10TH EDITION | 2026

Tracking Innovation

NORTH CAROLINA INNOVATION INDEX

NC DEPARTMENT of COMMERCE
SCIENCE, TECHNOLOGY & INNOVATION

NORTH CAROLINA DEPARTMENT OF COMMERCE
OFFICE OF SCIENCE, TECHNOLOGY & INNOVATION

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North Carolina Innovation Index

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Contents

Executive Summary

Science and technology fuel innovation—the creation and adoption of new products, business models, and processes that add value. As an engine of long-term economic growth, innovation transforms research into new companies, products, and jobs, determining whether a state's economy is positioned to compete globally or fall behind. A force multiplier, innovation creates new industries, makes existing ones globally competitive, sustains economic growth, and advances national security. With this report, the 10th in a series of innovation indexes that began with *Tracking Innovation* 2000,[1] North Carolina is one of a handful of states that regularly monitor innovation assets, activities, and trends within their borders.

This 2026 report, the most extensive since the series' inception, measures the health of North Carolina's innovation economy. It tracks North Carolina's performance across 41 innovation measures weighed against that of the United States overall. These measures provide insights into the links between innovation, resources, and economic results in the North Carolina economy. This year's report shows that NC has broken into the top 10 states for the first time since tracking began in 2000 in terms of its innovation economy, and is responding to the rapidly changing innovation landscape by evolving its strengths on the state and county levels to inform the priorities and investments needed to sustain its momentum.

1 The NC Board of Science, Technology & Innovation has produced nine innovation indexes during the last 24 years, in 2000, 2003, 2008, 2013, 2015, 2017, 2019, 2021, and 2024.

STATEWIDE SUMMARY FINDINGS

North Carolina's innovation economy is healthy overall, ranking 9th among all U.S. states on a score-based, absolute-comparison basis.[2] North Carolina's performance varies considerably, however, across the report's 41 measures: Its highest rank on any measure is 5th, its lowest is 47th, its most common is 25th, and its average across all 41 measures without score-based comparison is 19th [**Statewide Summary of All Measures**, *next page*].[3] Additionally, on 21 of the 41 measures, North Carolina's "Percent of U.S. Average Value" is equal to or better than average, meaning the state matches or outperforms the nation as a whole on a majority of the measures.[4]

Since the early 2000s, North Carolina's innovation economy has, on balance, advanced—on 32 measures it improved, on seven it declined, and on two it stayed the same or could not be measured over time. During that same period, the U.S. innovation economy, on balance, also advanced—on 31 measures it improved, on seven it declined, and on three it stayed the same or could not be measured over time.[5] Overall, North Carolina's statewide innovation ecosystem is healthy, has improved since the early 2000s, and at a rate slightly faster than the U.S as a whole.

2 In the 2024 version of this report, North Carolina's score-based rank was 11th. This score-based benchmark incorporates the magnitude of differences between the states on each of the 41 measures, instead of merely their ordinal rank from 1 to 50, based on all measures combined. As such, it provides a precise comprehensive rank of North Carolina's performance relative to other states on the 41 measures. See Appendix B for a description of the score-based rankings and methodology.

3 In the 2024 version of this report, North Carolina's average rank was 20th; in the 2021 version of this report, North Carolina's average rank was 20th; in the 2019 version of this report, North Carolina's average rank was 21st; in the 2017 and 2015 versions, North Carolina's average rank was 23rd; in the 2013 version North Carolina's average rank was 24th. However, a small number of measures were occasionally added or excluded depending on data availability, so caution should be taken when making comparisons to previous reports; due to changes in methodology, change in ranks cannot be completely attributed to changes in the economic conditions or structure of a state's economy. The rankings are for the state overall; for more detail on performance by NC county, which varies considerably across counties, see page iii of the Executive Summary and individual measures in the body of the report. All measures are expressed as ratios or percentages, which "normalizes" the data by controlling for "size" factors such as state population and Gross Domestic Product (GDP), thus enabling an "apples to apples" comparison. See the "Interpreting the Data" section in the Introduction for additional insights on understanding the various values, rankings, and averages in the report.

4 This is the first year North Carolina has performed above the U.S. average on a majority of the measures.

5 Historical data are unavailable for two of the 41 measures.

KEY PERFORMANCE MEASURES

Figure i: Statewide Summary of All Measures

MEASURE	N.C. RANK	N.C. % OF U.S. AVERAGE VALUE	PERFORMANCE OVER TIME[1] N.C.	PERFORMANCE OVER TIME[1] U.S.
Economic Well-Being & Quality of Life	**27**	0% 20% 40% 60% 80% 100% 120% 140% 160% 180% 200%		
Per Capita Gross Domestic Product, 2024	31	88%	↑	↑
Per Capita Income, 2024	34	90%	↑	↑
Median Household Income, 2024	36	91%	↑	↑
Average Annual Wage, 2024	21	91%	↑	↑
Unemployment Rate, 2024	26	90%	↓	–
Percentage of Citizens in Poverty, 2024	35	103%	↓	↓
Population growth, 2000–2025	8	183%	↑	↑
Research & Development	**13**	0% 20% 40% 60% 80% 100% 120% 140% 160% 180% 200%		
Total R&D Expenditures as a Percentage of GDP, 2022	13	89%	↑	↑
Business-Performed R&D as a Percentage of Private-Industry Output, 2022	15	69%	↓	↑
Academic Science & Engineering R&D per $1,000 of State GDP, 2023	5	141%	↑	↑
Federal R&D Obligations per Employed Worker, 2023	25	63%	↑	↑
Academic S&E Article Output per 1,000 SEH Doctorate Holders in Academia, 2023	5	112%	↑	↑
Commercialization	**12**	0% 20% 40% 60% 80% 100% 120% 140% 160% 180% 200%		
Average Annual SBIR & STTR Funding per $1 Million of GDP, 2022–2024	14	127%	↑	↑
Academic Patents Awarded per 1,000 S&E Doctorate Holders in Academia, 2023	16	88%	↑	↑
Patents Awarded per 1,000 Residents, 2022	21	72%	↑	↑
Venture Capital Dispersed per $1 Million of GDP, 2024	9	57%	↑	↑
Venture Capital Dispersed per Venture Capital Deal, 2024	8	82%	↑	↑
Academic License Inc. (Gross) as a Percentage of Academic R&D Expend., 2022–2023	9	91%	N/A	N/A
Academic License Inc. (Running) as a Percentage of Acad. S&E R&D Expend., 2022–2023	9	122%	↑	↓
Avg. Number of Univ. Startups Formed per $1M of Academic S&E R&D Expend., 2022–2023	10	128%	↑	↑
Innovative Organizations	**22**	0% 20% 40% 60% 80% 100% 120% 140% 160% 180% 200%		
KTI Employment Establishments as Percentage of All Business Establishments, 2024	20	116%	↑	↑
Employment in KTI Employment Establishments as a Percentage of Total Employment, 2024	19	103%	↓	↓
Average Monthly Number of Entrepreneurs per 100,000 People, 2024–2025	27	86%	↑	↑
Average Opportunity Share of New Entrepreneurs, 2024–2025	22	105%	↑	↓
Exports as a Percentage of GDP, 2024	26	73%	↑	↑
Gender Diversity in KTI Industries, 2024	7	107%	↓	↑
Ethnic Diversity in KTI Industries, 2024	22	127%	↓	↓
Education & Workforce	**21**	0% 20% 40% 60% 80% 100% 120% 140% 160% 180% 200%		
Individuals in S&E Occupations as a Percentage of All Occupations, 2023	15	101%	↑	↑
Employed SEH Doctorate Holders as a Percentage of the Workforce, 2023	16	98%	↑	↑
Engineers as a Percentage of All Occupations, 2023	27	94%	↑	↑
Bachelor's Degrees in S&E Conferred per 1,000 Individuals 18–24 Years Old, 2023	29	90%	↑	↑
S&E Degrees as a Percentage of Higher Education Degrees Conferred, 2023	22	101%	↑	↑
Educational Attainment of Residents Aged 25 and Over (Composite Score), 2024	18	102%	↑	↑
Average Years of Education Among In-Migrants, 2024	25	100%	↑	↑
In-Migration of College Educated Adults as a Percentage of Total State Population, 2024	19	122%	↑	↑
Environment & Infrastructure	**20**	0% 20% 40% 60% 80% 100% 120% 140% 160% 180% 200%		
Elementary & Secondary Public School Current Expend. as a Percentage of State GDP, 2023	47	78%	↓	↓
Approp. of State Tax Funds for Higher Education as a Percentage of State GDP, 2022	6	164%	↓	↓
Percentage of Homes with an Internet Accessible Device, 2022	25	100%	↑	↑
Percentage of Homes with a Broadband Subscription, 2022	19	100%	↑	↑
Cost of Living Index, 2023	12	96%	N/A	N/A
Manufacturing GDP a Percentage of State GDP, 2022	13	148%	↓	↓
AVERAGE N.C. RANK ACROSS ALL MEASURES	**19[2]**			

↑ Improving ↓ Worsening[3]

1 For most measures, "over time" refers to the period between the year 2000 and the year listed to the right of the measure. In the rare cases when data were not available starting in 2000 for a measue, the starting year is typically few years after 2000.

2 Assumes measures are weighted equally.

3 For the Unemployment Rate and Percentage of Citizens in Poverty, increases represent worsening, while decreases represent improving.

FINDINGS BY INDICATOR CATEGORY AND PERFORMANCE MEASURE

This report explores six key innovation indicator categories, with each capturing a distinct stage in the innovation ecosystem—from the conditions that generate new ideas, to the outcomes those ideas ultimately produce. As detailed below and explained in more detail in the **Introduction** (*in particular, see Figure 2: Innovation Ecosystem*), North Carolina's performance differs across and within these categories, with some reflecting areas of strength and others showing where the state lags the U.S. average. These performance measures offer a more granular view of where the state's innovation economy is thriving and where it has room to improve:

Economic Well-Being

North Carolina has one of the fastest-growing populations in the nation, but the productive capacity of its economy and the wages and incomes of its citizens are below and not keeping pace with the national average. While North Carolina's unemployment rate is below the national average, its poverty rate is slightly above the national average.

Research & Development (R&D)

North Carolina excels at academic R&D, with a level well above the national average, while the total level of the state's R&D, particularly that performed by business, is below the national average. Academic R&D has grown faster than the national average since 2000, providing a strong foundation to fuel and sustain economic growth.

Commercialization

North Carolina organizations, particularly its academic institutions, generate significant intellectual property. University academic license income (running royalties) and start-up company activity have improved to levels above the national average, but other innovation commercialization activities, such as patents awarded and venture capital, remain below average and must be stronger to realize the full economic and social benefits of that intellectual property.

Innovative Organizations

North Carolina has a higher-than-average concentration of knowledge- and technology-intensive (KTI) industries, which are increasing in employment and have wages that are above the national average for all industries. The state also has well above-average gender and ethnic diversity in KTI industries, but levels of entrepreneurial activity are at or below average.

Education & Workforce

North Carolina has a well-educated and well-trained science & engineering workforce, including at the more-advanced educational levels, similar to the national average. However, North Carolina's universities are graduating a lower proportion of science and engineering students and there are fewer engineers in the workforce compared to the national average. The overall educational attainment level of residents is at the national average, and the in-migration rate of college-educated adults is higher than the national average.

Environment & Infrastructure

North Carolina has considerable strengths, with state appropriations for higher education being well above the national average, manufacturing representing a substantially higher-than-average share of the state's economy, and digital connectivity, including home internet access and broadband subscriptions, matching national levels. However, K-12 public school spending as a share of state GDP is well below the national average and is the state's lowest-ranked measure among all 41 indicators in this report, pointing to a foundational gap that could constrain the future pipeline of innovation talent if left unaddressed.

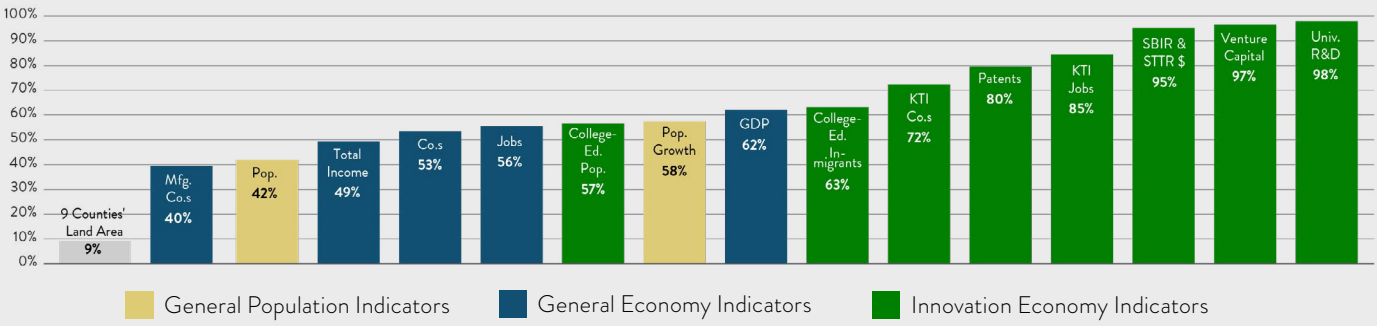
Each of these findings and its associated performance measures is displayed and discussed in more detail in the body of this report.

COUNTY-LEVEL FINDINGS

Across the state, these findings vary considerably by locale, with urban areas performing well above the U.S. average and rural areas faring less well and have the greatest need for improving their economic well-being and quality of life though the benefits of innovation.

At the county level, 15 key measures reveal important differences across North Carolina [**County-Level Summary of Key Measures**].[6] Nine counties that are highly populated and/or are home to major research universities (Wake, Mecklenburg, Guilford, Forsyth, Durham, Buncombe, New Hanover, Iredell, and Orange) represent just 9 percent of the state's land area but account for disproportionally larger shares of the state's population, economy, and innovation assets and activities.

Figure ii: County-Level Summary of Key Measures



Nine North Carolina Counties (Mecklenburg, Wake, Guilford, Forsyth, Durham, Buncombe, New Hanover, Orange, and Iredell) represent 9% of the state's land area but disproportionately larger shares of state's population, economy, and innovation assets and activities.

In terms of *General Population*, these nine counties represent 42 percent of the state's current population and 58 percent of the state's population growth between 2000 and 2025. In terms of the *General Economy*, these 9 counties represent larger shares—they hold 40 percent of the state's manufacturing companies, 53 percent of the state's companies, 49 percent of the state's total income, 56 percent of its jobs, and 62 percent of its GDP. And in terms of the *Innovation Economy*, these nine counties represent even larger shares—57 percent of the state's college educated population, 63 percent of its college educated in-migrants, 72 percent of the state's KTI companies, 80 percent of the state's patents, 85 percent of the state's KTI jobs, 95 percent of the state's SBIR/STTR grants, 97 percent of the state's venture capital, and 98 percent of the state's university R&D.

6 Not all of the report's 41 measures are available at the county level. The 15 key measures presented here are the ones that are both available at the county level and are most relevant to the state's General Population, General Economy, or Innovation Economy. Detailed descriptions of each measure are available in the body of the report. See the Table of Contents for each measure's location in the report. Dates of source data for these measures: Mfg. Co.s (2025), Pop. (2025), Co.s (2024), Total Income (2024), Jobs (2024), College-Ed. Pop. (2020-2024, five-year estimates), Pop. Growth (2000-2025), GDP (2024, chained 2017 dollars), College-Ed. In-migrants (2020-2024, five-year estimates), KTI Co.s (2024), Patents (2022-2024 average), KTI Jobs (2024), SBIR & STTR $ (2022-2024 average), Venture Capital (2022-2024 average), Univ. R&D (2024).

Within this group, three counties in the Research Triangle region (Wake, Durham, and Orange counties) account for an average of 47 percent of North Carolina's totals across all 15 key measures, and Wake is the only county with more than five percent share on each measure **[County Shares Chart of Key Measures]**. This region is notable for the high number of research universities, as indicated by academic R&D expenditures and federal funding for science and technology small businesses, many of which are university spinouts. Despite higher levels of academic R&D in Durham and Orange counties, more science and technology businesses are located in Wake County, where venture capital investments are highly concentrated (53 percent of state total) along with patenting activity (26 percent). Mecklenburg County leads in GDP and maintains large shares of science and engineering firms, jobs, and patents but lags in university R&D and federal commercialization funding.

The Piedmont-Triad counties (Guilford and Forsyth), Buncombe County, and New Hanover County show strong KTI employment and educated workforces relative to their size, though with less venture capital and research funding. The foundation exists in these emerging counties outside the Triangle to grow significant innovative, entrepreneurial ecosystems, however, and a focused, sustained effort to marshal their assets and address gaps has strong potential to broaden North Carolina's innovation strengths beyond the Research Triangle region.

Figure iii: County Shares Chart of Key Measures

County	Mfg. Co.s	Pop.	Total Income	Co.s	Jobs	College-Ed. Pop.	Pop. Growth	GDP	College-Ed. In-migrants	KTI Co.s	Patents	KTI Jobs	SBIR & STTR $	Venture Capital	Univ. R&D	NC Total Share	NC Cumulative Share
Wake	8%	11%	15%	15%	14%	17%	20%	16%	18%	29%	26%	28%	30%	53%	15%	21%	21%
Mecklenburg	10%	11%	14%	16%	17%	15%	17%	22%	18%	19%	21%	19%	4%	17%	2%	15%	36%
Durham	2%	3%	3%	3%	5%	5%	4%	7%	7%	7%	11%	21%	39%	17%	34%	11%	47%
Orange	1%	1%	2%	2%	2%	2%	3%	2%	3%	3%	6%	1%	11%	5%	34%	5%	52%
Guilford	6%	5%	5%	5%	6%	5%	5%	6%	4%	4%	4%	5%	2%	2%	3%	4%	57%
Forsyth	3%	4%	4%	3%	4%	4%	3%	4%	3%	3%	6%	3%	1%	1%	8%	4%	60%
Buncombe	3%	2%	3%	4%	3%	4%	2%	2%	5%	3%	1%	3%	1%	1%	0%	2%	63%
New Hanover	2%	2%	2%	3%	3%	3%	2%	2%	3%	3%	1%	3%	1%	0%	0%	2%	65%
Iredell	3%	2%	2%	2%	2%	2%	2%	2%	2%	2%	3%	2%	7%	0%	0%	2%	67%
Total	**40%**	**42%**	**49%**	**53%**	**56%**	**57%**	**58%**	**62%**	**63%**	**72%**	**80%**	**85%**	**95%**	**97%**	**98%**	-	-

General Population Indicators General Economy Indicators Innovation Economy Indicators

This table provides a county-level breakout of the 9 counties whose aggregated values are presented in the County Summary of Key Measures chart on the previous page.

Measured against the U.S. average rather than share of state total **[Counties Performing Above the U.S. Average on Key Measures]**,[7] 21 counties perform above average on two or more key measures, up from 18 counties in 2024—indicating that North Carolina's innovation strengths are spreading geographically over time. These include counties near metropolitan cores like Charlotte (Union, Moore, and Cabarrus), Durham-Chapel Hill (Chatham), and Greensboro (Guilford), counties with major universities (Pitt, New Hanover, Watauga), and tourism- and retiree-driven counties with high education and income levels (Avery, Currituck, Dare, Henderson, Polk, Transylvania).[8]

Figure iv: N.C. Counties with At Least 2 Measures Above the U.S. Average

County	College-Educated In-migrants / Total Population	College-Educated Population / Total Population	Median Household Income	KTI Employment Establishments / Total Establishments	SBIR-STTR / GDP	Per Capita GDP	University R&D / GDP	Patents / Population	Venture Capital / GDP	KTI Employment / Total Employment	Total Measures
Durham	■	■	□	■	■	■	■	■	■	■	10
Wake	■	■	▒	■	■	▒	▒	■	■	▒	10
Orange	■	■	□	■	■	□	■	■	■		9
Chatham	□	▒	□	□	■			□			6
Mecklenburg	■	▒	□	□		■					5
Forsyth	□	□				□	■				4
Union	▒	□	▒	□							4
Cabarrus		□	□	□							3
Dare	■	□	□								3
Henderson	□	□			▒						3
Iredell	▒		□		■						3
Moore	■	□	□								3
New Hanover	■	▒				□					3
Avery	▒				□						2
Buncombe	■	▒									2
Currituck	■		□								2
Guilford	□	□									2
Pitt	▒						▒				2
Polk	■	□									2
Transylvania	■	□									2
Watauga	□	▒									2
Count	**20**	**17**	**11**	**7**	**7**	**6**	**5**	**4**	**3**	**2**	**21**

■ At least 50% above the U.S. average

▒ Greater than 25% but less than 50% above the U.S. average

□ Less than 25% above the U.S. average

General Population Indicators

General Economy Indicators

Innovation Economy Indicators

7 All measures in this table are normalized (as ratios or percentages) by a factor, thus enabling an "apples to apples" comparison. Educational measures are normalized by county population; KTI companies and jobs are relative to total companies and jobs within a county, respectively, income is median household income; and the remainder of the measures are relative to county-level Gross Domestic Product. Dates of source data for these measures: Mfg. Co.s (2025), Pop. (2025), Co.s (2024), Total Income (2024), Jobs (2024), College-Ed. Pop. (2020-2024, five-year estimates), Pop. Growth (2000-2025), GDP (2024, chained 2017 dollars), College-Ed. In-migrants (2020-2024, five-year estimates), KTI Co.s (2024), Patents (2022-2024 average), KTI Jobs (2024), SBIR & STTR $ (2022-2024 average), Venture Capital (2022-2024 average), Univ. R&D (2024).

8 It is also notable that in the 2024 report, 62 cells in the Counties Performing Above the U.S. Average on Key Measures table were shaded; in the 2026 report, 82 are shaded. This increase over the two-year period means that NC counties rank above the U.S. average in 20 more instances in 2026 than in 2024. As noted above, the table includes only the counties that rank above the U.S. average on two or more key measures. An additional 22 counties, not shown above, rank above the U.S. average on one of the 10 measures. The 22 counties with one measure are Brunswick, Camden, Carteret, Catawba, Cherokee, Clay, Craven, Cumberland, Franklin, Harnett, Hoke, Johnston, Lee, Lincoln, Madison, Mitchell, Onslow, Pasquotank, Pender, Perquimans, Stanly, and Surry.

Other counties perform above expectations (e.g., Avery, Henderson, and Iredell counties in SBIR/STTR funding; Chatham County in patent activity), but factors like KTI jobs and venture capital remain highly concentrated in the Research Triangle region. These findings indicate that other regions with emerging innovation economies would benefit from a larger supply of KTI workers and additional sources of capital to drive and sustain economic growth and resiliency.

Together, these county level differences reveal that North Carolina is a tale of two innovation economies: One economy is based primarily in more research-intensive areas, which have large populations that are growing rapidly and that have economic and innovation assets, activities, and outcomes well above the U.S. average. The other is based largely in less developed areas, which have much smaller populations that are stable or shrinking and that have economic outcomes well below the U.S. average. Understanding the nature and performance of these two economies is critical for informed decision making and policies that improve the economic well-being and quality of life for all North Carolinians. The more detailed 41 measures that follow in the body of this report provide a strong, multilevel basis for that understanding.

IMPLICATIONS AND PRIORITIES

These findings and trends paint a picture of North Carolina that is both rich with successes and opportunities but also facing some persistent challenges. As the state's 2026 *First in Opportunity* strategic plan makes clear, North Carolina's economic momentum depends not just on generating growth but on ensuring that the benefits of this growth reach communities beyond its established innovation hubs. The state's economic environment and structure are especially critical to this effort, particularly as innovation activity expands into new regions of the state.

The degree to which North Carolina prospers depends on how quickly and effectively it addresses these geographic and structural gaps in tailored, regionally-responsive ways. Drawing on the findings of this report and aligned with the state's goal to accelerate economic competitiveness through strategic innovation, the following priorities for each key indicator category are crucial for growing and broadening North Carolina's innovation-fueled economy statewide.

Economic Well-Being

Translate Growth into Shared Prosperity: To ensure that North Carolina's rapid population growth translates into rising living standards for its citizens, the state must increase the pace of improvements in its economic growth rate, wages, and incomes of its workforce, which continue to lag the national average. At the same time, the state must ensure that the benefits of this growth are broadly shared, including in rural and economically distressed communities, so that reductions in poverty and improvements in household income keep pace with the state's overall economic expansion.

Research & Development

Increase Volume and Intensity: To grow its economy significantly in both the short term and long term, North Carolina must continue to increase the volume and intensity of its research & development efforts—particularly those performed by business—relative to that in other states. Business-performed R&D in NC has typically accelerated faster than the U.S. average but has recently slowed to a pace below average. One way North Carolina businesses could improve further is by closer and more frequent research & development partnerships with the state's universities, which have well-above-average research & development performance, and facilities, equipment, and expertise often beyond the scope of many of the state's businesses.

Commercialization

Better Leverage Strong Asset Base: To foster the start and growth of businesses developing and commercializing innovative technologies, North Carolina's universities should be incentivized and equipped to focus more on company and industry engagement, as well as technology commercialization. Additionally, the state must continue to support its programs focused on capturing and leveraging the benefits of federal grant programs, such as Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) programs, which provide working capital to small and emerging companies. These steps will make North Carolina more attractive for later-stage commercialization resources such as venture capital, but they must also be leveraged further by strategic, proactive efforts to attract and develop investors and innovative businesses and market the state's innovative activities.

Innovative Organizations

Boost Entrepreneurship and Business Linkages: To advance the technology and innovation levels of its existing businesses and to start, grow, and attract new high-technology businesses, North Carolina must ensure that a greater share and range of its population has the training, resources, and support to be entrepreneurial. Similarly, it must enhance and extend programs focused on technology adoption and diffusion, particularly in rural regions with historically lower levels of innovation and that are struggling to fully participate in the benefits of the innovation economy. In addition, to remain competitive in the global economy, the state must continue to explore new markets for the goods and services it produces, particularly by understanding how North Carolina industries fit within global commodity value chains and deepening and expanding relationships with overseas trading partners.

Education & Workforce

Emphasize STEM and Strengthen Fundamentals: To intensify the innovation-relevant education and training levels of its workforce, North Carolina must grow the share of its community college and university-level students earning degrees in science, technology, engineering, and math (STEM) disciplines. One way to achieve this could entail industries, educators, and government regularly collaborating to develop a North Carolina innovation-focused technology workforce agenda and strategy. The strategy could organize education and workforce programs around broad clusters and skills, particularly ones the state has determined to be in its strategic interests. Additionally,

North Carolina must continue to increase and maintain the educational attainment of its citizens at all levels of the educational spectrum, to a level at least equal to, and preferably greater than, the national average. Doing so would enhance efforts in the three priorities discussed above and multiply their impacts.

Environment & Infrastructure

Reinforce, Enhance, and Broaden: To ensure that the greatest number and range of its citizens enjoy the economic and social benefits of science, technology, and innovation, North Carolina must continue to invest throughout its regions in basic infrastructure elements of its innovation economy. Examples include elementary, secondary, and higher education organizations; broadband deployment and adoption; and industries that use science and technology and a highly skilled workforce to develop, manufacture, distribute, and export products. Combined with North Carolina's low cost of living and high quality of life, these elements provide a rich foundation for starting, growing, and attracting businesses that improve our economic well-being and quality of life.

Efforts such as those above must be sufficiently long-term and well-funded to make a difference, and they must have the flexibility to respond to continually changing circumstances and to support different needs across regions and sectors. Moreover, decisions about their continuation and modification must be guided by clear benchmarks and performance criteria, such as those provided and explained in more detail throughout this report. With this information, key stakeholders—including policymakers, industries, academic institutions, nonprofits, and citizens—will have appropriate and timely baseline information on science, technology, and innovation throughout the state.

CONCLUSION

Together, these findings offer a snapshot of where North Carolina's innovation economy stands today, including its strengths, its gaps, and the priorities needed to sustain its momentum. The remainder of this report examines each of these findings in greater depth, presenting detailed data across the six indicator categories introduced above. For each of the report's 41 measures, readers will find North Carolina's performance relative to the U.S. average and other states, trends over time since the early 2000s, and, where available, county-level detail highlighting variation within the state. Taken as a whole, this data-driven foundation is intended to inform the decisions of policymakers, industry leaders, educators, and citizens working to build a stronger, more broadly shared innovation economy across North Carolina.

Introduction

What are Science, Technology, and Innovation?

Innovation is the creation and adoption of new products, services, and business models to yield value. While innovation has many sources, science (systematic knowledge) and technology (the practical application of knowledge) are its fundamental elements. Throughout history, science, technology, and innovation have brought about the development of tools, products, processes, and services such as the wheel, sailing ships, the plow, agricultural irrigation systems, municipal water and sewer systems, the internal combustion engine, the telegraph, audio and video, accounting processes, medicines and medical technologies, information and communications technologies, and artificial intelligence and quantum technologies. Each generation of civilization has built on the technological achievements of prior generations and used them to create new possibilities and wealth and security. In short, science and technology, and their practical advancement via innovation, are what have enabled humans to get more value out of the earth's natural resources on an ongoing basis.[1]

Why are Science, Technology, and Innovation Important for the Economy?

Through decades of empirical research, economists have documented the central role of science, technology, and innovation in long-term productivity, job growth, output growth, and higher incomes.[2] In terms of productivity and growth, economic studies have valued the return on research, development, and innovation to be four times the return on investment in physical capital.[3] Put another way, between one-third to one-half of economic growth in the United States can be attributed to innovation.[4] In terms of income, U.S. Bureau of Labor Statistics (BLS) data show that in all but one of 71 technology oriented occupations, the median income exceeds the median for all occupations; moreover, in 57 of these occupations, the median income is 50 percent or more above the overall industry median.[5] National Science Foundation (NSF) data show that, between 2017 and 2024, total factor productivity (TFP) grew faster in the high-R&D information sector (13%) in the United States than in the domestic nonfarm economy as a whole (8%).[6,7]

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1 The 2025 Nobel Prize in Economics was awarded to three economists who explained innovation-driven economic growth. Their pioneering work shifted the long-standing focus away from static capital accumulation to a dynamic continuous growth process powered by research, technological breakthroughs, and intellectual openness. One of the economists showed that continuous growth requires "useful knowledge"—understanding not just that an invention works, but why it works—coupled with an intellectual environment that is open to new ideas and tolerant of change. The other economists developed rigorous mathematical models for the concept of "creative destruction," showing how an economy advances when superior new innovations enter the market and intentionally displace older, outdated products, technologies, and firms. This ongoing interplay of useful knowledge, creative destruction, and a supportive, receptive intellectual environment are what has enabled humans to yield—on an ongoing basis—more value out of the earth's natural resources.

2 For a review of these studies, see Tassey 2007, Chapter 3.

3 Jones and Williams 1998, 2000.

4 U.S. Department of Commerce 2012.

5 Hecker 2005. Also see indicator 1.3 later in this report.

6 TFP is a broad measure of the impact of science and engineering (S&E) activities (beyond labor and capital) on economic growth. For more information, see National Science Foundation, 2026, Translation to Impact: U.S. and Global Science, Technology, and Innovation Output.

7 Atkinson and Ezell 2012.

Introduction

Two fundamental effects of science- and technology-based innovation drive these impacts:

1. Innovation empowers product and productivity improvements in *existing* companies;
2. Innovation spurs the dynamic creation of *new* companies that create new value.

Together, these effects lead to a virtuous cycle of expanding employment, as well as increased wages and lower prices, all of which expand domestic economic activity and create jobs.[8]
A high-productivity, high-employment, high-income, growing economy must be a high-technology, innovation-driven economy. Other economies around the world, recognizing this and aspiring to the U.S. standard of living, have examined the technology-based economic growth process and are progressively evolving public-private asset growth models. The current global trends in investment and innovation are exceeding those in the U.S., and many economies across the globe are now establishing public-private research partnerships to pool risk, improve the efficiency of research and development (R&D), and diffuse innovation and new technology platforms more rapidly across and within domestic supply chains.

Why *Tracking Innovation* 2026?[9]

A major impediment to the proper design and implementation of policies and programs that help advance innovation is a lack of accurate, comprehensive, and up-to-date information on the various factors related to innovation—R&D performance, innovation rates, technology commercialization rates, trends in high-technology industries, education and training levels of the workforce, and how all these relate to overall economic performance. Nearly all states and regions are grappling with this problem, including North Carolina. Critical questions concern the level of North Carolina's innovative activity, as well as whether it has the proper infrastructure and resources in place to support innovation, as well as overall economic development, to its fullest extent.

For nearly a century, North Carolina has been transitioning from an agricultural and traditional manufacturing economy to a knowledge- and innovation-based economy fueled by science and technology. In the process, the state's policymakers, businesses, educational institutions, and citizens have made strategic investments in infrastructure, institutions, and human capital. Because of these investments (and as illustrated later in this report; see section 2), North Carolina has achieved a leading role in the "basic" and early-stage "applied" research that forms the foundation for breakthrough innovations. These innovations have helped North Carolina's per capita income as a share of U.S. per capita income more than double during the last century,

8 Atkinson and Foote 2020.

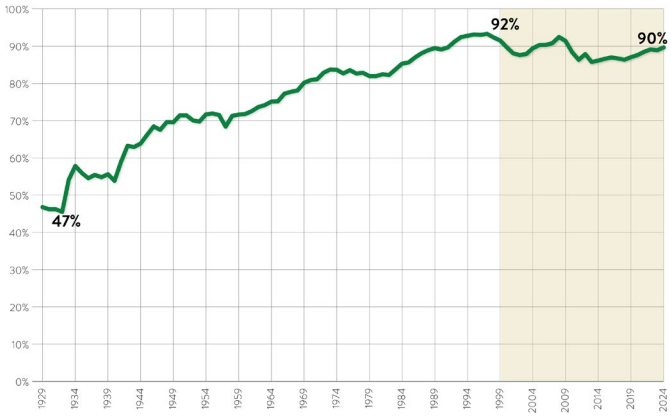
9 The NC Board of Science, Technology & Innovation has produced nine innovation indexes during past 24 years, in 2000, 2003, 2008, 2013, 2015, 2017, 2019, 2021, and 2024. See: nccommerce.com/documents/innovation-reports. While the 2008 report was titled "Advancing Innovation" rather than "Tracking Innovation," it includes a detailed innovation index in "Chapter 2: North Carolina's Innovation Performance.

increasing steadily from a low of47 percent in 1932 to a high of 92 percent in 1997 **[Figure 1]**. While significant and impactful, these investments have not been sufficient to propel North Carolina's per capita income to a level above the average per capita income for the nation as a whole. And since 1997, North Carolina's per capita income as a share of U.S. per capita income has decreased, currently at 90% in 2024, the latest year for which complete data are available.[10] Thus, ensuring proper infrastructure and resources for innovation is important not just for sparking economic well-being and prosperity, but also for sustaining them over time and extending them more broadly throughout the state. At a minimum, finding answers regarding how to do so and to what extent requires appropriate and timely baseline information on science, technology, and innovation in the state. This, in turn, will help identify strengths and weaknesses, inform decisions and policy making, and establish benchmarks for measuring effectiveness.

What is *Tracking Innovation* 2026?

The goal of *Tracking Innovation* 2026 is to provide that information in a systematic and accessible format, and therefore to help inform science, technology, and innovation planning and policy at all levels throughout the state. As a follow-up to previous reports tracking North Carolina's innovation performance, this report enables North Carolina to join a growing number of states regularly monitoring innovation trends within and outside their borders. It assembles information from a wide variety of sources to document innovation-related activity in North Carolina, six comparison states, and the U.S. Its 41 measures

Figure 1: N.C. Per Capita Income as a Share of U.S. Per Capita Income, 1929–2024



Source: U.S. Bureau of Economic Analysis.

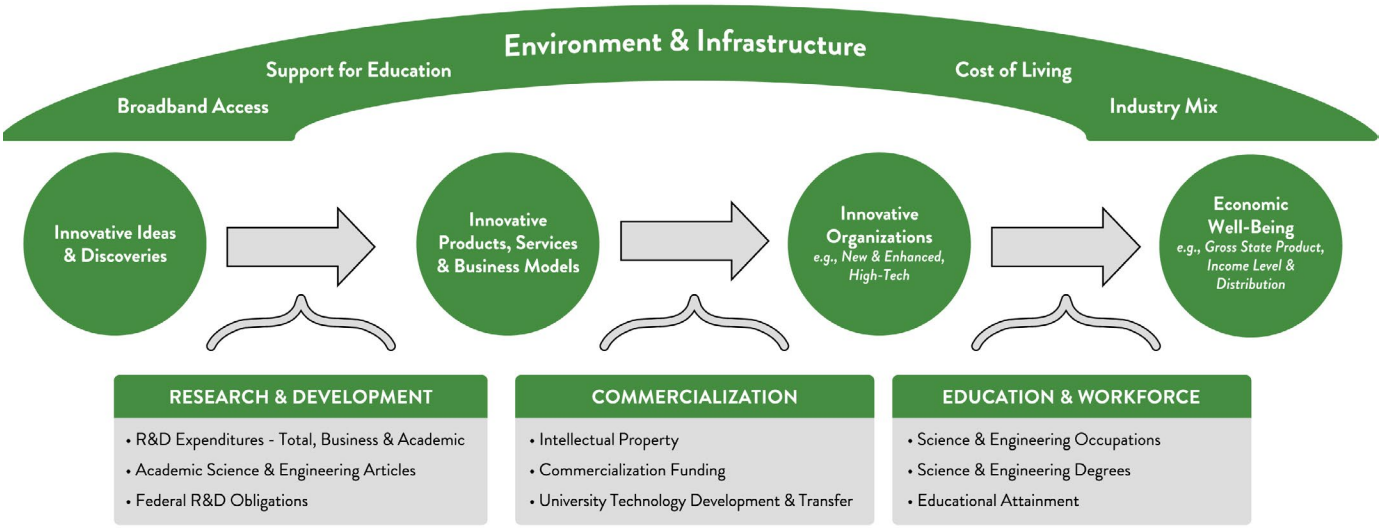
are summarized under 33 broad indicators of innovation, technology, and economic well-being. Each of the 41 measures, in turn, falls into one of six general categories:

1. **Economic Well-Being** (e.g., gross domestic product, income level and distribution)
2. **Research & Development** (e.g., R&D expenditures, academic articles)
3. **Commercialization** (e.g., intellectual property, commercialization funding)
4. **Innovation Organizations** (e.g., high-technology establishments, entrepreneurs)
5. **Education & Workforce** (e.g., science & engineering occupations, educational attainment)
6. **Environment & Infrastructure** (e.g., support for education, broadband access)

The report does not make normative judgments regarding which of its measures are most important for plotting the course of science, technology, and innovation policy in North

10 To be clear, North Carolina's nominal per capita income continues to increase over time. However, because the U.S.'s nominal per capita income also continues to increase, and at a rate equal to or slightly faster than North Carolina's, North Carolina has not yet been able to increase its share of the U.S. average above 92 percent. If recent trends continue, North Carolina's is on track to reach parity with or exceed the U.S. average in the coming years.

Figure 2: Innovation Ecosystem



Carolina. Instead, the facts—as best they can be gathered from existing secondary sources—are presented as concisely and clearly as possible, leaving it primarily to the reader to gauge the significance of specific trends. Though every measure is insufficient in isolation, together they lend useful insight into the status of science, technology, and innovation activity in North Carolina.

What is the Methodology of *Tracking Innovation* 2026?

Innovation Ecosystem

Innovation occurs in an "innovation ecosystem"—the complex and dynamic collection of people, organizations, cultures, policies, and programs that creates innovative ideas and discoveries, translates those ideas into innovative products, services and business models, and enhances existing organizations and builds new organizations to improve our economic well-being and quality of life **[Figure 2]**.

Accordingly, any effort to measure innovation comprehensively, accurately, and effectively in North Carolina should:

1. Focus on *multiple components* of the state's innovation ecosystem;
2. Include *multiple indicators* for each component.

