived from Mercer University, 40.5% from Fort Valley State University, and 17.3% from Wesleyan College.

5.2 INNOVATION INDEX

Data from the Innovation Index can be used to visualize and understand a region's weaknesses, strengths, and potential. The headline Innovation Index, a high-level summary index, is calculated from five major index categories (three based on innovation inputs and two based on innovation outputs). Those five indexes are built up from several core indexes that are built from several measures that are also organized thematically along more precisely defined concepts. (Driving Regional Innovation Report, 2016)

The Innovation Index provides insight into the innovation capacity of a region relative to the nation. This helps the region guide strategic discussions about where to invest scarce resources to build prosperity.

Innovation Index Composition



Source: Indiana Business Research Center, 2016

Below is the breakout of the elements that create the Innovation Index taken from as this report's source: *Driving Regional Innovation: The Innovation Index 2.0*, Indiana University, 2016.

Inputs

Inputs are those factors, influences or conditions that promote innovation and create knowledge and are categorized into three categories:

- The **Human Capital and Knowledge Creation Index** suggests the extent to which a region's population and labor force are able to engage in innovative activities.
- The **Business Dynamics Inde**x gauges the competitiveness of a region by investigating the entry and exit of individual firms – the creative destruction measures.
- The **Business Profile Index** measures local business conditions and resources available to entrepreneurs and businesses.

Outputs

Outputs are the direct outcomes and economic improvements that result from innovation inputs, and are divided into two categories:

- The **Employment and Productivity Index** describes economic growth, regional desirability or direct outcomes of innovative activity.
- The **Economic Well-Being Index** explores standard of living and other economic outcomes.

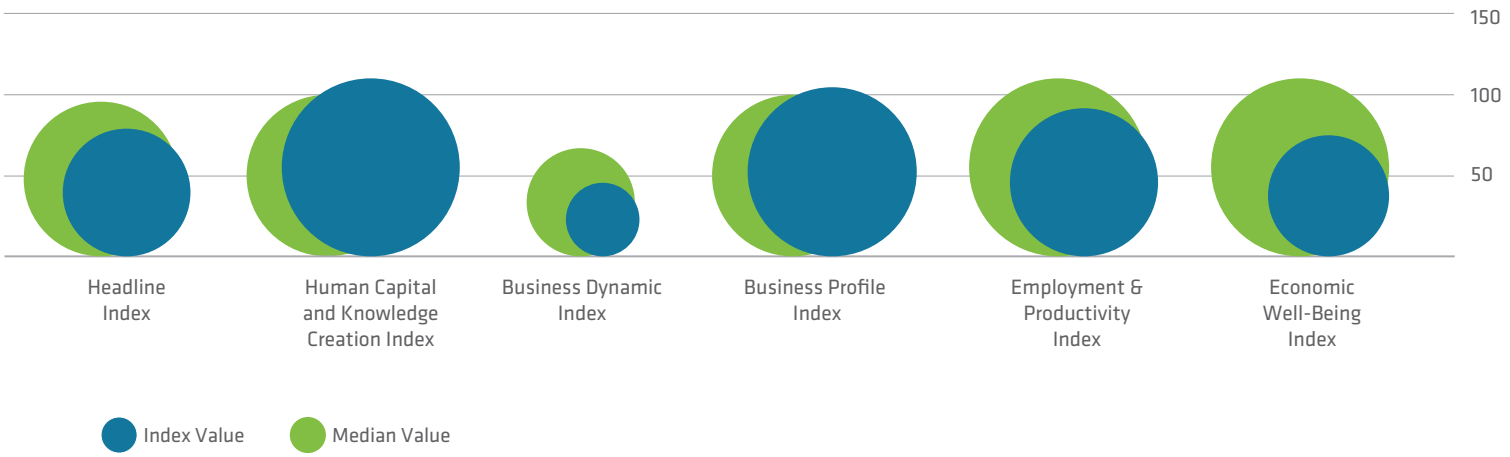
The Innovation Index charts in Section 5.2 are divided into three sets of counties: Middle Georgia, Regional Case Studies, and Local Case Studies. The four shaded counties in the Middle Georgia counties section are the four counties located closest to the Robins Air Force Base.

