



**Analysis of the Economic Impact of  
North Carolina A&T State  
University**



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# Executive summary

*This report assesses the impact of North Carolina Agricultural and Technical State University (N.C. A&T) on the state's economy and the benefits generated by the university for students, taxpayers, and society. The results of this study show that N.C. A&T creates a positive net impact on the state's economy and generates a positive return on investment for students, taxpayers and society.*





During the analysis year, N.C. A&T spent \$215 million on payroll and benefits for 1,973 full-time and part-time employees and spent another \$126 million on goods and services to carry out its day-to-day operations and research activities. This initial round of spending creates more spending across other businesses throughout the state economy, resulting in the commonly referred to multiplier effects. This analysis estimates the net economic impact of N.C. A&T that directly takes into account the fact that state and local dollars spent on the university could have been spent elsewhere in the state if not directed towards N.C. A&T and would have created impacts regardless. We account for this by estimating the impacts that would have been created from the alternative spending and subtracting the alternative impacts from the spending impacts of N.C. A&T.

This analysis shows that in fiscal year 2022 (FY22), operations, research, construction, visitor and student spending of N.C. A&T, together with its alumni, generated \$1.42 billion in added income for the North Carolina economy and a total economic impact of \$2.4 billion.

The additional income of \$1.42 billion created by the university is equal to approximately 0.21% of the total gross state product (GSP) of North Carolina. The total impact of \$2.4 billion is equivalent to supporting 17,337 jobs. These economic impacts break down as follows:

## Operations spending impact



Payroll and benefits to support N.C. A&T's day-to-day operations (excluding payroll from research employees) amounted to \$215 million. The university's non-pay expenditures amounted to \$126 million. The net impact of operations spending by the university during the analysis year was approximately \$440 million in added income for a total impact of \$744 million, which is equivalent to supporting 7,163 jobs.



NORTH CAROLINA

**The value added of \$1.42 billion created by N.C. A&T is equal to approximately 0.21% of the total gross state product.**

## Research spending impact



Research activities of the university impact the economy by employing people and making purchases for equipment, supplies and services. They also facilitate new knowledge creation throughout the state. In FY22, N.C. A&T spent \$73 million on payroll and other expenditures to support research activities. Research spending of the university generated \$85 million in added income for a total impact of \$157 million, which is equivalent to supporting 783 jobs.

## Construction spending impact



N.C. A&T invests in construction each year to maintain its facilities, create additional capacities and meet its growing educational demands. While the amount varies from year to year, these expenditures have a substantial impact on the state economy. Averaging FY20-FY22, the university's construction spending generated \$45 million in added income for a total output of \$79 million, equivalent to supporting 488 jobs.

## Visitor spending impact



Visitors attracted to North Carolina for activities at N.C. A&T brought new dollars to the economy through their spending at hotels, restaurants, gas stations and other state businesses. Spending from visitors added approximately \$24 million in income for the state economy for an impact of \$44 million, equivalent to supporting 368 jobs.

## Student spending impact



Around 32% of students attending N.C. A&T originated from outside the state. Some of these students relocated to North Carolina to attend the university. In addition, some students, referred to as retained students are residents of North Carolina who would have left the state if not for N.C. A&T's existence. The money that these students spent toward living expenses in North Carolina is attributable to the university.

The expenditures of relocated and retained students in the state during the analysis year added approximately \$118 million in income for the North Carolina economy, a total output of \$178 million, supporting 1,576 jobs.

## Alumni impact



Over the years, students gained new skills, making them more

productive. Today, thousands of these former students are employed in North Carolina. The accumulated impact of former students currently employed in the state's workforce amounted to \$702 million in added income for the state economy for an impact of \$1.2 billion, which is equivalent to supporting 6,959 jobs.

**When reviewing the impacts estimated in this study, it is important to note that the study reports impacts in the form of added income and total output. Total output includes all of the intermediary costs associated with producing goods and services, as well as money that leaks out of the state as it is spent at out-of-state businesses. Income, on the other hand, is a net measure that excludes these intermediary costs and leakages, and is synonymous with gross state product (GSP) and value added. For this reason, it is a more meaningful measure of new economic activity than output.**

## ACKNOWLEDGMENTS

### Office of the Provost

**Tonya Smith-Jackson, Ph.D.**  
Provost and Executive Vice Chancellor  
for Academic Affairs

#### Vice Chancellors

**Eric Muth, Ph.D.**  
Vice Chancellor for Research  
and Economic Development

**Tom Jackson**  
Vice Chancellor for  
Information Technology

**Melody Pierce, Ph.D.**  
Vice Chancellor for  
Student Affairs

# INTRODUCTION

North Carolina Agricultural and Technical State University, established in 1891, has today grown to serve 13,487 students. The university is led by Chancellor Harold L. Martin Sr. The university's service region, for the purpose of this report, is the state of North Carolina.

While N.C. A&T affects the state of North Carolina in a variety of ways, many of them difficult to quantify, this study considers the university's economic impacts. The university naturally helps students achieve their individual potential and develop the knowledge, skills and abilities they need to have fulfilling and prosperous careers. However, N.C. A&T impacts the state beyond influencing the lives of students.

The university's program offerings supply employers with workers to make their businesses more productive. The university, its day-to-day and research operations, its construction activities, and the expenditures of its visitors and students support the state economy through the output and employment generated by state vendors. The benefits created by the university extend as far as the state treasury in terms of the increased tax receipts and decreased public sector costs generated by students across the state.

This report assesses the impact of N.C. A&T as a whole on the state economy and the benefits generated by the university for students, taxpayers and society. We begin with an economic impact analysis of the university on the North Carolina economy. To derive results, we rely on a specialized Social Accounting Matrix software called IMPLAN, an input-output dollar flow accounting table that models the economic relationships between government, industry and households. The regional models generated are then used to calculate the added income created in the North Carolina economy as a result of increased consumer spending and the added knowledge, skills and abilities of students. Results of the economic impact analysis are broken out according to the following impacts: 1) impact of the university's day-to-day operations, 2) impact of research spending, 3) impact of the university's construction spending, 4) impact of visitor spending, 5) impact of student spending and 6) impact of alumni who are still employed in the North Carolina workforce.



**N.C. A&T impacts North Carolina beyond influencing the lives of students.**

For taxpayers, the study measures the benefits to state taxpayers in the form of increased tax revenues and public sector savings stemming from a reduced demand for social services.

The study uses a wide array of data that are based on several sources, including the FY22 academic and financial reports of N.C. A&T from the University of North Carolina System; industry and employment data from the Bureau of Labor Statistics and Census Bureau; outputs of IMPLAN's economic impact and SAM model; and a variety of published materials relating education to social behavior.