Introduction

The indicators included in this report meet these two goals while capturing, to the extent possible, the intersection of both what we *want* to measure and what we *can* measure using available data sources.[11] It also compares these indicators on multiple dimensions—spatially & temporally[12]—to generate a rich and comprehensive understanding of the health of North Carolina's innovation ecosystem.[13]

Data Sources

The report relies primarily on existing secondary data sources (see detailed listing in the "Sources" on page 158 at the end of this report). In rare cases, and unless otherwise noted, no surveys or other forms of primary data collection were undertaken to assemble measures. Additionally, all measures are:

- As current and accurate as possible;
- Derived from objective and reliable data sources;
- Easy to understand and compare across states; and
- Relevant and of interest to the public.

The measures included in this report are meant to serve as a baseline for decision making and further inquiry. To the extent possible, and when appropriate, future updates of the report will include additional data and measures.

State-By-State Comparisons

For the point-in-time comparisons focused on the most recent periods possible, the report presents information for the U.S. average and each of the 50 states in bar-chart form. This enables a comprehensive and informative assessment of where North Carolina currently fares relative to the nation overall and to each of the 49 other states. In addition, to enable a more targeted assessment of North Carolina's performance relative to a handful of important states, the report highlights North Carolina's performance on each measure to that of the following six comparison states:

- Two leading technology states (California and Massachusetts)
- Two strong southeastern states (Georgia and Virginia)
- Two mid-range and "up and coming" technology states (Colorado and Washington)[14]

For the over-time comparisons, the report presents information only for North Carolina, the U.S. average, and the six comparison states in line-chart form.[15] This enables an informative assessment of how North Carolina has fared relative to the nation overall and to each of the six comparison states over time, in particular the extent to which North Carolina is gaining ground, losing ground, or holding its own.[16]

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11 This acknowledges the oft-cited aphorism that "Not everything that can be measured matters, and not everything that matters can be measured."

12 The typical over-time period assessed in this report ranges from 2000 to the most recent year(s) for which current data are available, most often 2024 or 2025. For virtually all the indicators, there is a one- to three-year lag time between the current year (2026) and the most recent year for which data are available. This is because obtaining comprehensive (across all 50 states) data that are both reliable and accurate is labor intensive and time consuming and must be done with care and rigor. As the over-time charts indicate, however, a state's performance does not change quickly over a one- or two-year time period. Most changes are slow and incremental, and thus recent years' data are reasonable predictor of current years' performance.

13 The index is analogous to the results of regular, comprehensive medical examination designed to evaluate and understand the health of a person. In this case, the health of North Carolina's innovation ecosystem is being evaluated.

14 California and Massachusetts typically rank high on several indicators of science and technology. Georgia and Virginia are typically regarded as leading southeastern technology states with which North Carolina competes. Colorado and Washington often rank close to North Carolina on various innovation indicators and have improved their rankings significantly in recent years.

15 Line charts including all 50 states are too detailed to interpret meaningfully.

16 To facilitate a comparison of North Carolina's performance relative to that of the U.S. average and the six comparison states, the following color scheme is used on all charts: North Carolina (bold green), U.S. average (bold blue), California (pale red), Massachusetts (pale yellow), Georgia (pastel purple), Virginia (burgundy), Colorado (pale blue), and Washington (pale green).

Within-North Carolina Comparisons

When available, within-North Carolina data (most often in the form of county level data, but occasionally at other levels, such as ZIP code, city, or university) are presented.[17] These additional levels of comparison provide deeper context for evaluating North Carolina's performance, which provide a more nuanced understanding of the location and concentration of innovation-related factors throughout the state.[18]

New In This Report

While this 2026 report is very similar to the most recent (2024) *Tracking Innovation* report, it differs in a small number of notable ways. Specifically, it:

- Includes:
  - Two new measures as a component of indicator 4.3:
    - 4.3E and 4.3F: New Businesses Formed within North Carolina (by County)[19]
  - One new measure as a component of indicator 6.4:
    - 6.4G: Number of Manufacturing Establishments in North Carolina (by County)[20]

  These changes refine and supplement the data, particularly at the county and local level, but are not included in North Carolina's overall innovation rank because they are not at the state level.

- Excludes:
  - Net KTI Employment Business Formations as a Percentage of all Business Establishments
    - Previously measure 4.1D and 4.1E in the 2024 report[21]
  - Digital Divide Index (Percent Households in a High Digital Divide Tract)
    - Previously measure 6.2F in the 2024 report[22]

17 For each indicator, the decision regarding the level at which to display the data was determined by a combination of (a) the most precise level at which accurate and comprehensive data were available and (b) the level at which displaying the data proved most informative for the purposes of this report.

18 Accurate and reliable within-North Carolina data are available much less often than are state-level data. Hence, not every indicator includes within-North Carolina data.

19 These measures were added to help show entrepreneurship levels and rates *within and across* North Carolina.

20 This measure was added to fill a gap in previous *Tracking Innovation* report regarding location of manufacturing companies within the state.

21 These measures were excluded because they did not add unique value above and beyond measures 4.1A and 4.1B. While these measures were at the state level, their exclusion did not affect North Carolina's overall innovation rank because their values were consistent with North Carolina's average rank.

22 This measure was excluded because the Digital Divide Index, while based on factual, verifiable metrics, entails value judgements beyond the scope of this report regarding which variables to include in the index and how to weight each of the variables. Because this measure was at the county level, it did not affect North Carolina's overall innovation rank.

Interpreting the Data

The data in this report are voluminous and must be interpreted appropriately and carefully. To that end, several points should be kept in mind:

Values for most measures are expressed as ratios or percentages. This "normalizes" the data by controlling for factors such as state population and gross domestic product, thus enabling an "apples to apples" comparison.

Small differences in rankings and changes in value over time are not significant. In the text description accompanying each measure, the words "significant" or "significantly" are used only when differences across rankings or values over time surpassed a minimum and commonly accepted level of significance—i.e., at least one standard deviation away from the mean value of the data. In some cases, what appears to be a large difference in percentages is not, in fact, a statistically significant difference. Care was taken not to overinterpret the data.

Large patterns and trends matter more. While it is tempting to draw conclusions based on a comparison of a small number of states or years (e.g., two or three), those conclusions are far less valid and compelling than ones based on a comparison of a larger number of states and years.

Interpretation of a measure should not be made in isolation. While each measure, by itself, provides valuable information, that value increases dramatically when judged alongside the information provided by other measures, as each is just one component of the larger interconnected innovation ecosystem. Moreover, whereas some measures primarily reflect outcomes (e.g., gross state product, educational attainment, income levels, poverty levels), others primarily reflect causes or the broader environment and context (e.g., R&D expenditures, support for education, broadband access, industry mix). As such, each should be evaluated considering its place in the ecosystem **[Figure 2]**.

Data for states with smaller populations is less precise and may be misleading. While the data for states with small populations are correct in that they reflects what is available, they should potentially be discounted because the smaller number of observations means the error level may be higher and the smaller magnitude may be less meaningful and impactful overall.

Rankings tend to divert attention from the actual value of a given measure, which often is more important. On many measures, there is very little statistically significant variation between state ranks, which simply are an ordinal-level measure.[23] This is most true for rankings with a low level of variation across the distribution, in which case the difference between the top-ranked state and the lowest-ranked state may be small and not particularly meaningful. Thus, in this report North Carolina's actual value (a ratio or percentage) on each measure is reported, in addition to its rank (which is revealed by default in each graphic), permitting more meaningful interpretation of the findings. When measuring North Carolina's performance, it is better to know both its national rank and the percent of U.S. value. Each tells us something unique and helps us make sense of the other. Together, they provide more information than they would by themselves. The two numbers typically track together (e.g.,

23 Ordinal-level measures allow only for the rank order [1st, 2nd, 3rd, etc.] by which data can be sorted, but do not allow for relative degree of difference between the data.

when one is high, so is the other). When they don't, it typically is when a small number of states dominate U.S. activity (e.g., see Venture Capital in indicator 3.4) or when there is little statistically significant difference between states.

Rankings are for the state as a whole. Because the rankings are in summary form and reflect an average score for the entire state, they do not convey information about the performance of specific regions or areas (e.g., counties, cities, metropolitan statistical areas) within the state. Where such sub-state data are available (as they are for 25 of the 41 measures, they are presented, typically in map form), to provide a more nuanced and explicit understanding of the location of innovation-related assets and the performance of those locations, which can vary considerably across the state.

We hope you find the data informative and useful.

Section 1:
Economic Well-Being

The overall outcome of North Carolina's innovation economy is **Economic Well-Being**, which represents the extent to which innovation translates into real improvements in the economic conditions and quality of life of the state's residents and businesses. **Economic Well-Being** captures the combined results of innovation, including the extent to which an economy is growing, generating higher incomes, more jobs, and reduced poverty for the people who live there. Tracking measures of these outcomes over time, and relative to other states, helps determine whether North Carolina's investments in an innovative economy translate into shared prosperity.

INDICATOR 1.1: GROSS DOMESTIC PRODUCT

Indicator Overview

Gross domestic product (GDP) per capita captures the overall economic performance of a locale (e.g., state, country, or region). GDP is a measure of the total value of goods and services produced by an economy; on a per capita basis, GDP provides a measure of the productive capacity of a locale's workforce.[1] Although GDP is influenced by a wide range of factors—many of which are unrelated to the state's innovation economy—one of the ultimate aims of fostering innovation is to increase per capita GDP and other related indicators of economic performance.

KEY FINDINGS

- North Carolina's per capita GDP ranks below the U.S. average, has since at least 2001, and is increasing at a rate slightly slower than the U.S. average.
- Out of North Carolina's 100 counties, only six had a per capita GDP higher than the U.S. average in 2024, and five account for half of the state's total GDP.

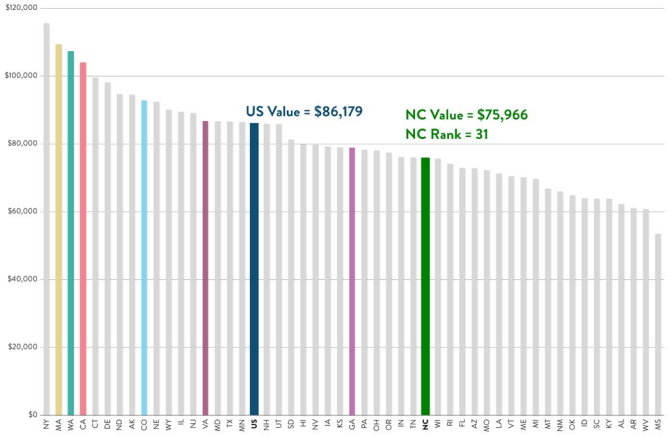
1 For the purposes of this report, the term "gross domestic product (GDP)" is used as a general counterpart to the more specific terms "gross state product (GSP)" at the state level, "gross regional product (GRP)" at the regional level, and "gross metro product (GMP)" at the metropolitan statistical area level.

INDICATOR 1.1: GROSS DOMESTIC PRODUCT

How Does North Carolina Perform?

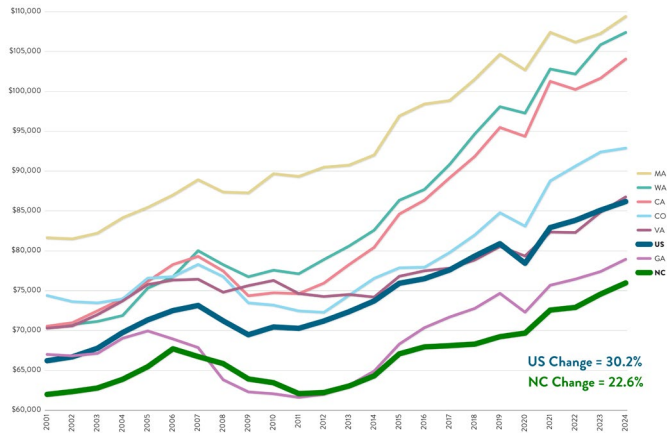
In 2024, North Carolina ranked 31st in the nation on this measure, with a per capita GDP of $75,966, putting it well below the national average ($86,179) **[1.1A]**. This is a one position improvement compared to the 2022 data analyzed in the 2024 edition of this report. Besides Georgia, all the comparison states had per capita GDP values above the U.S. average. Three of the six comparison states (Massachusetts, Washington, and California) were in the top five states for per capita GDP in the nation. Since 2001, North Carolina's GDP has increased 22.6 percent **[1.1B]**. This rate of change is the second lowest of the comparison states, greater than only the change that Georgia (17.8 percent) has seen from 2001 to 2024.

1.1A: Per Capita Gross Domestic Product, All U.S. States, 2024



Source: U.S. Science Board and U.S. Bureau of Economic Analysis.
Note: Adjusted for inflation (2024 dollars).

1.1B: Per Capita Gross Domestic Product, Comparison States, 2001–2024

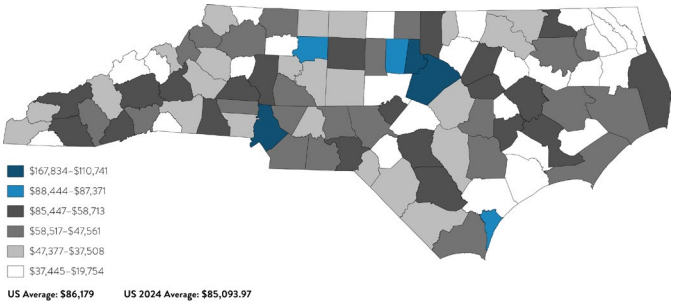


Source: U.S. Bureau of Economic Analysis.
Note: Adjusted for Inflation (2024 dollars).

INDICATOR 1.1: GROSS DOMESTIC PRODUCT

Additionally, North Carolina counties can be evaluated to determine how they compare to the U.S. value. Out of 100 counties in North Carolina, only six had a per capita GDP higher than the U.S. average in 2024 **[1.1C]**. Durham County had the highest value, at $167,834. Other counties with per capita GDP higher than the U.S. average include Mecklenburg, Wake, Forsyth, New Hanover, and Orange. Each of these counties is home to a large city and/or a large university. Forty-three counties have a per capita GDP under $40,000, with two having lower than $20,000. Since 2010, the per capita GDP of Durham, Mecklenburg, and Wake counties have been significantly above the U.S. average and significantly higher than and increasing significantly faster than the per capita GDP of the other counties in the state **[1.1D]**. Two other counties that rank above the U.S. average—Orange and New Hanover—have also increased over that time period. The majority of other counties have either remained relatively flat in per capita GDP or below the U.S. average between 2010 and 2024.

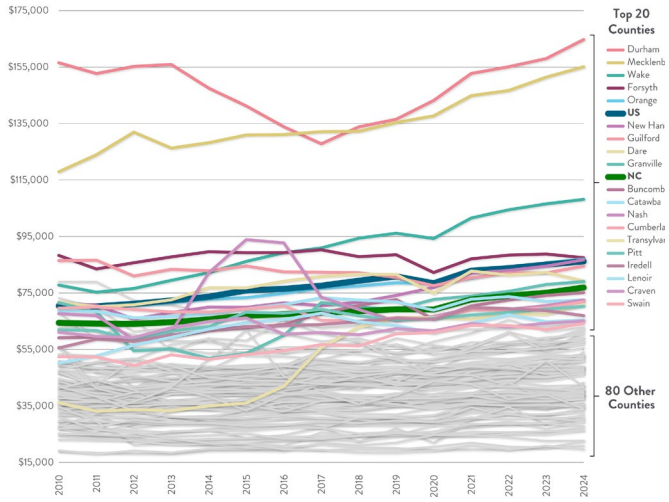
1.1C: Per Capita Gross Domestic Product, N.C. Counties, 2024



Source: U.S. Bureau of Economic Analysis, U.S. Census Bureau.

Note: Blue counties rank above U.S. average.

1.1D: GDP Per Capita, N.C. Counties, 2010–2024



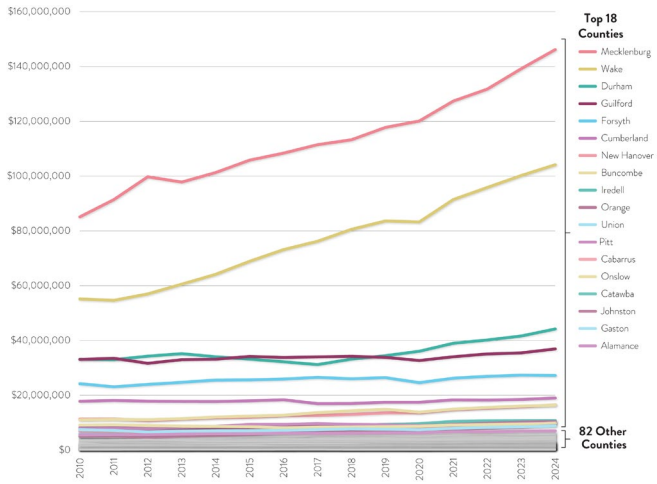
Source: U.S. Bureau of Economic Analysis, U.S. Census Bureau.

Note: Adjusted for inflation (2024 dollars).

INDICATOR 1.1: GROSS DOMESTIC PRODUCT

Since 2010, Mecklenburg County has had the highest total GDP for all counties, accounting for 22 percent of the state's total GDP **[1.1E]**. Wake County has also consistently remained the second highest share (15.7 percent) of the state's total. Both Mecklenburg and Wake Counties have consistently increased their total GDP since 2010, while most other counties have remained relatively consistent in their GDP. Durham County's share (6.7 percent) of the state total has also increased in recent years, while Guilford County's share (5.6 percent) of the state total increased. Together, those five counties account for half of the state's total GDP.

1.1E: Total GDP, N.C. Counties, 2010–2024



Source: U.S. Bureau of Economic Analysis, U.S. Census Bureau.
Note: Adjusted for inflation (2024 dollars).

INDICATOR 1.1: GROSS DOMESTIC PRODUCT

What Does This Mean for North Carolina?

Since 2001, North Carolina has consistently lagged behind comparison states and the U.S. average in per capita GDP. Additionally, whereas North Carolina ranked 19th nationally in per capita GDP in 2001, it ranks 31st in 2024 and has had slower per capita GDP growth than the U.S. average since 2001. Much of this lag is due to the growing gap between urban counties and rural counties. Because per capita GDP measures the ability of the state economy to support residents and weather economic turbulence, it is important that North Carolina improve this statistic by taking smart, strategic steps to grow the economy, particularly in rural regions. Fostering innovation is one such step; the value added by innovation can improve productivity and is often compensated with increasing jobs, income, and profit. ■

INDICATOR 1.2: INCOME

Indicator Overview

The two measures of income examined within this section—per capita income and median household income—can be used to approximate economic prosperity and the ability of the economy to generate improved standards of living for its citizens.[1] Per capita personal income is the total income received from all sources divided by the total population; it measures the amount of wealth generated by an economy from wages and salaries, transfer payments, dividends, interest, rents and proprietor's income for each person in that economy. Per capita income may, however, obscure differences in income distribution, as it depends somewhat on demographics, such as the share of a state's population that is of working age. Thus, to add more clarity to North Carolina's income picture, median household income—the income amount at which half of all households fall above and half of all households fall below—is included here as a second measure of income. Median household income provides insight into changes in economic conditions for middle-income households.

KEY FINDINGS

- North Carolina's per capita income ranks below the U.S. average, has since at least 2000, and, adjusted for inflation, is increasing at roughly the same rate as the U.S. per capita income is increasing.
- North Carolina's median household income ranks below the U.S. average, has since at least 2005, and, adjusted for inflation, is increasing slightly faster than the U.S. median household income is increasing.
- Within North Carolina, county per capita income and median household income vary considerably. On both income measures, most North Carolina counties have incomes well below the state average and the U.S. average.

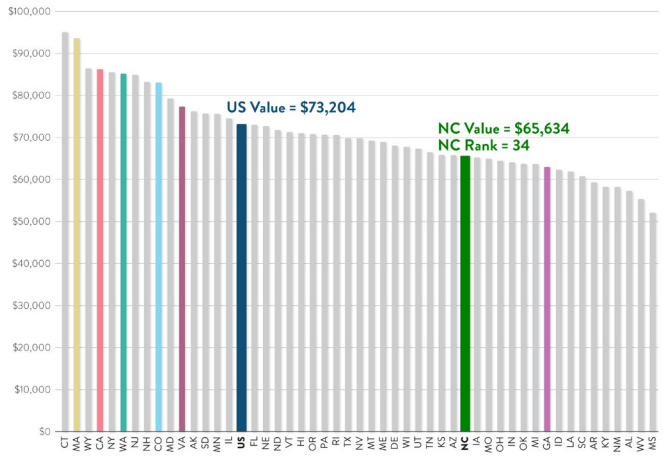
1 Income measures in this indicator do not account for differences in cost of living. Thus, the income earned in one state may provide a citizen in that state with more or less purchasing power than the same income provides a citizen in a different state or county. See Indicator 6.3 for cost-of-living comparisons.

INDICATOR 1.2: INCOME

How Does North Carolina Perform?

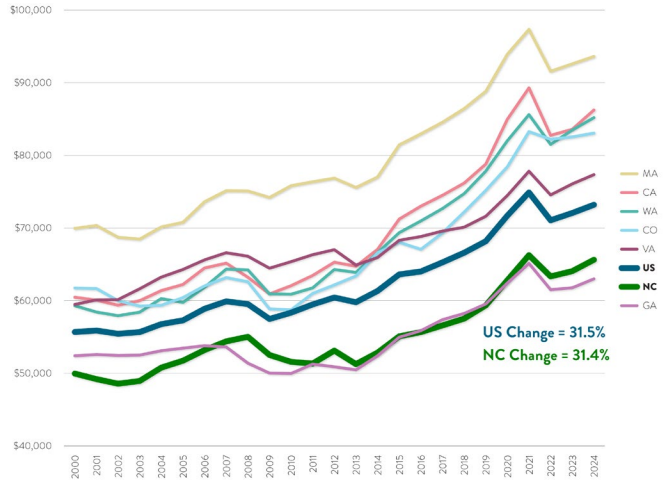
In 2024, North Carolina had a per capita income of $65,634 **[1.2A]**. This value places North Carolina 34th in the nation and at 90 percent of the U.S. average ($73,204). North Carolina ranks the second lowest of comparison states for per capita income, with only Georgia having a lower value ($63,006). While North Carolina sits well below most comparison states in per capita income, the rate of change since 2000 is comparable to Massachusetts (33.8%), Colorado (34.5%), Virginia (30.1%), and the U.S. average (31.5%) **[1.2B]**. This indicates that while North Carolina is increasing the per capita income, other states are increasing their per capita income at the same rate, keeping North Carolina's overall ranking consistently near the bottom 30 percent of states.

1.2A: Per Capita Income, All U.S. States, 2024



Source: U.S. Bureau of Economic Analysis.

1.2B: Per Capita Income, Comparison States, 2000–2024

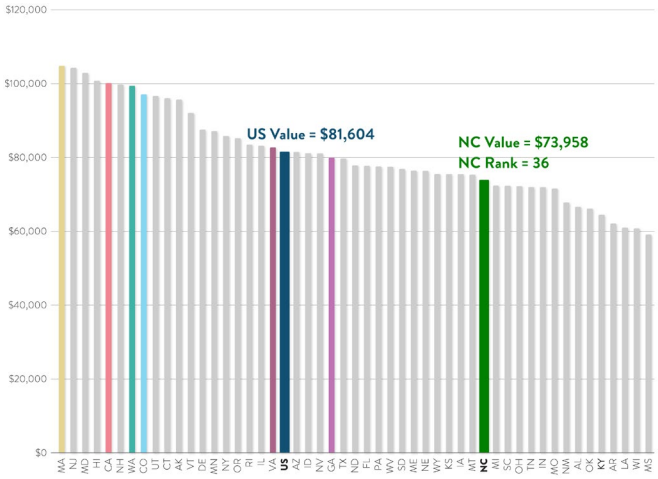


Source: U.S. Bureau of Economic Analysis.
Note: Adjusted for inflation (2024 dollars).

INDICATOR 1.2: INCOME

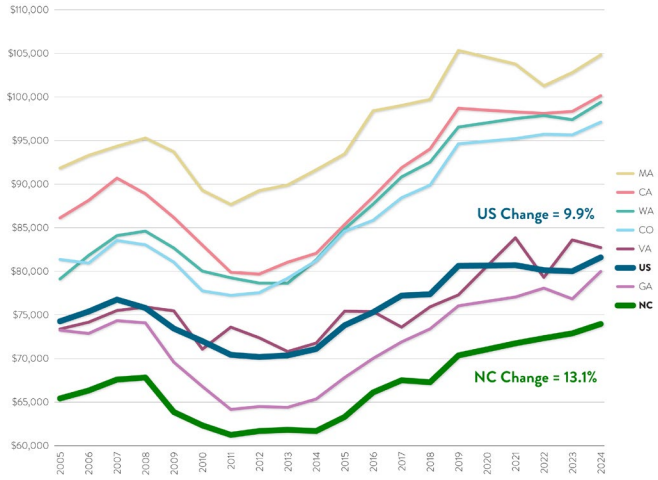
At 36th in the nation, North Carolina ranks even lower in median household income **[1.2C]**. With a value of $73,958, North Carolina has a median household income 91 percent of the U.S. average and 71 percent of the top state (Massachusetts). The closest comparison state to North Carolina in 2024 was Georgia, which had a median household income $6,000 higher than North Carolina. Since 2005, North Carolina has had a median household income lower than all comparison states **[1.2D]**. North Carolina's growth rate has been 13.1 percent since 2005, with relatively consistent increases since 2014. North Carolina's rate of change since 2005 is relatively comparable to that of Massachusetts (14.1%) and Virginia (12.7%) and is slightly higher than the U.S. growth of 9.9%. Georgia has the lowest rate of growth out of comparison states at 9.2 percent since 2005, while Washington has the highest at 25.6 percent.

1.2C: Median Household Income, All U.S. States, 2024



Source: U.S. Census Bureau.

1.2D: Median Household Income, Comparison States, 2005–2024



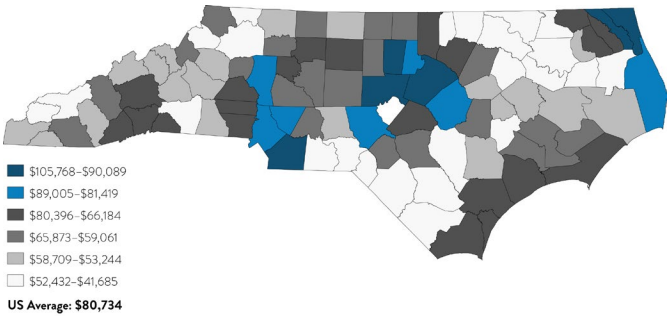
Source: U.S. Census Bureau.

Note: Adjusted for inflation (2024 dollars).

INDICATOR 1.2: INCOME

Within North Carolina, 14 counties have a per capita personal income higher than the state average, and five of those have a per capita personal income higher than the national average.[2] The low number of counties above the state average indicates that high-income counties like Orange and Chatham, with per capita personal incomes of $87,778 and $91,638, respectively, skew the distribution. In the 2020-2024 period, 13 North Carolina counties had a median household income higher than the U.S. average **[1.2E]**. These counties were Cabarrus, Camden, Chatham, Currituck, Dare, Durham, Iredell, Johnston, Mecklenburg, Moore, Orange, Union, and Wake. Wake County had the highest median household income in the state at $105,768, while Tyrell County had the lowest at $41,685.

1.2E: Median Household Income, N.C. Counties, 2020–2024



Source: U.S. Census Bureau.

Note: Blue counties are above U.S. average.

2 U.S. Bureau of Economic Analysis, "Personal Income Summary, County," 2024. Map not shown here.

INDICATOR 1.2: INCOME

What Does This Mean for North Carolina?

North Carolina's per capita and median household income metrics compared poorly to most states in the U.S. in 2024, and North Carolina has yet to surpass any comparison states in these metrics. Historical data has shown that North Carolina's performance has been lacking, with income growth not increasing fast enough to keep up with other states. Slow income growth indicates that the state economy may not be generating new opportunities for households to increase wealth and standards of living. Occupations in the innovation economy are often compensated with high incomes; to the extent that more individuals can enter the innovation economy, North Carolina income performance will improve. This may be accomplished through measures like improving education levels in the workforce and increasing the share of Knowledge- and Technology-Intensive (KTI) companies or Science, Technology, Engineering, and Mathematics (STEM) occupations in the state's economy. ■

INDICATOR 1.3: AVERAGE ANNUAL WAGES

Indicator Overview

An economy's average annual wage reflects and provides insight into its mix of jobs. Low average annual wages typically indicate that an economy has a high percentage of low-wage jobs that may be in low-technology and labor-intensive economic sectors. High average annual wages typically indicate that a state's industry mix provides a larger share of middle- and high-wage jobs and generates relatively high standards of living. Enhancing North Carolina's innovation-based economy, fueled by industries with Knowledge-and Technology-Intensive (KTI) employment, can lead to higher average annual wages, ultimately leading to greater economic well-being and quality of life.

KEY FINDINGS

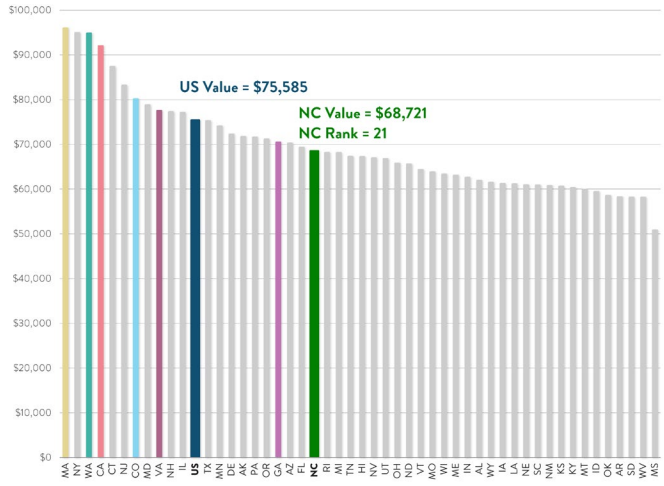
- North Carolina's average annual wage in 2024 ranked below the U.S. average and the average wages of all comparison states.
- Between 2001 and 2024, North Carolina's inflation-adjusted average wage increased at a rate slightly faster than the rate of increase in the U.S. average wage. Average annual wages for workers in Knowledge- and Technology-Intensive (KTI) employment industries, in both North Carolina and the U.S. overall, are consistently much higher than the average annual wages for workers in all industries.
- Within North Carolina, only four counties had average annual wages higher than the N.C. average in 2024. The same four counties also had higher average annual wages than the U.S. average.

INDICATOR 1.3: AVERAGE ANNUAL WAGES

How Does North Carolina Perform?

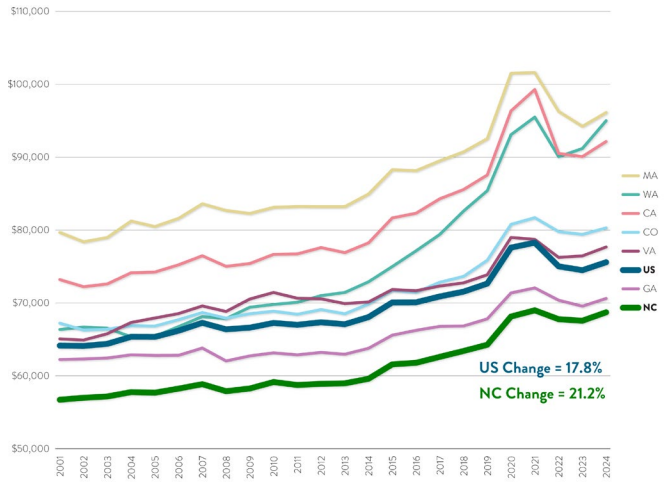
In 2024, North Carolina had an average annual wage of $68,721, placing it 21st in the nation for average annual wage **[1.3A]**. This position is up two placements compared to the 2022 data presented in the 2024 version of this report. All six comparison states had a higher average annual wage than North Carolina, with Georgia being the only other state with an average annual wage lower than the U.S. average. North Carolina's modest performance relates to the industry mix of its economy overall, which continues to depend—more than many other states do—on low-technology industries that are sensitive to labor costs, particularly in rural regions, the majority of the state. While North Carolina ranks below the U.S. average, when adjusted for inflation, the rate of growth for average annual wages in North Carolina exceeds that of four comparison states (Massachusetts, Colorado, Virginia, and Georgia) and the U.S. average **[1.3B]**.

1.3A: Average Annual Wage, All U.S. States, 2024



Source: Bureau of Labor Statistics, U.S. Department of Labor.

1.3B: Average Annual Wage, Comparison States, 2001–2024



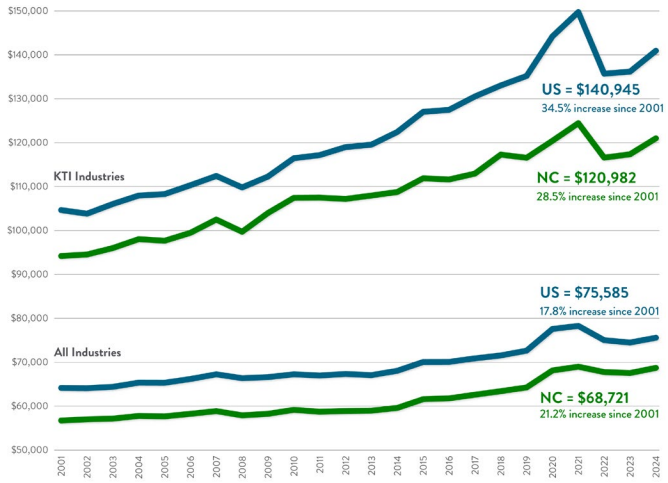
Source: Bureau of Labor Statistics, U.S. Department of Labor.
Note: Adjusted for inflation (2024 dollars).

INDICATOR 1.3: AVERAGE ANNUAL WAGES

Knowledge- and technology-intensive (KTI) industries (see Appendix A for a definition and full list of NAICS codes) tend to produce higher wages than do other industries. In North Carolina, KTI industries have average annual wages more than $52,000 higher than wages for all other industries **[1.3C]**. Additionally, when adjusted for inflation, KTI industries had a larger growth rate since 2001 (28.5 percent) compared to that for all other industries (21.2 percent). While North Carolina's KTI industries' average annual wages ($120,982) are well above its wages for all industries ($68,721), they remain below the U.S. average for KTI industries ($140,945) and are increasing at a rate slower than the U.S. average (34.5 percent).

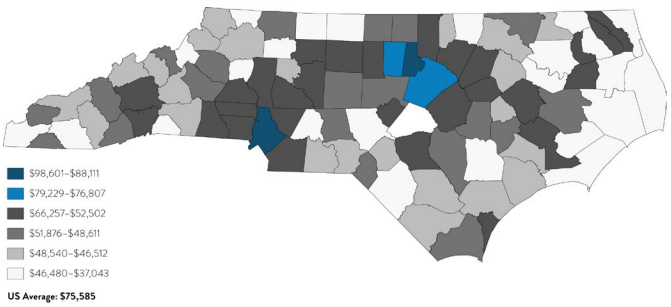
Within North Carolina, the vast majority of counties have an average annual wage lower than the state average. Only four counties—Durham, Mecklenburg, Wake, and Orange—had a 2024 average wage higher than the state average; the same four counties had average wage higher than the U.S. average **[1.3D]**. This pattern reflects the fact that high-wage, innovation-based jobs typically are concentrated in a few, typically urban, counties (see indicators 4.1 and 4.2).

1.3C: Average Annual Wage, KTI Employment Industries and All Industries, U.S. and N.C., 2001–2024



Source: Bureau of Labor Statistics, U.S. Department of Labor.
Note: Adjusted for inflation (2024 dollars).

1.3D: Average Annual Wage, N.C. Counties, 2024



Source: Bureau of Labor Statistics, U.S. Department of Labor.
Note: Blue counties rank *above* the U.S. average.

INDICATOR 1.3: AVERAGE ANNUAL WAGES

What Does This Mean for North Carolina?

North Carolina's average annual wage in 2024 was below the average annual wage for the nation as a whole and for all comparison states. However, average wages in North Carolina have increased over time, and this increase has slightly exceeded the country as a whole. Overall, the wage picture in North Carolina is improving somewhat but is still lower than it should be. A key way to increase wages is to increase the number of workers employed in KTI industries and other knowledge-based industries throughout the state. Growth in these occupations will lead to higher standards of living for North Carolinians, increased consumer spending, and economic growth across the state. ■

INDICATOR 1.4: UNEMPLOYMENT

Indicator Overview

The unemployment rate is the percentage of labor force participants who are unemployed but actively seeking and available for work. Unemployment is generally viewed as a lagging indicator that reflects the performance of an economy. Unemployment rates indicate the degree to which an economy provides sufficient jobs to its labor force; higher rates show a relative inability to generate job opportunities.

KEY FINDINGS

- North Carolina's unemployment rate has generally trended higher than the U.S. average since 2000, particularly between 2009–2012, during and after the recession, but since 2020 has decreased to closely follow the national average.
- In 2024, a majority of counties in North Carolina had unemployment rates equal to or lower than the U.S. value.

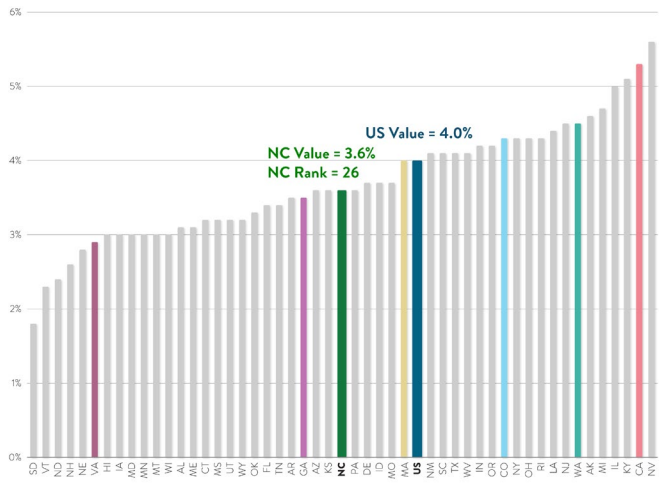
INDICATOR 1.4: UNEMPLOYMENT

How Does North Carolina Perform?

In 2024, North Carolina had an unemployment rate of 3.6 percent, putting it below that of the national average (4.0 percent) **[1.4A]**. An unemployment rate of 3.6 percent ranks North Carolina as the state with the 26th lowest unemployment rate, improving its ranking by five positions compared to the 2022 data presented in the 2024 edition of this report. Georgia and Virginia were the only other comparison states with unemployment rates lower than the U.S. value, with rates of 3.5 percent and 2.9 percent, respectively.

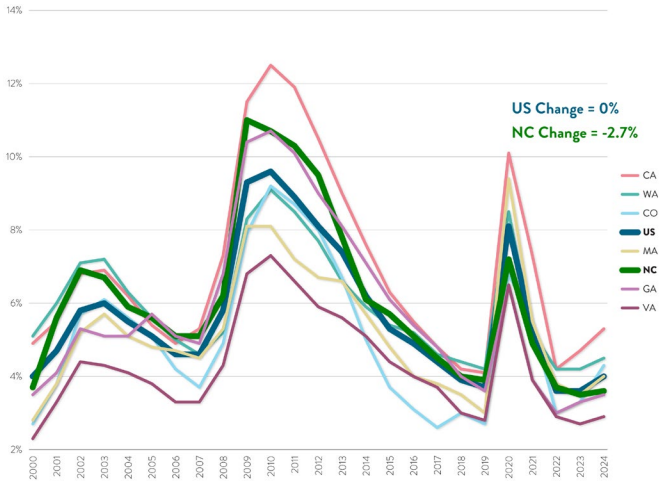
Between 2000 and 2024, North Carolina saw an overall slight decrease (–2.7 percent) in its unemployment rate **[1.4B]**. The U.S. unemployment rate in 2024 was the same as it was in 2000. Besides the comparison state of Washington, which has seen a decrease in its unemployment rate by 11.8 percent since 2000, North Carolina's unemployment rate has had the largest decrease among the comparison states since 2000. There were notable fluctuations in the unemployment rates over the years: a spike in unemployment rate in 2009 and 2010 due to the Great Recession that occurred late 2007-mid 2009, and another spike in 2020 due to the SARS-CoV-2 (COVID-19) pandemic. However, North Carolina's economy was able to recover and has been able to reduce the share of unemployed individuals, as did all the comparison states and the U.S.