The core counties of Middle Georgia, anchored by the Robins Air Force Base and the City of Macon, have equal or better capacity for growth and innovation than the other case study regions. This capacity can be leveraged with intentional actions to create a Software Center for Excellence in Middle Georgia.

5.2.1 INNOVATION FOR MIDDLE GEORGIA

The Innovation Index shows that Middle Georgia's capacity for innovation is alive and well. Whereas overall, the 11-county region may lag behind the individual counties of the case studies, the core counties of Middle Georgia anchored by the Robins Air Force Base and the City of Macon have equal or better capacity for growth and innovation than many of the case study regions. This capacity is further explored in the following sections of this report. The graphic below shows index scores for the Middle Georgia region as a whole, compared to Median value for US.

Innovation Index for Middle Georgia compared to Median US value



Source: StatsAmerica – Innovation Index 2.0, U.S. Economic Development Administration, 2016

DataInsight

DATA INSIGHT:

- The Economic Well-Being Index shows that the counties of Crawford, Houston, Jones and Monroe rank higher in capacity than the local case studies; and the same as all of the regional case studies. The potential for economic well-being is an important driver for attracting and retaining a skilled workforce.
- The Human Capital and Knowledge Creation Core Index shows Macon-Bibb, Houston, and Peach counties rank high to very high in capacity. This is comparable to both the local and regional case studies and indicates tremendous potential to grow industries in Middle Georgia that require a pipeline of skilled talent.

5.2.2 INNOVATION INDEX BY COUNTIES

The high-level summary Headline Innovation Index shows that Macon-Bibb, Houston, Monroe and Peach counties are rated at a relatively normal capacity for innovation. This is the same rating as the local case studies in Richmond and Muscogee counties.

Headline Innovation Index for Middle Georgia

Areas	State	County	Largest City/Town	Headline Index	Rank (3110)	Capacity
Middle Georgia	Georgia	Baldwin County	Milledgeville	72.7	2,614	Low
	Georgia	**Macon-Bibb County**	**Macon**	**81.4**	**1,850**	Normal
	Georgia	Crawford County	Roberta	76.8	2,252	Low
	Georgia	**Houston County**	**Warner Robins**	**90**	**1,018**	Normal
	Georgia	Jones County	Gray	76.6	2,272	Low
	Georgia	Monroe County	Forsyth	81.4	1,850	Normal
	Georgia	**Peach County**	**Fort Valley**	**82.7**	**1,712**	Normal
	Georgia	Pulaski County	Hawkinsville	65.1	3,001	Very Low
	Georgia	Putnam County	Eatonton	75.8	2,364	Low
	Georgia	**Twiggs County**	**Jeffersonville**	**68.2**	**2,884**	Very Low
	Georgia	Wilkinson County	Gordon	72.6	2,625	Low
Regional Case Study	Tennessee	Hamilton County	Chattanooga	106	268	Very High
	Alabama	Madison County	Huntsville	111	140	Very High
	Ohio	Hamilton County	Cincinnati	108.1	208	Very High
Local Case Study	Georgia	Richmond County	Augusta	85.9	1,385	Normal
	Georgia	Muscogee County	Columbus	88.4	1,152	Normal
	Georgia	Chatham County	Savannah	95.5	626	High

Source: StatsAmerica – Innovation Index 2.0, U.S. Economic Development Administration

DataInsight

DATA INSIGHT:

- Of the four areas (shaded) with proximity to Robins Air Force Base, only Twiggs County had a very low capacity for innovation.
- Among the local case study areas for comparison outside Middle Georgia, Chatham County has a high potential for wealth building due to its high capacity for innovation.