CHAPTER 1:

# Profile of North Carolina A&T State University and the economy



North Carolina Agricultural and Technical State University is a public, doctoral/research, 1890 land-grant university committed to exemplary teaching and learning, scholarly and creative research and effective engagement and public service. The university offers degrees at the baccalaureate, master's and doctoral levels and has a commitment to excellence in a comprehensive range of academic disciplines. Our unique legacy and educational philosophy provide students with a broad range of experiences that foster transformation and leadership for a dynamic and global society.

In 1890, Congress enacted the Second Morrill Act that mandated “a separate college for the colored race.” The Agricultural and Mechanical College for the Colored Race (now N.C. A&T) was established as that school in the state of North Carolina by an act of the General Assembly ratified on March 9, 1891. Originally operating in Raleigh as an annex to Shaw University, the college made a permanent home in Greensboro with the help of citizens such as Dr. DeWitt (a Black dentist), C. Benbow, and Charles H. Moore.

In 1915, state legislators changed the college's name to the Agricultural and Technical College of North Carolina; and in 1967, they elevated it to university status. N.C. A&T became a constituent university of the University of North Carolina System in 1972.

On February 1, 1960, four A&T freshmen helped spark the Civil Rights Movement in the South. Four N.C. A&T students "sat-in" at an all-white eating establishment (Woolworth's) and demanded equal service at the lunch counter. Because of their great desire for change and equality, they inspired many other students of the university to join them in their non-violent protest to desegregate Woolworth's lunch counter. By the end of July 1960, their mission was accomplished, and they became the A&T Four and their campaign became known as the Greensboro sit-ins.

N.C. A&T is the nation's largest HBCU and graduates the largest number of African American engineers at the undergraduate, master's and doctoral levels. Through its Willie A. Deese College of Business and Economics, N.C. A&T is also among the largest producers of African American certified public accountants. True to its heritage, the university is home to the largest agricultural college among HBCUs and is the nation's second largest producer of minority agricultural graduates.



**N.C. A&T is the nation's largest HBCU and graduates the largest number of African American engineers at the undergraduate, master's and doctoral levels.**

# NCAT EMPLOYEE AND FINANCE DATA



The study uses two general types of information: 1) data collected from the University of North Carolina System on the university and 2) state economic data obtained from various public sources and IMPLAN's proprietary data modeling tools.<sup>1</sup> This chapter presents the basic underlying information on N.C. A&T used in this analysis and provides an overview of the economy.

## Employee data

Data provided by the University of North Carolina System include information on faculty and staff. These data appear in Table 1.1. As shown, N.C. A&T employed 1,664 full-time and 309 part-time faculty and staff in FY21 (including student workers). Of these, all worked in the state. These data are used to isolate the portion of the employees' payroll and household expenses that remains in the state economy.

Table 1.1: **EMPLOYEE DATA, FY21**

Full-time faculty and staff	1,664
Part-time faculty and staff	309
Total faculty and staff	1,973
% of employees who work in the state	100%

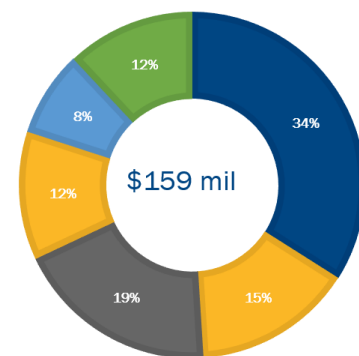
Source: Data provided by the U of NC System.

## Operating Revenues

Figure 1.1 shows the university's annual revenues by funding source—a total of \$159 million in FY22. As indicated, tuition and fees comprised 15% of total revenue, and revenues from local, state and federal government sources comprised another 53%. State government revenue includes the normal cost of pensions and fringe benefits provided by the State of North Carolina in the form of payments on behalf. All other revenue (i.e., auxiliary revenue, sales and donations) comprised the remaining 32%. These data are critical in identifying the annual costs of educating the student body from the perspectives of students, taxpayers and society.

Figure 1.1: **N.C. A&T REVENUES BY SOURCE, FY22**

- Government grants and contracts (34%)
- Tuition and fees (15%)
- State appropriations (19%)
- Private gifts, grants, and contracts (12%)
- Investment return (8%)
- Other core revenues (12%)



\* Revenue from state and local government includes capital appropriations. State government revenue also includes the normal cost of pensions and fringe benefits provided by the State of North Carolina in the form of payments on behalf.

Source: The UNC System.

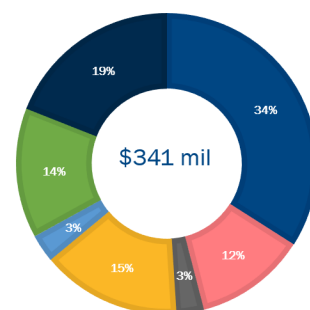
Percentages may not add due to rounding.

## Operating Expenditures

Figure 1.2 displays N.C. A&T expense data. The combined payroll, including faculty/staff salaries and wages, amounted to \$215 million. This was equal to 63% of the university's total expenses for FY22. Other expenditures, including operation and maintenance of plant, construction, depreciation and interest, and purchases of supplies and services, made up \$126 million. When we calculate the impact of these expenditures in Chapter 2, we exclude expenses for depreciation and interest, as they represent a devaluing of the university's assets rather than an outflow of expenditures.

Figure 1.2: **N.C. A&T EXPENSES BY FUNCTION, FY-22**

- Instruction (34%)
- Research (12%)
- Public service (3%)
- Academic (15%)
- Student services (3%)
- Institutional support (14%)
- Other core expenses (19%)





## Students

N.C. A&T served 13,487 students in Fall 2022. These numbers represent unduplicated student headcounts. The breakdown of the student body by gender was 62% female and 38% male. The breakdown by ethnicity was 81% Black or African American, 4.5% White, 4.2% Hispanic or Latino, and 10.3% all other. An estimated 42% of students remain in North Carolina after finishing their time at N.C. A&T and the remaining 58% settle outside the state.

Table 1.2 summarizes the breakdown of the student population and their corresponding awards. Over the last 10 years, the university has recorded a 28% increase in enrollment and a 42% increase in the number of degrees awarded. The breakdown of degrees awarded over the last 10 years reveals a 300% increase in the number of doctoral degrees awarded and a 55% increase in the number of B.S. degrees awarded (Table 1.3).