1.4A: Unemployment Percentage Rate, All U.S. States, 2024



Source: Bureau of Labor Statistics, U.S. Department of Labor.

1.4B: Unemployment Rate, Comparison States, 2000–2024

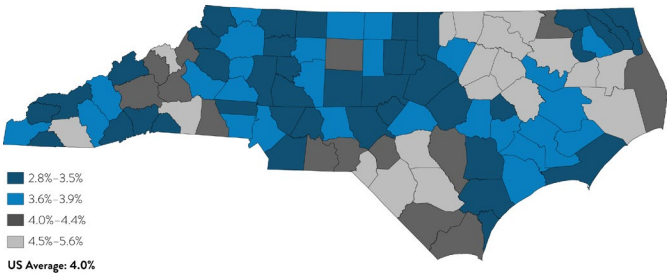


Source: Bureau of Labor Statistics, U.S. Department of Labor.

INDICATOR 1.4: UNEMPLOYMENT

In North Carolina, out of 100 counties, 71 had unemployment rates equal to or lower than the U.S. average in 2024 **[1.4C]**. Currituck and Camden counties had the lowest unemployment rates, at 2.8 percent each. Generally, there were pockets of high unemployment rates in the southeast region, northeast region, and western counties, with some of the western county rates potentially being a result of Hurricane Helene at the end of 2024. This indicates that while wages may not be high in all counties (see indicator 1.3), generally people are finding job opportunities throughout the state.

1.4C: Unemployment Rate, N.C. Counties, 2024



Source: Bureau of Labor Statistics, U.S. Department of Labor.

Note: Blue counties rank *below* the U.S. average.

INDICATOR 1.4: UNEMPLOYMENT

What Does This Mean for North Carolina?

In terms of unemployment, North Carolina is in the middle of the pack compared to other states. North Carolina's higher-than-average unemployment increase during the 2007–2009 recession resulted primarily from the disproportionate unemployment impact on sectors such as financial services and low-skill, low-tech manufacturing, in which North Carolina has had a higher-than-average presence. Though North Carolina's employment rate has since converged with the U.S. average, growing the state's innovation economy would serve to increase employment in STEM (science, technology, engineering, and math) fields and would have strong multiplier effects on other segments of the economy. These developments would help insulate the state's unemployment rate further from recessionary impacts. As the North Carolina economy continues to shift to higher-skill jobs, the job creation potential of the innovation economy could help the state to replace jobs in declining industries. ■

INDICATOR 1.5: POVERTY

Indicator Overview

This indicator explores the extent to which the North Carolina innovation economy provides opportunities for the entire state workforce. Monitoring poverty is important for examining the effects of the state economic shift from a low-skill manufacturing-based economy to one based on knowledge production and use. High or widespread poverty levels indicate that advances in the innovation economy are failing to translate into greater opportunity for all North Carolinians. On the other hand, low or decreasing poverty levels may suggest that the high-wage jobs associated with the knowledge-based economy are leading to the improved economic standing of all North Carolinians.

KEY FINDINGS

- The percentage of North Carolinians in poverty is above the U.S. average, has been since at least 2005, but is decreasing at a rate faster than the U.S. average.
- Within North Carolina, the percentage of the population living in poverty varies greatly from 6.1 percent to 27.2 percent; 32 counties had poverty levels lower than the U.S. average, and 38 had poverty levels lower than the state average.

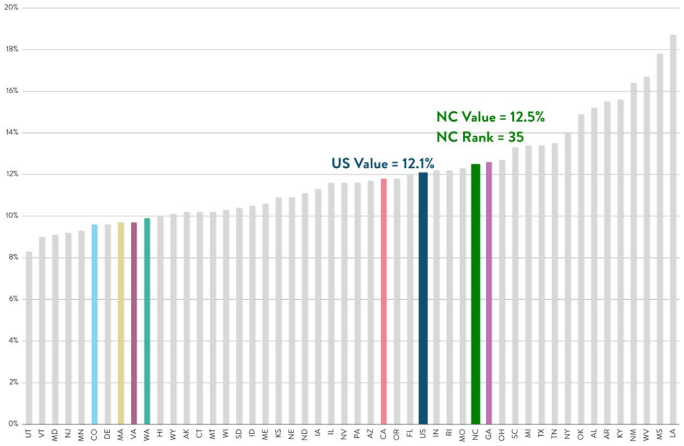
INDICATOR 1.5: POVERTY

How Does North Carolina Perform?

In 2024, 12.5 percent of North Carolina citizens lived in poverty, making it the 35th highest state for poverty level in the nation **[1.5A]**. North Carolina's poverty rate was higher than the U.S. poverty rate, and the only other comparison state higher than the U.S. rate was Georgia (12.6%). The other comparison states range from 11.8 to 9.6 percent of citizens in poverty, with Colorado having the lowest percentage of 9.6 percent.

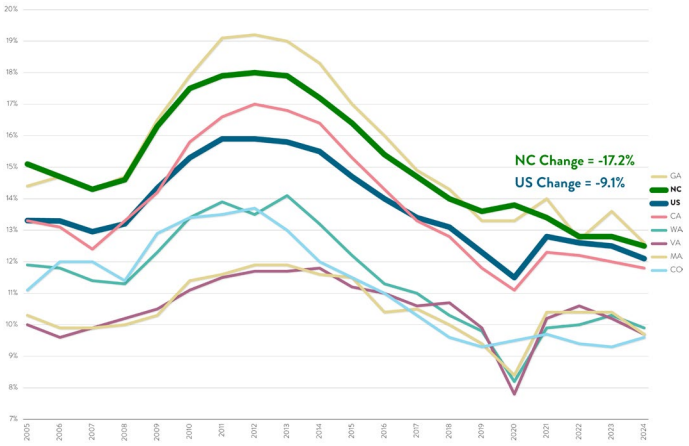
Despite a low ranking and trailing most of the other comparison states, North Carolina has made progress in decreasing the share of citizens in poverty. Out of all comparison states, North Carolina has the largest decrease in poverty percentage since 2005 (-17.2%), with Washington closely following (-16.8%) **[1.5B]**. This rate of improvement in poverty level is almost double that for the U.S. (-9.1%) and three times that of Massachusetts (-5.8%).

1.5A: Percentage of Citizens in Poverty, All U.S. States, 2024



Source: U.S. Census Bureau.

1.5B: Percentage of Citizens in Poverty, Comparison States, 2005–2024

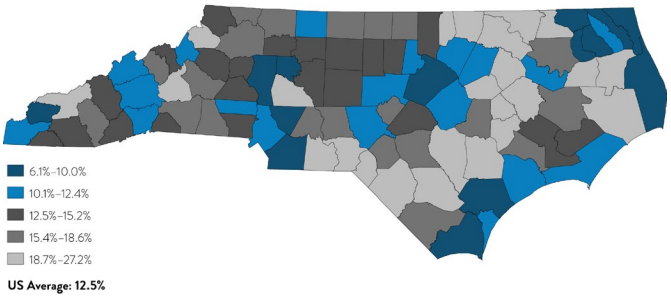


Source: U.S. Census Bureau.

INDICATOR 1.5: POVERTY

Five-year average poverty within North Carolina (2020–2024) revealed a wide range of poverty levels from 6.1 to 27.2 percent **[1.5C]**. Compared to the U.S. average, 32 counties had lower percentages of citizens in poverty, and the remaining 68 counties had higher percentages of citizens in poverty. Thirty-eight counties had poverty levels lower than the state average. Notable areas with high values include the sandhills, the Triad, and the eastern portion of the state between Raleigh and the coast.

1.5C: Percentage of Population Below Poverty Level, N.C. Counties, 2020–2024 Average



Source: U.S. Census Bureau.

Note: Blue counties rank *below* the U.S. average.

INDICATOR 1.5: POVERTY

What Does This Mean for North Carolina?

Current levels of poverty in North Carolina are not favorable when compared to national levels, though over-time trends are improving. As the North Carolina economy becomes increasingly reliant on knowledge-based jobs, it will be vitally important that no segment of the population be isolated without means of generating income. The high poverty levels across many parts of the state indicate that advances in the innovation economy are failing to translate into greater opportunity for all North Carolinians. To the extent the state has low or improving poverty levels, they are concentrated in a small minority of counties. North Carolina policy should seek to reduce poverty, and income inequality more generally, to ensure that the economy of the future—highly reliant on innovation and knowledge production—generates economic opportunities for all citizens. ■

INDICATOR 1.6: POPULATION GROWTH

Indicator Overview

This indicator measures the extent to which North Carolina's total population is growing over time. For a given state, three components make up population growth: (1) natural growth—the excess of births over deaths; (2) in-migration—the movement of people from another state; and (3) immigration—the movement of people from outside the country to the state. Changes in population have social and economic implications that influence business location decisions, infrastructure demands, and service requirements. Population growth is also considered an indicator of economic and social opportunities, as people often move to regions where there are job opportunities or a high quality of life.

KEY FINDINGS

- Between 2000 and 2025, North Carolina moved from the 11th to the 9th most populous state, growing at a rate 83 percent faster than the U.S. average.
- Within North Carolina, the location and growth of the population are highly concentrated in a very small number of counties; 11 counties (out of 100) accounted for 70 percent of the change in population between 2000 and 2025.

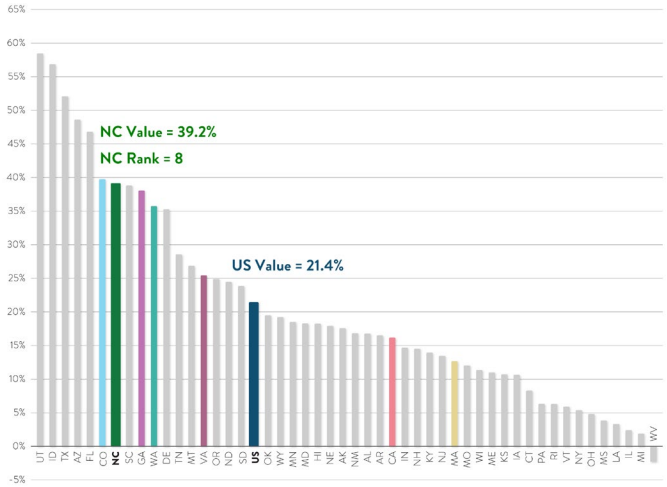
INDICATOR 1.6: POPULATION GROWTH

How Does North Carolina Perform?

Between 2000 and 2025, North Carolina's population grew by 39.2 percent **[1.6A]**. This large increase in population means North Carolina had the 8th fastest growing population in the nation, exceeding the average U.S. rate (21.4 percent) by 83 percent. Colorado was the only one of the comparison states above North Carolina for population growth in this time period, with a 39.8 percent increase, placing it one spot above North Carolina. Additionally, Georgia, which had a population in 2025 comparable to North Carolina, ranked two spots below North Carolina on its rate of population growth. Comparison states California and Massachusetts had much slower increase in population from 2000 to 2025, only increasing by 16.2 percent and 12.7 percent, respectively.

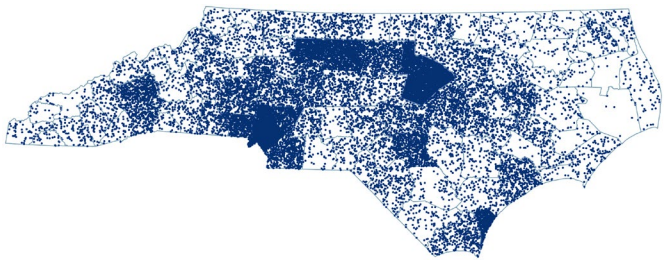
Within North Carolina, the location and growth of the population are highly concentrated in a small number of counties **[1.6B]**. Three counties account for 27.2 percent of the state's population: Wake (11.2 percent), Mecklenburg (11.0 percent), and Guilford (5.0 percent). The next nine counties—Forsyth (3.6 percent), Durham (3.1 percent), Cumberland (3.0 percent), Buncombe (2.5 percent), Union (2.4 percent), Johnston (2.3 percent), Cabarrus (2.2 percent), and New Hanover (2.2 percent)—make up an additional 23.45 percent of the state population. This means that just 12 of 100 counties account for over half of the state's population.

1.6A: Percentage Change in Population, All U.S. States, 2000–2025



Source: U.S. Census Bureau.

1.6B: Estimated Location of Population in N.C., 2025

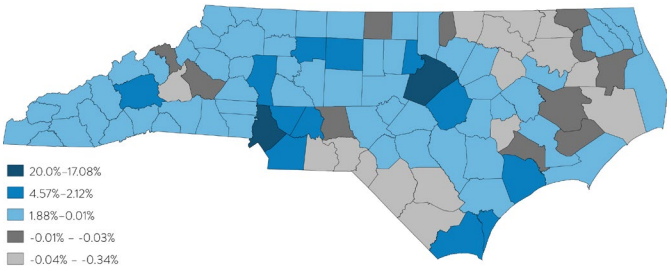


Source: U.S. Census Bureau.

INDICATOR 1.6: POPULATION GROWTH

In terms of growth, the level of concentration is even greater than the distribution of population. Just two counties (Wake and Mecklenburg) account for 37.1 percent of the state's population growth **[1.6C, 1.6D]**. Wake County (20.0 percent of total) accounted for the largest share of the state's population growth between 2000 and 2025, with Mecklenburg County (17.1 percent of total) closely following. Out of the state's 100 counties, 25 counties contributed to 90.1 percent of the population growth in the state over the selected time period (see Percent of Total Change and Cumulative Percent of Total Change columns in 1.6D). In North Carolina, 27 counties had a population decrease between 2000 and 2025, making their share to the state total negative, as indicated by light gray on the map. However, given the growth in other parts of the state, with many counties which having population growth above the U.S. average, North Carolina's net growth was strongly positive.

1.6C: Population Change, Percent of Total Change, N.C. Counties, 2000–2025



Source: U.S. Census Bureau.

Note: Blue counties have an increase in population.

1.6D: Population Change, North Carolina Counties, 2000–2025

County	Population 2000	Population 2025	Absolute Change 2000-2025	Percent of Total Change	Cumulative Percent of Total Change
Wake	627,846	1,257,235	629,389	20.0%	20.0%
Mecklenburg	695,454	1,233,383	537,929	17.1%	37.1%
Union	123,677	267,674	143,997	4.6%	41.6%
Guilford	421,048	562,234	141,186	4.5%	46.1%
Johnston	121,965	256,448	134,483	4.3%	50.4%
Durham	223,314	347,240	123,926	3.9%	54.3%
Cabarrus	131,063	249,725	118,662	3.8%	58.1%
Gaston	73,143	174,702	101,559	3.2%	61.3%
Orange	306,067	401,718	95,651	3.0%	64.4%
Brunswick	122,660	211,798	89,138	2.8%	67.2%
Forsyth	160,307	245,959	85,652	2.7%	69.9%
Iredell	206,330	277,417	71,087	2.3%	72.2%
New Hanover	150,355	217,175	66,820	2.1%	74.3%
Buncombe	91,025	150,137	59,112	1.9%	76.2%
Onslow	190,365	246,558	56,193	1.8%	78.0%
Harnett	130,800	186,177	55,377	1.8%	79.7%
Pitt	133,798	182,936	49,138	1.6%	81.3%
Cumberland	74,769	110,619	35,850	1.1%	82.4%
Lincoln	49,329	85,111	35,782	1.1%	83.6%
Henderson	302,963	338,473	35,510	1.1%	84.7%
Davidson	63,780	98,654	34,874	1.1%	85.8%
Franklin	47,260	82,037	34,777	1.1%	86.9%
Alamance	118,227	152,498	34,271	1.1%	88.0%
Chatham	89,173	122,375	33,202	1.1%	89.0%
Moore	147,246	180,182	32,936	1.0%	90.1%
75 Other Counties	3,247,349	3,559,503	312,154	9.9%	100.0%
Total	**8,049,313**	**11,197,968**	**3,148,655**	**100.00%**	

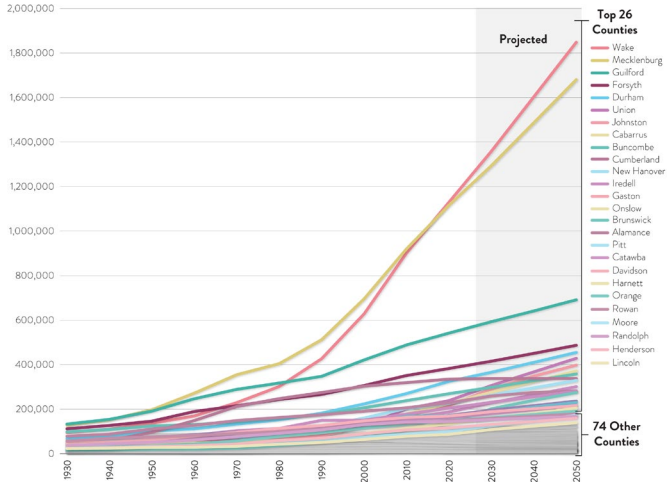
Source: U.S. Census Bureau.

Note: Listed counties each accounted for >1% of the population change between 2000 and 2025

INDICATOR 1.6: POPULATION GROWTH

These recent population growth trends reflect longer-term population growth trends **[1.6E]**. In 1930, all North Carolina counties had relatively comparable populations, with a population range between 133,010 for the most populous county (Guilford) and 5,164 for the least populous (Tyrrell). However, between 1960 and 1990, certain counties began to increase population very quickly, particularly Wake and Mecklenburg counties, while other counties grew more slowly or stayed relatively flat in their growth. The projections for 2050 suggest that the most populous county (Wake: 1,848,178) will have nearly 560 times the amount of people as the least populous county (Hyde: 3,303). Wake and Mecklenburg counties are predicted to have the highest populations in 2050, and when compared to their 1930 population, growth rates of 1,850 percent and 1,212 percent, respectively.
And each of top 26 counties is projected to account for at least 1 percent of the change in the state's population between 1930 and 2050, whereas each of the other 74 counties accounts for less than 1 percent of the change in the state's population during that period; of those 74 counties, 13 are projected to decrease in population. Overall, the pattern is for more populated counties to grow faster than less populated counties.

1.6E: Change in Population, N.C. Counties, 1930–2050



Source: U.S. Census Bureau, via North Carolina Office of State Budget and Management State Demographer.

INDICATOR 1.6: POPULATION GROWTH

What Does This Mean for North Carolina?

The relationship between population growth and economic well-being is strong and positive, as evidenced by high rates of population growth in counties and regions ranking high on the indicators of economic well-being (see indicators 1.1–1.5). North Carolina will continue to experience population growth from in-migrants and immigrants into those locales having high economic output, employment opportunities, and high wages. To the extent state leaders want that growth to continue, and to the extent that it actually does continue, the need to enhance and grow infrastructure (schools, utilities, roads/transit, broadband, water/sewer, etc.) will increase as well. Failure to meet the needs of a growing population will result in higher levels of unemployment and poverty. ■

Section 2:
Research & Development

The starting point of North Carolina's innovation economy is **Research & Development (R&D)**, which is foundational in the discovery and creation of new knowledge that fuels new products, processes, and industries. **R&D** measures show the investments made by businesses, universities, and the federal government to generate the innovative ideas and technologies. Tracking measures of these investments and activities over time, and relative to other states, helps determine whether North Carolina is building the foundational knowledge necessary to sustain a competitive, innovation-driven economy.

INDICATOR 2.1: TOTAL RESEARCH & DEVELOPMENT

Indicator Overview

This indicator shows the extent to which R&D plays a role in the state's economy. R&D expenditures refer to R&D activities performed by businesses, universities, non-profits, and federal and state agencies.[1] R&D is the driving force behind innovation and sustained economic growth. R&D enables organizations to create new products and processes that allow them to expand markets, stimulate investment, and create jobs. Companies located near R&D centers benefit from shared knowledge and expertise, which increases new product and technology output and adoption.

KEY FINDINGS

- North Carolina's total Research & Development (R&D) expenditures as a percentage of gross domestic product (GDP) ranks below the U.S. average and has since at least the early 2000s, but is increasing at a rate double the rate of the U.S. average.
- Businesses perform three-fourths of the R&D in North Carolina, and business-performed R&D is most concentrated in metropolitan regions across the state, whereas the state's university R&D is highly concentrated in the Research Triangle region.

1 R&D-performing organizations either fund their own R&D activities or receive funding from other organizations. For example, a considerable portion of academic R&D performance is funded by the federal government.

INDICATOR 2.1: TOTAL RESEARCH & DEVELOPMENT

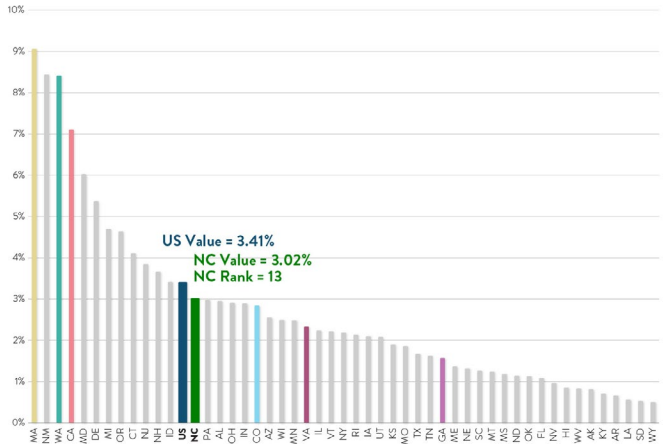
How Does North Carolina Perform?

When analyzing the total R&D (industry + academic + all others) as a percentage of GDP, North Carolina ranks 13th in the nation, with a level that is 89 percent that of the U.S. value **[2.1A]**. In other words, the ratio of R&D to GDP in North Carolina is 89 percent of what we would expect based on the national ratio of R&D to GDP. North Carolina's value of 3.02 percent is one-third the value of the top-ranking state, Massachusetts.

This ranking reflects the relative distribution of academic R&D to industry R&D within North Carolina and nationally. North Carolina, specifically, has an academic R&D expenditure per state GDP that is 141 percent that of the U.S. value (see indicator 2.3). However, North Carolina's industry R&D expenditures are 69 percent that of the U.S. value (see indicator 2.2) and 21 percent of the leading state's expenditures (Washington).[2]

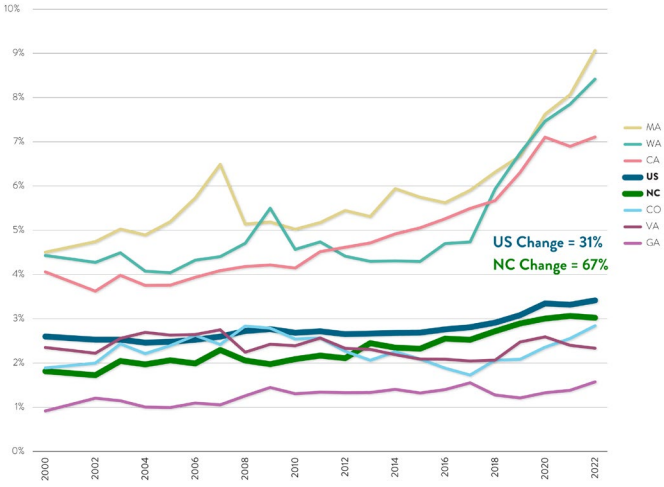
North Carolina has just below that value, with 76 percent of the state's R&D expenditures being from businesses. North Carolina's lower-than-average rate of industry R&D expenditures puts it at a competitive disadvantage for the total R&D output. However, since 2000, North Carolina's total R&D rate has been growing more than two times faster than the U.S. rate, narrowing the gap between the two **[2.1B]**. While North Carolina has room to improve on total R&D expenditures, compared to the comparison states, North Carolina falls in the middle, with its closest competitor being Colorado, which has had a significant increase in R&D expenditures in the last several years.

2.1A: Total R&D Expenditures as a Percentage of GDP, All U.S. States, 2022



Source: National Science Board.

2.1B: Total R&D Expenditures as a Percentage of GDP, Comparison States, 2000–2022



Source: National Science Board.

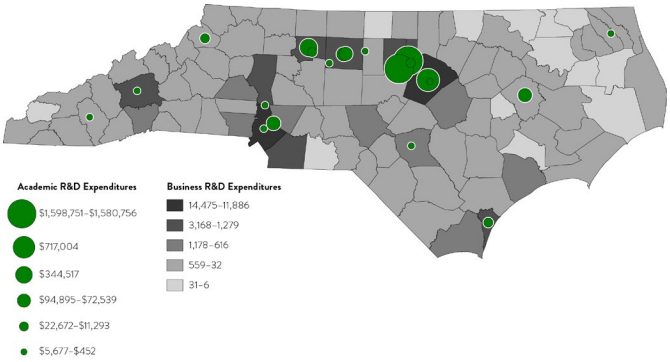
Note: 2001 data was not available and was interpolated from 2000 and 2002 data.

2 The State of U.S. Science and Engineering 2026 | NCSES | NSF

INDICATOR 2.1: TOTAL RESEARCH & DEVELOPMENT

Within North Carolina, R&D is highly concentrated in a pattern that reflects the location of the state's population and research universities **[2.1C]**. While it is reasonable to assume more balanced rates of R&D across the state's industries,[3] the rate of R&D across North Carolina universities is considerably less equal, with nearly 86 percent occurring in the Research Triangle Region (Wake, Durham, and Orange counties). In general, this pattern indicates that R&D is most concentrated in metropolitan regions (areas surrounding the counties of Wake, Mecklenburg, Durham, Guilford, Buncombe, New Hanover, Forsyth, Union, Orange, and Iredell), particularly those with major research universities, where companies have access to the talent needed to conduct R&D activities.

2.1C: Location of R&D Expenditures in N.C., 2024–2025



Source: Quarterly Census of Employment and Wages, Labor & Economic Analysis Division, NC Department of Commerce; National Science Foundation.

Note: Business R&D from 2025, Academic R&D from 2024 . Business establishments perform 76% of R&D in NC; universities perform 19% of R&D.

3 The extent to which this approximation is accurate depends on the size of the businesses and the industry mix across the state. In general, large companies conduct more research than small companies do. Moreover, National Science Foundation data indicate that trends in U.S. business R&D performance are driven by five industries that together accounted for 443 billion, or 74 percent, of domestic business R&D performance in 2021: chemicals manufacturing; computer and electronic products manufacturing; transportation equipment manufacturing; information; and professional, scientific, and technical (PST) services (National Science Foundation, National Center for Science and Engineering Statistics, Business Research and Development Survey, 2021).

INDICATOR 2.1: TOTAL RESEARCH & DEVELOPMENT

What Does This Mean for North Carolina?

For North Carolina to continue to grow its economy in both the short term and long term, it is essential to increase the volume and intensity of R&D efforts relative to other U.S. states, particularly as it relates to business R&D. In the near term, North Carolina should continue at minimum to increase its R&D efforts to meet those of the U.S. value. Given the R&D strengths of its universities, an efficient and effective way NC industry could achieve this goal is by tighter and more frequent R&D partnerships with the state's universities, which have above-average research expenditures (see indicator 2.2). ■

INDICATOR 2.2: BUSINESS-PERFORMED R&D

Indicator Overview

This indicator reveals the extent to which businesses contribute to R&D expenditures and economic output in North Carolina. In the U.S., the business sector is the largest performer of R&D, accounting for nearly three quarters of R&D expenditures (see Indicator 2.1).[1] Across different states, this indicator not only reveals the state expenditure levels compared to business output as measured by dollars, but where industries are prioritizing R&D and how North Carolina's R&D focus by industry compares to the R&D by industry focus of the U.S. overall.

KEY FINDINGS

- North Carolina's business-performed R&D as a percentage of private-industry output ranks below the U.S. average. Since 2000, North Carolina generally had an increase in R&D expenditures compared to private-industry output, though that increase reversed after 2021, leading to a net decrease over the entire time period.
- Within North Carolina, business-performed R&D is concentrated in the largest metropolitan counties in the state.
- Relative to the U.S. average, business R&D within North Carolina is more concentrated in the pharmaceutical, computer and electronic products, and software publishing industries.

1 The State of U.S. Science and Engineering 2026 | NCSES | NSF

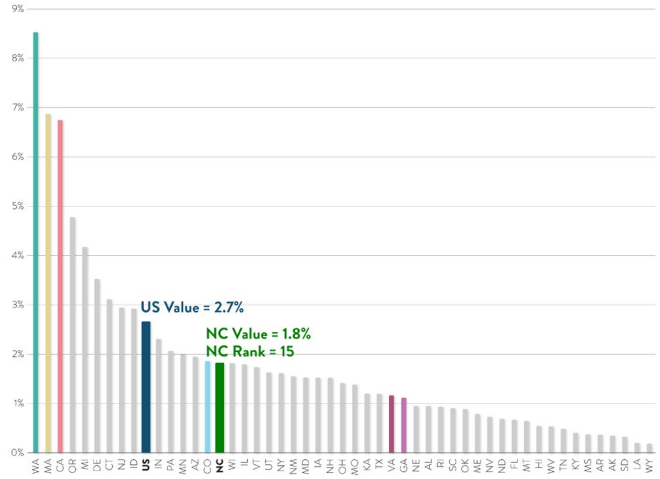
INDICATOR 2.2: BUSINESS-PERFORMED R&D

How Does North Carolina Perform?

In terms of business R&D expenditures as a percentage of private-industry output, North Carolina falls below the U.S. average, with a value of 1.8 percent, ranking 15th in the nation **[2.2A]**. North Carolina's R&D business expenditures compared to private-industry output is just 21 percent of the leading state's (Washington) and below that of three other comparative states (Massachusetts, California, and Colorado).

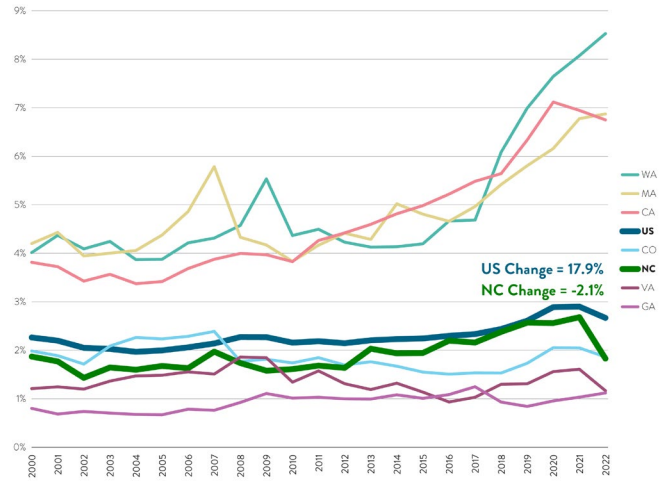
Between 2000 and 2021, North Carolina saw an increase in R&D expenditures compared to private-industry output, though that increase reversed after 2021, leading to a net decrease of 2 percent over the entire time period **[2.2B]**. Among the comparison states, the clear outliers are Washington, Massachusetts, and California, whose business R&D expenditures as a percentage of private-industry output are three to four times higher than those of North Carolina. These states not only lead the comparison states but lead the country nationally.

2.2A: Business-Performed R&D as a Percentage of Private-Industry Output, All U.S. States, 2022



Source: National Science Board.

2.2B: Business-Performed R&D as a Percentage of Private-Industry Output, Comparison States, 2000–2022



Source: National Science Board.

INDICATOR 2.2: BUSINESS-PERFORMED R&D

In terms of industries focusing on R&D, as defined by North American Industry Classification System (NAICS) codes 21-33, 31-33, and 42-81, North Carolina spent $13.099 billion in R&D in 2023 **[2.2C]**.

Just 10 industries account for 81 percent of the R&D expenditures. Leading the state is computer and electronic products, which accounts for 20 percent of R&D and is closely followed by chemicals, which account for 19 percent of the total R&D in North Carolina. An even closer look at each of these subsectors reveals that 82 percent of the chemical subsector R&D expenditures are by the pharmaceuticals and medicines industry (NAICS code: 3254), 100 percent of the publishing subsector is software publishing (NAICS code: 5112), and 93 percent of the miscellaneous is attributed to medical equipment and supplies (NAICS code: 3391). Compared to the U.S., North Carolina ranks ahead on R&D expenditures for computer and electronic products, publishing, and electrical equipment, appliances, and components, and beverage and tobacco products. Additionally, North Carolina is on par with the U.S. for R&D in the chemicals industry and professional, scientific, and technical services. North Carolina has a deep-rooted history in tobacco and agriculture, hence the performance above that of the U.S. in the beverage and tobacco products sector. The other areas in which North Carolina is performing beyond the U.S. values are representative of increased shift in technology and pharmaceutical companies opening large facilities and/or headquarters in the state.

2.2C: Business-Performed R&D Expenditures in U.S. and N.C. by Industry, 2023

Subsector	NAICS Code	United States		North Carolina	
		Expenditure (in Millions)	% of All Industries	Expenditure (in Millions)	% of All Industries
All Industries	**21–23, 31–33, 42–81**	**$635,478**	-	**$13,099**	-
Computer and electronic products	334	$103,031	16%	$2,555	20%
Chemicals	325	$124,078	20%	$2,550	19%
Publishing	513	$51,517	8.1%	$1,800	14%
Professional, scientific, and technical services	54	$73,317	12%	$1,507	12%
Data processing, hosting, and related services	518	$52,844	8.3%	$716	5.5%
Machinery	333	$20,489	3.2%	$481	3.7%
Transportation equipment	336	$47,549	7.5%	$415	3.2%
Miscellaneous	339	$22,951	3.6%	$335	2.6%
Electrical equipment, appliances, and components	335	$6,543	1.0%	$182	1.4%
Beverage and tobacco products	312	$971	0.2%	$126	1.0%
Subtotal		**$503,290**	**79%**	**$10,667**	**81%**

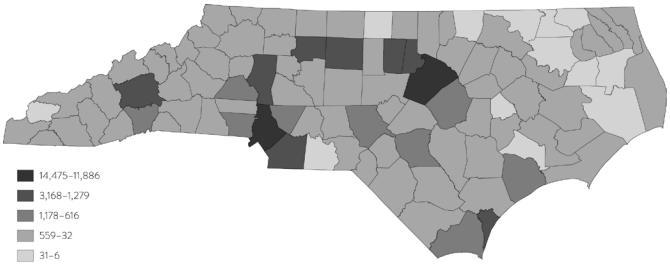
Source: National Center for Science and Engineering Statistics, and U.S. Census Bureau.

Notes: Dollars in millions. Expenditures by company, not including expenditures by others for R&D performed by company.

INDICATOR 2.2: BUSINESS-PERFORMED R&D

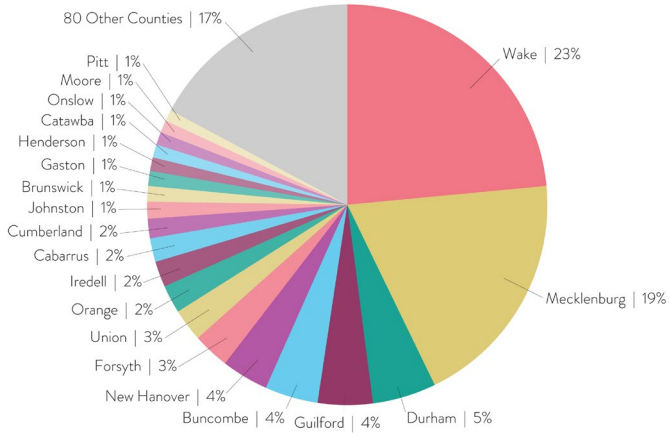
North Carolina's location of business R&D expenditures[2] is relatively concentrated in the Research Triangle Park and Charlotte regions **[2.2D, 2.2E]**, along with other large metro areas. Within the state, 20 counties account for 83 percent of business R&D expenditures, based on the number of establishments within the top 10 R&D intensive industries in the state. While the number of business establishments that are R&D intensive vary widely across the state, all counties have a minimum of six establishments within R&D-intensive industry subsectors. The five counties with the highest share of business R&D expenditures are Wake (23.2 percent), Mecklenburg (19.1 percent), Durham (5.1 percent), Guilford (4.4 percent), and Buncombe (4.2 percent). New Hanover, Forsyth, Union, Orange, and Iredell counties all have greater than 2 percent share for total establishments. Wake County has the highest number of establishments at 14,475 establishments in 2025, whereas Tyrrell County has the lowest number of establishments (six). Overall, density of businesses performing R&D remains relatively low in much of the state, particularly in the eastern and western regions of the state.

2.2D: Location of Business R&D Expenditures, N.C. Counties, 2025



Source: Lightcast.

2.2E: Location of Business R&D Expenditures, N.C. Counties, 2025



Source: Lightcast.

2 Location and number of business R&D expenditures were estimated using NAICS codes for the 10 subsectors with the highest R&D expenditures (81 percent overall) in North Carolina, as seen in 2.2C.

INDICATOR 2.2: BUSINESS-PERFORMED R&D

What Does This Mean for North Carolina?

For short-term and long-term economic growth, North Carolina must increase its business R&D expenditures to match that of the U.S., at a minimum. By increasing R&D expenditures to that of the U.S. value, North Carolina would be within the top fifth of states. Increased business R&D spending would align more with North Carolina's higher-than-average academic institution R&D spending (see indicator 2.3). To increase business R&D spending in an effort to increase economic and innovation output, the state should work to recruit R&D focused businesses and support the R&D efforts of those that already exist. Additionally, efforts should focus on expanding businesses that perform R&D beyond the RTP and Charlotte regions. Doing so would both increase R&D expenditures as well as create more jobs within the state for the highly trained individuals from North Carolina colleges and universities. ■

INDICATOR 2.3: ACADEMIC R&D

Indicator Overview

R&D is the driving force behind innovation and sustained economic growth, and academic institutions play a large part in innovation ecosystems, with universities accounting for 48 percent of basic research.[1] The measure of R&D expenditures by a college or university relative to a state's total economic output measures the intensity of a state's academic R&D. While businesses and industry conduct the majority of R&D, academic institutions account for 11 percent of the nation's total R&D and contribute greatly to the foundation of innovation and economic growth.[2]

KEY FINDINGS

- North Carolina's academic R&D spending as a share of state GDP ranks well above the U.S. average, has since at least the early 2000s, and is increasing at a rate faster than the U.S. average.
- North Carolina's academic R&D is highly concentrated in a small number of universities located primarily in the Research Triangle Region.
- The federal government funds the majority of North Carolina's academic R&D, but some universities also receive significant funding from state and local government and business/industry.