5.2.3 HUMAN CAPITAL AND KNOWLEDGE CREATION CORE INDEX

The indicators included in the human capital and knowledge creation component index suggest the extent to which a county's population and labor force can engage in innovative activities. Counties with high levels of human capital are those with enhanced knowledge that can be measured by high educational attainment, STEM-related occupations, and creation of knowledge and technology for adoption by a population. (Driving Regional Innovation Report, 2016)

Continuing to support and expand those activities that build human capital and knowledge creation in the Middle Georgia region are important components in building an innovation culture in the region.

Human Capital and Knowledge Creation Core Index for Middle Georgia

Areas	State	County	Largest City/Town	Headline Index	Rank (3110)	Capacity
Middle Georgia	Georgia	Baldwin County	Milledgeville	93.4	1,402	Normal
	Georgia	**Macon-Bibb County**	**Macon**	**108.5**	**788**	High
	Georgia	Crawford County	Roberta	69	2,690	Low
	Georgia	**Houston County**	**Warner Robins**	**124.5**	**426**	Very High
	Georgia	Jones County	Gray	84.7	1,853	Normal
	Georgia	Monroe County	Forsyth	92.9	1,419	Normal
	Georgia	**Peach County**	**Fort Valley**	**131.4**	**308**	Very High
	Georgia	Pulaski County	Hawkinsville	78.2	2,227	Low
	Georgia	Putnam County	Eatonton	90.7	1,529	Normal
	Georgia	**Twiggs County**	**Jeffersonville**	**60.5**	**2,967**	Very Low
	Georgia	Wilkinson County	Gordon	65.5	2,820	Very Low
Regional Case Study	Tennessee	Hamilton County	Chattanooga	126.3	396	Very High
	Alabama	Madison County	Huntsville	142.8	144	Very High
	Ohio	Hamilton County	Cincinnati	147.3	95	Very High
Local Case Study	Georgia	Richmond County	Augusta	102.5	991	Normal
	Georgia	Muscogee County	Columbus	131.3	309	Very High
	Georgia	Chatham County	Savannah	127.2	382	Very High

Source: StatsAmerica – Innovation Index 2.0, U.S. Economic Development Administration

DataInsight

DATA INSIGHT:

- In Middle Georgia, Peach County and Houston County have the highest innovation levels for human capital and knowledge creation. Of the four areas (shaded) with proximity to Robins Air Force Base, only Twiggs County had a very low capacity for innovation.
- With 90.1 as the human capital median value, three of the Middle Georgia region counties (Macon-Bibb, Houston and Peach) have a high to very high innovation capacity. Counties like Baldwin, Jones, Monroe, and Putnam show a relatively normal capacity for innovation in human capital and knowledge creation.

5.2.4 BUSINESS DYNAMICS INDEX

Business dynamics is the entry and exit mechanism by which outdated ideas and industry practices are replaced by new and potentially revolutionary ones. Business dynamics measures establishment formations (births of establishment, jobs attributed to the births and changes over time), establishment dynamics (establishment expansions and deaths), and venture capital. Business dynamics drives competition—creating new industries, invigorating old ones and relegating inefficient practices to the pages of history. (Driving Regional Innovation Report, 2016)

The region-wide low to normal capacity ratings for all counties in Middle Georgia show less entry and exits of establishments and venture capital in the region.

Business Dynamics Index for Middle Georgia

Areas	State	County	Largest City/Town	Headline Index	Rank (3110)	Capacity
Middle Georgia	Georgia	Baldwin County	Milledgeville	51.1	1,507	Normal
	Georgia	**Macon-Bibb County**	**Macon**	**42.9**	**2,375**	**Low**
	Georgia	Crawford County	Roberta	76.8	2,252	Low
	Georgia	**Houston County**	**Warner Robins**	**48.8**	**1,754**	**Normal**
	Georgia	Jones County	Gray	39.6	2,648	Low
	Georgia	Monroe County	Forsyth	49.1	1,715	Normal
	Georgia	**Peach County**	**Fort Valley**	**44.7**	**2,176**	**Normal**
	Georgia	Pulaski County	Hawkinsville	40.2	2,609	Low
	Georgia	Putnam County	Eatonton	54.8	1,213	Normal
	Georgia	**Twiggs County**	**Jeffersonville**	**39.1**	**2,683**	**Very Low**
	Georgia	Wilkinson County	Gordon	46	2,025	Normal
Regional Case Study	Tennessee	Hamilton County	Chattanooga	95.7	177	Very High
	Alabama	Madison County	Huntsville	85.2	286	Very High
	Ohio	Hamilton County	Cincinnati	78.3	371	Very High
Local Case Study	Georgia	Richmond County	Augusta	47.3	1,887	Normal
	Georgia	Muscogee County	Columbus	73.3	460	High
	Georgia	Chatham County	Savannah	54.3	1,247	Normal