Table 1.2: **BREAKDOWN OF STUDENT HEADCOUNT**

Category	Fall 2013	Fall 2014	Fall 2015	Fall 2016	Fall 2017	Fall 2018	Fall 2019	Fall 2020	Fall 2021	Fall 2022
<b>Bachelors</b>	8,577	8,894	9,036	9,354	10,012	10,298	10,709	10,798	11,328	11,554
<b>Masters</b>	1,289	1,148	1,065	1,058	1,070	1,059	1,027	1,103	1,174	1,103
<b>Certificates</b>	8	7	15	8	3	1	1	19	44	61
<b>Doctoral</b>	299	310	341	381	409	401	437	439	450	458
<b>Unclassified</b>	388	366	395	376	383	383	382	394	326	311
<b>Total</b>	<b>10,561</b>	<b>10,725</b>	<b>10,852</b>	<b>11,177</b>	<b>11,877</b>	<b>12,142</b>	<b>12,556</b>	<b>12,753</b>	<b>13,322</b>	<b>13,487</b>

Table 1.3: **BREAKDOWN OF DEGREES AWARDED**

Degree	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22
Bachelor's	1,313	1,394	1,293	1,503	1,516	1,662	1,670	1,941	2,110	2,029
Master's	456	470	427	434	395	423	410	387	374	405
Doctoral	29	43	46	49	63	57	59	66	64	68
Other			1	1				14	21	53
<b>Total</b>	<b>1,798</b>	<b>1,907</b>	<b>1,767</b>	<b>1,987</b>	<b>1,974</b>	<b>2,142</b>	<b>2,139</b>	<b>2,408</b>	<b>2,569</b>	<b>2,555</b>

# THE NORTH CAROLINA ECONOMY



Since N.C. A&T was first established, it has been serving North Carolina by enhancing the workforce, providing local residents with easy access to higher education opportunities, and preparing students for highly-skilled, technical professions. Table 1.4 summarizes the breakdown of the state economy by major industrial sector ordered by total income, with details on labor and non-labor income. Labor income refers to wages, salaries and proprietors' income. Non-labor income refers to profits, rents and other forms of investment income. Together, labor and non-labor income comprise the state's total income, which can also be considered as the state's gross state product (GSP).

Table 1.4: **INCOME BY MAJOR INDUSTRY SECTOR IN NORTH CAROLINA, 2021 \***

Industry sector	Labor income (millions)	Non-labor income (millions)	Total income (millions)**	% of total income	Sales (millions)
Manufacturing	\$37,843.41	\$ 47,379.81	\$ 85,223.23	14%	\$ 233,719.83
Administrative Government	\$60,873.95	\$ 10,195.58	\$ 71,069.53	11%	\$ 71,069.53
Real Estate and Rental and Leasing	\$9,930.89	\$ 59,030.01	\$ 68,960.90	11%	\$ 119,265.38
Finance and Insurance	\$29,841.55	\$ 32,544.00	\$ 62,385.55	10%	\$ 111,305.93
Professional, Scientific, and Technical Services	\$44,925.68	\$ 11,475.24	\$ 56,400.92	9%	\$ 88,111.89
Health Care and Social Assistance	\$39,186.59	\$ 5,528.71	\$ 44,715.30	7%	\$ 69,671.43
Wholesale Trade	\$20,475.75	\$ 13,542.58	\$ 34,018.32	5%	\$ 73,535.21
Construction	\$23,823.38	\$ 6,560.63	\$ 30,384.01	5%	\$ 63,138.89
Retail Trade	\$20,709.36	\$ 8,252.78	\$ 28,962.14	5%	\$ 57,807.83
Accommodation and Food Services	\$15,116.42	\$ 8,094.88	\$ 23,211.30	4%	\$ 43,104.38
Administrative and Waste Management	\$19,598.82	\$ 2,808.19	\$ 22,407.01	4%	\$ 44,167.51
Information	\$9,706.54	\$ 12,117.14	\$ 21,823.69	3%	\$ 48,951.05
Other Services (except Public Administration)	\$18,688.00	\$ 696.36	\$ 19,384.36	3%	\$ 35,703.88
Transportation and Warehousing	\$13,039.38	\$ 2,626.20	\$ 15,665.59	2%	\$ 33,890.80
Management of Companies and Enterprises	\$11,713.05	\$ 1,371.37	\$ 13,084.42	2%	\$ 22,023.64
Utilities	\$3,189.04	\$ 6,011.45	\$ 9,200.49	1%	\$ 21,498.17
Educational Services	\$5,251.39	\$ 267.42	\$ 5,518.81	<1%	\$ 7,839.22
Agriculture, Forestry, Fishing and Hunting	\$3,732.79	\$ 1,725.85	\$ 5,458.64	<1%	\$ 16,008.47
Government Enterprises	\$3,186.11	\$ 1,507.29	\$ 4,693.40	<1%	\$ 7,339.62
Arts, Entertainment, and Recreation	\$2,934.34	\$ 1,487.63	\$ 4,421.98	<1%	\$ 7,402.17
Mining, Quarrying, and Oil and Gas Extraction	\$187.49	\$ 754.53	\$ 942.02	<1%	\$ 2,590.99
<b>Total</b>	<b>\$393,953.94</b>	<b>\$ 233,977.66</b>	<b>\$ 627,931.60</b>	<b>100%</b>	<b>\$ 1,178,145.83</b>

\* Data reflect the most recent year for which data are available.

\*\* Numbers may not add due to rounding.