1 The State of U.S. Science and Engineering 2026 | NCSES | NSF

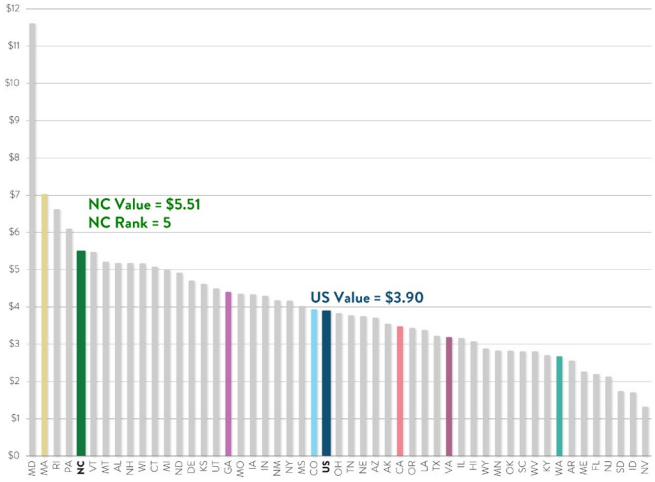
2 The State of U.S. Science and Engineering 2026 | NCSES | NSF

INDICATOR 2.3: ACADEMIC R&D

How Does North Carolina Perform?

North Carolina is home to large research institutions with a historical core strength in academic research. North Carolina's ranking is reflective of that history, ranking 5th in the nation for its academic R&D expenditures relative to the state total economic output **[2.3A]**.[3] North Carolina's value of $5.51 of academic R&D expenditures per $1,000 state GDP is 141 percent of the U.S. value. Among comparison states, North Carolina is surpassed only by Massachusetts, which is 32 percent greater than North Carolina's value; the top state (Maryland) greatly surpasses all other states.

2.3A: Academic R&D per $1,000 of State GDP, All U.S. States, 2023



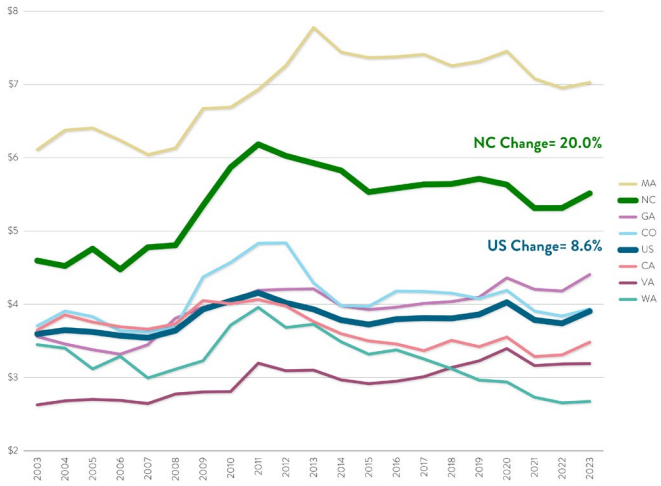
Source: National Science Board.

3 Academic R&D is reported for institutions with R&D more than $150,000.

INDICATOR 2.3: ACADEMIC R&D

Since 2003, North Carolina's academic R&D expenditures compared to the state's total gross domestic product (GDP) have increased by 20 percent, whereas the U.S. overall has only seen approximately 9 percent growth in academic R&D expenditures relative to GDP **[2.3B]**. North Carolina has consistently ranked above the U.S. average and all comparative states besides Massachusetts. Since 2003, North Carolina has had the third fastest growth in academic R&D expenditures, ranking below Georgia and Virginia, which have had changes of 24 percent and 21 percent, respectively. Generally, North Carolina's pattern in academic R&D expenditures follows the pattern of the other comparison states: peaks between 2011-2013, followed by slight decreases and plateaus until 2023, when there was a small increase. Washington is the only state that varies in this trend and has seen a large decrease since the peak in 2011. North Carolina following the same trend as comparison states indicates that the state's academic R&D expenditures relative to the state GDP is consistent with the federal funding and economic environment of that year.

2.3B: Academic R&D per $1,000 of State GDP, Comparison States, 2003–2023

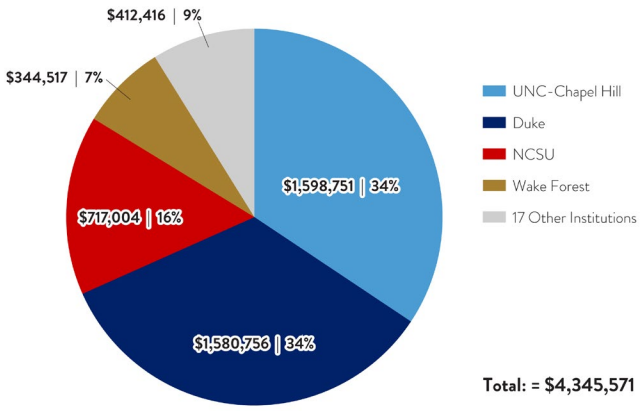


Source: National Science Board.

INDICATOR 2.3: ACADEMIC R&D

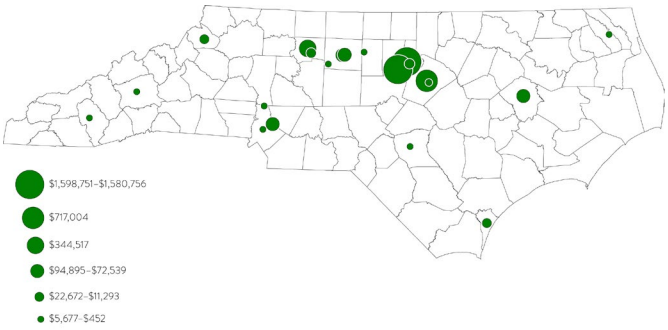
Within North Carolina, academic R&D is highly concentrated in the Research Triangle region. The three largest universities located in that region—Duke University, UNC-Chapel Hill, and North Carolina State University—account for 86 percent of all academic R&D expenditures within the state **[2.3C, 2.3D]**. Wake Forest University in Winston-Salem also has significant academic R&D (seven percent of the state total), while 17 other public and private universities conduct the state's remaining 7 percent of academic R&D across the state.

2.3C: N.C. University R&D Expenditures, 2024



Source: National Science Foundation.
Note: Dollars in thousands.

2.3D: N.C. University R&D Expenditures, 2024



Source: National Science Foundation.
Notes: Dollars in thousands. Universities perform 19% of R&D in N.C. (indicator 2.1).

INDICATOR 2.3: ACADEMIC R&D

Funding for academic R&D comes from a variety of sources, including the federal government, state government, and nonprofits and, in part, can help to identify research priorities. Nationwide and in North Carolina, the federal government is the largest supporter of academic R&D **[2.3E]**. In North Carolina, for the four universities that comprise that majority of the academic R&D spending, three quarters of them receive a greater-than-average share of their funds from the federal government and business/industry. Duke leads in the share of federal funding compared to total expenditure, with 66 percent of R&D funded by federal government. Additionally, while majority of universities had less than 10 percent of their R&D funding from business/industry, Duke had 14 percent relative to its total spending. This large share is in part due to the Duke Clinical Research Institute (DCRI), which performs clinical trials for pharmaceutical companies.

North Carolina State University is the only academic institution that receives less than 50 percent of its academic R&D funding from the federal government, although the federal government remains the university's largest source of funding. This lower share of federal funding reflects the fact that, as a land-grant university with a historical focus on agricultural and mechanical arts, as well as material science, North Carolina State University receives a significant and much higher than average share (more than 20 percent) of its funding from state and local government.

2.3E: University R&D Expenditures by Source of Funds, U.S. Average and N.C. Institutions, 2024

UNIVERSITY	SOURCE OF FUNDS					
	Federal Government	State & Local Government	Business / Industry	Institution Funds	Nonprofits	Other
US Average	**55%**	**5%**	**5%**	**26%**	**6%**	**3%**
Duke	66%	0%	14%	12%	6%	1%
UNC-Chapel Hill	59%	3%	3%	26%	6%	1%
NC State University	44%	21%	9%	25%	1%	0%
Wake Forest	65%	3%	11%	8%	10%	4%
17 Other NC Institutions	**50%**	**7%**	**3%**	**37%**	**2%**	**1%**

Source: National Science Foundation.

INDICATOR 2.3: ACADEMIC R&D

What Does This Mean For North Carolina?

North Carolina's academic research, the majority of which focuses on basic fundamental science, is important for producing new knowledge and scientific stature. Industry R&D is more often the engine that translates the basic research discoveries into commercial products. This suggests that attention should be given to continuing to strengthen both academic R&D and academic-industry collaborative R&D. Strengths in both, particularly across a wider range of North Carolina's geography, will help improve the economic well-being and quality of life across the state. A supporting factor of academic R&D are having universities that hold R1 designations from the Carnegie Classification of Institutions of Higher Education. These "very high research activity" universities can help drive regional R&D. While North Carolina historically had three R1 universities (Duke, UNC Chapel Hill, and North Carolina State Universities), East Carolina University and UNC Charlotte gained that status in February 2025. ■

INDICATOR 2.4: FEDERAL R&D OBLIGATIONS

Indicator Overview

This indicator tracks how federal R&D obligations are disbursed relative to the size of a state's employed civilian workforce. Federal R&D obligations are a binding financial commitment in a congressional budget appropriation and include contracts, staff employment, and purchases of goods and services. For the purposes of this indicator, federal R&D obligations are attributed to the states in which the prime recipients of federal obligations are located and are provided in current dollars (not adjusted for inflation).[1] While this funding comes from 11 federal agencies, the Department of Defense (DOD) and Department of Health and Human Services (HHS) are the largest contributors to the federal R&D portfolio and account for 46 percent and 28 percent, respectively, of the federal R&D funding. A high value in this indicator suggests the existence of many large prime contractors or major federally funded R&D facilities in a state such as national laboratories.[2]

KEY FINDINGS

- North Carolina's ratio of federal R&D obligations per employed worker ranks well below the U.S. average.
- North Carolina's ratio of federal R&D obligations to employed worker has increased significantly since 2000, at a rate faster than the rate of the U.S. rate overall.

1 Tracking federal R&D obligations below the prime contractor level is beyond the scope of the data sources used in this report.

2 Federal R&D Obligations Declined 2.1% in FY 2023; Estimated to Increase in FY 2024 | NCSES | NSF.

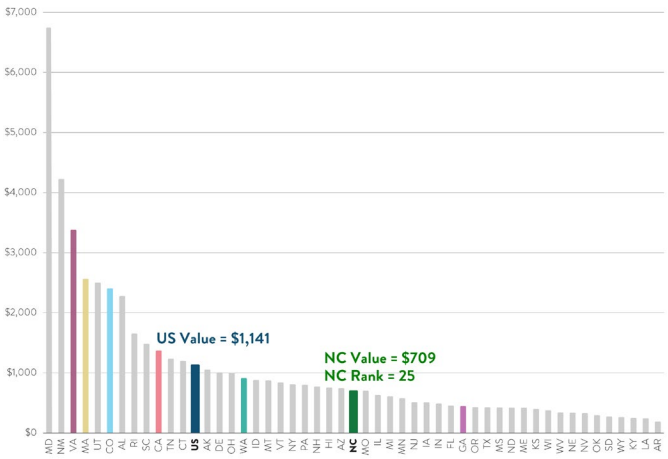
INDICATOR 2.4: FEDERAL R&D OBLIGATIONS

How Does North Carolina Perform?

The value of North Carolina's federal R&D obligations per employed worker ranks 25th in the nation, with a level that is 62 percent of the U.S. value and 11 percent of the value of the top-ranking state, Maryland **[2.4A]**.[3] North Carolina ranks low among the comparison states, ahead of only Georgia.

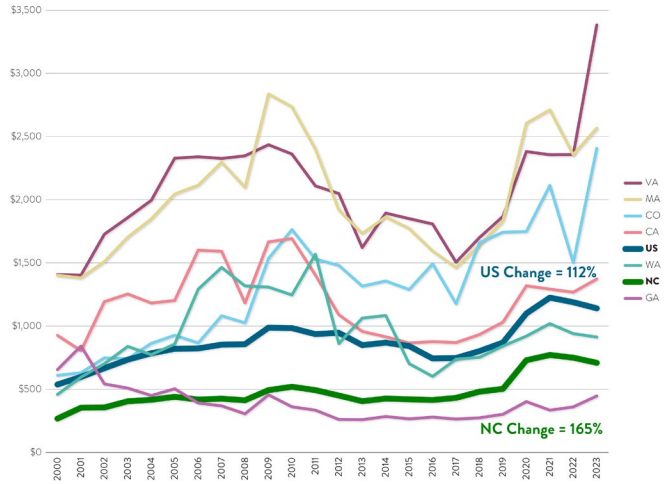
While lagging behind the U.S. value, since 2000, North Carolina has made progress in increasing its federal R&D obligations. Besides Colorado, North Carolina has had the largest increase in federal R&D obligations out of the comparison states, with a 165 percent increase since 2000 **[2.4B]**. North Carolina, while increasing at a faster rate than the U.S., followed the same overall trend over time as the U.S.: small increases from 2000-2019, followed by much larger increases and peaking in 2021, and then leveling off/slightly decreasing from 2021-2023. The decline on the U.S. level, and likely in North Carolina as well, is largely due to decreases in R&D obligations from the Department of Health and Human Services (HHS). Even with portions of these decreases offset on a national level by DOD funding, declines in HHS funding declining by nearly 30 percent impacted access to funds for states like North Carolina that rely heavily on HHS funding. The majority of the comparison states saw increases between 2022 and 2023.

2.4A: Federal R&D Obligations per Employed Worker, All U.S. States, 2023



Source: National Science Board.

2.4B: Federal R&D Obligations per Employed Worker, Comparison States, 2000–2023



Source: National Science Board.

3 Proximity to Washington, D.C. and the presence of national labs in a state can make a large difference in this indicator; these two factors play a large role in Maryland, New Mexico, and Virginia leading the nation in federal R&D obligations.

INDICATOR 2.4: FEDERAL R&D OBLIGATIONS

What Does This Mean For North Carolina?

Federal R&D obligations to all U.S. states amounted to approximately $186 billion in 2023. Although this amount is approximately 20 percent of total R&D performed in 2023 ($940 billion), it is substantial and drives a considerable amount of innovation. In 2023, only 12 states exceeded the national average of $1,141 in federal R&D obligations per worker, meaning that these states received more federal R&D obligations than expected based on the size of their workforce. North Carolina should strive to increase its competitiveness on this front by working to increase its number of prime federal contractors. It should also work to increase its number of subcontractors to prime federal contractors. ■

INDICATOR 2.5: ACADEMIC S&E ARTICLE OUTPUT

Indicator Overview

The volume of peer-reviewed science and engineering (S&E) articles relative to science, engineering, and health (SEH) doctorate holders is an approximate measure of a state's contribution to science, with a higher value indicating a larger volume of publications per 1,000 SEH doctorate holders. While this measure provides insight into academic productivity, other measures for academic productivity include patents (see indicator 3.2), trademarks, copyrights, start-ups formed (see indicator 3.6), and the number of personnel trained (see indicators 5.4 and 5.5). Academic institutions include 2-year colleges, 4-year colleges and universities, medical schools, and university-affiliated research centers.[1] SEH doctorates include those in computer sciences; mathematics; the biological, agricultural, or environmental life sciences; physical sciences; social sciences; psychology; engineering; and health fields.[2] Science and engineering article output and employment of SEH doctorate holders in academia have both increased over time, but article output growth has outpaced employment, so most states have seen an increase in this indicator's value over time.

KEY FINDINGS

- North Carolina ranks above the U.S. average in academic science and engineering (S&E) article output per 1,000 science, engineering, and health (SEH) doctorate holders.
- North Carolina has increased its output of S&E articles relative to SHE doctorate holders by 32 percent since 2001, more than double the rate of change compared to the U.S. overall.

1 Research is more central to the mission of some of these institutions than others. As used in this indicator, publication counts are based on the number of articles that appear in a set of journals tracked by Elsevier's Scopus database. The journal set consists of S&E publications (including publications on the natural sciences, applied sciences, medical sciences, and social sciences but excluding the arts and humanities). Only documents published in refereed scientific journals were counted (mostly articles, reviews, and conference proceedings), as these documents were reviewed by peers prior to being accepted for publication. The peer-review process is designed to ensure that the research is of good quality and constitutes an original contribution to scientific knowledge. Fractional counting at the level of researchers is used to ensure that a single paper is not counted several times. For example, if two of three authors are in state A and the third author is in state B, then two-thirds of the publication is attributed to state A, and one-third is attributed to state B.

2 SEH doctorate data are estimates and exclude those with doctorates from foreign institutions and those older than the age of 75. Data for SEH doctorate holders in academia are presented by employment location, regardless of residence. Estimates for states with smaller populations of SEH doctorate holders are generally less precise than estimates for states with larger populations.

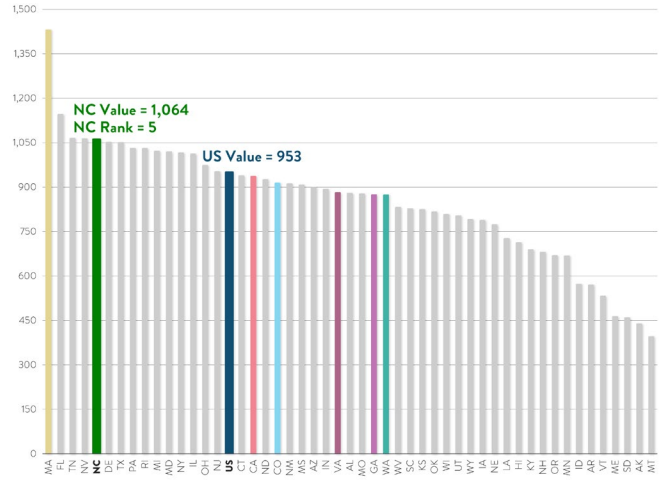
INDICATOR 2.5: ACADEMIC S&E ARTICLE OUTPUT

How Does North Carolina Perform?

North Carolina's prevalence of research-focused universities is reflected in its large volume of academic publications relative to SEH holders, ranking the state 5th in the nation **[2.5A]**. This is an increase of 11 positions compared to the state's rank in the 2024 *Tracking Innovation* Report. At 1,064 academic articles per 1,000 SEH doctorate holders, North Carolina ranks well above most other comparison states and has a value that is 112 percent of the U.S. average value. North Carolina is essentially tied with Tennessee and Nevada in article output per 1,000 SEH doctorate holders, and North Carolina's article output is 74 percent of the top performing state's (Massachusetts). This article output tracks closely with North Carolina's high academic R&D expenditures (see indicator 2.3), with higher academic R&D expenditures being a key contributing factor to higher article output.

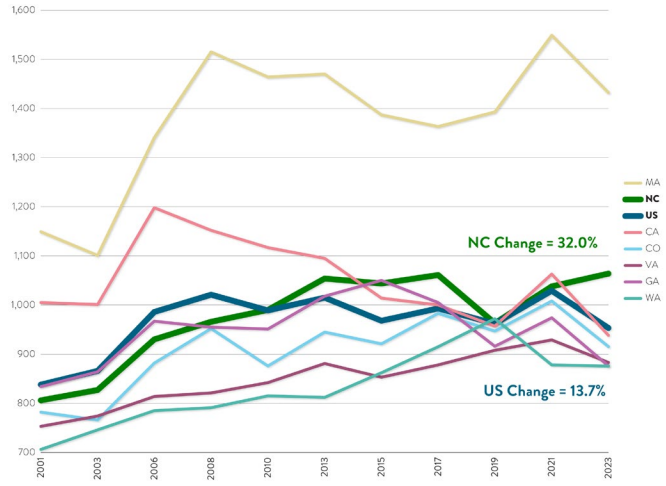
Since 2001, North Carolina has seen a relatively steady increase in academic article output relative to SEH doctorate holders, with the exception of a small a decrease in 2019. From 2001 to 2023, North Carolina had a 32 percent increase in article output relative to SEH doctorate holders, which is more than double the rate of the U.S. **[2.5B]**. North Carolina's change in value over time is the largest change of all comparison states and the U.S. Additionally, while all other comparison states saw a decrease in the article output relative to SEH doctorate holders in 2023, North Carolina saw an increase.

2.5A: Academic S&E Article Output per 1,000 SEH Doctorate Holders in Academia, All U.S. States, 2023



Source: National Science Board.

2.5B: Academic S&E Article Output per 1,000 SEH Doctorate Holders in Academia, Comparison States, 2001–2023



Source: National Science Board.

What Does This Mean for North Carolina?

North Carolina has a great strength in its academic science and engineering, evidenced by the large volume of academic science and engineering article output relative to SEH doctorate holders. These strengths, however, are highly concentrated in a small number of universities and other R&D-focused organizations located primarily in the Research Triangle region and other metropolitan areas, such as the Piedmont Triad. As evidenced in the Economic Well-Being indicators in Section 1 and the Innovative Organizations indicators in Section 4, these academic S&E strengths are benefiting a less-than-optimal share and geographic distribution of North Carolina's citizens and companies. North Carolina's academic, corporate, and policy leaders should increase their efforts designed to spread the benefits of the state's academic S&E strengths throughout all regions of the state. ■

Section 3: Commercialization

Commercialization lies at the critical juncture between discovery and economic impact. This process translates new knowledge and intellectual property into marketable products, services, and companies. **Commercialization** captures whether the ideas generated through R&D are successfully making their way into practice, including through patents, licensing, start-up companies, and early-stage funding. Tracking these measures of these outcomes over time, and relative to other states, helps determine whether North Carolina is effectively converting its research & development strengths into economic activity.

INDICATOR 3.1: SBIR & STTR FUNDING

Indicator Overview

The SBIR and STTR programs, collectively referred to as *America's Seed Fund*™, are administered through federal agencies (11 for SBIR and five for STTR) to small-innovative businesses to advance high impact research and innovations. SBIR/STTR makes awards to evaluate the feasibility and scientific merit (Phase I up to $314,316) and develop the technology to a point in which it can be commercialized (Phase II up to $2,095,748)[1]. STTR is unique from SBIR in that it requires collaboration with a non-profit research institution.

SBIR and STTR are the single largest source of early-stage technology development funding for small businesses across the country, with nearly $4.3 billion awarded annually. In addition to the federal programs, some states, like North Carolina, have created programs to incentivize small businesses to apply for federal grants and provide additional capital to small businesses to improve the likelihood of commercializing their products. Small businesses are a large part of a state's innovation economy, and the level of SBIR/STTR funding in a state strongly correlates with the strength of its technology-based economic development.

KEY FINDINGS

- North Carolina ranks in the top 28 percent of states for Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) funding as a share of state GDP.
- Since 2000, North Carolina's SBIR and STTR funding as a share of state GDP has increased 203 percent, improving its ranking by 15 positions.
- For the 2022-2024 time period, the state's SBIR and STTR awards were highly concentrated in the Research Triangle region; over half the state's counties had no SBIR or STTR awards.

1 https://www.sbir.gov/about/policies

INDICATOR 3.1: SBIR & STTR FUNDING

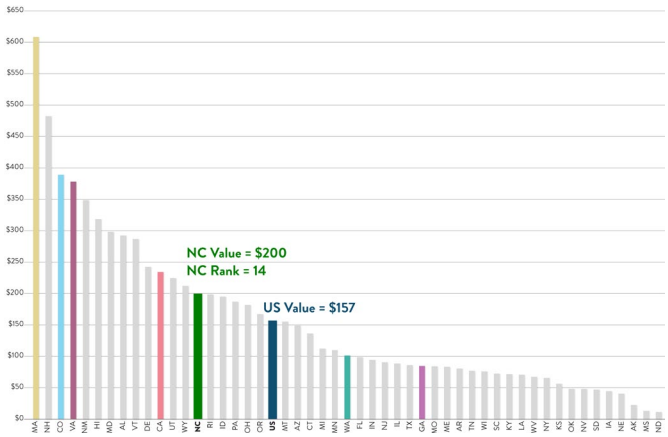
How Does North Carolina Perform?[2]

During the 2022-2024 period, North Carolina ranked in the top third of states for SBIR/STTR funding relative to GDP **[3.1A]**. At $200 in SBIR/STTR funding per $1 million GDP, North Carolina ranked 14th in the nation, with a value 127 percent that of the U.S. average ($157). North Carolina is positioned below comparison states Massachusetts (1st), Colorado (3rd), Virginia (4th), and California (11th) in the rankings, and North Carolina has a value just 33 percent of the top state of Massachusetts. Among the comparison states, only Washington and Georgia fell below the U.S., with values of $101 and $84.6, respectively. These levels of early-stage funding suggest that North Carolina is capitalizing on opportunities to fund and commercialize its innovative discoveries but still has room to improve given the disproportionate amount that goes to the top-performing states.

Since 2000, North Carolina has had a large increase in SBIR/STTR funding relative to GDP, with a rate of change over that time period of 203 percent **[3.1B]**. This growth rate is 7.25 times larger than the U.S. rate (28 percent) and is the largest of all comparison states, with Georgia having the second largest change since 2000 (125 percent). While the overall over-time rate for North Carolina is positive, its SBIR/STTR per state GDP funding decreased between the 2020-2022 average and 2022-2024 average, its largest decrease over the entire 24-year period. This was likely a result of federal funding changes, as all other comparison states (besides Georgia) and the U.S. values also decreased between these two periods.

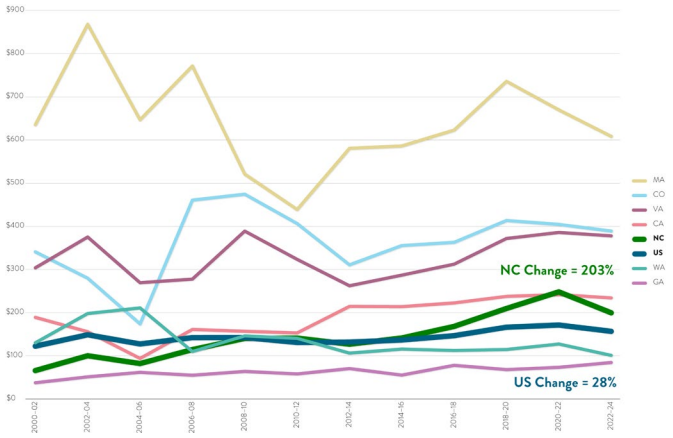
2 The total award dollars reported here include both Phase I and Phase II SBIR/STTR awards.

3.1A: Average Annual SBIR & STTR Funding per $1 Million of Gross Domestic Product, All U.S. States, 2022–2024



Source: National Science Board.

3.1B: Average Annual SBIR & STTR Funding per $1 Million of Gross Domestic Product, Comparison States, 2000–2024



Source: National Science Board.

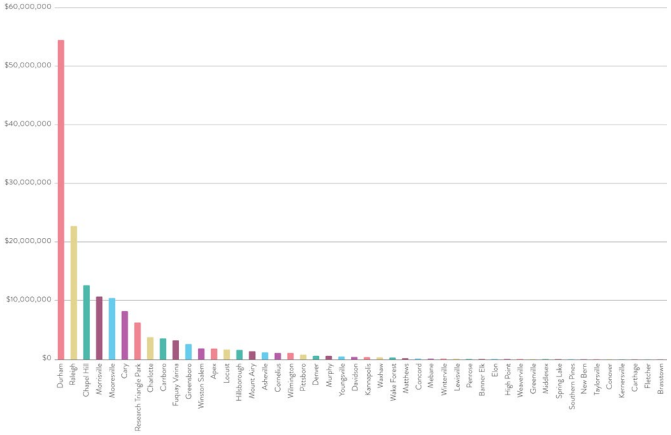
Massachusetts saw the largest decrease, with the indicator value dropping $61 between 2020-2022 average and 2022-2024 average.

INDICATOR 3.1: SBIR & STTR FUNDING

SBIR and STTR awards during the 2022–2024 period were highly concentrated in central North Carolina near the Research Triangle region **[3.1C, 3.1D]**. The cities of Durham and Raleigh alone account for 50 percent of the state's SBIR/STTR awards and award amounts **[3.1C]**. In total, 10 cities (Durham, Raleigh, Chapel Hill, Morrisville, Mooresville, Cary, Research Triangle Park, Carrboro, Charlotte, Fuquay Varina) account for 87 percent of the total SBIR/STTR award amount to North Carolina, and eight out of 10 are located in central North Carolina. The city of Durham, which accounts for 34.8 percent of the average yearly award for the state, had average yearly award totals ($54,567,258) 2.4 times that of the next highest city (Raleigh: $22,793,505) and 2,731 times larger than the city with the smallest average award amount (Brasstown: $19,980).

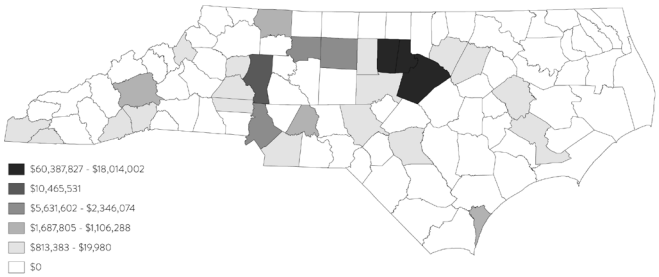
In terms of county location for these cities, just three counties account for 80 percent of the state's total SBIR/STTR awards (Durham: 38.5 percent, Wake: 30.3 percent, Orange: 11.5 percent). With the addition of two more counties, Iredell, which contains Mooresville (6.7 percent) and Mecklenburg, home to Charlotte (3.6 percent), the total increases to 90 percent of the total share of awards **[3.1D]**. The remaining share is spread among 24 additional counties, meaning 71 North Carolina counties had no SBIR/STTR awards for 2022-2024. Overall, this highly concentrated SBIR/STTR award activity reflects the level of concentration in North Carolina's R&D activity, particularly its academic R&D, as well as its population. However, it does draw clear attention to the need to reach small businesses in other areas of the state.

3.1C: Average Annual SBIR & STTR Awards, N.C. Cities, 2022–2024



Source: https://www.sbir.gov

3.1D: Average Annual Amount of SBIR & STTR Awards, N.C. Counties, 2022–2024



Source: https://www.sbir.gov

INDICATOR 3.1: SBIR & STTR FUNDING

What Does This Mean for North Carolina?

North Carolina performs well in its SBIR/STTR funding, having improved from ranking in the bottom third for SBIR/STTR funding as a share of state GDP in 2000 to the top third in 2024. This improvement in SBIR/STTR federal funds with respect to GDP indicates both how aggressive the state's small businesses are in pursuing federal support for innovation activity, as well as their competitiveness in developing and commercializing innovative ideas, technologies, and products.

Given the importance of such funding, emphasis should be placed on further improving the state's position in this category. Continued funding for the One North Carolina Small Business Program[3], which provides state grants to help companies apply for SBIR/STTR grants and to match those grants once companies win them, is critical on this front. Additionally, proposal opportunity identification and counseling services, such as those provided by North Carolina's Small Business and Technology Development Center (SBTDC), the First Flight Venture Center, and other organizations, should be continued and enhanced to ensure that North Carolina businesses are maximizing their ability to receive SBIR/STTR grants. ■

3 www.commerce.nc.gov/grants-incentives/technology-funds/one-north-carolina-small-business-program

INDICATOR 3.2: ACADEMIC PATENTS

Indicator Overview

This indicator relates the number of academic-owned utility patents to the size of the doctoral science & engineering (S&E) workforce in academia[1]. Academia includes two-year colleges, four-year colleges and universities, medical schools, and university-affiliated research centers. S&E doctorates include those in computer sciences; mathematics; biological, agricultural, or environmental life sciences; physical sciences; social sciences; psychology; engineering; and health fields. Utility patents, commonly known as patents for inventions, include any new, useful, or improved method, process, machine, device, manufactured item, or chemical compound, and represent a key measure of intellectual property.[2] As such, academic patents are one approximate measure of the degree to which the doctoral academic workforce generates results with perceived economic value.[3]

KEY FINDINGS

- The ratio of academic patents to science and engineering doctorate holders for North Carolina is slightly below the U.S. value but is growing at a rate faster than the U.S. average.
- North Carolina's academic patenting activity is highly concentrated in a small number of universities located primarily in the Research Triangle region.

1 S&E doctorate data exclude those with doctorates from foreign institutions and those above the age of 75.

2 Patent assignments are made on the basis of the address of their original assignee(s). For patents with multiple U.S. university assignees from different U.S. states, the data credit each participating U.S. state as owning one patent.

3 Another measure of academic economic value is the actual or expected revenue derived from academic patents. However, because actual revenue accrues over time and expected revenue is difficult to estimate with a reasonable level of accuracy, revenue data are not presented for this indicator. License income, which depends heavily on patent activity, is presented in indicator 3.5.

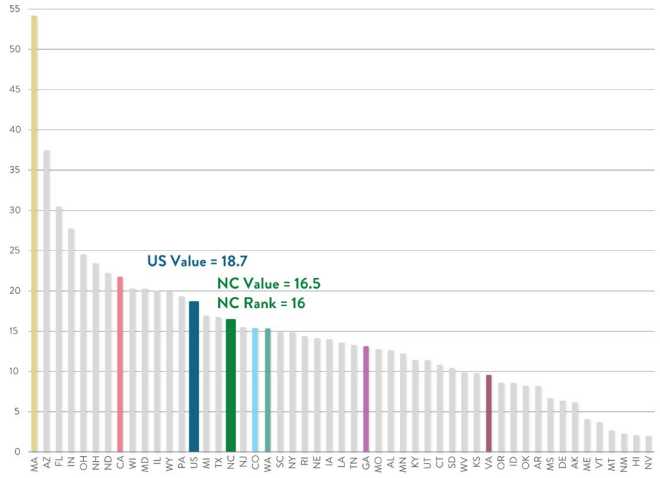
INDICATOR 3.2: ACADEMIC PATENTS

How Does North Carolina Perform?

With an average of 16.5 patents per 1,000 science and engineering doctorate holders, North Carolina performs slightly below the U.S. value of 18.7 in 2023 **[3.2A]**. North Carolina ranked 16th in the nation, a position improvement by two positions from 2021 data in the previous edition of this report. Only two comparison states have values above the U.S. average: Massachusetts and California. Massachusetts is the top comparison state and the top state in the country, with an average value of 54.2. California ranks 8th (21.75). Colorado (15.4), Washington (15.3), Georgia (13.2), and Virginia (9.6) are all positioned below North Carolina in terms of their academic patent output per 1,000 science and engineering doctorate holders.

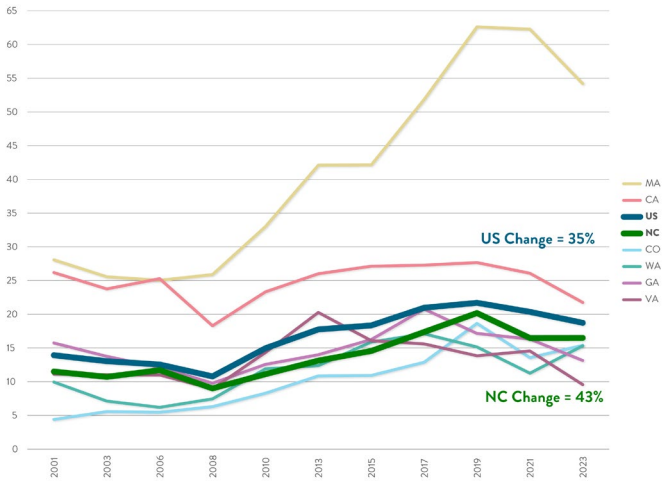
From 2001-2023, North Carolina improved its academic patent output relative to science and engineering doctorate holders by 43 percent **[3.2B]**. This is a greater change than the U.S. average (35 percent), California (-17 percent), Georgia (-17 percent), and Virginia (-14 percent) for the same time period. Colorado had substantial growth in its academic patent output, with a value of just 4.4 in 2001 to a value of 15.4 in 2023 (250 percent increase).

3.2A: Academic Patents Awarded per 1,000 Science & Engineering Doctorate Holders in Academia, All U.S. States, 2023



Source: National Science Board

3.2B: Academic Patents Awarded per 1,000 Science & Engineering Doctorate Holders in Academia, Comparison States, 2001–2023

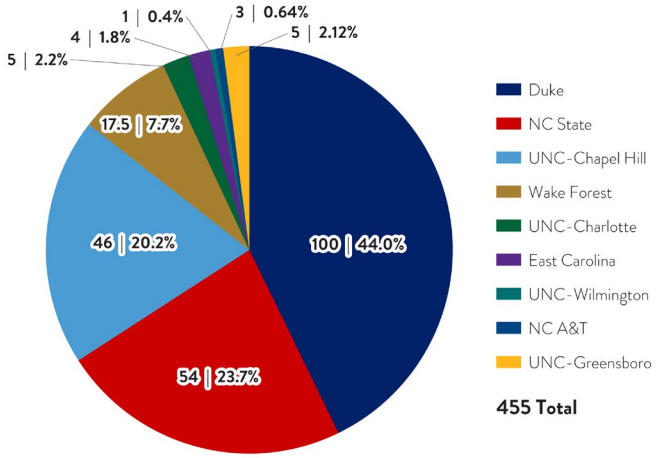


Source: National Science Board

INDICATOR 3.2: ACADEMIC PATENTS

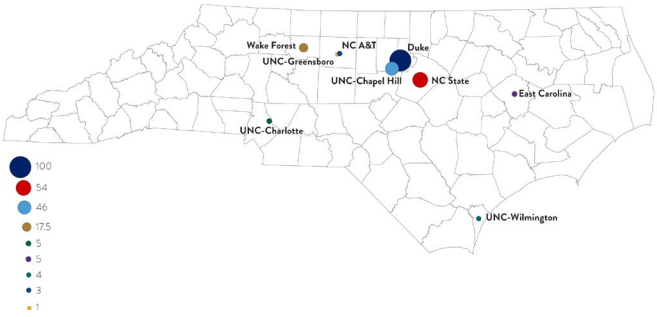
During the 2023-2024 period, an average of 235.5 patents were awarded per year to North Carolina academic institutions (471 total) **[3.2C, 3.2D]**. Academic patent output from North Carolina institutions is concentrated in the Research Triangle region due to the presence of three large research universities—NC State University, Duke University, and the University of North Carolina Chapel Hill—the latter two of which have medical schools. For the 2023-2024 period, those three universities account for 87.9 percent of the academic patents in the state, with six other universities accounting for the remaining 12.1 percent. Duke University alone accounts for 44 percent of the share of patents awarded during that period.

3.2C: Average Annual Academic Patents Awarded to N.C. Universities, 2023–2024



Source: Association of University Technology Managers

3.2D: Total Academic Patents Awarded to N.C. Universities, 2023–2024



Source: Association of University Technology Managers

INDICATOR 3.2: ACADEMIC PATENTS

What Does this Mean for North Carolina?

While North Carolina has well above-average academic R&D expenditures (see indicator 2.3), the translation of R&D expenditures to patents is slightly below average. This may indicate university researchers are focusing more on research rather than development of technologies for the market. Additionally, the differences across the state's universities for patents may indicate barriers to filing patents or differences in resources for such efforts, particularly at research institutions with smaller technology translation teams or equivalent positions.

To enhance patent productivity at research institutions, university researchers need to be well informed about patent opportunities and supported by teams within their institution for market assessment, legal assistance, new venture services, and other operational support. Additionally, creation of a University Innovation Commercialization Council for all universities in the state, as recommended by the 2014 Governor's Innovation-to-Jobs Working group,[4] would define best practices for innovation based commercialization at the state's universities, promote inter-university cooperation and standardization, and accelerate transformation in culture to encourage technology commercialization. These initiatives and support efforts would increase commercial impact of academic discoveries and should be of high priority for state and university leaders. ■

4 Recommendations of the Governor's Innovation-to-Jobs Working Group. March 2015. Available at: www.commerce.nc.gov/governors-innovation-jobs-working-group-recommendations/open. The formation of NCInnovation in 2020 is consistent with this recommendation, and NCInnovation's work since then is helping to increase the number of academic patents from UNC institutions.

INDICATOR 3.3: PATENTS AWARDED

Indicator Overview

This indicator represents state utility patent activity normalized by the number of residents. Utility patents are commonly known as patents for inventions and can be granted for any new, nonobvious, useful, or improved method, process, machine, device, item, or chemical compound.[1] The patent output presented here is from academic institutions, businesses, inventors, and entrepreneurs. Patents are the leading form of legal codification and ownership of innovative thinking and its application. As such, they are a key indicator of the rate of new product and process innovation. There are considerable differences in the propensity of different industries to patent new ideas, and thus the industry mix partially explains differences in patenting rates across locales. Patents are particularly important for companies whose success depends on their ability to protect their innovative products.