Source: StatsAmerica - Innovation Index 2.0, U.S. Economic Development Administration

DataInsight

DATA INSIGHT:

- Among the Middle Georgia counties, Putnam has the highest innovation level for business dynamics and Twiggs County has the lowest.
- With 84.3 as the business dynamics median value, none of the Middle Georgia counties have high innovation capacity for business dynamics. Counties like Baldwin, Houston, Monroe, Peach, Putnam, and Wilkinson show a relatively normal capacity for innovation in business dynamics.

5.2.5 BUSINESS PROFILE INDEX

The Business Profile Index attempts to gauge the business environment of a region by measuring the local business conditions and resources available to entrepreneurs and businesses.

The components of the Business Profile Index identify the possible resources a region might offer that can lead to growth and subsequent innovation. These resources can be found in the form of capital (foreign investments or local banks), connectivity within and with other regions, dynamism of region and entrepreneurship. (Driving Regional Innovation Report, 2016)

Business Profile Index for Middle Georgia

Areas	State	County	Largest City/Town	Index	Rank (3110)	Capacity
Middle Georgia	Georgia	Baldwin County	Milledgeville	66.3	2179	Normal
	Georgia	**Macon-Bibb County**	**Macon**	**85**	**777**	High
	Georgia	Crawford County	Roberta	60.3	2647	Low
	Georgia	**Houston County**	**Warner Robins**	**81.7**	**962**	Normal
	Georgia	Jones County	Gray	74.7	1475	Normal
	Georgia	Monroe County	Forsyth	76.9	1299	Normal
	Georgia	**Peach County**	**Fort Valley**	**76.2**	**1351**	Normal
	Georgia	Pulaski County	Hawkinsville	62.7	2467	Low
	Georgia	Putnam County	Eatonton	89.4	561	High
	Georgia	**Twiggs County**	**Jeffersonville**	**76.1**	**1358**	Normal
	Georgia	Wilkinson County	Gordon	87	679	High
Regional Case Study	Tennessee	Hamilton County	Chattanooga	102.3	122	Very High
	Alabama	Madison County	Huntsville	99.4	182	Very High
	Ohio	Hamilton County	Cincinnati	103.7	95	Very High
Local Case Study	Georgia	Richmond County	Augusta	86.2	723	High
	Georgia	Muscogee County	Columbus	63.7	2382	Low
	Georgia	Chatham County	Savannah	86.8	687	High

Source: StatsAmerica - Innovation Index 2.0, U.S. Economic Development Administration

DataInsight

DATA INSIGHT:

- Among the counties in Middle Georgia, Putnam has the highest innovation level for local business conditions and resources available to entrepreneurs and businesses while Crawford county has the lowest. Only Putnam, Wilkinson and Macon-Bibb counties have a comparable advantage and potential to the local case study areas in Georgia.
- With 73.9 as the business profile median value, three Middle Georgia counties have a high innovation capacity. Counties like Baldwin, Houston, Jones, Monroe, Peach, and Twiggs show a relatively normal capacity for innovation regarding conditions and resources available to entrepreneurs and businesses.