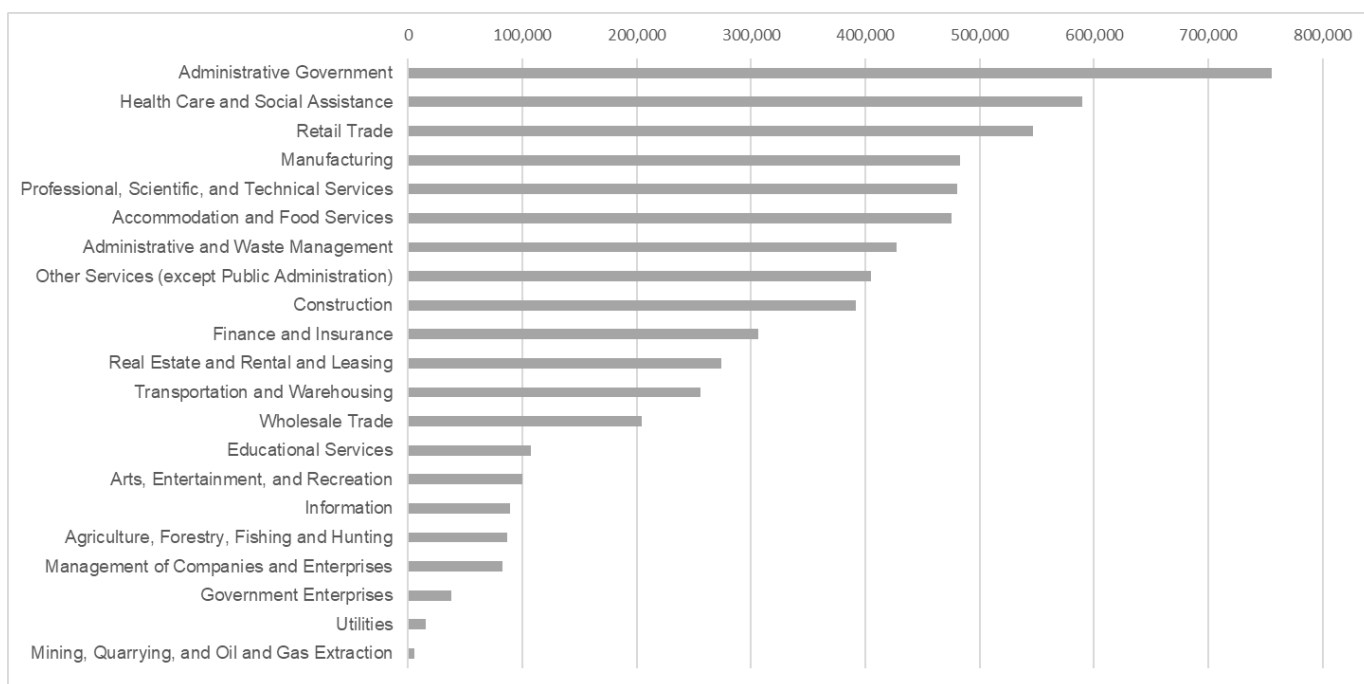
Source: IMPLAN industry data.



As shown in Table 1.4, the total income, or GSP, of North Carolina is approximately \$627.9 billion, equal to the sum of labor income (\$393.9 billion) and non-labor income (\$233.9 billion). In Chapter 2, we use the total added income as the measure of the relative impacts of the university on the state economy.

Figure 1.3 provides the breakdown of jobs by industry in North Carolina. The Administrative Government sector is the largest employer, supporting 755,445 jobs or 12.3% of total employment in the state. The second largest employer is the Health Care sector, supporting 589,612 jobs or 9.6% of the state's total employment. Altogether, the state supports 6.1 million jobs.<sup>4</sup>

Figure 1.3: **JOBS BY MAJOR INDUSTRY SECTOR IN NORTH CAROLINA, 2021 \***



\* Data reflect the most recent year for which data are available.  
Source: IMPLAN employment data.

Job numbers reflect IMPLAN's complete employment data, which includes the following four job classes: 1) employees who are counted in the Bureau of Labor Statistics' Quarterly Census of Employment and Wages (QCEW), 2) employees who are not covered by the federal or state unemployment insurance (UI) system and are thus excluded from QCEW, 3) self-employed workers, and 4) extended proprietors.



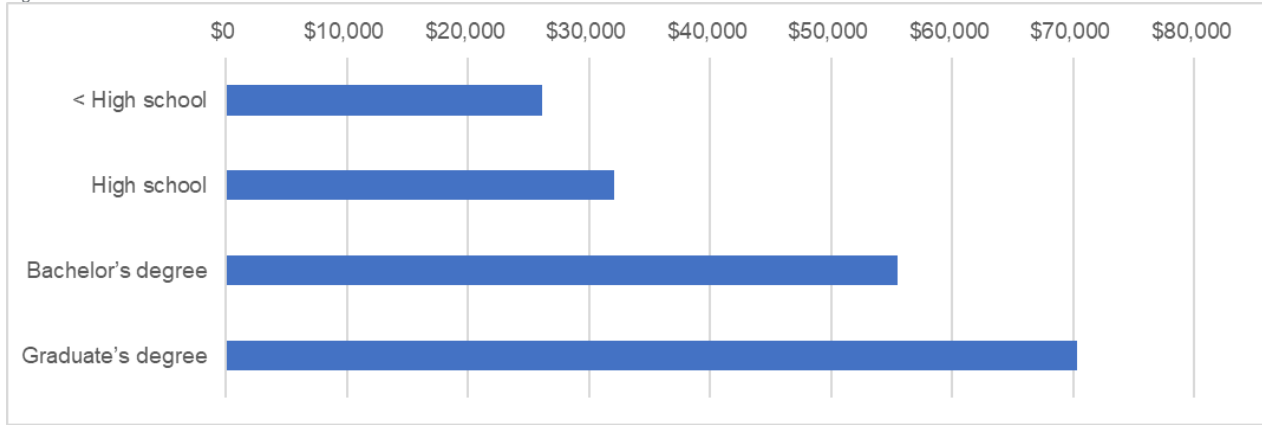
Table 1.5 and Figure 1.4 present the mean earnings by education level in North Carolina. These numbers are derived from the Federal Reserve of Richmond employment data on average earnings per worker in the state. As shown, students have the potential to earn more as they achieve higher levels of education compared to maintaining a high school diploma. Students who earn a bachelor's degree from N.C. A&T can expect approximate wages of \$55,494 per year within North Carolina, approximately \$23,419 more than someone with a high school diploma.

Table 1.5: AVERAGE EARNINGS BY EDUCATION LEVEL 2021

Education level	State earnings	Difference from next lowest degree
Less than high school	\$26,097	n/a
High school or equivalent	\$32,075	\$5,978
Bachelor's degree	\$55,494	\$23,419
Graduate of Professional degree	\$70,355	\$14,861

Source: Federal Reserve Bank of Richmond employment data.

Figure 1.4: AVERAGE EARNINGS BY EDUCATION LEVEL



Source: Federal Reserve Bank of Richmond employment data.