KEY FINDINGS

- The ratio of North Carolina's patents awarded per 1,000 residents is below the U.S. average and since the early 2000's has been increasing at a rate lower than the U.S. average.
- North Carolina's patenting activity is highly concentrated in a small number of counties located primarily in the Research Triangle region.

1 See indictor 3.2 for a more detailed description of utility patents. The U.S. Patent and Trademark Office (USPTO) classifies patents geographically according to the residence of the first-named inventor. Only U.S.-origin patents are included.

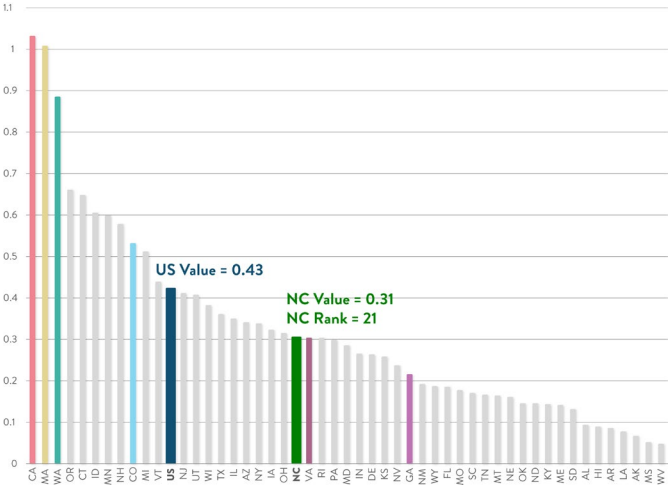
INDICATOR 3.3: PATENTS AWARDED

How Does North Carolina Perform?

North Carolina sits in the middle of the pack for its patent performance with respect to its number of residents **[3.3A]**. This is not dramatically different than its positioning in academic patent output (see indicator 3.2). North Carolina's value of 0.31 patents awarded per 1,000 residents is just 72 percent of the U.S. value (0.43) and just 30 percent of the top performing state (California – 1.03). Besides North Carolina, other comparison states that are positioned below the U.S. average are Virginia (0.30) and Georgia (0.22).

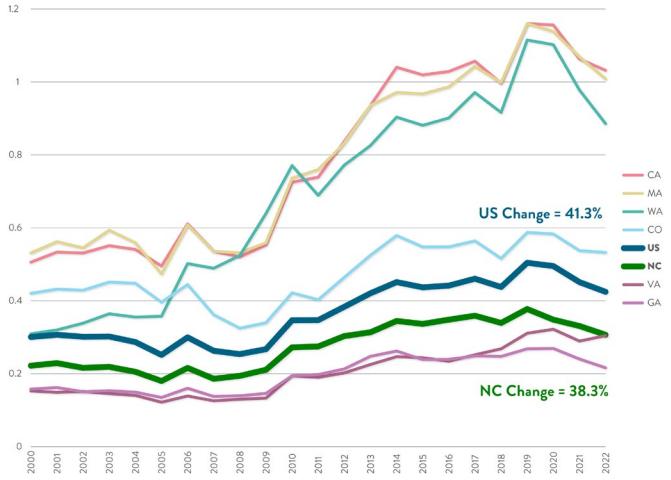
Since 2000, North Carolina's patent output with respect to residents has grown 38.3 percent **[3.3B]**. Given that North Carolina's population has increased by over 37 percent in that same time frame (see indicator 1.6), this increase in patent output with respect to number of residents shows solid growth in patenting. Out of the comparison states, Washington has seen the largest change in patent-per-resident output since 2000, with an increase of 186 percent between 2000 and 2022. Besides North Carolina, two other comparison states also had changes lower than the U.S. average of 41.3 percent: Colorado (26.6 percent) and Georgia (37.2 percent).

3.3A: Patents Awarded per 1,000 Residents, All U.S. States, 2022



Source: National Science Board.

3.3B: Patents Awarded per 1,000 Residents, Comparison States, 2000–2022

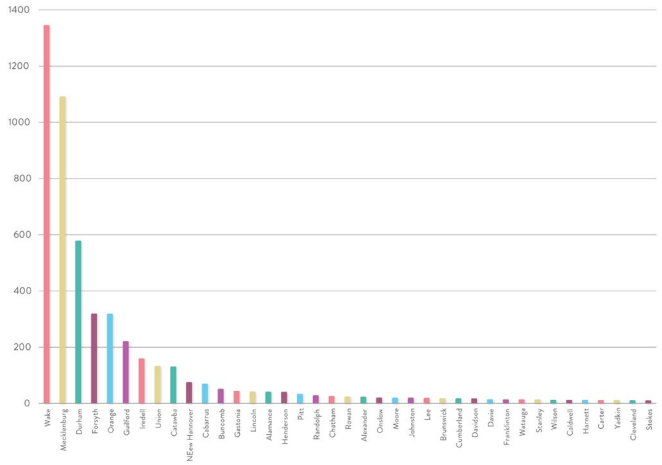


Source: National Science Board

INDICATOR 3.3: PATENTS AWARDED

Among North Carolina's 100 counties, 39 counties had an average of 10 or more patents annually between 2022 and 2024 **[3.3C, 3.3D]**. The distribution in average number of patents varied greatly across counties, with Wake County having the largest average number of patents (1,346), and four counties (Bladen, Hyde, Martin, and Swain) having zero patents. The top 10 counties for average number of patents include Wake, Mecklenburg, Durham, Forsyth, Orange, Guildford, Iredell, Union, Catawba, and New Hanover. All of these counties have large research universities and/or science and technology focused businesses that support increased patent filings. Out of all the state's 100 counties, 33 had one or fewer average number of patents over the same time period.

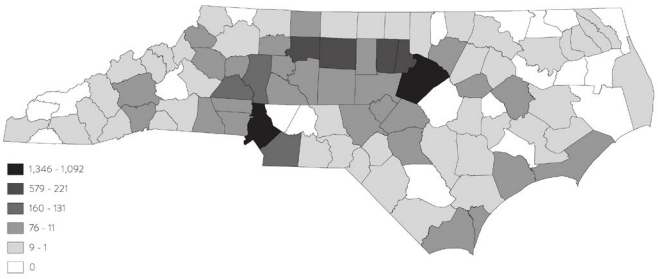
3.3C: Average Annual Number of Patents, N.C. Counties, 2022–2024



Source: U.S. Patent and Trademark Office, via Neo IP Intellectual Property Law Firm and Magic Number, Inc. d/b/a Patent Forecast.

Note: Counties with 10 or more patents.

3.3D: Average Annual Number of Patents, N.C. Counties, 2022–2024



Source: U.S. Patent and Trademark Office, via Neo IP Intellectual Property Law Firm and Magic Number, Inc. d/b/a Patent Forecast.

INDICATOR 3.3: PATENTS AWARDED

What Does this Mean for North Carolina?

While this indicator represents patents from business, academia, and individuals, in North Carolina, academic patents only account for approximately 6 percent of the total patents. This means that businesses and individuals account for the majority of legally protected intellectual property in the state. Lower than average patent output from North Carolina may indicate a lack of innovators with respect to the overall population. While patent output is not the only measure of innovation, increased patent output does support economic activity within the state and the overall innovation ecosystem. To increase patent output, the state should work to enhance the conditions that facilitate the commercialization of intellectual property. ■

INDICATOR 3.4: VENTURE CAPITAL

Indicator Overview

This indicator shows the relative magnitude of venture capital investments in a state relative to the size of the state's economy. Venture capital is an important source of funding that supports start-ups and firms aiming to commercialize their technologies. Venture capital includes financing at seed, early, and later stages in companies' lifetimes. Seed funding specifically focuses on financing proof-of-concept and initial development. Early-stage venture capital investments support product development, marketing, initiation of commercial manufacturing, and sales. Later-stage financing includes acquisition financing and management and leveraged buyouts. Venture capital is especially important to startup companies in the early stages of development; these companies often need financing to get a project off the ground but are unable to access traditional financing because of an insufficient cash flow history. Positive trends in this measure may be predictors of new products and services, job creation, and revenue growth.

KEY FINDINGS

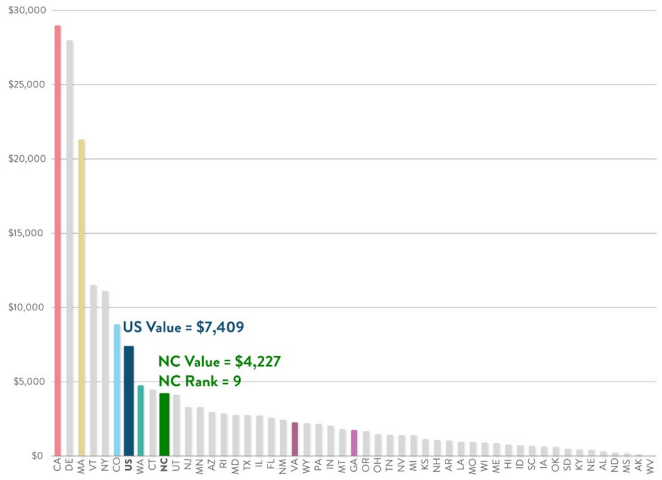
- North Carolina ranks in the top 20 percent of states but below the U.S. average for venture capital investments with respect to state GDP and for the amount of venture capital disbursed per deal.
- Venture capital investments are relatively concentrated in specific regions of North Carolina, with just three counties accounting for 86 percent of the share of venture capital investments; 63 counties had no venture capital investments between 2022 and 2024.

INDICATOR 3.4: VENTURE CAPITAL

How Does North Carolina Perform?

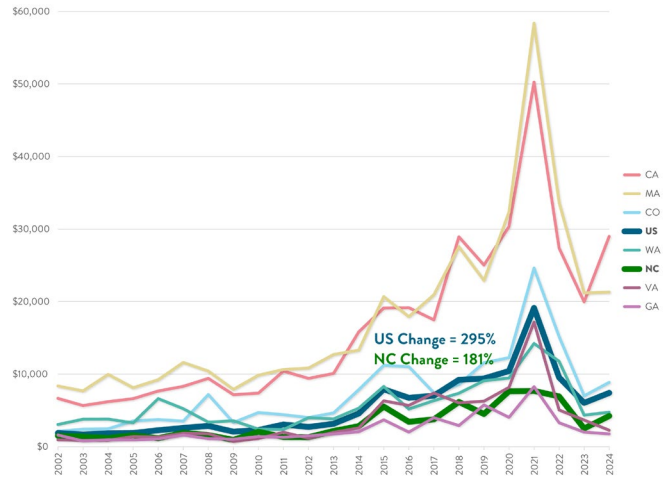
In 2024, North Carolina ranked 9th in the country for the venture capital disbursed relative to the state's GDP **[3.4A]**. At $4,227 venture capital disbursed per $1 million of GDP, North Carolina has a value 57 percent of the U.S. average value ($7,409). However, the U.S. average is skewed high compared due to large venture capital investments concentrated in a small number of states, particularly California and Massachusetts, which have a history of being startup hubs. California, Massachusetts, and New York account for 75 percent of the total share of venture capital investments, whereas North Carolina accounts for just 1.6 percent of the total. North Carolina has continued to increase its venture capital investments with respect to the size of the state's economy from, $1,504 in 2002 to $4,227 in 2024, a 181 percent increase **[3.4B]**. While this is below the U.S. growth (295 percent) in the same time period, it exceeds the increases seen by Massachusetts (155 percent), Washington (55.5 percent), Virginia (142 percent), and Georgia (10.1 percent), among comparison states.

3.4A: Venture Capital Disbursed per $1 Million of GDP, All U.S. States, 2024



Source: National Science Board, Pitchbook.

3.4B: Venture Capital Disbursed per $1 Million of GDP, Comparison States, 2002–2024

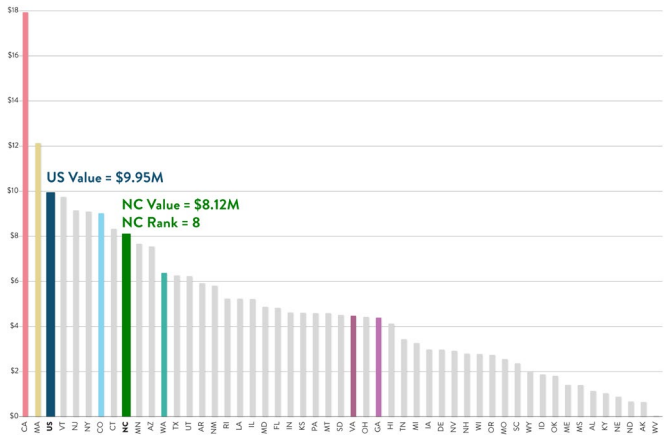


Source: National Science Board, Pitchbook.

INDICATOR 3.4: VENTURE CAPITAL

Additionally, North Carolina ranks one position higher when looking at venture capital disbursed per deal, with an average of $8.12 million per deal **[3.4C]**. Again, North Carolina is below the U.S. average, partially due to venture capital deals in California and Massachusetts being higher. Compared to comparison states, North Carolina sits in the middle with California (1st), Massachusetts (2nd), and Colorado (6th) ranking higher. North Carolina has increased the venture capital disbursed per deal by 28.8 percent since 2002, an increase about 1.5 times larger than the U.S. overall **[3.4D]**. Notably, Washington (-20.1 percent), Virginia (-12.4 percent), and Georgia (-54.4 percent) have all seen declines in venture capital deal size in this same time frame.

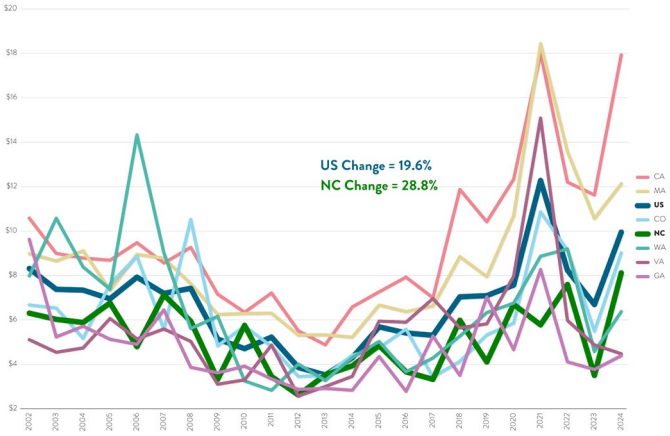
3.4C: Venture Capital Disbursed per Deal, All U.S. States, 2024



Source: National Science Board, Pitchbook

Note: Dollars in millions.

3.4D: Venture Capital Disbursed per Deal, Comparison States, 2002–2024



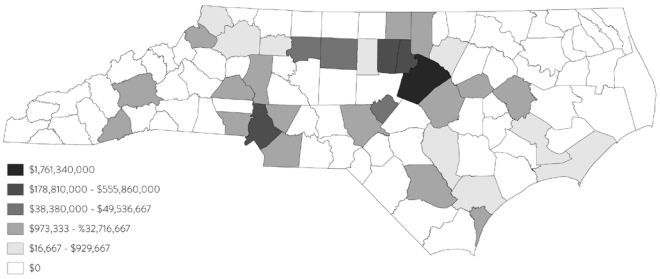
Source: National Science Board, Pitchbook

Note: Current dollars, in Millions

INDICATOR 3.4: VENTURE CAPITAL

Within North Carolina, during the 2022-2024 period, venture capital investments were relatively concentrated in the RTP and Charlotte-metro regions **[3.4E]**. Smaller and fewer deals were made in other counties outside of those regions, and 63 counties had no venture capital deals. Three counties (Durham: $1.7B, Wake: $5.3B, and Mecklenburg: $1.7B) accounted for 86 percent of the total share of venture capital investments during 2022-2024.[1] Other notable counties with large total investments over that time period include Buncombe (10 24 deals, $98.2M), Cabarrus (10 deals, $35.4M), Forsyth (30 deals, $137.4M), Guilford (16 deals, $148.6M), Lee (10 deals, $115.1M), New Hanover (16 deals, $40.9M), and Orange (27 deals, $563.4M). Overall, 37 counties had at least one venture capital deal, meaning 63 counties, or the majority of counties, did not have a venture capital deal between 2022 and 2024.

3.4E: Location of Venture Capital Investments in N.C., Average Annual Investments, 2022-2024



Source: National Science Board, Pitchbook

Note: Current dollars, in Millions

1 Amounts listed in the text are totals; the map shows annual averages.

INDICATOR 3.4: VENTURE CAPITAL

What Does This Mean for North Carolina?

North Carolina ranks relatively well regarding venture capital investments and deal size compared to most states but still ranks far behind the leading states. If businesses cannot access venture capital investments within North Carolina, they will likely relocate to places with higher venture capital interest like Silicon Valley in California and Boston in Massachusetts. Ensuring North Carolina companies have access to venture capital will increases economic output through more jobs/employees and goods produced/commercialized products. Likewise, increasing the geographic dispersion of venture capital will broaden the impact throughout the state. ■

INDICATOR 3.5: TECHNOLOGY LICENSE INCOME

Indicator Overview

Universities and nonprofit research organizations use technology license agreements to transfer codified knowledge in the form of intellectual property (IP) to companies and entrepreneurs seeking to commercialize the technology. The income generated from license agreements is a key measure of the value of that IP. Additionally, net licensing income can be used to support subsequent R&D and education activities, including patenting and other commercialization-related costs.

This indicator measures technology licensure through gross income and running royalties received relative to academic science and engineering R&D expenditures. Gross income is more inclusive, measuring license issues fees, payments, annual minimums, running royalties, termination payments, equity received when cashed-in, and software and biological material end-user license fees equal to $1,000 or more. Running royalties are a subset of the gross income and are usage-based payments made by licensee to the licensor for ongoing use of an asset or IP.

KEY FINDINGS

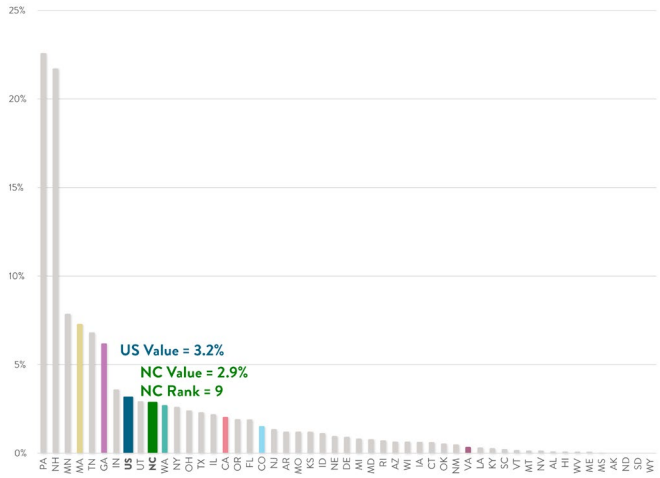
- North Carolina's gross income received, as well as its running royalties received, from technology licenses as a percentage of academic R&D expenditures are similar to the U.S. average but rank among the top 10 states.
- A small number of North Carolina universities, concentrated primarily in the RTP region, account for over 99 percent of the license income for the state.

INDICATOR 3.5: TECHNOLOGY LICENSE INCOME

How does North Carolina Perform?

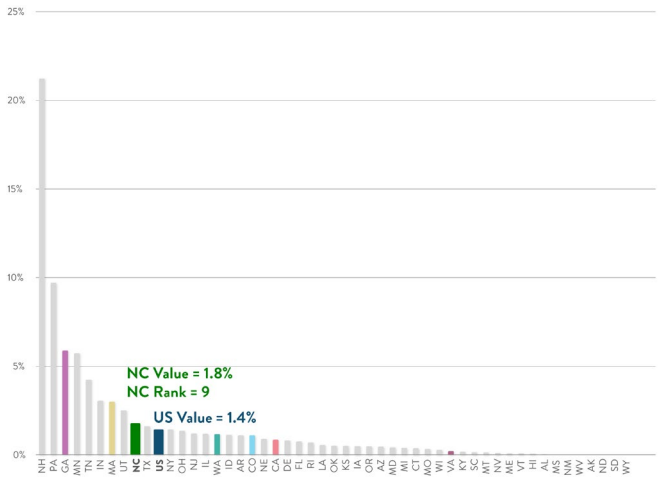
For gross academic license income as a percentage of academic R&D expenditures during the 2022-2023 period, North Carolina ranked 9th at 2.9 percent **[3.5A]**. Despite this value being smaller than the 2020-2021 average in the most recent edition of this report, this ranking is a two-place improvement for North Carolina. North Carolina's 2022-2023 average was below that of the U.S. average (3.2 percent) and comparison states Massachusetts (7.3 percent) and Georgia (6.2 percent). Looking specifically at running royalties with respect to academic R&D expenditures during 2022 and 2023, North Carolina has a value of 1.8 percent, which is 22 percent greater than the U.S. overall value of 1.5 percent **[3.5B]**. Similar to the gross academic license income, North Carolina's value for running royalties relative to academic R&D expenditures was below Georgia (5.9 percent) and Massachusetts (3.0 percent).

3.5A: Academic License Income (Gross Received) as a Percentage of Academic R&D Expenditures, All U.S. States, 2022–2023 Average



Source: Association of University Technology Managers

3.5B: Academic License Income (Running Royalties) as a Percentage of Academic R&D Expenditures, All U.S. States, 2022–2023 Average

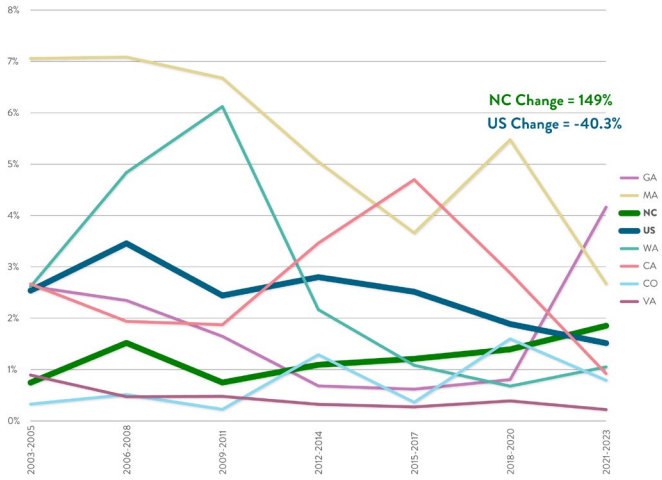


Source: Association of University Technology Managers

INDICATOR 3.5: TECHNOLOGY LICENSE INCOME

Since 2003, North Carolina has increased its academic license income in running royalties as a percentage of academic R&D expenditures by 149 percent **[3.5C]**. In contrast, the U.S. has seen a decrease in its value in that same time period of 40.3 percent. Out of all comparison states, North Carolina has had the largest increase in the running royalty license income, closely followed by Colorado which has seen a 142 percent increase in its value between 2003 and 2023. Massachusetts (-62.1 percent), Washington (-59.8 percent), California (-65.5 percent), and Virginia (-75.3 percent) have all seen large decreases in their running royalty license income with respect to academic R&D expenditures. Given that all of these states besides Washington have seen relatively stable academic R&D expenditures (see indicator 2.3), this decrease is due to lower licensing income and not because academic R&D was increasing rapidly.

3.5C: Academic License Income (Running Royalties) as a Percentage of Academic R&D Expenditures, Comparison States, Three-Year Averages, 2003–2023



Source: Association of University Technology Managers

INDICATOR 3.5: TECHNOLOGY LICENSE INCOME

Between 2023 and 2024, eight North Carolina higher education academic institutions were major contributors to the state's academic license income for both gross received and running royalties **[3.5D, 3.5E]**. These eight institutions accounted for 3.6 percent of the average annual gross license income and 3.7 percent of the average annual running royalties license income for the U.S., bringing in a total of $111,534,026 and $80,449,937, respectively on an annual basis.[1] Four institutions (Duke University, University of North Carolina Chapel Hill, North Carolina State University, and Wake Forest University) had a 99.6 percent share of North Carolina's academic licensure income, with the four other universities (University of North Carolina Charlotte, University of North Carolina Greensboro, University of North Carolina Wilmington, and East Carolina) account for the remaining 0.4 percent. Duke had the largest average annual gross and running royalty license income at $92,542,908 and $71,550,775, respectively. The largest contributors to gross and running royalty license income are concentrated in the RTP region, consistent with other data regarding academic R&D expenditures (see indicator 2.3) and patent output (see indicator 3.2).

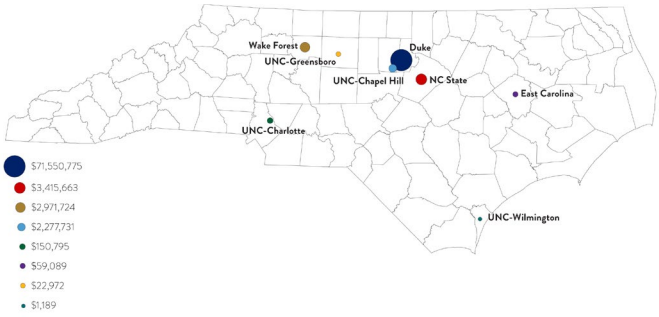
3.5D: Average Annual Academic License Income, U.S. Average and N.C. Institutions, 2023–2024

HIGHER EDUCATION INSTITUTION	GROSS RECIEVED	RUNNING ROYALTIES
US	$63,526,373	$44,242,637
Duke	$92,542,908	$71,550,775
East Carolina	$103,496	$59,089
NC State	$6,531,705	$3,415,663
UNC-Chapel Hill	$7,525,130	$2,277,731
UNC-Charlotte	$213,401	$150,795
UNC-Greensboro	$22,972	$22,972
UNC-Wilmington	$137,980	$1,189
Wake Forest	$4,456,436	$2,971,724

Source: Association of University Technology Managers

Note: The U.S. average was calculated using participating universities and may not account for all institutions across the U.S.

3.5E: Location of Academic License Incoming (Running Royalties) in N.C., Average Annual Income, 2023-2024



Source: Association of University Technology Managers

1 These eight universities have offices focusing on technology patenting and commercialization. All data are self-reported by the universities to the Association of University Technology Managers (AUTM) via its Annual Licensing Survey. While it is possible that some NC universities have technology license income not reported to AUTM, the likelihood and amount are very low and not likely to change the findings presented here significantly.

INDICATOR 3.5: TECHNOLOGY LICENSE INCOME

What Does This Mean for North Carolina?

North Carolina's academic R&D has consistently been a core innovation-related strength (see indicator 2.3). While there has been improvement in licensing income, the state could improve further in terms in licensing income as a percentage of R&D expenditures. The level of license income varies considerably across the state's universities and is concentrated across a relatively small number of universities overall. The concentration of these efforts exists in large universities that have the personnel and funding to equip offices and activities that generate patents and other forms of IP that can be licensed. As such, efforts need to be made to support the research focused institutions that do not currently have large staff to support these needs. To meet these needs, funding organizations and nonprofits focused on funding scientific research across the state could also provide more information and support in generating patents and licensed IP to help institutions get more license income. This will not only help the institutions that lack large staff to do this but will help institutions acquire more income/funds to self-sustain after organization funding opportunities subside. ■

INDICATOR 3.6: UNIVERSITY STARTUPS

Indicator Overview

Startup companies that originate within universities are commonly referred to as spinoffs, and are typically founded to commercialize technologies developed through university R&D. Universities typically claim the intellectual property (IP) rights to these technologies, which results in the creation of a license for this IP for the university and patents for new companies. Many, but not all, university startups remain in the state where they were founded and contribute to local economies. This indicator measures startups formed per $1 million of academic R&D expenditures and the average number of startups formed and stayed in home state per $1 million of academic R&D expenditures. These measures provide information on how many companies form as a result of university research, how many stay within North Carolina to contribute to the economy, and how university research and startups are intertwined to support the innovation economy.

KEY FINDINGS

- North Carolina ranks in the top quartile of states and above the U.S. average for both the number of startups formed and the number of startups remaining in the home state per academic R&D expenditures.
- Since 2003, North Carolina has increased the number of startups formed relative to academic R&D expenditures, but there have been steep declines in number of startups since 2020.
- Within North Carolina, six universities produced startups between 2023 and 2024; three universities have above-U.S. average values for startups formed and remaining in home state.

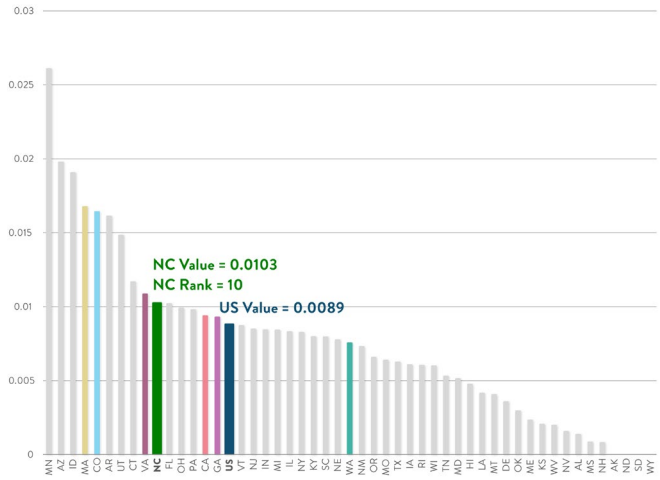
INDICATOR 3.6: UNIVERSITY STARTUPS

How Does North Carolina Perform?

In terms of the average number of university startups formed per $1 million of academic R&D expenditures, North Carolina ranks in the top 20 percent of states and well above the U.S. average **[3.6A]**. With a value of 0.0103, North Carolina had a value 28 percent larger than the U.S. average (0.0089) for 2022-2023. North Carolina ranks above comparison states California (0.0094), Georgia (0.0093), and Washington (0.0076), but it falls short of Virginia (0.011), Colorado (0.016), and Massachusetts (0.017). Washington was the only comparison state falling short of the U.S. average for number of university startups formed with respect to academic R&D expenditures.

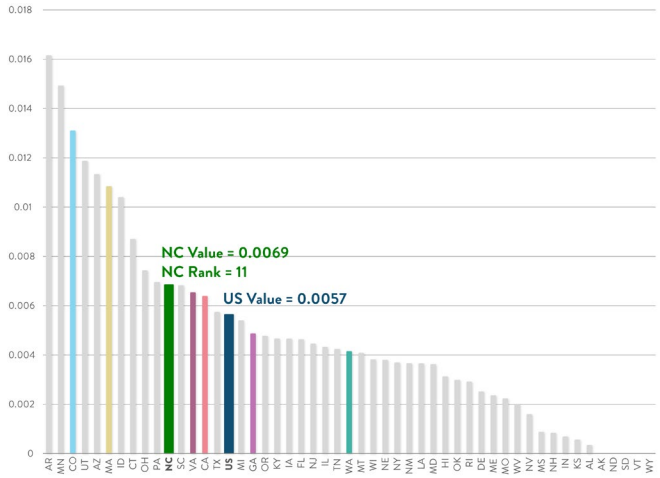
When looking at the number of university startups remaining in home state between 2022 and 2023, North Carolina ranked 11th in the nation and above the U.S. average **[3.6B]**. The leading state (Arkansas) has a value nearly 2.3 times larger than North Carolina's value of 0.0069. Besides North Carolina, comparison states Colorado (0.013), Massachusetts (0.011), Virginia (0.0065), and California (0.0064) had values above the national average, with only Georgia (0.0049) and Washington (0.0042) falling below.

3.6A: Average Number of University Startups Formed per $1 Million of Academic R&D Expenditures, All U.S. States, 2022–2023



Source: Association of University Technology Managers.

3.6B: Average Number of University Startups Formed & Remaining in Home State per $1 Million of Academic R&D Expenditures, All U.S. States, 2022–2023



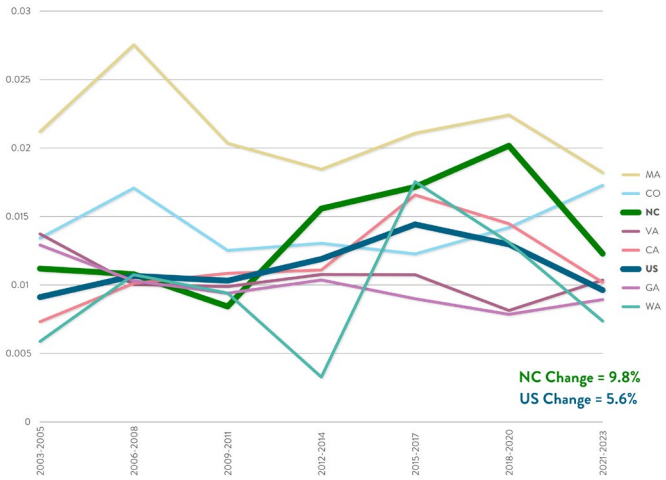
Source: Association of University Technology Managers.

INDICATOR 3.6: UNIVERSITY STARTUPS

From 2003 to 2023, North Carolina has increased its number of university startups formed by 9.8 percent **[3.6C]**. Between 2003 and 2020, the number of startups forming with respect to R&D expenditures was generally increasing, with a peak in the 2018-2020 average. However, after the 2018-2020 period, North Carolina saw a sharp decline in university startups formed. This may in part be due to the COVID-19 pandemic slowing progress on research and funding for non-COVID related projects, and thus less research being ready to commercialize through a university startups. Out of all comparison states, California has had the largest growth since 2003, with an increase of 39.5 percent in its value. In contrast, Georgia has had the largest decrease in its value between 2003 and 2023, with a decrease of 30.8 percent.

Within North Carolina, six universities had university startups between 2023 and 2024, and three had more startups formed and remaining in the home state than the national average **[3.6D]**. North Carolina State University led the universities in both startups formed and remained in the home state, with values almost three times the national average. Notably, similarly to academic R&D expenditures (see indicator 2.3), academic patents (see indicator 3.2), and license income (see indicator 3.5), the top universities for startups formed and remained in the home state are concentrated in the RTP region of the state. The other universities (UNC-Charlotte, East Carolina, and UNC-Greensboro), while below the national average, each had an average of 2.5 or more startups formed between 2023 and 2024.

3.6C: Number of University Startups Formed per $1 Million of Academic R&D Expenditures, Comparison States, Three-Year Averages, 2003–2023



Source: Association of University Technology Managers.

3.6D: Average Annual Number of University Startups Formed & Remaining in Home State, U.S. Average and N.C. Institutions, 2023–2024

HIGHER EDUCATION INSTITUTION	Average Annual Number of University Startups Formed	Average Annual Number of University Startups Formed *& Remained in Home State*
US Average (per institution)	**4.9**	**3.2**
Duke	10.5	5.5
ECU	2.5	1.5
NC State	14.5	10
UNC-Chapel Hill	7	5.5
UNC-Charlotte	3.5	3
UNC-Greensboro	3	0.5

Source: Association of University Technology Managers

INDICATOR 3.6: UNIVERSITY STARTUPS

What Does This Mean for North Carolina?

As mentioned frequently throughout this report, North Carolina has notably strong academic research. Over the last couple decades, there has been a statewide effort to increase commercialization of academic research with support from organizations like the Office of Science, Technology & Innovation in the North Carolina Department of Commerce, NCInnovation, NC Biotechnology Center, and NCIDEA. However, while some academic institutions are excelling above the national average, these few schools are concentrated in the RTP region, where startups have historically been more supported with resources and community.

Having a supportive ecosystem for creating and sustaining a university spinoff is crucial to continuing North Carolina's ranking and increasing number of university startups. To increase the number of innovative startups from universities, organizations like those listed above should continue to make an effort to support university research personnel and their startups through funding, education, and community-connection efforts. This is particularly important for university spin offs in areas where fewer startups exist or in universities that have smaller staff to help support the processes that may occur before the formation of a startup (patenting, licensing IP, etc.). ■

Section 4:
Innovative Organizations

Complementary to Commercialization is **Innovative Organizations**, where businesses adopt, apply, and scale new knowledge and technologies into the broader innovation economy. This section captures the extent to which North Carolina's economy is populated by knowledge- and technology-intensive (KTI) industries, as well as the entrepreneurial activity, diversity, and global engagement of the businesses that drive them. Tracking these measures over time, and relative to other states, helps determine whether North Carolina's business community is positioned to compete and grow in an innovation-driven economy.

INDICATOR 4.1: KTI EMPLOYMENT ORGANIZATIONS

Indicator Overview

This indicator represents the portion of a state's total employment attributable to knowledge- and technology-intensive (KTI) industries compared to the state's total employment. KTI industries have high and medium-high R&D intensity, where R&D intensity is defined as the ratio of R&D expenditures to production. KTI industries include nine manufacturing industries: chemical and chemical products; pharmaceuticals; computer, electronic, and optical products; electrical equipment; other machinery and equipment; motor vehicles, trailers, and semi-trailers; air and spacecraft and related machinery; railroad, military vehicles, and other transportation equipment; medical and dental instruments. KTI industries also include three service industries: information technology and other services, software publishing, and scientific research and development.[1]

States often consider KTI employment industries desirable, in part because they typically compensate workers better than other industries do (see indicator 1.3C). Additionally, a high percentage of KTI employment business formations indicates an increasingly prominent role for these industries in a state or region.

KEY FINDINGS

- The percentage of North Carolina's knowledge- and technology-intensive (KTI) business establishments relative to all business establishments in the state ranks above the national average and increased faster than the national average between 2000 and 2024.
- KTI employment within North Carolina is concentrated in a small percentage of counties.

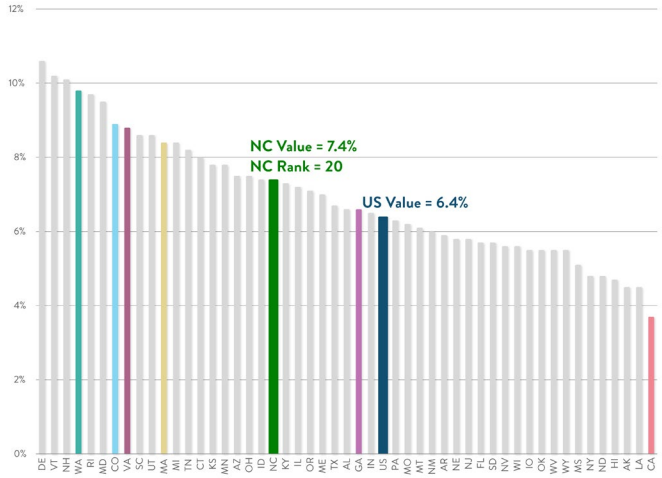
1 See Appendix A for a list of the 41 industries (by 3 to 6-digit NAICS code) that are defined as having KTI employment.

INDICATOR 4.1: KTI EMPLOYMENT ORGANIZATIONS

How Does North Carolina Perform?

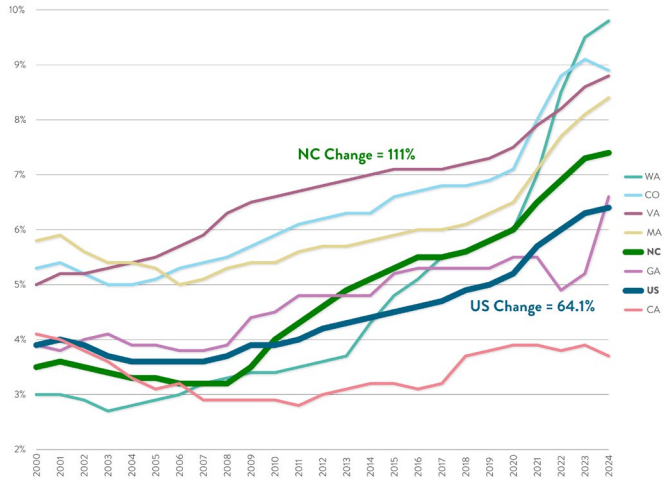
North Carolina's KTI employment establishments represent 7.4 percent of the state's total business establishments, ranking 20th in the nation and above the U.S. value of 6.4 percent **[4.1A]**. Among the comparison states, North Carolina ranks only above Georgia (6.6 percent) and California (3.7 percent). California is the only comparison state below the U.S. value and is ranked last in the United States.[2] Despite having a 2024 value lower than most of the comparison states, North Carolina's KTI employment establishments relative to the total business establishments has increased faster than the rate for all comparison states besides Washington (227 percent) **[4.1B]**. North Carolina saw a much faster rate of growth in number of KTI businesses relative to total businesses from 2008 and beyond.