5.2.6 EMPLOYMENT AND PRODUCTIVITY INDEX

This index describes economic growth, job growth, regional desirability and the direct outcomes of innovative activity. Measures in this index suggest the extent to which local and regional economies are moving up the value chain by producing more sophisticated and differentiated products and are increasing the high-value talent pool. (Driving Regional Innovation Report, 2016)

With respect to employment and productivity, the Middle Georgia counties of Macon-Bibb, Houston, Jones and Monroe have comparable innovation capacities to that of the local case study in Richmond County.

Employment and Productivity Index for Middle Georgia

Areas	State	County	Largest City/Town	Headline Index	Rank (3110)	Capacity
Middle Georgia	Georgia	Baldwin County	Milledgeville	78.6	2735	Low
	Georgia	**Macon-Bibb County**	**Macon**	**90.3**	**2115**	Normal
	Georgia	Crawford County	Roberta	86.3	2357	Low
	Georgia	**Houston County**	**Warner Robins**	**91.7**	**2037**	Normal
	Georgia	Jones County	Gray	89.7	2146	Normal
	Georgia	Monroe County	Forsyth	90.4	2108	Normal
	Georgia	**Peach County**	**Fort Valley**	**85**	**2446**	Low
	Georgia	Pulaski County	Hawkinsville	71.7	2946	Very Low
	Georgia	Putnam County	Eatonton	65.5	3049	Very Low
	Georgia	**Twiggs County**	**Jeffersonville**	**87.6**	**2295**	Low
	Georgia	Wilkinson County	Gordon	82	2588	Low
Regional Case Study	Tennessee	Hamilton County	Chattanooga	102.4	1244	Normal
	Alabama	Madison County	Huntsville	114.5	456	High
	Ohio	Hamilton County	Cincinnati	106.5	914	Normal
Local Case Study	Georgia	Richmond County	Augusta	102.5	1235	Normal
	Georgia	Muscogee County	Columbus	85.5	2416	Low
	Georgia	Chatham County	Savannah	108.4	802	High

Source: StatsAmerica – Innovation Index 2.0, U.S. Economic Development Administration

DataInsight

DATA INSIGHT:

- Among the counties in Middle Georgia, Houston has the highest innovation level for employment and productivity and Putnam County has the lowest.
- With 98.4 as the employment and productivity median value, none of the Middle Georgia Region counties have a high to very high innovation capacity. Counties like Macon-Bibb, Houston, Jones, and Monroe show a relatively normal capacity for innovation in employment and productivity.

5.2.7 ECONOMIC WELL-BEING INDEX

Economic Well-being measures poverty rates, unemployment rates, net migration, compensation, and the growth in per capita personal income. Great and innovative economies improve economic well-being such that residents earn more and have a higher standard of living, decrease in poverty rates, increased employments and improved income which signals the region as a desirable location to live in and brings in-migration of new residents (Driving Regional Innovation Report, 2016).

The Middle Georgia counties of Crawford, Houston, Jones and Monroe all rank higher in the Economic Well-Being Index than the local Georgia case studies in Richmond, Muscogee, and Chatham counties.

Economic Well-Being Index for Middle Georgia

Areas	State	County	Largest City/Town	Index	Rank (3110)	Capacity
Middle Georgia	Georgia	Baldwin County	Milledgeville	69.4	3,081	Very Low
	Georgia	**Macon-Bibb County**	**Macon**	**70.5**	**3,072**	Very Low
	Georgia	Crawford County	Roberta	109	1,583	Normal
	Georgia	**Houston County**	**Warner Robins**	**115.2**	**1,308**	Normal
	Georgia	Jones County	Gray	99.4	2,057	Normal
	Georgia	Monroe County	Forsyth	104.9	1,773	Normal
	Georgia	**Peach County**	**Fort Valley**	**67.8**	**3,090**	Very Low
	Georgia	Pulaski County	Hawkinsville	74.3	3,025	Very Low
	Georgia	Putnam County	Eatonton	92.2	2,442	Low
	Georgia	**Twiggs County**	**Jeffersonville**	**67.2**	**3,094**	Very Low
	Georgia	Wilkinson County	Gordon	83.2	2,831	Very Low
Regional Case Study	Tennessee	Hamilton County	Chattanooga	104.6	1,798	Normal
	Alabama	Madison County	Huntsville	111.2	1,480	Normal
	Ohio	Hamilton County	Cincinnati	103.1	1,881	Normal
Local Case Study	Georgia	Richmond County	Augusta	79.3	2,943	Very Low
	Georgia	Muscogee County	Columbus	90.8	2,532	Low
	Georgia	Chatham County	Savannah	93.1	2,384	Low