# Economic impacts on the North Carolina economy



*N.C. A&T impacts the North Carolina economy in a variety of ways. The university is an employer and buyer of goods and services. It attracts monies that otherwise would not have entered the state economy through its day-to-day and research operations, its construction activities, and the expenditures of its visitors and students. Further, it provides students with the knowledge, skills and abilities they need to become productive citizens and add to the overall output of the state. North Carolina A&T creates substantial economic impacts in terms of output, value-added, labor income and employment to its host area of influence, the larger Piedmont Triad area and the state of North Carolina.*

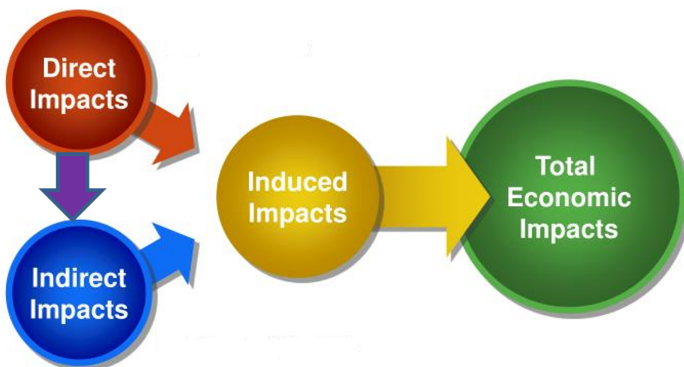


**I**N THIS CHAPTER, we estimate the economic impacts of N.C. A&T: 1) the operations spending impact, 2) the research spending impact, 3) the construction spending impact, 4) the visitor spending impact, 5) the student spending impact, and 6) the alumni impact, measuring the value added in the state as former students expand the state economy's stock of human capital. In particular, it addresses the short- and long-term economic impact of the university in Guilford County, the larger Triad area and the State of North Carolina.

The economic impact of the university refers to the number of processes that track how the spending from university operations and related economic events such as commencements, sporting and cultural events, Homecoming events, etc. move through the economy. The economic impact study measures the cumulative effects of these expenses on a predefined geographical area, be county, region, state or national level.

In particular, the economic impact generated by the university is divided into several sources of expenditure: operational expenditure, capital expenditure, faculty and staff expenditure, student expenditure and visitor expenditure. Every dollar spent will generate an immediate or direct demand for goods and services that reverberates, through a multiplying effect, through several layers of economic activity. The resulting cumulative effect can then be decomposed as information about wages, employment, industry production and taxes.

This multiplying effect is calculated using a backward linkage method through the supply chain to assess the direct, indirect and induced impacts of economic activity. The total impact of the university's presence is then the sum of these three impacts. The direct impact is the initial expenditure of production made by one of the sources of expenditure generated by the university. Since each supplier of an industry has to purchase inputs from other suppliers, the accumulated linkages of inter-industry spending traveling back are the indirect impacts. To complete the picture, the increases in production resulting from increases in purchases also result in increased employment and labor spending that has its own traceable economic effects and will generate their own direct and indirect impacts. The sum of these additional direct and indirect effects is called the induced impacts.





The total economic impact for the university can further be disaggregated into output, value added, income and employment. Output is the total amount of gross sales for a given period of time, plus or minus inventory. Value added consists of employee compensation, proprietor income, other property income and indirect business taxes that are generated by the economic activity caused by the university. Value added is usually a proxy for the geographical area's share of the state's gross domestic product. Income comprises all forms of employment income, including wages, salaries and proprietors' incomes. Lastly, employment is a proxy for the number of full and part-time jobs generated by the economic activity caused by the university measured in annual average jobs.

It is important to mention that the total impacts do not include expenditures outside of the university's area of economic influence since those leakages do not contribute to the output, value added, income or employment for the area of study and as such, they are not included in the impacts. The definitions of N.C. A&T's regional economy (the Piedmont Triad Region) was based on the standard metropolitan and micropolitan statistical area definitions of NC Department of Commerce and consist of Alamance, Caswell, Davidson, Davie, Forsyth, Guilford, Montgomery, Randolph, Rockingham, Stokes, Surry and Yadkin counties.

**Value added reflects a truer measure of economic impact since they demonstrate what would not have existed in the state economy if not for the university.**

# OPERATIONS SPENDING IMPACT



Faculty and staff payroll is part of the state’s total earnings, and the spending of employees for groceries, apparel, and other household expenditures helps support state businesses. The university itself purchases supplies and services, and many of its vendors are located in North Carolina. These expenditures create a ripple effect that generates still more jobs and higher wages throughout the economy.

Table 2.1 presents university expenditures (excluding research and construction) for the following three categories: 1) salaries, wages and benefits, 2) operation and maintenance of plant, and 3) all other expenditures, including purchases for supplies and services. Also included in all other expenditures are expenses associated with grants and scholarships. Many students receive grants and scholarships that exceed the cost of tuition and fees. The university then dispenses this residual financial aid to students, who spend it on living expenses. Some of this spending takes place in the state, and is therefore an injection of new money into the state economy that would not have happened if N.C. A&T did not exist. In this analysis, we exclude expenses for depreciation and interest due to the way those measures are calculated in the national input-output accounts, and because depreciation represents the devaluing of the university’s assets rather than an outflow of expenditures.



Table 2.1: **N.C. A&T EXPENSES BY FUNCTION, FY22**

Category*	Operating Expenses (thousands)	Percent of total
Employee salaries, wages, and benefits	\$155,795	51.84%
Supplies and services	84,944	28.26
Scholarships and fellowships	38,671	12.87
Utilities	6,460	2.15
Depreciation	14,633	4.87
<b>Total</b>	<b>\$300,503</b>	<b>100%</b>



The first step in estimating the multiplier effects of the university’s operational expenditures is to map these categories of expenditures to the approximately 546 industries (based on NAICS coding) of the IMPLAN model. Assuming that the spending patterns of university personnel approximately match those of the average U.S. consumer, we map salaries, wages and benefits to spending on industry outputs using national household expenditure coefficients provided by IMPLAN. For the other expenditure categories (i.e., operation and maintenance of plant and all other expenditures), we assume the university’s spending patterns approximately match national averages and apply the national spending coefficients for junior colleges, colleges, universities, and professional schools. Operation and maintenance of plant expenditures are mapped to the industries that relate to capital construction, maintenance and support, while the university’s remaining expenditures are mapped to the remaining industries.

Once the expenditures have been allocated to their respective industries, we estimate the portion of these expenditures that occur inside each area of influence. Expenditures occurring outside the area of influence are known as leakages. IMPLAN estimate in-region expenditures using regional purchase coefficients (RPCs), a measure of the overall demand for the commodities produced by each sector that is satisfied by state suppliers, for each of the approximately 546 industries in the IMPLAN database. For example, if 40% of the demand for Food Services is satisfied by Guilford County suppliers, the RPC for that industry is 40%. The remaining 60% of the demand is provided by suppliers located outside the county. Similar calculations are made for the Triad area and the state. Expenditures are then multiplied, industry by industry, by the corresponding RPC to arrive at the specific area of influence expenditures associated with the university. Finally, in-state spending is entered, industry by industry, into the IMPLAN model’s multiplier matrix, which in turn provides an estimate of the associated multiplier effects on state labor income, non-labor income, total income, output, and jobs.