4.1A: KTI Employment Establishments as a Percentage of All Business Establishments, All U.S. States, 2024



Source: U.S. Bureau of Labor Statistics, NC Department of Commerce Labor and Economic Analysis Division.

4.1B: KTI Establishments as a Percentage of All Business Establishments, Comparison States, 2000–2024



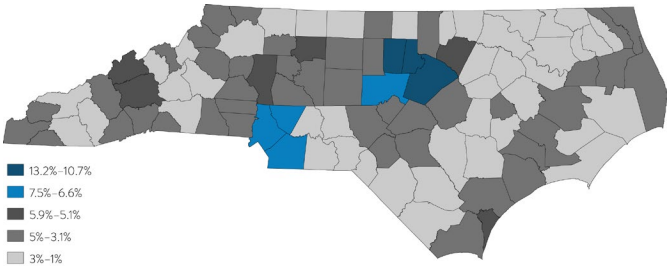
Source: U.S. Bureau of Labor Statistics, NC Department of Commerce Labor and Economic Analysis Division.

2 While California dominates in terms of total number of KTI establishments, its KTI establishments as a share of all businesses is low due to the size of the state's total business base: California hosts over 4 million small and large businesses. The sheer volume of non-KTI establishments—ranging from retail and real estate to agriculture and local services—dilutes the share of KTI firms.

INDICATOR 4.1: KTI EMPLOYMENT ORGANIZATIONS

On a county level, North Carolina has very few counties where the share of KTI establishments relative to all business establishments is larger than the U.S. average share **[4.1C]**. In terms of the total number of KTI establishments, Durham, Wake, and Mecklenburg account for 55 percent of KTI establishments in the state. Out of North Carolina's 100 counties, seven counties (Cabarrus, Chatham, Durham, Mecklenburg, Orange, Union, and Wake) had values larger than the U.S. value for KTI establishments relative to total business establishments in that specific county. Durham County had the largest percentage, with 13.2 percent of businesses being KTI establishments, and Wake County closely followed with 12.1 percent. Beyond the counties that were above the U.S. value, Iredell (5.9 percent), Franklin (5.6 percent), Buncombe (5.5 percent), Madison (5.4 percent), and New Hanover (5.4 percent) counties were within 1 percent of the U.S. value. Of the remaining 88 counties, each has two percent or less of the state's KTI employment establishments.

4.1C: KTI Establishments as a Percentage of Total Establishments, N.C. Counties, 2024



Source: Quarterly Census of Employment and Wages, Labor and Economic Development Division, NC Department of Commerce.

Note: Blue counties rank above the U.S. average.

INDICATOR 4.1: KTI EMPLOYMENT ORGANIZATIONS

What Does This Mean for North Carolina?

Historically, North Carolina's economy was driven by lower-technology manufacturing and agricultural industries. However, since 2008, North Carolina has rapidly increased its number of KTI establishments as a percentage of total business establishments, surpassing the U.S. value in 2010 and remaining above the U.S. value since. To continue to compete favorably in this economy, North Carolina must continue to increase the technology levels of its existing establishments and to start and grow new KTI employment establishments at a faster-than-average rate, particularly in more rural regions. ■

INDICATOR 4.2: KTI EMPLOYMENT

Indicator Overview

This indicator assesses the percentage of people employed by knowledge- and technology-intensive (KTI) industries relative to total employment.[1] KTI employment industries are defined as those with high and medium-high R&D intensity. R&D intensity is defined by the ratio of R&D expenditures to production. KTI occupations include scientific, engineering, and technician occupations that employ workers primarily in manufacturing and service industries. States often consider such industries desirable, in part because they tend to compensate workers better than other industries do (see indicator 1.3C). Skilled and educated workers are the core drivers of states' most important industries, from research and development, to high value-added manufacturing, to high-wage traded services.

KEY FINDINGS

- The percentage of North Carolina's workforce employed in knowledge- and technology- intensive (KTI) employment establishments ranks slightly above the U.S. average but since 2000 has decreased slightly, at a rate similar to the U.S. average.
- North Carolina's employment in KTI employment establishments is highly concentrated in a very small number of urban counties.

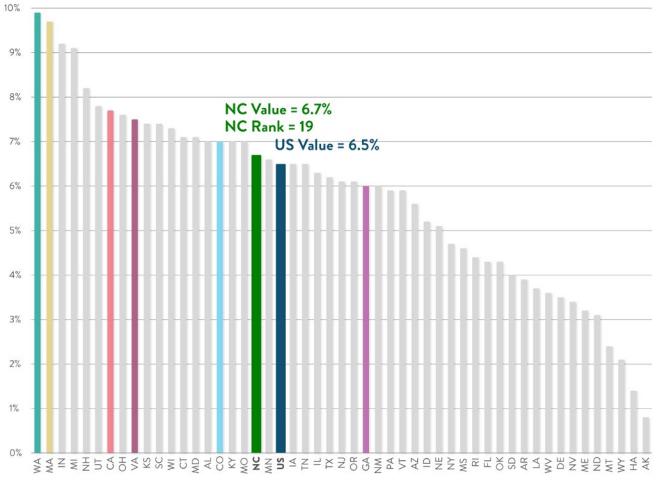
1 See Appendix A for a list of the 41 industries (by 3 to 6-digit NAICS code) that are defined as having KTI employment.

INDICATOR 4.2: KTI EMPLOYMENT

How Does North Carolina Perform?

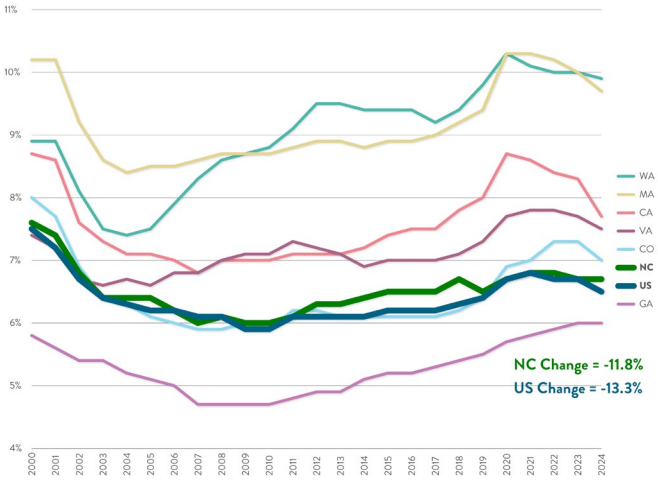
In 2024, 6.7 percent of North Carolina's workforce was in employed in KTI industries **[4.2A]**. North Carolina ranked 19th in the country, with a percentage that was 103 percent the U.S. value (6.5 percent) and 68 percent the value of the top state (Washington: 9.9 percent). Relative to other comparison states, North Carolina was second lowest, with only Georgia falling below it. Between 2000 and 2024, North Carolina had a similar loss in percentage of people employed in KTI industries as the U.S.–11.8 percent decrease for NC and 13.3 percent decrease for the U.S. **[4.2B]**. North Carolina was not the only comparison state that saw a decrease in percentage of people employed by KTI industries, however. Massachusetts (-4.9 percent), California (-11.5 percent), and Colorado (-12.5 percent) also saw decreases during this time period. Washington saw the largest increase in percentage of workers employed by KTI industries, with an increase of 11.2 percent between 2000 and 2024.

4.2A: Employment in KTI Employment Establishments as a Percentage of Total Employment, All U.S. States, 2024



Source: U.S. Bureau of Labor Statistics, North Carolina Department of Commerce Labor and Economic Analysis Division.

4.2B: Employment in KTI Employment Establishments as a Percentage of Total Employment, Comparison States, 2000–2024

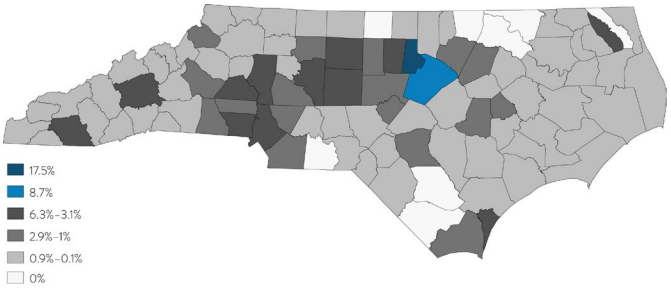


Source: U.S. Bureau of Labor Statistics, North Carolina Department of Commerce Labor and Economic Analysis Division.

INDICATOR 4.2: KTI EMPLOYMENT

Although KTI employment establishments employ workers in nearly all of North Carolina's 100 counties, two-thirds (68.1 percent) of those employees work in just three urban counties—Wake (28.2 percent), Durham (20.6 percent), and Mecklenburg (19.2 percent) **[4.2C]**. Moreover, only two of those counties—Wake and Durham—are the only ones in the state whose employment in KTI employment establishments as a percentage of total county employment is greater than or equal to than the U.S. average (6.7 percent). Establishments located in each of the next nine counties—Guilford (5.4 percent), New Hanover (2.9 percent), Forsyth (2.6 percent), Buncombe (2.6 percent), Gaston (2.4 percent), Catawba (2.1 percent), Iredell (1.6 percent), Orange (1.4 percent), Cumberland (1.2 percent), and Randolph (1.1 percent)—account for 24.2 percent of the state's KTI workers. This means that establishments located in only 13 percent of the state's counties employ 92.3 percent of the state's KTI workers. Each of the remaining 87 counties has less than one percent of the state's KTI employment.

4.2C: Employment in KTI Employment Establishments as a Percentage of Total Employment, N.C. Counties, 2024



Source: Quarterly Census of Employment and Wages, NC Department of Commerce Labor and Economic Analysis Division.

Note: Blue counties have higher values than the U.S. average.

INDICATOR 4.2: KTI EMPLOYMENT

What Does This Mean for North Carolina?

As with KTI employment establishments (see indicator 4.1), North Carolina's above-average level of employment in KTI employment establishments reflects the recent growth in KTI industries forming within and locating to the state despite the facts that a large proportion of North Carolina remains rural in nature and has historically had a higher-than-average share of companies in lower-technology manufacturing industries and agriculture. Moreover, looking across the state, the distribution of KTI workers is more concentrated than the distribution of KTI employment establishments. This pattern of geographically concentrated KTI employment establishments and KTI workers is considerably more concentrated than the state's population (see indicator 1.6). Together, these patterns suggest that more factors than just the location of the state's population influence where people work and the types of establishments in which they work. These other factors include, among others, the location of research and development assets and activities (see indicators in Section 2) and the education attainment levels of the population across the state (see indicator 5.6). For North Carolina to increase the percentage of its workforce in KTI employment establishments, it must not only increase the technology levels of its existing companies and start and grow new KTI employment companies. It must also ensure that a greater share and range of its population has the educational requirements and training to work in KTI employment establishments. ■

INDICATOR 4.3: ENTREPRENEURIAL ACTIVITY

Indicator Overview

This indicator evaluates the state of entrepreneurial activity in the state of North Carolina in three ways: the number of new entrepreneurs, the opportunity share of new entrepreneurs, and new business formation at the county level.[1] Entrepreneurs provide expertise in transforming innovative ideas into products, technologies, and services. Strong entrepreneurial activity will advance North Carolina's transition to knowledge-based, technology-driven economy that creates new jobs within the state's economy.

KEY FINDINGS

- North Carolina's monthly rate of new business creation ranks well below the U.S. average and, since 1998, has increased moderately but at a rate slower than the U.S. average.
- North Carolina's average opportunity share of new entrepreneurs ranks above the U.S. average and has increased slightly since 1998.
- Within North Carolina, a relatively small number of counties account for the majority of new businesses formed.

1 State-level data for entrepreneurial activity are drawn from the Kauffman Foundation, which measures entrepreneurial activity in two ways presented here. First, it uses the U.S. Census Bureau's and Bureau of Labor Statistics' Current Population Survey to measure the monthly rate of business creation to approximate entrepreneurial activity. Second, it measures the average opportunity share of new entrepreneurs using a proxy indicator of the percent of new entrepreneurs starting businesses because they saw market opportunities. Specifically, it measures the percentage of new entrepreneurs who were not unemployed before starting their businesses. The Kauffman Index of Entrepreneurial Activity (Kauffman Index) measures the rate of business creation at the individual owner level. Presenting the percentage of the adult, non-business owner population that starts a business each month, the Kauffman Index captures all new business owners, including those who own incorporated or unincorporated businesses, and those who are employers or non-employers. For more information, see https://indicators.kauffman.org/data-tables.

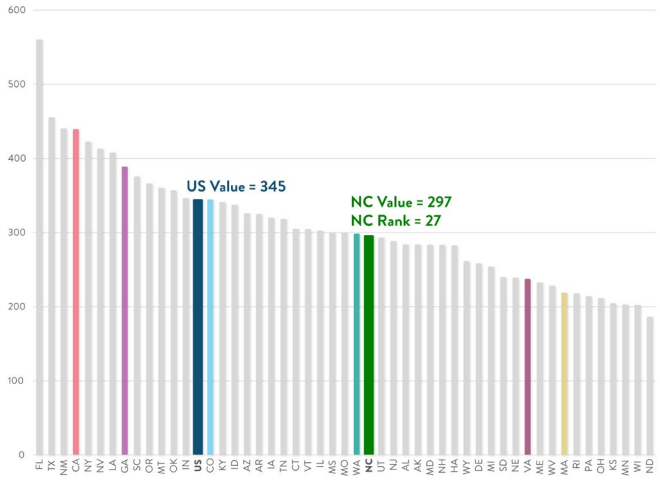
INDICATOR 4.3: ENTREPRENEURIAL ACTIVITY

How Does North Carolina Perform?

North Carolina's monthly new entrepreneurs relative to population ranks 27th in the nation, with a level that is 86 percent of the U.S. value and 53 percent of the top-ranking state, Florida **[4.3A]**. For every 100,000 people in North Carolina, an average of 297 became entrepreneurs and started businesses each month in 2024-2025. This is a decrease from the 2019-2020 average of 302 reported previously.[2] Among comparison states, besides North Carolina, Colorado, Washington, Virginia, and Massachusetts all rank below the U.S. average.

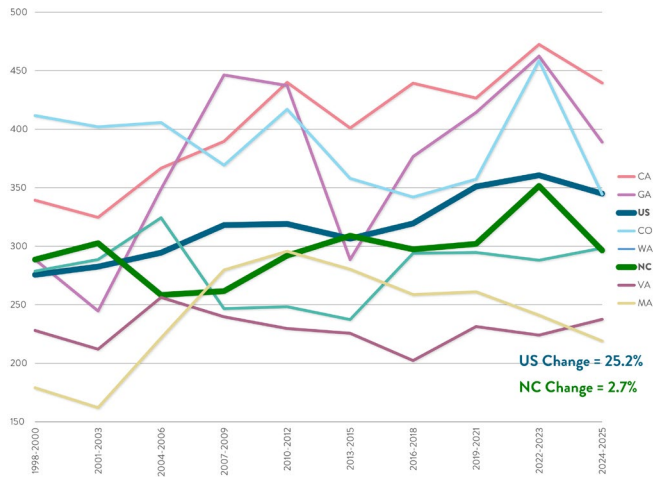
Since 1998, North Carolina has increased its number of new entrepreneurs by 2.7 percent **[4.3B]**. This increase is considerably slower than the U.S. average change, which increased by 25.2 percent between 1998 and 2025. Among comparison states, North Carolina had the second slowest increase from 1998 to 2025, and Georgia has the largest increase at 37.8 percent. Colorado had a large decline in the average number of new entrepreneurs, with a decline of 16.3 percent between 1998 and 2025.

4.3A: Average Monthly Numbers of New Entrepreneurs Per 100,000 People, All U.S. States, 2024–2025



Source: Kauffman Foundation.

4.3B: Average Monthly Numbers of New Entrepreneurs Per 100,000 People, Comparison States, 1998–2025



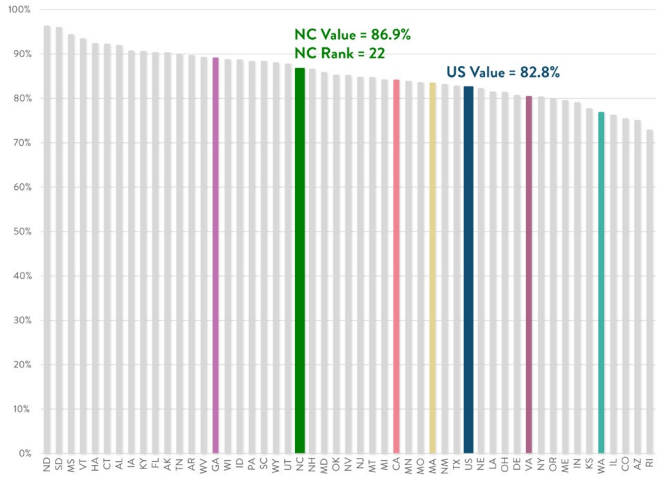
Source: Kauffman Foundation.

2 2024 *Tracking Innovation* Report

INDICATOR 4.3: ENTREPRENEURIAL ACTIVITY

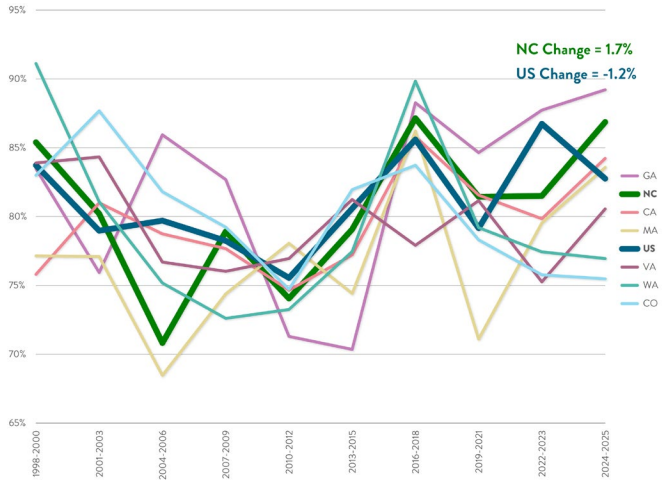
For the average opportunity share of new entrepreneurs, North Carolina ranked 22nd and had a value 105 percent that of the U.S. average for 2024-2025 **[4.3C]**. Among comparison states, besides North Carolina, Georgia, California, and Massachusetts all ranked above the national average, whereas Virginia, Washington, and Colorado ranked below. Since 1998, North Carolina has seen a very small increase (1.7 percent) in the average opportunity share of new entrepreneurs **[4.3D]**. The national average has decreased slightly over the same time-period by 1.2 percent, along with comparison states Virginia, Washington, and Colorado. North Carolina had the smallest increase in opportunity share of new entrepreneurs among the states that saw growth from 1998-2025 (Georgia, California, and Washington).

4.3C: Average Opportunity Share of New Entrepreneurs, All U.S. States, 2024–2025



Source: Kauffman Foundation.

4.3D: Average Opportunity Share of New Entrepreneurs, Comparison States, 1998–2025

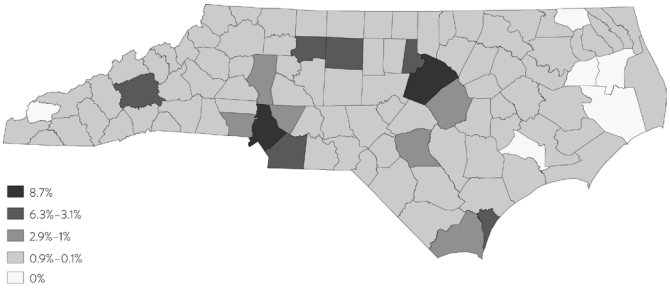


Source: Kauffman Foundation.

INDICATOR 4.3: ENTREPRENEURIAL ACTIVITY

Within North Carolina, most newly formed businesses[3] were concentrated in a small number of counties between 2024 and 2025 **[4.3E, 4.3F]**. All 100 counties had new businesses formed in 2024 and 2025, with the range in average businesses formed ranging from 36,907 for the highest (Wake County) to 18 for the lowest (Tyrell County). Fourteen North Carolina counties (Wake, Mecklenburg, Guilford, Durham, Forsyth, New Hanover, Buncombe, Union, Cabarrus, Cumberland, Johnston, Iredell, Gaston, and Brunswick) account for 74 percent of new businesses formed between 2024 and 2025. The remaining 86 counties account for the other 26 percent of new businesses. Compared to county population, Wake County has the highest percentage of new businesses compared to the county population at 3.0 percent, whereas Gates County had the lowest percentage of new businesses relative to the county population (0.34 percent).

4.3E: New Businesses Formed, Percent of Total Number, N.C. Counties, 2024–2025



Source: North Carolina Secretary of State Business Registration Database.

4.3F: New Businesses Formed, N.C. Counties, 2024–2025

County	Total New Businesses Formed	Average New Businesses Per Year	New Businesses as Percent of Total New Businesses	Cumulative Percent as Share of Total
Wake	73,813	36,907	30.0%	30.0%
Mecklenburg	45,824	22,912	18.6%	48.6%
Guilford	9,384	4,692	3.8%	52.5%
Durham	6,073	3,037	2.5%	54.9%
Forsyth	5,853	2,927	2.4%	57.3%
New Hanover	5,599	2,800	2.3%	59.6%
Buncombe	5,576	2,788	2.3%	61.8%
Union	5,519	2,760	2.2%	64.1%
Cabarrus	4,728	2,364	1.9%	66.0%
Cumberland	4,421	2,211	1.8%	67.8%
Johnston	4,045	2,023	1.6%	69.5%
Iredell	3,899	1,950	1.6%	71.0%
Gaston	3,357	1,679	1.4%	72.4%
Brunswick	2,939	1,470	1.2%	73.6%
86 Other	64,931	378	26.4%	100%
Total	**245,961**	**122,981**	**100%**	

Source: North Carolina Secretary of State Business Registration Dashboard, U.S. Census Bureau.

Note: Note: Each of the counties included here accounts for at least 1% of total new businesses. These 14 counties include 54% of the state's population.

3 For the purposes of this report, newly formed businesses include the following company types: Business Corporation, Limited Liability Company, Limited Liability Partnership, and Limited Partnerships.

INDICATOR 4.3: ENTREPRENEURIAL ACTIVITY

What Does This Mean for North Carolina?

North Carolina is relatively middle-of-the-pack when it comes to entrepreneurial activity for both number of new entrepreneurs and opportunity share of new entrepreneurs. Several factors affect the rate of entrepreneurship, such as economic and labor market conditions, industry mix, education, and culture. These factors can make it difficult to pinpoint the causes of different business creation rates and entrepreneurship. However, despite these factors, taking steps as a state to help businesses feel supported and connected can help encourage residents to take the next step in entrepreneurship and form a business that may lead to innovation output and job creation. ■

INDICATOR 4.4: EXPORTS

Indicator Overview

This indicator measures the dollar value of each state's international exports as a percentage of its GDP. Export statistics are based on the state from which goods start their journey to the port of export; that is, the data reflect the transportation origin of exports.[2] Exports are an important indicator of a state's potential for generating income and increasing the competitiveness of businesses in the state. More than 95 percent of the world's population lives outside the U.S., 80 percent of the world's buying power lies outside the U.S., and money brought into the state from export businesses allows for the purchase of local goods and services and thus improves the state's local economy.[3] Export-based companies also are frequently required to adapt products in unique ways for foreign consumers. They may be called upon to negotiate trade restrictions and certification requirements, work with foreign suppliers, and/or manage expansive distribution channels, all of which create the flexibility and determination that result in greater competitiveness for home markets.

KEY FINDINGS

- The value of North Carolina's exports as a percentage of state Gross Domestic Product (GDP)[1] ranks below the U.S. average and has since at least the early 2000s.
- North Carolina and U.S. exports as a percentage of GDP have increased slightly since 2002 but have decreased from 20-year highs in the early 2010s.

1 When used in the context of states, "domestic" refers to the state level. When used as the context of nations, "domestic" refers to the national level.

2 The data come from the Origin of Movement (OM) series, available since 1987 from the U.S. Census Bureau, Foreign Trade Division. OM data cover exports of goods only; there are no comparable statistics for exports of services at the state level.

3 Export income is considered "new" money introduced into a state's economy. This "new" money can be spent on local goods and services, resulting in an income multiplier effect.

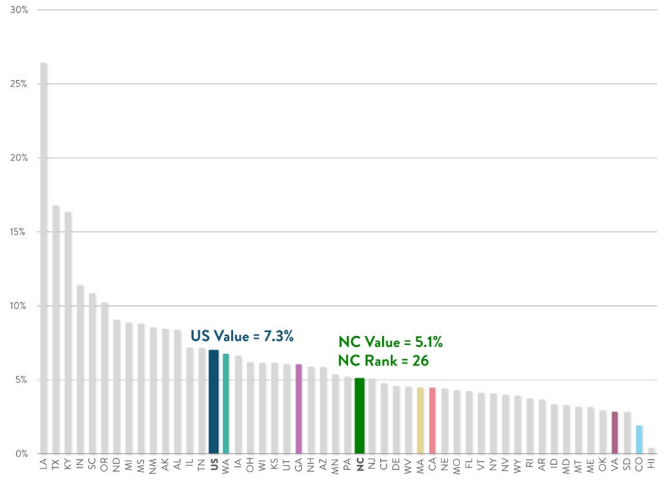
INDICATOR 4.4: EXPORTS

How Does North Carolina Perform?

In 2024, North Carolina ranked 26th in the country for exports as a percentage of GDP **[4.4A]**. With a value of 5.1 percent, North Carolina's value is just 73 percent of the U.S. average and 19 percent of the top-ranking state, Louisiana. Louisiana ranks much higher than other states, with 26.4 percent of its GDP coming from exports due to the large oil and chemical industry presence in the state and exports from those industries being more expensive and highly traded products. Among comparison states, North Carolina ranks above Massachusetts, California, Virginia, and Colorado. However, Washington and Georgia rank slightly higher, with values of 6.8 percent and 6.1 percent, respectively. Notably, all the comparison states are below the U.S. average.

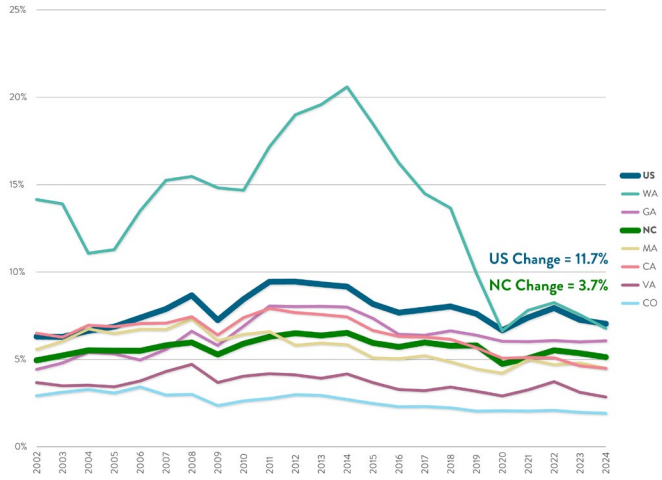
Since 2002, North Carolina's value of exports relative to the state's total economic output has increased slightly (3.7%) and has remained relatively stable **[4.4B]**. North Carolina's rate of change is slower than the U.S. average, which has increased by 11.7 percent over the same time. Among comparison states, besides North Carolina, the only other comparison state to see an increase in exports from 2002 to 2024 was Georgia (36.9% increase). However, Washington, Massachusetts, California, Virginia, and Colorado all saw declines in exports relative to state GDP. Washington had the largest decrease over the 22-year period with a value of –52.2 percent. These declines could be in part due to these states' GDP rising dramatically over that time period (see indicator 1.1) but export amounts not increasing as rapidly.

4.4A: Exports as a Percentage of GDP, All U.S. States, 2024



Source: U.S. Census Bureau, National Science Foundation.

4.4B: Exports as a Percentage of GDP, Comparison States, 2002–2024



Source: U.S. Census Bureau, National Science Foundation.

INDICATOR 4.4: EXPORTS

What Does This Mean for North Carolina?

Exports continue to be one of the key drivers for North Carolina's economic development. Exporting helps companies in North Carolina diversify their business portfolios and become more profitable and resilient in the global market. For North Carolina to remain competitive in the global economy, it must continue to explore new markets for the goods and services it produces. Such efforts require focus in strengthening and expanding relationships with overseas trading partners and understanding how North Carolina industries fit within global commodity value chains. Infrastructure investment in highways, inland terminals, and port facilities is needed to improve the ability to efficiently move goods. Enhanced export assistance and increased availability of financial credits to small and medium-sized companies seeking to export are crucial in connecting businesses to the global economy.[4] ■

4 In addition to the U.S. Department of Commerce's presence across the globe, the International Trade Division of the Economic Development Partnership of North Carolina (EDPNC) has staff in the state and in locations around the globe to facilitate export growth.

INDICATOR 4.5: DIVERSITY IN KTI INDUSTRIES

Indicator Overview

This indicator evaluates the diversity of the knowledge- and technology-intensive (KTI) industries workforce. Understanding the workforce makeup of KTI industries, which tend to pay higher wages (see indicator 1.3C), is important to understanding who KTI industries are directly benefitting economically. Additionally, diverse environments allow for diverse mindsets and the creation of new ideas to drive innovation. This indicator data was drawn from Lightcast database, which collects labor market information from public and private sources. Diversity was measured in two ways: First the percentage of women in KTI industries is compared to population percentage of women in that area. This creates a ratio where a value of one, or 100 percent, means that women in that geographic area are proportionally represented in the KTI industry. Second, it measures the ethnic diversity in KTI industries by comparing the percentage of workers that identify as Black or African American and Hispanic or Latino to their share of the population.[1] This also creates a ratio in which a value of one, or 100 percent, indicates that those ethnicities are proportionally represented in that geographic area.

KEY FINDINGS

- North Carolina's gender diversity in KTI industries is well above the U.S. average and has been since 2001.
- North Carolina's racial and ethnic diversity in KTI industries is well above the U.S. average and has been since 2001.

1 Ethnicity results are reported with the following categories that are standard to the Office of Management and Budget (OMB): Hispanic or Latino as an ethnicity, White, Black or African American, American Indian or Alaska Native, Asian, Native Hawaiian or other Pacific Islander, and two or more races as a race. These categories, which may not fully capture a diverse ethnic background, are set to change with the 2030 Census.

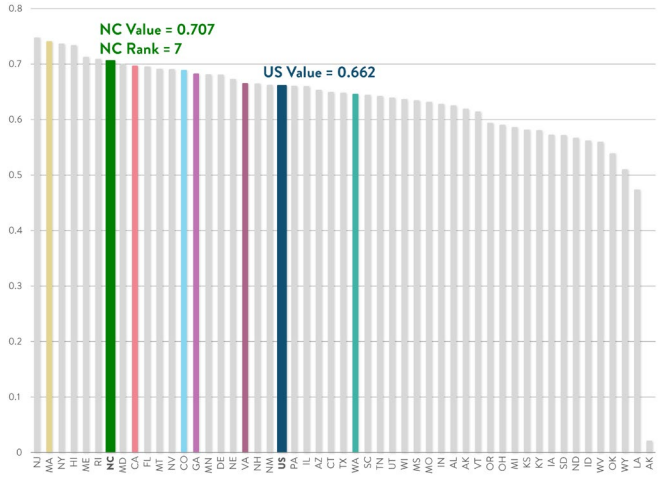
INDICATOR 4.5: DIVERSITY IN KTI INDUSTRIES

How Does North Carolina Perform?

North Carolina's gender diversity in KTI industries ranks 7th in the U.S., with a value that is 107 percent of the U.S. value and 95 percent of the top-ranking state, New Jersey **[4.5A]**. Specifically, North Carolina's proportion of women workers is 0.707, meaning that the number of women in KTI industries is 70% as representative of the population. The only comparison state that ranks above North Carolina is Massachusetts, with a value of 0.741. Washington is the only comparison state ranking below the U.S. average.

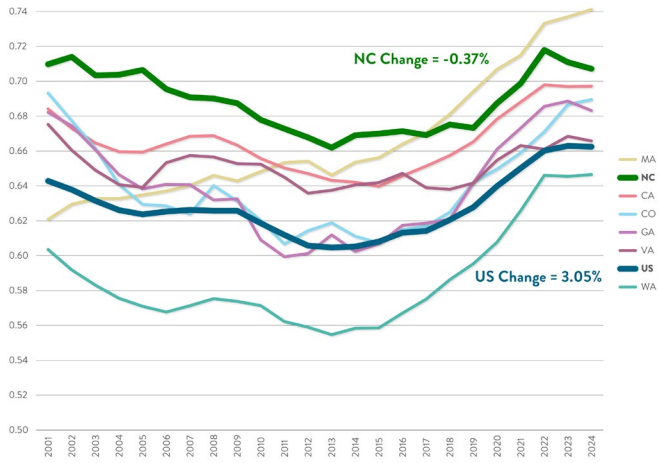
Since 2001, North Carolina has consistently ranked above the U.S. average in gender diversity, and until 2017, was the highest-ranking state out of the comparison states **[4.5B]**. Between 2001 and 2024, North Carolina saw a minor decline of -0.37 in the percentage of the state's women working in KTI industries. Among comparison states, Massachusetts saw the largest growth during this same period, with an increase in gender diversity by 19.4 percent. Besides North Carolina, Colorado and Virginia also saw slight declines in their gender diversity in KTI industries.

4.5A: Gender Diversity of KTI Industries, All U.S. States, 2024



Source: Lightcast.

4.5B: Gender Diversity of KTI Industries, Comparison States, 2001–2024



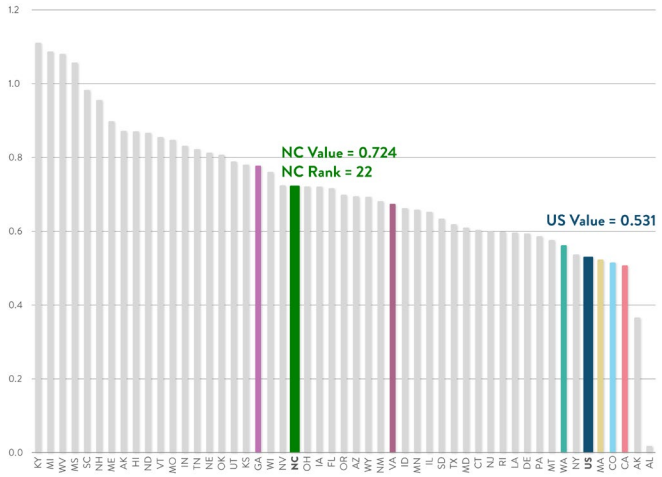
Source: Lightcast.

INDICATOR 4.5: DIVERSITY IN KTI INDUSTRIES

North Carolina's racial and ethnic diversity in KTI industries ranks lower compared to its gender diversity, with a value of 0.724, placing it 22nd in the nation **[4.5C]**.[2] This means that the number of Black or African American and Hispanic or Latino workers in KTI industries is 72 percent as representative of their share of the population overall. Despite its mid-range ranking, North Carolina's value is 127 percent of the U.S. value and is below only Georgia among comparison states. Three comparison states—California, Colorado, and Massachusetts—have values lower than the U.S. average for racial and ethnic diversity in KTI industries.

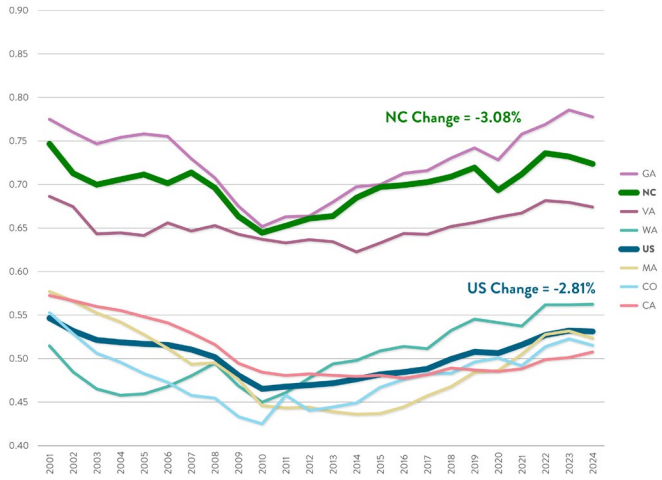
Since 2001, North Carolina has seen a slight decline in the racial and ethnic diversity in KTI industries **[4.5D]**. Almost all comparison states had declines over the 2001–2024-time frame, with only Georgia having a very small increase of 0.35 percent. The sharpest declines in racial and ethnic diversity in North Carolina were seen around the 2007-2009 recession and in 2020, likely a result of the COVID-19 pandemic.

4.5C: Racial and Ethnic Diversity of KTI Industries, All U.S. States, 2024



Source: Lightcast.

4.5D: Racial and Ethnic Diversity in KTI Industries, Comparison States, 2001–2024



Source: Lightcast.

2 The U.S. average is lower than expected because racial and ethnic groups are not equally dispersed across the country. This causes the U.S. average to be skewed by states with abnormally high or low demographic concentrations.

INDICATOR 4.5: DIVERSITY IN KTI INDUSTRIES

What Does This Mean for North Carolina?

Despite North Carolina having over 70 percent of women and racial and ethnic minority populations represented in KTI industries, North Carolina's gender, racial, and ethnic diversity rates have stayed relatively stable between 2001 and 2024. Efforts to have a more representative workforce will help ensure that a larger share of the state's population is participating in the innovation economy and benefitting from its higher-than-average growth and wage rates (see indicator 1.3C). ■

Section 5:
Education & Workforce

Education & Workforce includes the human capital that sustains North Carolina's innovation economy—the skills, training, and education levels of the people who research, commercialize, and apply new knowledge and technologies. The **Education & Workforce** measures represent whether the state is developing and attracting the talent needed to fill the jobs an innovation-driven economy creates, from scientists and engineers to a broadly educated workforce. Tracking these measures over time, and relative to other states, helps determine whether North Carolina has workforce in place to sustain and grow its innovation strengths.

INDICATOR 5.1: SCIENCE & ENGINEERING WORKFORCE

Indicator Overview

This indicator represents the extent to which a state's workforce is employed in science and engineering (S&E). A high value indicates that a state's economy has a high percentage of technical jobs relative to other states. As such, it reflects the labor pool's interests, its level of skill development, and the nature of the employment opportunities in the state. Policymakers and scholars consistently emphasize innovation based on S&E research and development as a vehicle for economic growth and competitiveness. In the increasingly interconnected 21st-century world, workers with S&E expertise are integral to a nation's and state's innovative capacity because of their high skill level, their creative ideas, and their ability not only to advance basic scientific knowledge but also to transform advances in fundamental knowledge into tangible and useful products and services.

Occupations for S&E are defined by Standard Occupational Classification (SOC) codes[1] and include engineers and computer, mathematical, life, physical, and social scientists. Managers, technicians, elementary and secondary schoolteachers, faculty teaching in S&E fields, and medical personnel are not included.[2]

KEY FINDINGS

- The percentage of North Carolina's workforce in science & engineering (S&E) occupations ranks slightly above the U.S average and is increasing at a rate faster than the U.S. average.