Source: StatsAmerica – Innovation Index 2.0, U.S. Economic Development Administration

DataInsight

DATA INSIGHT:

- Among the Middle Georgia counties, Houston has the highest innovation level for economic well-being and Twiggs county has the lowest.
- With 109.7 as the economic well-being median value, none of the Middle Georgia counties have a high economic well-being level. Counties like Crawford, Houston, Jones, and Monroe show a relatively normal economic well-being level. The others show low or very low capacity for innovation in this area. It should be noted that none of the case studies in any category have high to very high capacity in this index.
- Of the four areas (shaded) with proximity to Robins Air Force Base, only Houston County had a normal economic well-being level.

6.0 ACKNOWLEDGMENTS

Future iQ would like to acknowledge the contribution of everyone who has informed the findings in this report through survey responses, taking part in focus groups or interviews. We would also like to thank Angie Gheesling and Dan Rhoades for their insightful guidance and consistent support at weekly project meetings with the Future iQ team.

7.0 FOR MORE INFORMATION

For more information about The Middle Georgia Innovation Project

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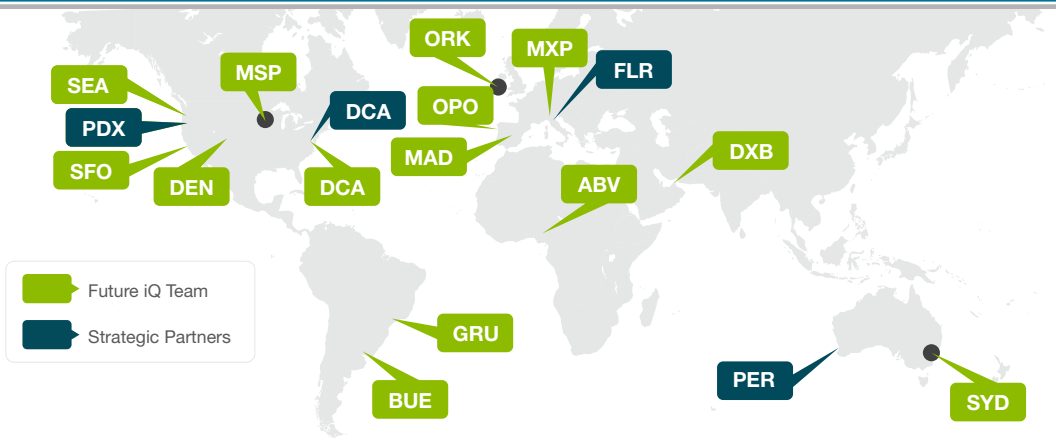
For more information, and to access additional reports, please visit:
https://lab2.future-iq.com/middle-georgia-innovation/

The Middle Georgia Innovation Project Innovation Framework and Ecosystem Report
February 2021

The Middle Georgia Innovation Project Innovation Performance and Gap Analysis Report - Part 1
March 2021

The Middle Georgia Innovation Project Innovation Performance and Gap Analysis Report - Part 2
March 2021



8.0 ABOUT FUTURE IQ

Future iQ specializes in applying innovative tools and approaches to assist cities, organizations, regions and industries shape their economic and community futures. With nearly two decades of experience, the company has a global clientele spanning three continents.

To learn more about Future iQ, and our recent projects visit **www.future-iq.com** or by email at **info@future-iq.com**

For more details, and to access additional information about the Middle Georgia Innovation Project please visit **https://lab2.future-iq.com/middle-georgia-innovation/**

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