Table 2.2: OPERATIONS SPENDING IMPACT, FY22

Impact	Employment	Labor Income (thousands)	Value Added (thousands)	Output (thousands)
Direct	4,749	\$172,973	\$215,755	\$307,829
Indirect	1,288	\$63,752	\$116,945	\$249,615
Induced	1,127	\$58,357	\$107,398	\$186,756
<b>Total Impact</b>	<b>7,163</b>	<b>\$295,082</b>	<b>\$440,099</b>	<b>\$744,200</b>



Table 2.2 presents the economic impact of university operations spending, comprising of Employment generated, Labor Income produced, Value Added to the state, and Total Output. This sums to a total impact of \$744 million in total output associated with the spending of the university and its employees in the state. This is equivalent to supporting 7,163 jobs.

While Total Output is an essential statistical tool needed to study and understand the interrelationships of the industries that underlie the overall economy, because of its duplicative nature it may not be a good stand-alone indicator of the overall health or contribution of an industry. For this reason, we also provide a measure of Value Added, defined as the total market value of all final goods and services produced within a region in a given period of time (usually a quarter or year). It is the sum of the intermediate stages of production. It is the sum of all added value at every stage of production (the intermediate stages) of all final goods and services produced within a country in a given period of time. In other words, it is the wealth created by industry activity. The total value added is approximately \$440 million. These impacts represent new economic activity created in the state economy solely attributable to the operations of N.C. A&T.

**The total value added of the university's operations is \$440 million in total added income, equivalent to supporting 7,163 jobs.**

# RESEARCH SPENDING IMPACT



Similar to the day-to-day operations of N.C. A&T, research activities impact the economy by employing people and requiring the purchase of equipment and other supplies and services. Table 2.3 shows N.C. A&T's research expenses by source for the last five fiscal years. In FY22, N.C. A&T spent over \$73 million on research and development activities. These expenses would not have been possible without external funding — N.C. A&T received around 70% of its research funding from other sources.

Table 2.3: **RESEARCH EXPENDITURES BY SOURCE, FY22 (Thousands)**

Category	2018	2019	2020	2021	2022
Externally Sponsored R&D expenditures	\$25,721	\$24,724	\$23,385	\$26,746	\$33,463
Institutionally Sponsored R&D expenditures	12,419	12,615	12,766	14,005	14,445
<b>Total R&amp;D Expenditures</b>	<b>\$38,140</b>	<b>\$37,339</b>	<b>\$36,151</b>	<b>\$40,751</b>	<b>\$47,908</b>
DORED Sponsored Projects Activity	50,956	52,060	48,440	51,183	58,690
Externally Sponsored Non-R&D Activity	25,235	27,336	25,055	24,437	25,227
<b>Total Sponsored Activity All Sources</b>	<b>\$63,375</b>	<b>\$64,675</b>	<b>\$61,206</b>	<b>\$65,188</b>	<b>\$73,135</b>



We employ a methodology similar to the one used to estimate the impacts of operational expenses. We begin by mapping total research expenses to the industries of the IMPLAN model, removing the spending that occurs outside the state, and then running the in-state expenses through the multiplier matrix.

Initial, direct, indirect, and induced effects of N.C. A&T's research expenses appear in Table 2.4. The university's research expenses have a total gross impact of \$56 million in labor income and \$85 million value added, equivalent to sustaining 783 jobs.

N.C. A&T's research activities create an economic impact beyond spending. There are impacts created through advancements and innovation created by the university's research. Research activities that create advancements in a variety of scientific fields' added productivity all have immense value in the state economy. However, the full magnitude of their value is difficult to quantify. Some of this value may be captured in the alumni impacts, presented later in this chapter. The broader spill-over effects, however, remain as additional value created beyond the scope of this analysis.

Table 2.4: **RESEARCH SPENDING IMPACT, FY22**

Impact	Employment	Labor Income (thousands)	Value Added (thousands)	Output (thousands)
Direct	310	\$28,187	\$39,031	\$73,135
Indirect	256	\$17,300	\$25,903	\$48,292
Induced	217	\$11,238	\$20,692	\$35,982
<b>Total Impact</b>	<b>783</b>	<b>\$56,725</b>	<b>\$85,626</b>	<b>\$157,409</b>

# CONSTRUCTION SPENDING IMPACT



In this section, we estimate the economic impact of the construction spending of N.C. A&T. Because construction funding is separate from operations funding in the budgeting process, it is not captured in the operations spending impact estimated earlier. However, like operations spending, the construction spending creates subsequent rounds of spending and multiplier effects that generate still more jobs and income throughout the state. During FY22, N.C. A&T spent a total of \$42 million on various construction projects.

Assuming construction spending approximately matches national construction spending patterns of junior colleges, colleges, universities, and professional schools, we map N.C. A&T construction spending to the construction industries of the IMPLAN model. Next, we use the RPCs to estimate the portion of this spending that occurs in the areas of interest. Finally, the in-state spending is run through the multiplier matrix to estimate the direct, indirect and induced effects.





Table 2.5 presents the average impacts of N.C. A&T construction spending during FY20 – FY22. The FY20 – FY22 N.C. A&T construction spending creates a net total short-run impact of \$46 million in added income—the equivalent of supporting 488 jobs on average per year in North Carolina.

Table 2.4: **CONSTRUCTION SPENDING IMPACT, FY 20 – FY22**

Impact	Employment	Labor Income (thousands)	Value Added (thousands)	Output (thousands)
Direct	293	\$20,351	\$25,451	\$42,492
Indirect	73	\$5,175	\$8,596	\$17,017
Induced	121	\$6,288	\$11,575	\$20,125
<b>Total Impact</b>	<b>488</b>	<b>\$31,814</b>	<b>\$45,621</b>	<b>\$79,634</b>



Typically, N.C. A&T hosts thousands of out-of-state visitors for on-campus events. N.C. A&T, its partners, and affiliations bring national and internationally renowned speakers and entertainers to the state. In addition, N.C. A&T attracts visitors for commencement, cultural and sporting events. It is important to remind the reader of the restrictions imposed by the COVID-19 pandemic and its strong influence on the number of visitors during FY22. Of the events hosted during FY22, N.C. A&T estimated that 110,000 visitors were from outside the state.

By far, the university's greatest source of visitors is Homecoming Week. This week-long celebration attracts anywhere from 40,000 to 60,000 visitors to the Greensboro area per year. In addition, an estimated 40,000 visitors are drawn to the area for sporting events and another 10,000 people visit the Triad area for events such as commencement and new student orientation. Using information from the Consumer Expenditure Survey and VisitNC.com, we estimated that approximately 47,000 households staying an average of 3.3 nights spend approximately \$33.2 million dollars in Guilford County in Hotels and Lodging (30%), Transportation (33%), Restaurants (18%), Groceries (12%), and Miscellaneous Entertainment (7%).