1 The SOC system is used by federal statistical agencies to classify workers into occupational categories for the purpose of collecting, calculating, or disseminating data. All workers are classified into one of 867 detailed occupations according to their occupational definition.

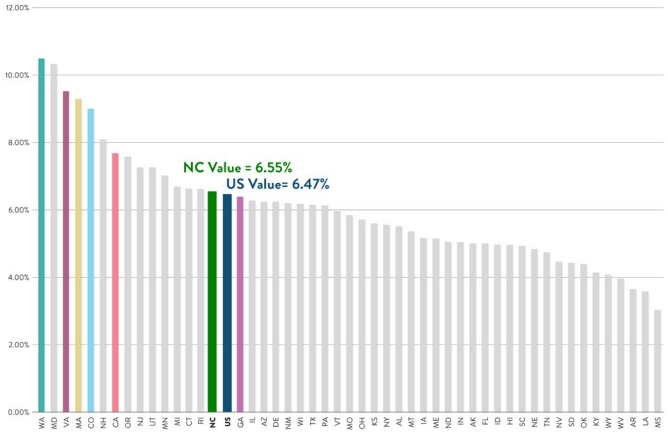
2 Data on individuals in S&E occupations come from a survey of workplaces that assigns workers to a state based on where they work. Estimates do not include self-employed persons and are developed by the U.S. Bureau of Labor Statistics (BLS) from data provided by state workforce agencies and from the American Community Survey. Data on the size of the workforce are BLS estimates and represent the employed component of the civilian labor force. In these estimates, workers are assigned to a state based on where they live.

INDICATOR 5.1: SCIENCE & ENGINEERING WORKFORCE

How Does North Carolina Perform?

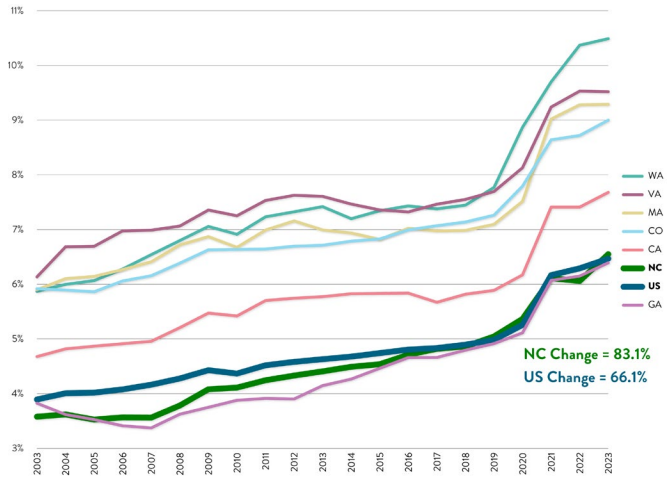
In terms of individuals in S&E occupations as a percentage of the workforce, North Carolina ranks 15th in the nation, with a level that is one tenth of a percent higher than the U.S. average value and 60 percent of the value of the top-ranking state, Washington **[5.1A]**. Apart from Georgia, all the comparison states rank well ahead of North Carolina and are within the top eight among all states. From 2003 to 2023, the percentage of North Carolina's workforce in S&E occupations increased 83.1 percent. This rate is faster than the rate of increase for the U.S. overall (66.1 percent) and ahead of the rate for all comparison states **[5.1B]**.[3]

5.1A: Individuals in Science and Engineering Occupations as a Percentage of All Occupations, All U.S. States, 2023



Source: National Science Board.

5.1B: Individuals in Science and Engineering Occupations as a Percentage of All Occupations, Comparison States, 2003–2023



Source: National Science Board.

3 The data source used for this measure changed after the 2024 *Tracking Innovation* report was released. That report, which contained data for the 2003-2020 period, used data from the U.S. Bureau of Labor Statistics, as reported by the National Science Foundation. This 2026 report adds to that time series data for 2021-2023, using data from the U.S. Census Bureau, American Community Survey, as reported by the National Science Foundation. This change in data sources causes an upward shift for the U.S. average and the comparison states beginning in 2020.

What Does This Mean for North Carolina?

North Carolina's high rate of growth in S&E occupations indicates that it is gaining relative to the U.S. overall. The share of the state's workers in S&E occupations reflects the share of its establishments composed of knowledge- and technology- intensive (KTI) employment establishments (see indicator 4.1) and the share of its employment that works in KTI employment establishments (see indicator 4.2). On both these measures, North Carolina ranks at or above average among all states. For North Carolina to exceed the comparison states and rise above the U.S. average on S&E employment, it would likely also need to continue to increase the technology levels of its existing companies and to start and grow new KTI companies. The concentrated geographic distribution and employment of the state's KTI establishments suggest that broadening the distribution of such establishments across North Carolina, as well as deepening the existing concentrations of such establishments, would help increase the share of the state's employment in S&E occupations. ■

INDICATOR 5.2: EMPLOYED SEH DOCTORATE HOLDERS

Indicator Overview

This indicator measures the concentration of science, engineering, and health (SEH) doctorate holders relative to the state's total workforce. As such, it indicates a state's ability to retain highly trained scientists and engineers that conduct research & development (R&D), manage R&D activities, or are otherwise engaged in knowledge- and technology-intensive (KTI) industries. A high value for this indicator in a state suggests employment opportunities for individuals with highly advanced training in SEH fields. Data on employed SEH doctorate holders include those with doctoral degrees in computer and mathematical sciences; the biological, agricultural, or environmental life sciences; physical sciences; social sciences; psychology; engineering; and health fields. SEH doctorate data exclude individuals with doctorates from foreign institutions and those above the age of 75.[1]

KEY FINDINGS

- The percentage of North Carolina's workforce holding science, engineering, and health (SEH) doctorates ranks slightly below the U.S. average and has been roughly equal to the U.S. average since the early 2000s.
- Since 2001, the percentage of North Carolina's workforce holding SEH doctorates has increased at roughly the same rate as the U.S. average.

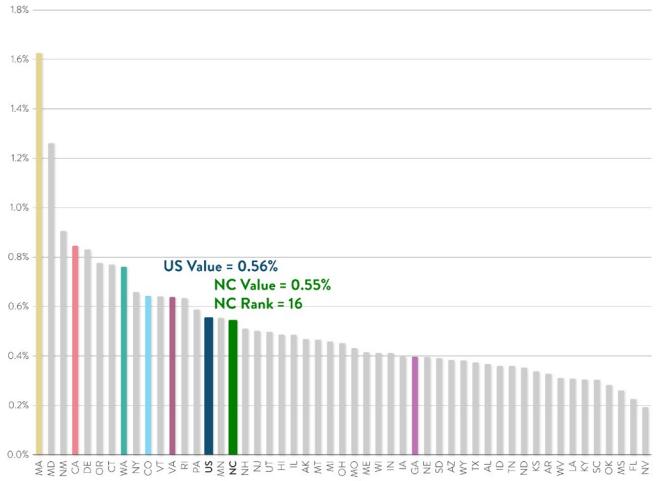
1 Employed workforce data are developed by the U.S. Bureau of Labor Statistics (BLS), which assigns workers to a state based on where they live. Workforce data represent annual estimates of the employed civilian labor force; estimates are not seasonally adjusted.

INDICATOR 5.2: EMPLOYED SEH DOCTORATE HOLDERS

How Does North Carolina Perform?

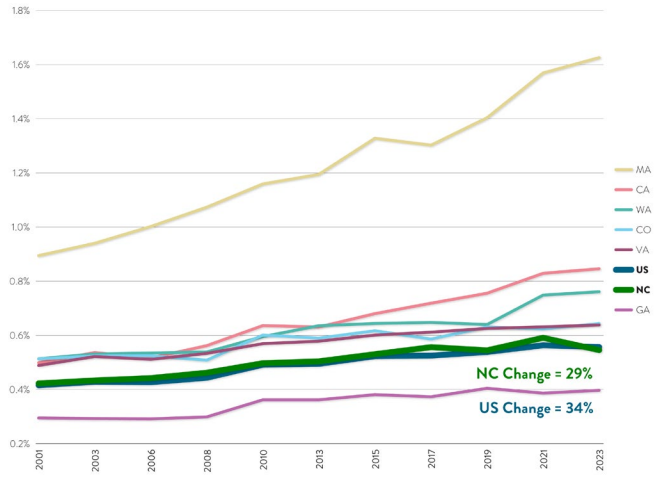
As of 2023, 0.55 percent of the workforce in North Carolina held a SEH doctorate degree, placing the state 16th in the nation **[5.2A]**.[2] North Carolina's value is 98 percent of the U.S. value (0.56 percent) and 34 percent of the top-ranking state, Massachusetts (1.6 percent). Among the comparison states, Georgia is the only other state below the U.S. value. Since 2001, North Carolina has seen a 29 percent increase in the percentage of SEH doctorate holders in the workforce and has steadily increased at a rate roughly equal to that of the U.S. overall **[5.2B]**. Among the comparison states, Massachusetts has seen the largest rate of change and increase, followed closely by California. Additionally, only Colorado, at a 25 percent increase from 2001 to 2023, had slower increase than North Carolina.

5.2A: Employed SEH Doctorate Holders as a Percentage of the Workforce, All U.S. States, 2023



Source: National Science Board.

5.2B: Employed SEH Doctorate Holders as a Percentage of the Workforce, Comparison States, 2001–2023



Source: National Science Board.

Note: Data interpolated between years listed on x-axis.

2 States in the top quartile for this indicator tend to have high concentrations of major research laboratories, research universities, or research-intensive industries.

INDICATOR 5.2: EMPLOYED SEH DOCTORATE HOLDERS

What Does This Mean for North Carolina?

North Carolina has a mid-to-high percentage of SEH doctorate holders in the workforce but ranks slightly behind most of the comparison states and the U.S. overall. North Carolina has many of the key factors that contribute to SEH doctorate holders in the workforce: academic research institutions that produce SEH doctorates, higher-than-average KTI establishments (see indicator 4.1), and above-average percentage of workers employed by KTI establishments (see indicator 4.2). For North Carolina to outpace comparison states and rise above the U.S. average on employed SEH doctorate holders, it will likely need to increase number of KTI industries, grow KTI industries that are already here, and increase the number of research-intensive companies or organizations. All of these entities, particularly R&D facilities, employ a higher-than-average share of SEH doctorate holders. Growing this portion of the innovation economy in the state would not only increase employed SEH doctorate holders but also business R&D expenditures in the state (see indicator 2.2). ■

INDICATOR 5.3: ENGINEERS AS A PERCENTAGE OF WORKFORCE

Indicator Overview

This indicator represents the percentage of trained engineers in a state's workforce. Engineers design and operate production processes and create new products and services. This indicator includes the Standard Occupational Classification (SOC) codes for engineering fields:[1] aerospace, agricultural, biomedical, chemical, civil, computer hardware, electrical and electronics, environmental, industrial, marine and naval architectural, materials, mechanical, mining and geological, nuclear, and petroleum.[2] Occupations also include postsecondary teachers in these fields.

KEY FINDINGS

- The percentage of trained engineers in North Carolina's workforce ranks below the U.S. average and has since at least the early 2000s, but is increasing at a rate nearly three times faster than the U.S. average.

1 The SOC system is used by federal statistical agencies to classify workers into occupational categories for the purpose of collecting, calculating, or disseminating data. All workers are classified into one of 867 detailed occupations according to their occupational definition.

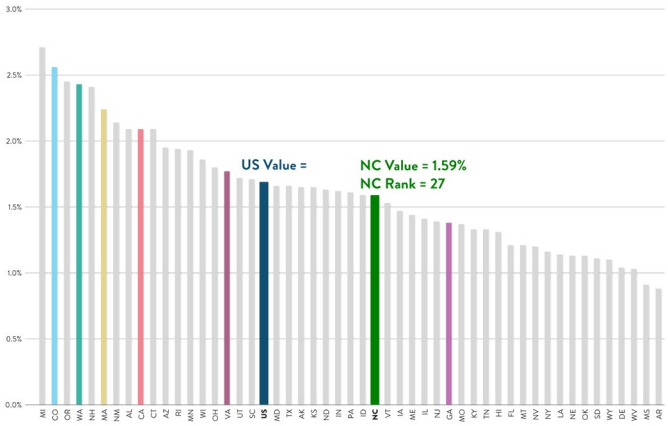
2 Data on individuals in S&E occupations come from a survey of workplaces that assigns workers to a state based on where they work. Estimates do not include self-employed persons and are developed by the U.S. Bureau of Labor Statistics (BLS) from data provided by state workforce agencies and from the American Community Survey – a yearly survey that reaches approximately 3.5 million households. Data on the size of the workforce are BLS estimates and represent the employed component of the civilian labor force. In these estimates, workers are assigned to a state based on where they live.

INDICATOR 5.3: ENGINEERS AS A PERCENTAGE OF WORKFORCE

How Does North Carolina Perform?

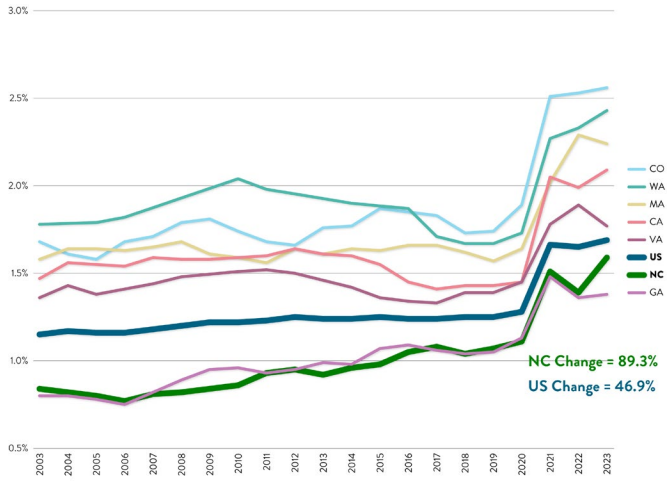
In terms of the percentage of trained engineers in a state's workforce, North Carolina ranks 27th in the nation, with a level that is 94 percent of the U.S. average value and 59 percent of the value of the top-ranking state, Michigan **[5.3A]**. All the comparison states have consistently ranked ahead of North Carolina since 2003 **[5.3B]**. Four comparison states (Colorado, Washington, Massachusetts, and California) are within the top 10 among all states. From 2003 to 2023, the percentage of trained engineers in North Carolina's workforce increased by 89.3 percent, higher than the rate of increase for the U.S. overall (46.9 percent). This rate is faster than the rate of increase for all other comparison states.[3]

5.3A: Engineers in Workforce as a Percentage of All Occupations, All U.S. States, 2023



Source: National Science Board.

5.3B: Engineers as a Percentage of All Occupations, Comparison States, 2003–2023



Source: National Science Board.

3 The data source used for this measure changed after the 2024 *Tracking Innovation* report was released. That report, which contained data for the 2003-2020 period, used data from the U.S. Bureau of Labor Statistics, as reported by the National Science Foundation. This 2026 report adds to that time series data for 2021-2023, using data from the U.S. Census Bureau, American Community Survey, as reported by the National Science Foundation. This change in data sources causes an upward shift for the U.S. average and the comparison states beginning in 2020.

INDICATOR 5.3: ENGINEERS AS A PERCENTAGE OF WORKFORCE

What Does This Mean for North Carolina?

In general, the states with the highest percentage of engineers in their workforce are centers of automobile and aircraft manufacturing, such as Michigan and Washington, or states that rank high on employment in high knowledge- and technology-intensive establishments as share of total employment, such as Washington and California (see indicator 4.2). The relatively low percentage of trained engineers in North Carolina's workforce is a cause for concern, because regions with a high concentration of engineers have a greater capacity for innovation and often lead in key industries. For North Carolina to rise above the U.S. average on the percentage of trained engineers in its workforce, it would also need to continue to increase the technology levels of its existing companies and to start and grow new high science, engineering and technology companies. The concentrated geographic distribution and employment of the state's high science, engineering and technology employment establishments suggest that broadening the distribution of such establishments across North Carolina, as well as deepening the existing concentrations of such establishments, would help increase the share of the state's employees trained as engineers. ■

INDICATOR 5.4: BACHELORS DEGREES IN S&E

Indicator Overview

This indicator represents the extent to which a state provides bachelor's degree-level training in science and engineering (S&E) fields. Educational attainment in an S&E field provides greater opportunities to work in higher-paying, higher-tech jobs and can prepare an individual for more advanced degree education opportunities. For this indicator, S&E fields include agricultural sciences and natural resources; biological and biomedical sciences; computer and information sciences; engineering; geosciences, atmospheric sciences, and ocean sciences; mathematics and statistics; multidisciplinary and interdisciplinary sciences; physical sciences; psychology; and social sciences.[1]

KEY FINDINGS

- The ratio of S&E bachelor's degrees to the population aged 18–24 years in North Carolina ranks below the U.S average, has been similar to the U.S. average for nearly twenty years, but since 2012 has been increasing at a rate slightly below the U.S. average rate.

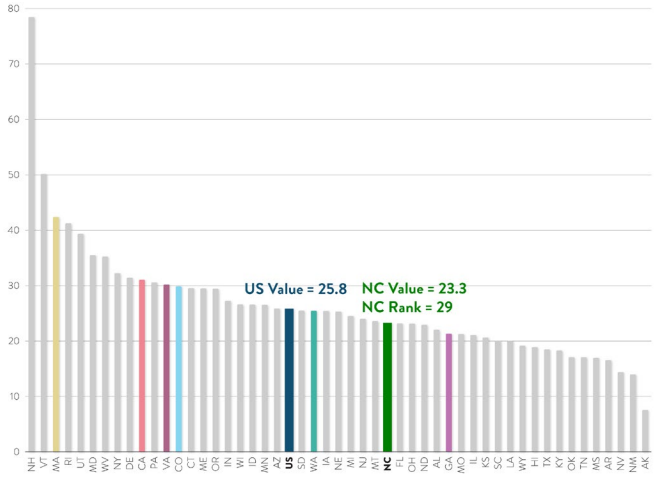
1 Bachelor's S&E fields do not include medical fields or technologies. The number of bachelor's degrees awarded in S&E fields is an actual count provided by the National Center for Education Statistics. Estimate of the population aged 18-24 years old are provided by the U.S. Census Bureau. A high value for this indicator may suggest the successful provision of undergraduate training in S&E fields. Due to students often relocating after graduation, this measure does not directly indicate the qualification of a state's workforce. A state's value for this indicator may also be high when its higher education system draws a large percentage of out-of-state students, a situation that sometimes occurs in states with small resident populations and the District of Columbia.

INDICATOR 5.4: BACHELORS DEGREES IN S&E

How Does North Carolina Perform?

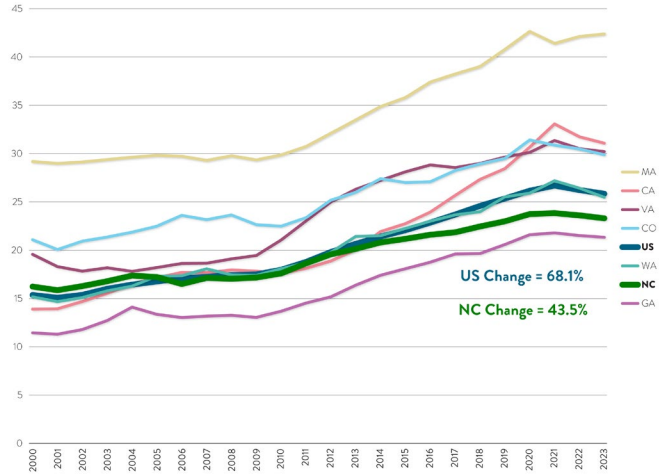
In terms of the ratio of new bachelor's degrees in S&E to 1,000 individuals 18–24, North Carolina ranks 29th in the nation **[5.4A]**. With a value of 23.3, North Carolina's value is 90 percent of the U.S. value and 30 percent of the top-ranked state, New Hampshire. Georgia is the only comparison state ranked lower than North Carolina. North Carolina's ranking ratio of S&E bachelor's degrees compared to number of individuals 18-24 has been one of the lowest of comparison states, and North Carolina fell behind the U.S. average in 2012 **[5.4B]**. Out of all the comparison states, California has seen the largest growth, with a 123 percent increase between 2000 and 2023. North Carolina's rate of growth for new bachelor's degrees in S&E was the second lowest of all comparison states, falling behind Massachusetts, California, Virginia, Washington, and Georgia.

5.4A: Bachelor's Degrees in S&E Conferred per 1,000 Individuals 18–24 Years Old, All U.S. States, 2023



Source: National Science Board.

5.4B: Bachelor's Degrees in S&E Conferred per 1,000 Individuals 18–24 Years Old, Comparison States, 2000–2023



Source: National Science Board.

INDICATOR 5.4: BACHELORS DEGREES IN S&E

What Does This Mean for North Carolina?

While North Carolina has seen an increase in bachelor's S&E degrees conferred, it is not large enough to keep pace with the U.S. average and the demand in the state to fill technical roles. A 2026 *UNC System Workforce Alignment Report* documents the demand in North Carolina for computer sciences, engineering, physical and life sciences, social sciences, and agriculture majors and highlights the large gaps being left by too few bachelor's degree graduates.[2] In particular, none of the in-demand degrees for North Carolina had enough bachelor's-level graduates. Given North Carolina's growing population and economy, as well as research showing that areas with higher share of bachelor-degree holders have greater employment growth over fifty years,[3] North Carolina should focus efforts on increasing bachelor's-level conferred degrees in S&E to ensure sustained job and economic growth. ■

2 UNC System Workforce Alignment Report.

3 A region's high concentration of bachelor's degree-holders predicts future economic growth | SSTI.

INDICATOR 5.5: S&E DEGREES

Indicator Overview

This indicator represents the share of higher education degrees in science and engineering (S&E) relative to total higher education degrees in the state. S&E fields include agricultural sciences and natural resources; biological and biomedical sciences; computer and information sciences; engineering; geosciences, atmospheric sciences, and ocean sciences; mathematics and statistics; multidisciplinary and interdisciplinary sciences; physical sciences; psychology; and social sciences. At the doctoral level, health sciences are also included in S&E fields of study. Counts of both S&E degrees and higher education degrees conferred include bachelor's, master's, and doctoral degrees; associate's degrees and professional degrees are not included.[1] Due to students commonly moving after graduation, this indicator alone cannot predict the qualifications of a state's future technical workforce.

KEY FINDING

- The percentage of higher education degrees conferred in S&E fields in North Carolina ranks above the U.S. average and has since at least the early 2000s, but is increasing slower than the U.S. average.

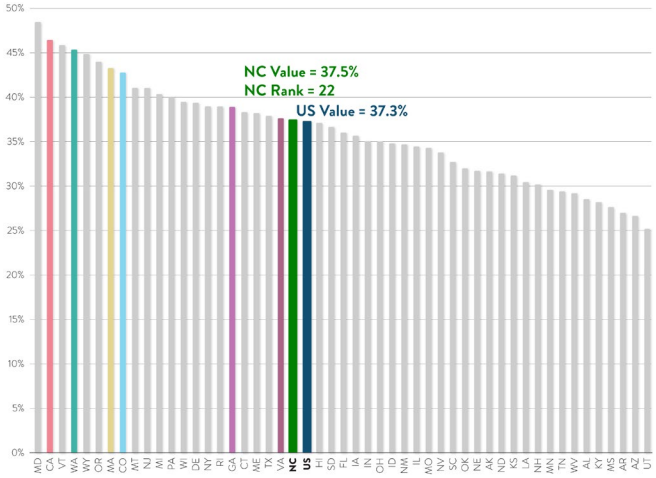
1 The number of degrees awarded is a count provided by the National Center for Education Statistics and includes degrees from both public and private institutions. These values are reported by the state in which the school is located and include degrees awarded to both in-person and online students. Degree data reflect the location of the degree-granting institution, not the state where degree-earning students reside.

INDICATOR 5.5: S&E DEGREES

How Does North Carolina Perform?

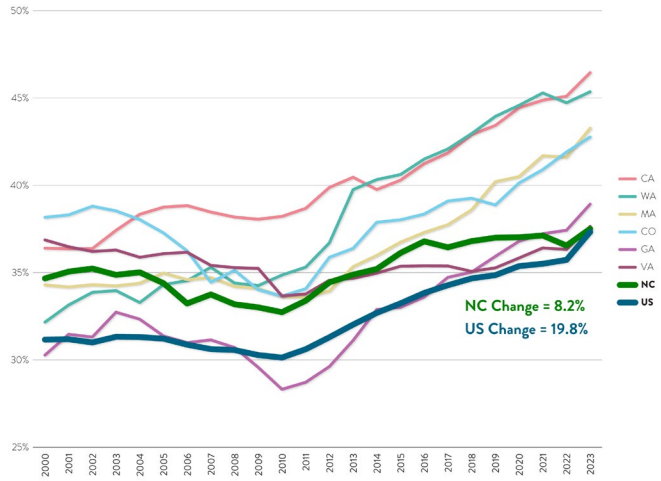
The number of university students in North Carolina graduating in S&E fields is 37.5 percent of all higher education degrees, which ranks North Carolina 22nd in the country **[5.5A]**. North Carolina's value is 101 percent of the U.S. value and 77 percent of Maryland, the top-ranked state. North Carolina is the lowest ranked among the comparison states, with Virginia being the closest at 37.6 percent. In 2000, North Carolina ranked above comparison states Massachusetts, Washington, Georgia, and the U.S. overall **[5.5B]**. However, Massachusetts, Washington, and Georgia outpaced North Carolina's rate of change between 2000 and 2023—surpassing North Carolina in 2005, 2006, and 2021, respectively. North Carolina's rate of change between 2000 and 2023 is second lowest only to Virginia, and the U.S. has a rate of change more than double North Carolina's, suggesting the U.S. may surpass North Carolina in coming years.

5.5A: S&E Degrees as Percentage of Higher Education Degrees Conferred, All U.S. States, 2023



Source: National Science Board.

5.5B: S&E Degrees as Percentage of Higher Education Degrees Conferred, Comparison States, 2000–2023



Source: National Science Board.

What Does This Mean for North Carolina?

In terms of S&E degrees as a percentage of higher education degrees conferred, North Carolina is only slightly above the U.S. average and is trailing all the comparison states. Specifically, North Carolina has seen a low rate of increase in the number of S&E degrees compared to higher education degrees overall, which could lead to fewer personnel to fill technical and professional roles in high-demand fields, as indicated in the 2026 UNC System Workforce Alignment Report.[2] Similar to Indicator 5.4, if North Carolina expects to fill knowledge- and technology-intensive roles in state to support economic development, efforts should be made by the state to increase the number of S&E higher education degrees. ■

2 UNC System Workforce Alignment Report.

INDICATOR 5.6: EDUCATIONAL ATTAINMENT

Indicator Overview

Regardless of industry or occupation, a well-educated, skilled workforce is a prerequisite for success in the innovation economy. The educational attainment of the workforce—measured here as an aggregate using a composite score (see "Methodological Note," on the last page of this indicator)—is a fundamental determinant of how well a state can generate and support economic growth centered on innovation. Moreover, the greater the share of well-educated workers within a state, the less the state has to rely on in-migration (see indicator 5.7) to sustain its pool of well-educated workers. North Carolina's ability to compete in the innovation economy is heavily dependent on its ability to produce and maintain a well-educated workforce.

KEY FINDINGS

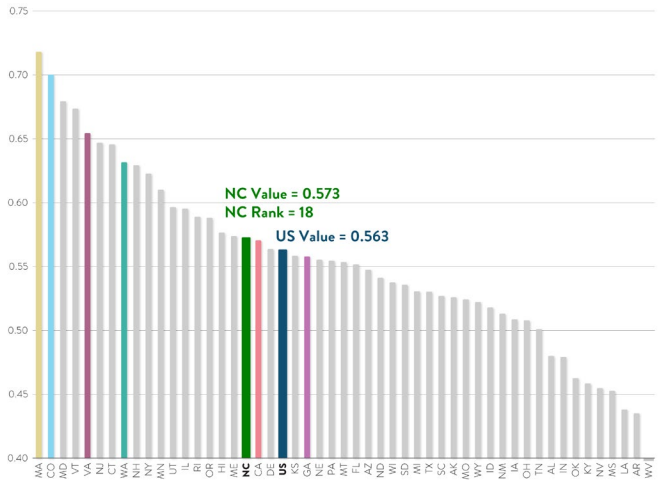
- North Carolina's educational attainment composite score is slightly above the U.S. average and is increasing at a rate slightly faster than the U.S. average.
- Within North Carolina, educational attainment levels vary considerably—only 20 counties, the majority of which are urban, have an educational composite score higher than the U.S. average composite score.

INDICATOR 5.6: EDUCATIONAL ATTAINMENT

How Does North Carolina Perform?

In terms of its educational attainment composite score, North Carolina's value ranks 18th in the nation, with a level that is 102 percent of the U.S. value and 80 percent of the value of the top-ranking state, Massachusetts **[5.6A]**. This ranking is an improvement by three positions compared to its rank in the *Tracking Innovation* 2024 report. This composite score derives from the following statistics:[1] 9.1 percent of North Carolina citizens over 25 years of age have not completed high school, 24.7 percent completed their education with a high school degree, 18.7 percent completed with a high school degree and have some college experience, 10.2 percent completed with an associate degree, 22.6 percent completed with a bachelor's degree, and 14.5 percent completed with a graduate or professional degree. All the comparison states have a higher educational attainment composite score than North Carolina, apart from California, which had the same composite score and Georgia, which had a lower composite score. From 2005 to 2024, North Carolina's educational attainment composite score increased by 52.0 percent, which was greater than the increase for the U.S. average composite score (38.5 percent) and the average of the composite scores for the comparison states (36.3 percent) **[5.6B]**. It was also greater than the increase for any of the comparison states individually.

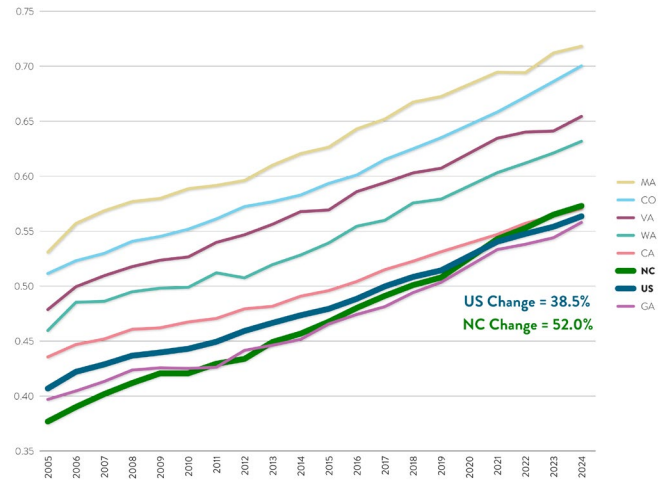
5.6A: Educational Attainment, All U.S. States, 2024



Source: U.S. Census Bureau.

Note: Weighted measure (composite score) of the educational attainment of residents aged 25 years and over.

5.6B: Educational Attainment, Comparison States, 2005–2024



Source: U.S. Census Bureau.

Note: Weighted measure (composite score) of the educational attainment of residents aged 25 years and over.

Data for 2020 was not comparable to other years and is removed. The missing data is ignored for the line construction.

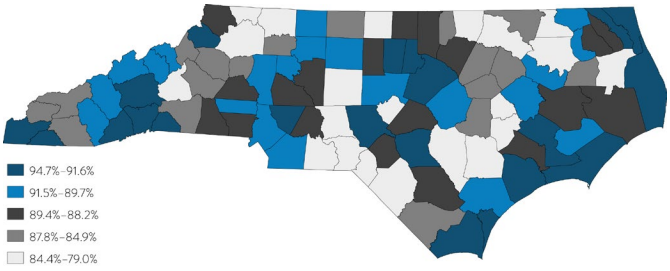
1 Using these statistics and the weighted measure methodology described on the last page of this indicator, North Carolina's composite score for 2024 is calculated as follows .091(-0.05) + 0.247(0) + 0.187(0.25) + 0.102(0.5) + 0.226(1) + 0.145(1.75) = 0.573 (as shown in charts 5.6a and 5.6b).

INDICATOR 5.6: EDUCATIONAL ATTAINMENT

Within North Carolina, educational attainment is considerably higher in urban counties (e.g., Mecklenburg, Wake, Guilford, Forsyth, Durham, etc.) and counties with high numbers of retirees (e.g., Moore, Buncombe, Dare, New Hanover), or universities (e.g., Orange, Pitt, Watauga) **[5.6C, 5.6D]**. Of the state's 100 counties, 42 have, for residents 25 years and older, a high-school completion rate higher than the U.S. average, 89.6 percent. In terms of the percentage of residents 25 years and over who have completed a bachelor's degree or more education, only 17 counties have a rate higher than the U.S. average, 35.7 percent. The educational attainment composite score follows a similar pattern but adds or exchanges several counties—Pitt, Carteret, Brunswick, Chatham, Union, Guilford, Transylvania, Cabarrus, and Henderson—for a total of 20 counties above the national average **[5.6E]**.

Thus, the overall pattern across North Carolina is that a majority of counties have relatively low educational attainment levels (80 have an educational composite score below the U.S. average composite score) and typically are in rural regions. Of the 20 counties that have an educational composite score higher than the U.S. average composite score, 8 counties are among the top 10 most populous counties in the state; the remainder are less populous counties that are the home to universities, are adjacent to these counties, or have a large number of retirees or military personnel.

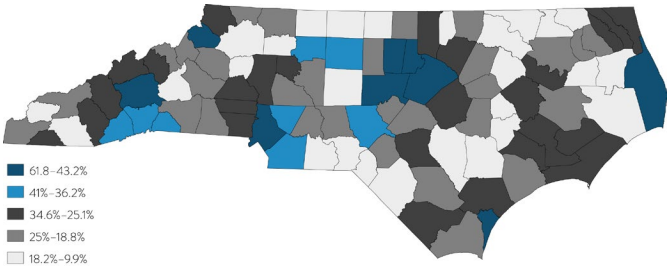
5.6C: Percentage of Residents 25 Years and Over Who Have Completed High School or More Education, N.C. Counties, 2020–2024 Estimate



Source: U.S. Census Bureau.

Note: Blue counties rank above the U.S. average.

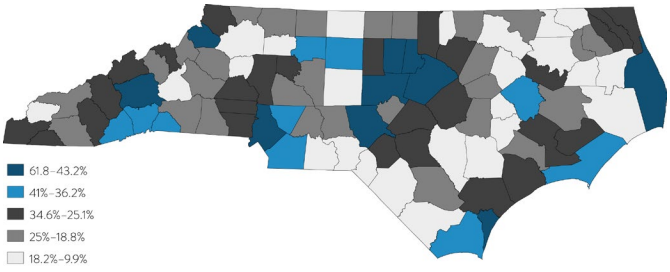
5.6D: Percentage of Residents 25 Years and Over Who Have Completed a Bachelor's Degree or More Education, N.C. Counties, 2020–2024 Estimate



Source: U.S. Census Bureau.

Note: Blue counties rank above the U.S. average.

5.6E: Weighted Measure (composite score) of the Education Attainment of Residents Aged 25 Years and Over, N.C. Counties, 2020–2024 Estimate



Source: U.S. Census Bureau.

Note: Blue counties rank above the U.S. average.

What Does This Mean for North Carolina?

Fifteen years ago, the 2011 State of the North Carolina Workforce report highlighted four key facts focused on educational attainment: (1) individuals with a baccalaureate degree were half as likely to be unemployed as the average worker, while individuals without a high school degree were twice as likely as the average worker to be unemployed; (2) workers with a baccalaureate degree can expect to earn $1.5 million more over a 30-year career than a high school dropout; (3) nearly half of the new jobs being created in North Carolina will require, at a minimum, some postsecondary education, many in science, technology, engineering and math (STEM) disciplines; (4) STEM jobs will constitute an increasing share of higher- and medium-wage jobs, creating significant barriers to employment for unprepared young adults and existing workers. These facts, combined with the educational attainment findings presented above, make it clear that North Carolina must improve the educational attainment levels of its citizens in order to generate innovative ideas, to support the expansion of a knowledge-based economy, and to increase the economic well-being and quality of life of its citizens. ▸

INDICATOR 5.6: EDUCATIONAL ATTAINMENT

METHODOLOGICAL NOTE

The weighted measure (composite score) used in charts 5.6A and 5.6B and map 5.6E is virtually identical to the one developed and used by the Information Technology & Innovation Foundation (ITIF) in its 2017 State New Economy Index. Specifically, it uses U.S. Census Bureau data to determine, for each state, the share of the state's population aged 25 years and over with the following six educational attainments: no high school diploma, high school diploma, some college (1 or more years, no degree), associate's degree, bachelor's degree, graduate or professional school degree, and doctorate degree. It then assigns each degree class a weight, as follows:

-0.05	No High School Diploma	0.50	Associate's Degree
0.0	High School Diploma	1.00	Bachelor's Degree
0.25	Some College	1.75	Graduate or Professional Degree

Each share is multiplied by its respective weight and the products are summed to arrive at the final score. This composite score is valuable for at least two reasons:

1. It includes, in a single measure, the full spectrum of relevant degree classes, and
2. It assigns greater weight to higher-level degrees.

Accordingly, it provides an efficient and effective measure of the general educational attainment level of each state.

INDICATOR 5.7: EDUCATIONAL ATTAINMENT OF IN-MIGRANTS

Indicator Overview

The ability of a state to successfully attract well-educated, skilled individuals to relocate from other states and countries enhances that state's ability to foster an innovation economy. This indicator measures the education attainment of in-migrants in two ways: average years of education among in-migrants, and in-migration of college-educated adults as a percentage of total state population. The first measure is a more comprehensive indicator of the educational attainment of in-migrants, whereas the second measure is a more targeted indicator of the higher-level educational attainment of in-migrants. States better able to attract educated and skilled workers provide organizations in the innovation economy with the skill sets necessary to compete in knowledge-intensive production. Furthermore, attracting outside talent enhances a state's ability to generate new innovative ideas that may have economic impacts in the future.

KEY FINDINGS

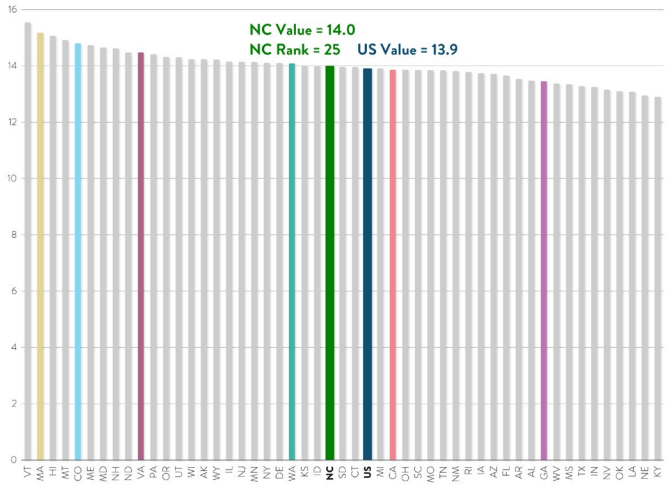
- North Carolina's average years of education among in-migrants ranks slightly above the U.S. average and is increasing at a rate slower than the U.S. average.
- North Carolina's in-migration of college-educated adults as a percentage of total state population ranks above the U.S. average, has more often than not since at least the mid-2000s, and is increasing at a rate three times greater than the U.S. average.
- Within North Carolina, the in-migration of individuals with a bachelor's degree or higher is very concentrated in a small number of counties.

INDICATOR 5.7: EDUCATIONAL ATTAINMENT OF IN-MIGRANTS

How Does North Carolina Perform?