Visitors' expenditures were distributed to the IMPLAN sectoring scheme based on national average expenditure patterns, data provided by various Consumer Expenditure Surveys, and estimated costs of visits gathered from different sources. As shown in Table 2.6, the total output of visitor spending in FY22 is \$43.9 million, with 14.8 million in labor income. This totals to \$23.9 million of value added income, equivalent to supporting 368 jobs.

Table 2.6: VISITOR SPENDING IMPACT, FY22

Impact	Employment	Labor Income (thousands)	Value Added (thousands)	Output (thousands)
Direct	246	\$7,918	\$12,346	\$22,486
Indirect	66	\$3,982	\$6,278	\$12,120
Induced	56	\$2,919	\$5,373	\$9,346
<b>Total Impact</b>	<b>368</b>	<b>\$14,819</b>	<b>\$23,996</b>	<b>\$43,952</b>

# STUDENT SPENDING IMPACT



Both in-state and out-of-state students contribute to the student spending impact of N.C. A&T. However, not all of these students can be counted towards the impact. Of the in-state students, only those students who were retained, or who would have left the state to seek education elsewhere had they not attended N.C. A&T, are measured. Students who would have stayed in the state anyway are not counted towards the impact since their monies would have been added to the North Carolina economy regardless of N.C. A&T. In addition, only out-of-state students who relocated to North Carolina to attend the university are measured. Students who commute from outside the state or take courses online are not counted towards the student spending impact because they are not adding money from living expenses to the state.

An estimated 4,343 students came from outside the state to attend N.C. A&T. Estimates of typical student expenditures were obtained from the university's estimated costs of attendance including tuition and fees, room and board, transportation, and other miscellaneous expenditures. Although the estimated costs of attendance were not detailed enough to be used in the IMPLAN modeling system, they did provide information that was used to develop a profile of average expenditures by categories listed above for undergraduate, graduate and professional students.

The expenditure estimates were also broken down by in-state, out-of-

state, on-campus and off-campus students, to obtain the average expenditure for each student category. Table 2.7 reflect these expenditures by students. Notice that room and board expenditures are only added to off-campus students since on-campus students' room and board expenses are included in the university operations spending.

Table 2.7: **STUDENT EXPENDITURES, FY22**

Category	Per student	#Students	Total spending
Room and board*	\$10,314	7,334	\$75,641,226
Books and supplies	\$1,600	13,487	\$21,579,200
Transportation	\$1,870	13,487	\$25,220,690
Other expenses	\$2,730	13,487	\$36,819,510
Total gross spending			<b>\$159,260,626</b>
Net spending (gross spending less retail margins)			<b>\$112,683,365</b>

Students' \$112.6 million expenditures were distributed to the IMPLAN sectoring scheme based on national average expenditure patterns. Estimating the impacts generated by the \$112.6 million in student spending follows a procedure similar to that of the operations impact described above. We distribute the \$112.6 million in sales to the industry sectors of the IMPLAN model, apply RPCs to reflect in-state spending, and run the models.

Table 2.8 presents the results. The total impact of student spending is \$44.2 million in labor income, supporting 1,576 jobs. These values represent the direct effects created at the businesses patronized by the students, the indirect effects created by the supply chain of those businesses, and the effects of the increased spending of the household sector throughout the state economy as a result of the direct and indirect effects.

Table 2.8: **STUDENT SPENDING IMPACT, FY22**

Impact	Employment	Labor Income (thousands)	Value Added (thousands)	Output (thousands)
Direct	1,221	\$23,185	\$82,359	\$112,683
Indirect	186	\$12,360	\$20,417	\$37,720
Induced	169	\$8,744	\$16,099	\$27,996
<b>Total Impact</b>	<b>1,576</b>	<b>\$44,289</b>	<b>\$118,876</b>	<b>\$178,400</b>



In this section, we estimate the economic impacts stemming from the added labor income of alumni in combination with their employers' added non-labor income. This impact is based on the number of alumni who reside and work in North Carolina. We then use this total number to consider the impact of those alumni in the single FY22. Former students who earned a degree as well as those who may not have finished their degree or did not take courses for credit are considered alumni.

While N.C. A&T creates an economic impact through its operations, research, construction, visitor, and student spending, the greatest economic impact of N.C. A&T stems from the added human capital—the knowledge, creativity, imagination and entrepreneurship—found in its alumni. While attending N.C. A&T, students gain experience, education, and the knowledge, skills, and abilities that increase their productivity and allow them to command a higher wage once they enter the workforce. But the reward of increased productivity does not stop there. Talented professionals make capital more productive too (e.g., buildings, production facilities, equipment). The employers of N.C. A&T alumni enjoy the fruits of this increased productivity in the form of additional non-labor income (i.e., higher profits).



The methodology here differs from the previous impacts in one fundamental way. Whereas the previous spending impacts depend on an annually renewed injection of new sales into the state economy, the alumni impact is the result of years of past instruction and the associated accumulation of human capital. The initial effect of alumni is comprised of two main components. The first and largest of these is the added labor income of N.C. A&T's former students. The second component of the initial effect is comprised of the added non-labor income of the businesses that employ former students of the university.

Of the 70,000 alumni in the university database, we estimate approximately 45% of them living in the state. Obtaining information for early career and mid-career average salaries, we estimate the differential in earning for a college graduate versus a high school graduate for working alumni 65 years old and under.

Table 2.9 shows the economic impact of alumni per year. Alumni spending generates only induced impacts, since this type of spending is a household/labor income. The approximately 31,000 alumni residing in the state generate an output of 1.2 billion dollars, a value added of \$700 million and support an ecosystem of approximately 6,959 jobs.

Table 2.9: **ALUMNI SPENDING IMPACT, FY22**

Impact	Employment	Labor Income (thousands)	Value Added (thousands)	Output (thousands)
Direct	0	\$0.00	\$0.00	\$0.00
Indirect	0	\$0.00	\$0.00	\$0.00
Induced	6,959	\$376,259	\$701,945	\$1,209,192
<b>Total Impact</b>	<b>6,959</b>	<b>\$376,259</b>	<b>\$701,945</b>	<b>\$1,209,192</b>

# TOTAL IMPACT



Total initial spending accruing to N.C. A&T's regional and state economy equals the summation of spending originating from spending by the institution for wages and salaries; spending by the institution for other budget categories (e.g., outlays for items other than wages and salaries); spending by undergraduate students attending the institution; and spending by the graduate and professional students attending the institution, as well as spending by visitors to the institution for athletics events, commencements, and homecoming. For FY22, total initial spending was \$558 million. Table 2.10 displays the grand total impacts of N.C. A&T on the economy of North Carolina in FY22. The total added value of N.C. A&T is \$1.42 billion, and total output is \$2.4 billion, equivalent to 0.36% of the GSP of North Carolina. N.C. A&T's total impact supported 17,337 jobs in FY22.



Table 2.10: **N.C. A&T TOTAL IMPACT, FY22**

Category	Employment	Labor Income (thousands)	Value Added (thousands)	Output (thousands)
Operations	7,163	\$295,082	\$440,099	\$744,200
Research spending	783	\$56,725	\$85,626	\$157,409
Student spending	1,576	\$44,289	\$118,876	\$178,400
Capital spending	488	\$31,814	\$45,621	\$79,634
Visitor spending	368	\$14,819	\$23,996	\$43,952
Alumni spending	6,959	\$376,259	\$701,945	\$1,209,192
<b>Total Impact</b>	<b>17,337</b>	<b>\$818,989</b>	<b>\$1,416,163</b>	<b>\$2,412,787</b>



Table 2.11: **N.C. A&T IMPACT BY GEOGRAPHIC AREA, FY22**

Category	Guilford County Impact	Piedmont Triad Impact	Statewide Impact
Employment	10,200	11,643	17,337
Labor Income (thousands)	\$428,896	\$502,737	\$818,989
Value Added (thousands)	\$692,887	\$826,816	\$1,416,163
Output (thousands)	\$1,157,524	\$1,397,717	\$2,412,787

Table 2.11 displays the impacts of N.C. A&T on the economy of Guilford County, the Piedmont Triad Area, and the state of North Carolina. N.C. A&T’s impact on Guilford County is \$1.16 billion, and supports 10,200 jobs. For the larger Piedmont Triad, this impact is \$1.4 billion, supporting 11,643 jobs.

Table 2.12 displays the tax impacts of N.C. A&T at the various levels of governments. N.C. A&T’s activities generate over \$72 million in state taxes and over \$153 million in federal taxes.

Table 2.12: **N.C. A&T FISCAL IMPACTS, FY22 (THOUSANDS)**

Impact	Sub County	County	State	Federal	Total
Direct	\$3,523	\$5,440	\$15,332	\$45,149	\$69,443
Indirect	\$1,664	\$2,773	\$7,488	\$19,209	\$31,134
Induced	\$11,002	\$23,535	\$49,363	\$89,139	\$173,040
<b>Total</b>	<b>\$16,190</b>	<b>\$31,748</b>	<b>\$72,184</b>	<b>\$153,497</b>	<b>\$273,617</b>



## R1 HYPOTHETICAL ECONOMIC IMPACT

Under the new strategic plan of the university, Preeminence 2030: North Carolina A&T Blueprint, the goal of the university is to attain the Carnegie R1 classification (very high research activity university) by 2030. In this section, we calculate a hypothetical R1 economic impact of the university. That is, assuming that N.C. A&T had been an R1 institution, what would be its economic impact in FY22?

To achieve this, we use information gathered about N.C. A&T peer institutions that are R1 (see Table 2.13). Based on this, we developed three hypothetical scenarios, resulting in three counterfactual economic impacts.

**Scenario 1:** This scenario assumes that N.C. A&T's operational spending, research spending, and graduate enrollment rise to the 25th percentile of its R1 peers. This is equivalent to having R&D spending of \$67 million, operational spending of \$297 million, and graduate enrollment increasing by 5% from current levels.

**Scenario 2** This scenario assumes that N.C. A&T's operational spending, research spending, and graduate enrollment rise to the 50th percentile of its R1 peers. This is equivalent to having R&D spending of \$147 million, operational spending of \$334 million, and graduate enrollment increasing by 27% from current levels.

**Scenario 3:** This scenario assumes that N.C. A&T's operational spending, research spending, and graduate enrollment rise to the 75th percentile of its R1 peers. This is equivalent to having R&D spending of \$181 million, operational spending of \$422 million, and graduate enrollment increasing by 54% from current levels.

A&T R1 Peers	R&D in 2021 (\$000)	Operational spending (\$000)	Number of Students
The University of Louisiana at Lafayette	\$181,400	\$297,090	16,225
University of Maine	146,801	306,371	12,657
Montana State University	193,577	376,914	16,788
The University of Texas at El Paso	109,410	422,036	24,003
University of Southern Mississippi	67,417	291,382	14,146
North Dakota State University-Main Campus	164,050	334,001	12,461
Old Dominion University	62,332	501,967	23,494

Table 2.14: **ACTUAL VERSUS HYPOTHETICAL ECONOMIC IMPACTS**

N.C. A&T	Economic Impact (thousands)	Jobs supported/created
Actual 2022	\$2,412,787	17,337
Scenario 1	\$2,434,901	17,618
Scenario 2	\$2,708,948	19,447
Scenario 3	\$3,021,699	22,096

Table 2.14 compares the three economic impact scenarios with the actual impact of FY22. The three R1 scenario impacts range from \$2.43 billion to \$3 billion in total economic impact. Under the medium scenario, in which N.C. A&T were an R1 university with spending roughly equal to the median level of its R1 peers, the economic impact in FY22 would have been \$2.7 billion in output, supporting 19,447 jobs. The third scenario, in which N.C. A&T had spending equivalent to the 75<sup>th</sup> percentile of its R1 peers, would produce a total economic impact of \$3 billion, supporting 22,000 jobs.



# Conclusion



While N.C. A&T's value to the economy of the state of North Carolina is larger than simply its economic impact, understanding the dollars and cents value is an important asset to understanding the university's value as a whole. In order to fully assess N.C. A&T's value to the state economy, this report has evaluated the university from the perspectives of economic impact analysis.

From an economic impact perspective, we calculated that N.C. A&T generates a total economic impact of \$2.4 billion in total output for the state economy. This represents the sum of several different impacts, including the university's:

- Operations spending impact (\$744 million);
- Research spending impact (\$157 million);
- Construction spending impact (\$79.6 million);
- Visitor spending impact (\$43.9 million);
- Student spending impact (\$178 million); and
- Alumni impact (\$1.2 billion).

The total impact of \$2.4 billion is equivalent to approximately 0.36% of the total GSP of North Carolina and is equivalent to supporting 17,337 jobs.

Modeling the counterfactual economic impact of the university under a hypothetical R1 status shows the university's economic impact could range from \$2.4 billion to as much as \$3 billion.