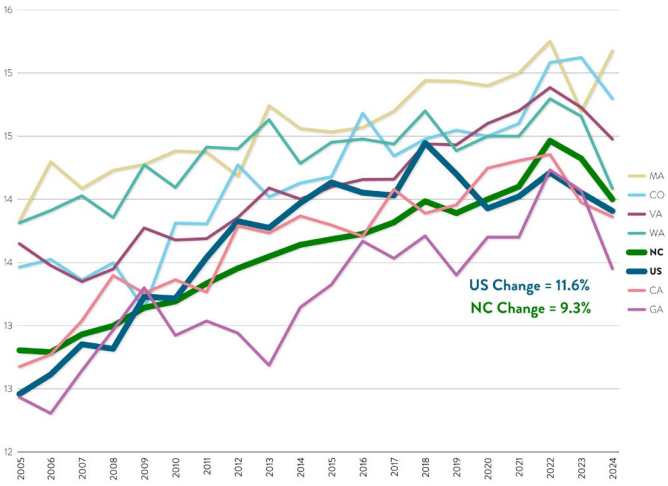
In terms of average years of education among in-migrants, North Carolina ranks 25th in the nation, with a value just above the U.S. average (14.0 years versus 13.9 years), and 90 percent of the value of the top-ranking state, Vermont (15.5 years) **[5.7A]**. Among the comparison states, North Carolina ranks above Georgia and California but below all other comparison states on this measure. Massachusetts ranks in the top 5 among all states historically, and Colorado has improved by the greatest amount since 2005 among the comparison states. From 2005–2024, the average years of education among in-migrants in North Carolina increased by 9.3 percent, which is slower than the 11.6 percent increase for the U.S. overall and the average of all comparison states (7.5 percent) **[5.7B]**.

5.7A: Average Years of Education Among In-Migrants, All U.S. States, 2024



Source: U.S. Census Bureau.

5.7B: Average Years of Education Among In-Migrants, Comparison States, 2005–2024

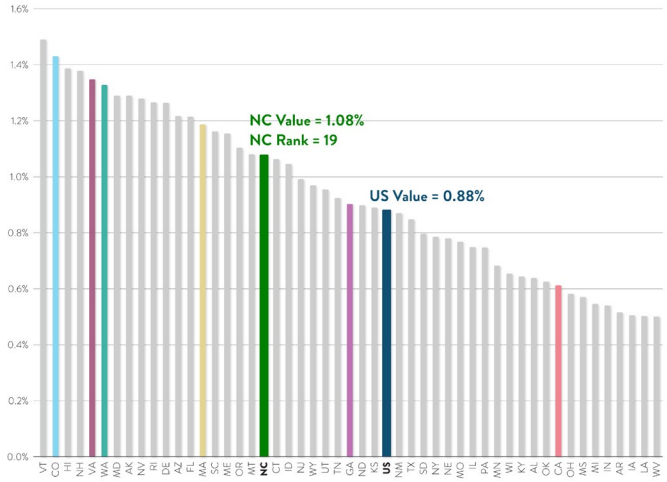


Source: U.S. Census Bureau.

INDICATOR 5.7: EDUCATIONAL ATTAINMENT OF IN-MIGRANTS

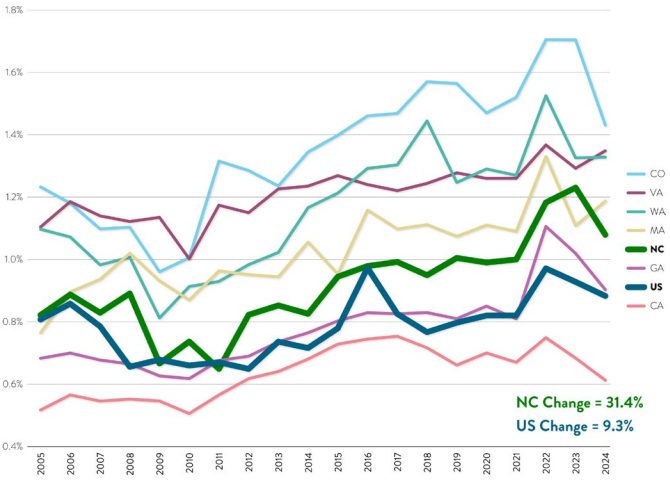
College-educated adult in-migrants account for 1.08 percent of North Carolina's population. North Carolina's value ranks 19th in the nation, 22 percent above the U.S. average value, and 66 percent of the value of the top-ranking state, Colorado **[5.7C]**. Among the comparison states, California and Georgia rank lower than North Carolina on this measure. From 2005–2024, North Carolina in-migration of college-educated adults as a percentage of total state population increased by 31.4 percent, whereas the percentage for the U.S. overall increased by 9.3 percent **[5.7D]**. Relative to the comparison states, North Carolina's rate of increase is higher than those of all comparison states besides Massachusetts.

5.7C: In-Migration of College Educated Adults as a Percentage of Total State Population, All U.S. States, 2024



Source: U.S. Census Bureau.

5.7D: In-Migration of College Educated Adults as Percentage of Total State Population, Comparison States, 2005–2024

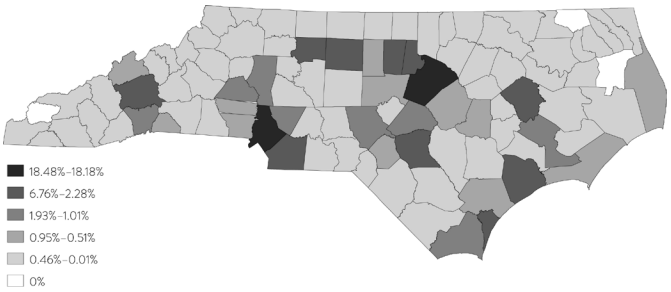


Source: U.S. Census Bureau.

INDICATOR 5.7: EDUCATIONAL ATTAINMENT OF IN-MIGRANTS

Within North Carolina, the in-migration of individuals with a bachelor's degree or higher is very concentrated in a small number of counties **[5.7E]**.[1] Two counties combined accounted for 36.7 percent of the state's in-migrants with a bachelor's degree or higher between 2020 and 2024—Mecklenburg (18.2 percent) and Wake (18.5 percent). Approximately another third of college-educated in-migrants moved to nine counties—Durham (6.8 percent), Buncombe (4.6 percent), Guilford (4.1 percent), Cumberland (3.7 percent), Forsyth (3.3 percent), New Hanover (3.3 percent), Orange (2.7 percent), Onslow (2.5 percent), and Union (2.3 percent). In total, this means that 11 of the state's 100 counties account for 69.7 percent of the state's in-migrants with a bachelor's degree or higher between 2020 and 2024. The next nine counties combined—Iredell (1.9 percent), Moore (1.7 percent), Brunswick (1.7 percent), Cabarrus (1.7 percent), Pitt (1.5 percent), Harnett (1.1 percent), Henderson (1.0 percent), Catawba (1.0 percent), and Craven (1.0 percent)—account for another 12.7 percent of the state's in-migrants with a bachelor's degree or higher over the same period. Each of the remaining 80 counties accounts for less than one percent of the state's in-migrants with a bachelor's degree or higher between 2020 and 2024, and together they account for 17.6 percent of that in-migration.

5.7E: In-Migration of College Educated Adults, Percent of State Total, N.C. Counties, 2020–2024



Source: U.S. Census Bureau.

1 The percentages presented here are based, for a given county, on the number of in-migrants that have a bachelor's degree or higher and that relocated from another county within the state, a different state, or from a different country between 2020 and 2024. The trends illustrated in map 5.7E are highly correlated with trends illustrated in map 1.6B and chart 1.6C.

INDICATOR 5.7: EDUCATIONAL ATTAINMENT OF IN-MIGRANTS

What Does This Mean for North Carolina?

The ability of the state to attract highly educated individuals is a key factor that influences the generation of innovative ideas and strengthens a knowledge-based economy. Strong influxes of highly educated workers strengthen the innovation economy labor pool by providing diverse and highly demanded skill sets. North Carolina's performance on this factor—slightly above the middle of the U.S. state distribution—suggests that the state can continue to do more to attract highly educated individuals to relocate here. Additionally, a small number of counties accounts for the majority of the state's in-migration of individuals with a bachelor's degree or higher. These findings suggest that the state should work to increase the opportunities for highly educated individuals to relocate from other states and countries. This holds especially true for counties with a low percentage of college-educated in-migrants. ■

Section 6:
Environment & Infrastructure

Environment & Infrastructure includes the conditions that enable innovation to initiate and spread throughout North Carolina—physical, digital, and institutional foundations that support innovation activity across the state. **Environment & Infrastructure** captures investments in education systems, broadband access, and the industry sectors that enable innovation to reach a broader range of communities. Tracking these measures over time, and relative to other states, helps determine whether North Carolina has the foundation in place to sustain and broaden its innovation economy.

INDICATOR 6.1: PUBLIC INVESTMENT IN EDUCATION

Indicator Overview

This indicator provides information regarding 1) expenditures on public elementary and secondary school and 2) appropriations of tax dollars towards higher education (colleges and universities) in the state, each as a percentage of state GDP. The first measure represents the relative amount of resources that state governments expend to support public education in pre-kindergarten through grade 12. Current expenditures include instruction and instruction-related costs, student support services, administration, and operations; they exclude funds for school construction and other capital outlays, debt service, and programs outside of public elementary and secondary education. State and local support are the largest sources of funding for elementary and secondary education.[1] The second measure represents the relative amount of state government financial support for higher education operating expenses.[2]

KEY FINDINGS

- North Carolina's elementary and secondary public school current expenditures as a percentage of state gross domestic product (GDP) rank well below the U.S. average, have since at least the early 2000s, and are decreasing over time.
- North Carolina's appropriations of state tax funds for operating expenses of higher education as a percentage of state GDP rank well above the U.S. average, have since at least the early 2000s, but are decreasing over time.

1 Current expenditures are expressed in actual dollars and their data year is the end date of the academic year. GDP data refer to the calendar year in current dollars.

2 Because of decreases in state tax collections in FY 2009–11 during the Great Recession, state monies allocated to higher education decreased in many states. This decrease was offset to a degree by federal stimulus funds that were used to restore the level of state support for public higher education. Nationally, state financial support of higher education operating expenses relative to GDP has experienced a downward trend since the early 2000s. The state monies used to calculate this indicator do not include federal stimulus funds for education stabilization or federal, state, or local government funds for the modernization, renovation, or repair of higher education facilities.

INDICATOR 6.1: PUBLIC INVESTMENT IN EDUCATION

For each measure, a higher value indicates that a state has made financial support of the respective education level more of a priority.[3] Investments in public pre-kindergarten through grade 12 are important for preparing a broadly educated and innovation-capable workforce. Investments in public postsecondary education are critical to increase the ability of public academic institutions to prepare students for skilled and well-paying employment. Investing in public education has been shown to increase social productivity and tax revenue while decreasing public funds spent on criminal justice, public health, and public assistance.[4] Additionally, well-regarded public higher education programs enhance a state's ability to attract students from around the globe, many whom choose to remain and work in the state after graduation.

3 This does not assume that more spending necessarily leads to improved educational outcomes.

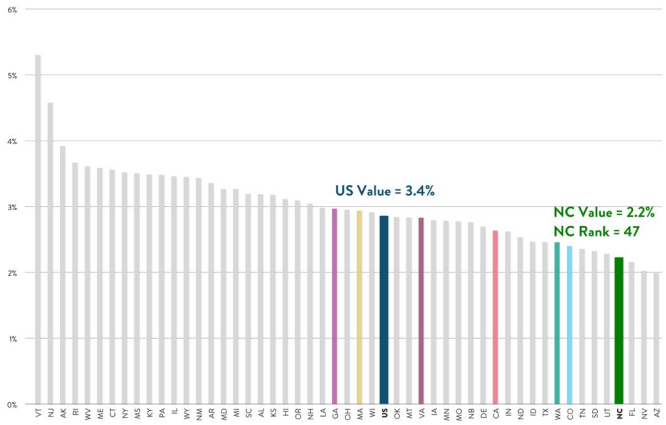
4 Investing in Our Nation's Future: Advancing Educational Opportunity for Underserved Students

INDICATOR 6.1: PUBLIC INVESTMENT IN EDUCATION

How Does North Carolina Perform?

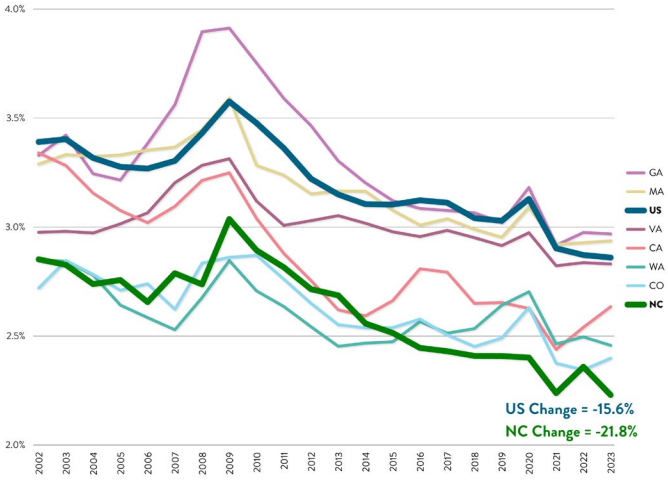
Regarding elementary and secondary public-school expenditures relative to GDP, North Carolina ranked 47th in the nation, placing it only above Florida, Nevada, and Arizona **[6.1A]**. With expenditures being 2.2 percent of the state GDP, North Carolina's value is 78 percent of the U.S. average (2.9 percent) and just 42 percent of the top state's (Vermont: 5.3 percent). Compared to the comparison states, North Carolina spends the least amount on public elementary and secondary school relative to GDP. Since 2002, North Carolina has consistently ranked below the U.S. average **[6.1B]**. Between 2002 and 2023, North Carolina's expenditures relative to GDP have decreased nearly 22 percent. This decrease is the largest of all the comparison states, with California following very closely (-21.1 percent). Overall, all the comparison states and U.S. average have seen a decrease in public elementary and secondary education spending relative to GDP since 2002.

6.1A: Elementary and Secondary Public School Current Expenditures as a Percentage of State GDP, All U.S. States, 2023



Sources: U.S. Census Annual Survey of School System Finances and U.S. Bureau of Economic Analysis.

6.1B: Elementary and Secondary Public School Current Expenditures Changes, Comparison States, 2002–2023

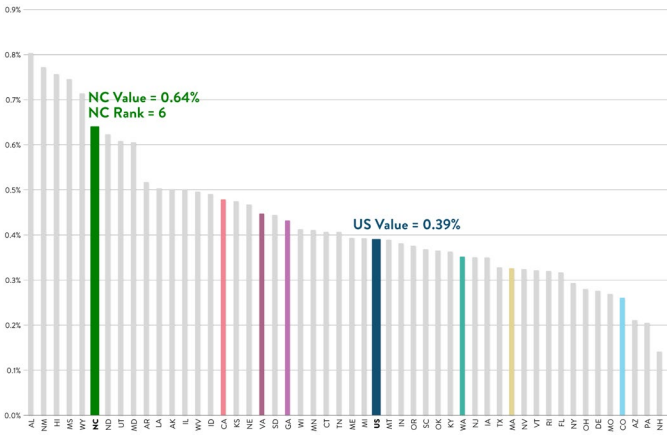


Sources: U.S. Census Annual Survey of School System Finances and U.S. Bureau of Economic Analysis.

INDICATOR 6.1: PUBLIC INVESTMENT IN EDUCATION

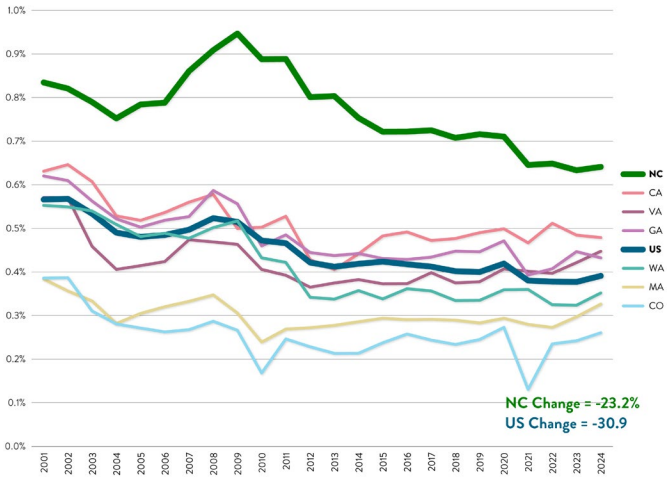
In terms of appropriations of state tax funds for operating expenses of higher education as a percentage of state GDP, North Carolina fares much better. North Carolina ranked 5th in the nation, with a level that is 64 percent greater than the U.S. average and 80 percent of the value of the state with the highest value, Alabama **[6.1C]**. A value of 0.64 percent puts North Carolina well above all the comparison states. However, despite its high ranking, North Carolina has seen a decline in these funds of 23.2 percent since 2001 **[6.1D]**. All the comparison states and the U.S. average have seen declines in these state appropriations, but out of all comparison states, Washington (-36.3 percent), Colorado (-32.5 percent), and Georgia (-30.3 percent) saw the largest declines.

6.1C: Appropriations of State Tax Funds for Operating Expenses of Higher Education as a Percentage of State GDP, All U.S. States, 2024



Source: National Science Board.

6.1D: Appropriations of State Tax Funds for Operating Expenses of Higher Education as a Percentage of State GDP, Comparison States, 2001–2024



Source: National Science Board.

INDICATOR 6.1: PUBLIC INVESTMENT IN EDUCATION

What Does This Mean for North Carolina?

North Carolina's funding for public elementary and secondary education and higher education tracks with other education-related metrics throughout this report. Specifically, the high support for state appropriations allotted to higher education operating expenses aligns with North Carolina's academic R&D expenditures relative to GDP (see indicator 2.3) and the large percentage of higher education degrees conferred in the state (see indicator 5.5). Additionally, the lack of funding for public elementary and secondary education could be a contributing factor to test scores and students' meeting state requirements. National exams for reading and math in 2024 showed North Carolina students ranked equal to national average or slightly above, but little to no changes were made between 2022 and 2024 scores.[5] Continuous decreases in state funding puts national score results and graduation rates at risk.

There is a close link between investment in education and related measures of success, but in order for North Carolina to continue to compete in a knowledge and innovation-driven economy, students must be prepared via their education. To do this, that North Carolina should continue its strong levels of investment in higher education and significantly increase its levels of investment in elementary and secondary education. ■

5 NC students score at or above average on national assessment, but pandemic gaps persist | NC DPI

INDICATOR 6.2: BROADBAND

Indicator Overview

Broadband refers to a range of technologies (fiber, co-ax cable, and wireless technologies) that transmit internet. Broadband is a platform for innovation, in that using broadband technologies can foster and enable innovation in all sectors by increasing business productivity, improving health care and education, and enabling the creation and use of new technologies.

In this indicator, broadband is examined at the state level by assessing the percentage of homes with an internet-accessible device and a broadband subscription. For this analysis, internet-accessible devices excludes smart phones, which may not be considered sufficient to perform necessary functions for work or educational needs, particularly older models of cell phones with limited internet capabilities. Rather, internet-accessible devices include at least a laptop or equivalent. These devices can connect to the internet and perform necessary function for work, educational, or healthcare (i.e. telehealth) needs. Broadband subscription rates specifically measure the demand for broadband by calculating the number of households with broadband subscriptions and dividing by the number of homes. According to the Federal Communication Commission (FCC), fixed broadband is defined as 25 Mbps (download)/3 Mbps (upload) for 2015-2023, and 100 Mbps (download)/20 Mbps (upload) for 2024 to present.

KEY FINDINGS

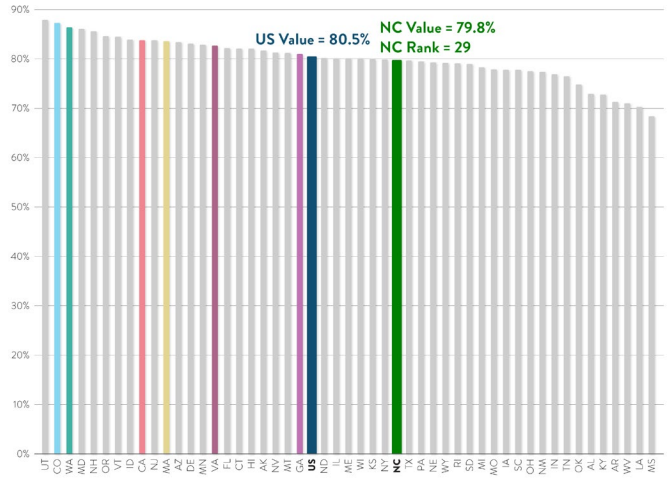
- North Carolina's percentage of homes with an internet-accessible device ranks similar to but slightly lower than the U.S. average, has since at least 2015, and is increasing at a rate slightly faster than the rate for the U.S. overall.
- North Carolina's percentage of homes with a broadband subscription ranks equal to the U.S. average, the first time since 2015, and is increasing at a rate slightly faster than the rate for the U.S. overall.
- Across North Carolina, internet access rates vary considerably by county, with more prosperous counties generally having the highest rates.

INDICATOR 6.2: BROADBAND

How Does North Carolina Perform?

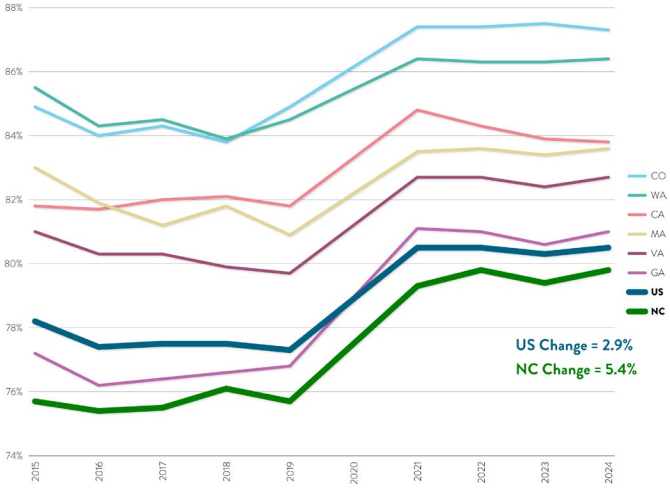
North Carolina has an internet-accessible device rate (79.8 percent) that is 99 percent of the national average (80.5 percent) but in the bottom half of U.S. states **[6.2A]**. North Carolina is ranked below comparison states Colorado (87.3 percent), Washington (86.4 percent), California (83.8 percent), Massachusetts (83.6 percent), Virginia (82.7 percent), and Georgia (81.0 percent) but has had the largest increase in access since 2015 **[6.2B]**. North Carolina's rate of change is almost double that of the U.S., indicating it may surpass the U.S. value in the next few years if that growth continues.

6.2A: Percentage of Homes with Internet-Accessible Device, All U.S. States, 2024



Source: U.S. Census Bureau.

6.2B: Percentage of Homes with Internet-Accessible Device, Comparison States, 2015–2024



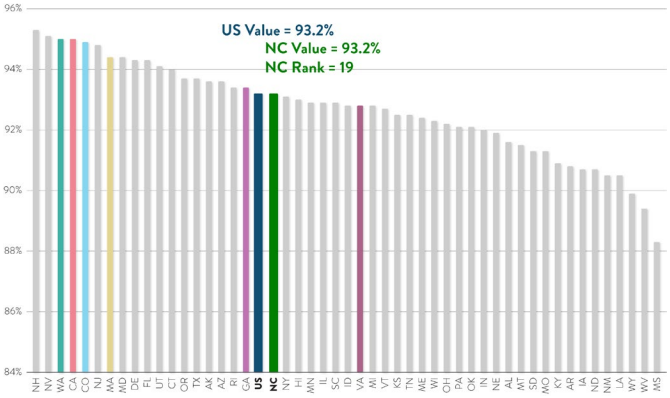
Source: U.S. Census Bureau.

INDICATOR 6.2: BROADBAND

Despite North Carolina's lower performance for internet accessible device rate, North Carolina's percentage of homes with a broadband subscription (93.2 percent) ranks 19th in the nation and is equal to the national average **[6.2C]**. North Carolina's value is 98 percent of the top state (New Hampshire: 95.3 percent), and is the second lowest of comparison states, higher only than Virginia (92.8 percent) **[6.2D]**. Despite North Carolina's lower ranking than the majority of the comparison states, North Carolina has seen the largest increase in broadband subscription rates since 2016, at 18.0 percent.

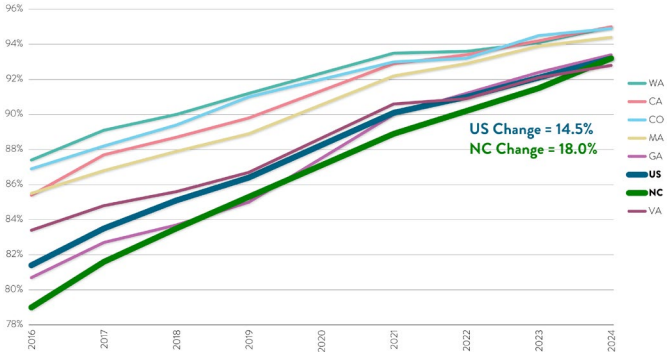
Within North Carolina, the percent of homes with an internet subscription varies widely **[6.2E]**. The county with the highest percentage of homes having internet was Wake (95.4 percent), whereas Hyde County had the lowest percentage of homes with an internet subscription, at just 72.0 percent. Across North Carolina, 19 counties had a five-year average for percentage of homes with an internet subscription higher than the U.S. average of 91.1 percent: Wake, Mecklenburg, Orange, Union, Iredell, Durham, Carteret, Brunswick, New Hanover, Camden, Cabarrus, Onslow, Dare, Davie, Pasquotank, Currituck, Cumberland, Guilford, Lincoln, Moore, and Watauga. Many of these counties are in the Piedmont region of the state and along the coast where cities, military bases, and tourist destinations are located. The counties with higher internet subscriptions also correlate with higher population density within the state (see indicator 1.1).

6.2C: Percentage of Homes with a Broadband Subscription, All U.S. States, 2024



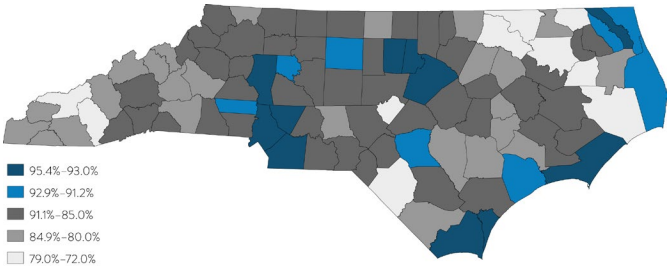
Source: U.S. Census Bureau.

6.2D: Percentage of Homes with a Broadband Subscription 2016–2024



Source: U.S. Census Bureau.

6.2E: Percent of Homes with Internet Access, 5-year average, N.C. Counties, 2020–2024



Source: U.S. Census Bureau.

Note: Blue States are above the U.S. average.

INDICATOR 6.2: BROADBAND

What Does This Mean for North Carolina?

North Carolina is a very rural state, with the 2020 census showing nearly one-third of the population residing in rural counties. This rural nature can hinder access to broadband and internet-accessible devices for much of the state, increasing the rural-urban divide for everything from innovation to healthcare and education. The North Carolina Division of Broadband Solutions is administering programs and funding to increase access rates, with more than $670 million in broadband projects underway and distribution of computers to individuals throughout the state. In March of 2026, it was announced that $26 million in funding will be provided through the Stop-Gap Solutions program to connect more than 5,100 homes, businesses, and community anchor institutions in 66 counties by the end of 2026.[1] This expansion will specifically target harder to reach areas where traditional methods of internet expansion are difficult. Future iterations of this report will be able to monitor the progress of increasing access through the expansion of broadband infrastructure throughout North Carolina through Stop-Gap-Solutions and other state funded projects. ■

1 Governor Josh Stein Announces High-Speed Internet Access Coming in 2026 to 5,161 Rural North Carolinians | NC Governor

INDICATOR 6.3: COST OF LIVING

Indicator Overview

This indicator is a price index that compares cost of living differences among urban areas based on the price of consumer goods and services. Specifically, it uses the Cost of Living Index produced quarterly by the Council for Community and Economic Research (C2ER).[1] The Cost of Living Index assumes that prices collected at a specified time, in strict conformance with standard specifications, provide a sound basis for constructing a reasonably accurate gauge of relative differences in the cost of consumer goods and services. The average for all participating areas, both metropolitan and nonmetropolitan, equals 100, and each participant's index is read as a percentage of the average for all areas combined, i.e., the U.S. average.[2] Assessments of quality of life, of which cost of living is a major component, influence states' and regions' ability to attract and retain talented people. A reasonable and affordable cost of living can attract people to an area, thus facilitating businesses' ability to fill open positions and fuel expansion in the area.[3]

KEY FINDINGS

- North Carolina's Cost of Living Index is below the U.S. average.
- Within North Carolina, 91 counties have Cost of Living Indexes lower than the U.S. average, while the remaining nine counties were comparable to the national average or slightly less affordable.

1 For more detail on the Cost of Living Index and C2ER, see https://www.coli.org/. In general, the Cost of Living Index is intended to measure differences among urban areas; however, C2ER has developed a county-level Cost of Living Index based on an econometric model that identifies key determinants of an area's cost of living. Data using that model appear in map 6.3B.

2 For example, if City A has an index of 98.3, the cost of living in that city is approximately 1.7 percent less than the U.S. average cost of living. If City B has a composite index of 128.5, the cost of living in that city is approximately 28.5 percent higher than the U.S. average. Thus, if a worker lives in City A and is contemplating a job offer in City B, that worker would need a 30.72 percent increase in after-tax income to remain at their City A lifestyle once moving to City B (30.72% = 100*[(128.5 - 98.3)/98.3]). Conversely, if the same worker were considering a move from City B to City A, that worker could sustain a 23.5 percent decrease in after-tax income without reducing their lifestyle (23.5% = 100*[(98.3 – 128.5)/128.5]).

3 For the purposes of this report, a Cost of Living Index slightly above or slightly below the U.S. average is advantageous, as it indicates that an area's cost of living is reasonably affordable, but not so extreme as to suggest that the area is excessively expensive (in the case of a high index value) or has low-quality infrastructure, amenities, goods, and services (in the case of a low index value).

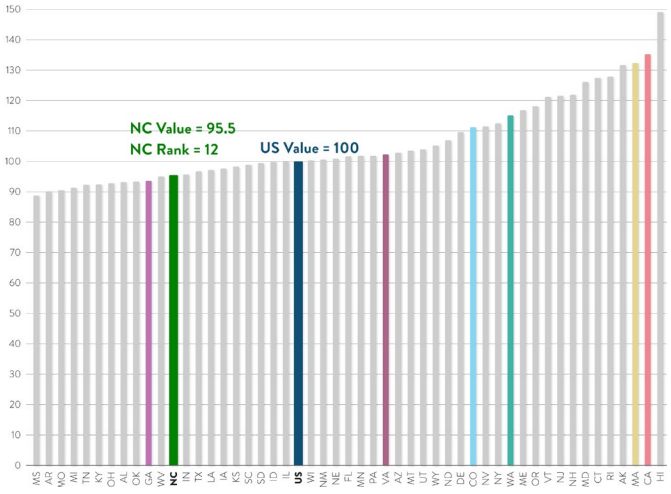
INDICATOR 6.3: COST OF LIVING

How Does North Carolina Perform?

In 2025, North Carolina ranked the 12th most affordable state in the nation, with a value that is 95.5 percent the national average and a value that is 108 percent the value of the most affordable state, Mississippi **[6.3A]**. The only comparison state with a lower cost of living than North Carolina in 2025 was Georgia (93.6). All other comparison states had Cost of Living Index values higher than the U.S. average, with Colorado, Washington, Massachusetts, and California all being in the top 15 most expensive states to live. California had the largest of Cost-of-Living Index with a value of 125.2, placing it 49th in the nation for cost of living, second last only to Hawaii.

Cost of living varies widely across the country. New York County in New York has the highest cost of living index, at 183 percent higher than the U.S. average, whereas Oglala Lakota County in South Dakota has the lowest cost of living, with an index that is 21.4 percent lower than the U.S. average. The top five most expensive counties to live in are New York County (New York), San Francisco County (California), Kings County (New York), Bronx County (New York), and Teton County (Wyoming). Ten counties (Baker, Volusia, Guthrie, Grant, Flathead, Catron, Sandoval, Polk, Kershaw, and Newberry) have cost of living index values of 100, meaning they are equivalent to the U.S. average. The five counties with the lowest cost of living in the U.S. are Issaquena (Mississippi), Jefferson (Mississippi), Magoffin (Kentucky), Starr (Texas), and Oglala Lakota (South Dakota).

6.3A: Cost of Living Index, All U.S. States, 2025

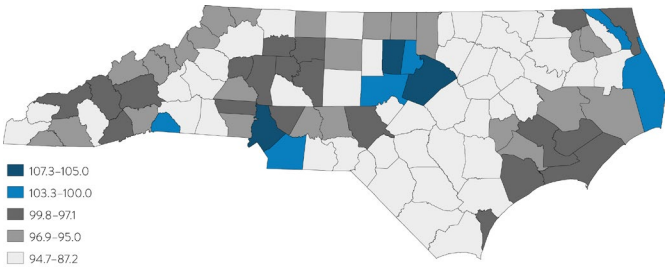


Source: Lightcast, Council for Community and Economic Research (C2ER).

INDICATOR 6.3: COST OF LIVING

Within North Carolina, nine counties (Orange, Mecklenburg, Wake, Chatham, Dare, Camden, Durham, Union, and Polk) had Cost of Living Index values higher than or equal to the U.S. average **[6.3B]**. Additionally, 35 counties within North Carolina had Cost of Living Index values between the North Carolina average and the U.S. average, and the remaining 56 counties were considered the most affordable, with values lower than North Carolina's average (95.5). Orange County had the highest Cost of Living Index in the state, with a cost-of-living 7.3 percent higher than the national average.[4] In contrast, the lowest cost-of-living was in Robeson County, which was 12.8 percent more affordable than the U.S. average.[5]

6.3B: Cost of Living Index, N.C. Counties, 2025



Source: Lightcast, Council for Community and Economic Research (C2ER).

Note: Blue counties rank above the U.S. average.

4 In 2025, eight counties across the U.S. have the same cost of living index as Orange County, and 15.5 percent of counties in the U.S. had higher cost of living than Orange County, North Carolina.

5 In 2025, only 2.7 percent of counties in the U.S. had a lower Cost of Living Index than Robeson County, North Carolina.

INDICATOR 6.3: COST OF LIVING

What Does This Mean for North Carolina?

Generally, independent of other factors, an affordable or close-to-average cost of living is an advantage for a state of region. A much higher cost of living than the U.S. average can be unattractive to both employers and employees, as employers often have to pay more in these areas to attract workers and employees have to be making enough to live in the area. Alternatively, lower cost of living can also be unattractive, as it may indicate an area has fewer amenities and infrastructure to support companies and their employees. On average, North Carolina's cost of living is neither excessively high nor overly low. low. In general, counties with a cost of living slightly above or slightly below the U.S. average are more likely to be the targets for, and sources of, innovative activity, as they are relatively affordable and more likely to possess a good mix of infrastructure, amenities, goods, and services. Those counties with a cost of living that is notably lower than the U.S. average, while more affordable, may have a less suitable mix of infrastructure, amenities, goods, and services. To the extent that is the case, efforts may be needed to increase those factors in order to increase the innovative activity and economic growth of those areas. ■

INDICATOR 6.4: INDUSTRY MIX

Indicator Overview

This indicator measures North Carolina's industry mix (i.e., the basic industry composition and patterns of North Carolina's economy) in three ways. Industry mix is measured first by detailing—for each major economic sector—four factors:[1] the level of employment, employment change (2001-2024), relative concentration (see Methodological Note on the last page of this indicator), and average wage. The second measure details—for knowledge and technology-intensive (KTI) employment industries only, which are 75 percent manufacturing based[2]—the same four factors. The third measures manufacturing GDP as a percentage of state GDP. Together, these measures provide useful context for interpreting and explaining many of the other indicators in this report, particularly the ones focused on industry activity (e.g., 2.2 - Industry R&D and Innovative Organizations in Section 4) and Employment (e.g., Workforce in Section 5).[3]

KEY FINDINGS

- North Carolina's sector and industry mix positions the state, overall, to be an innovation leader in only a small number of sectors and industries.
- A large portion of the state's sectors and employment is not knowledge- and technology-intensive (KTI) in nature and, therefore, is less likely to produce the types of innovations that drive growth, employment, and higher wages in the economy.
- Among the small number of sectors that are KTI, three-fourths have wages well above the North Carolina average wage for all sectors. Slightly less than half are increasing in employment, but overall KTI employment as a percentage of total employment is increasing.
- North Carolina's manufacturing GDP as a percentage of state GDP ranks above the U.S. average but has been declining steadily since 2000.

1 Economic sectors are defined by 2-digit North American Industry Classification System (NAICS) codes. NAICS is the standard used by federal statistical agencies in classifying business establishments for the purpose of collecting, analyzing, and publishing statistical data related to the U.S. business economy. NAICS is a 2- through 6-digit hierarchical classification system, offering five levels of detail. Each digit in the code is part of a series of progressively narrower categories, and more digits in the code signify greater classification detail. The first two digits designate the economic sector, the third digit designates the subsector, the fourth digit designates the industry group, the fifth digit designates the NAICS industry, and the sixth digit designates the national industry. For more information about NAICS codes, see www.census.gov/naics.

2 The data pertaining to establishments are based on their classification according to the 2012 edition of the North American Industry Classification System (NAICS). See Appendix A for a list of the 41 industries (by NAICS code) that are defined having knowledge- and technology- intensive (KTI) employment. These 41 codes are divided into nine manufacturing industries and three service industries. Also see the Source information for indicator 6.4 at the end of this report for more description of the data used for this particular indicator.

3 This indicator does not present a "cluster" analysis. A cluster is a group of businesses and industries that are related through presence in a common product chain, dependence on similar labor skills, or utilization of similar or complementary.

INDICATOR 6.4: INDUSTRY MIX

How Does North Carolina Perform?[4]

North Carolina has five major economic sectors—Healthcare and Social Assistance (14.2 percent), Retail Trade (10.9 percent), Manufacturing (9.5 percent), Accommodation and Food Services (9.4 percent), and Educational Services (8.0 percent)—that account for slightly more than half of the state's total employment **[6.4A, 6.4B, following pages]**.5,6 Out of these five major sectors, Manufacturing, Healthcare and Social Assistance, and Education Services have the highest wages, but only Manufacturing has a higher average annual wage than the North Carolina average annual wage of $68,721 (see indicator 1.3).[7]

The next top four economic sectors for employment—Professional, Scientific, and Technical Services (6.9 percent), Administrative and Support and Waste Management and Remediation Services (6.7 percent), Construction (5.6 percent), Public Administration (5.4 percent)—together account for another almost one quarter of all of North Carolina's employment. Of these, Professional, Scientific, and Technical Services and Construction have above-NC average wages, and Professional, Scientific, and Technical Services has a substantial share of KTI employment industries and employment. In total, these nine economic sectors account for 76 percent of the state's total employment, whereas the other 11 sectors account for the remaining 24 percent. **A key point worth noting is that the average wages ($63,811) of the 9 sectors comprising approximately three-fourths of North Carolina's employment are lower than the average wages ($89,982) of the 11 sectors comprising approximately one-fourth of North Carolina's employment. To increase North Carolina's average wage overall, it is necessary to start, grow, and attract companies in these higher-wage sectors and train the workforce for them.**

4 The measures reported here are for the state overall, not just the small number of much-acclaimed, very well-performing regions such as the Research Triangle and Charlotte.

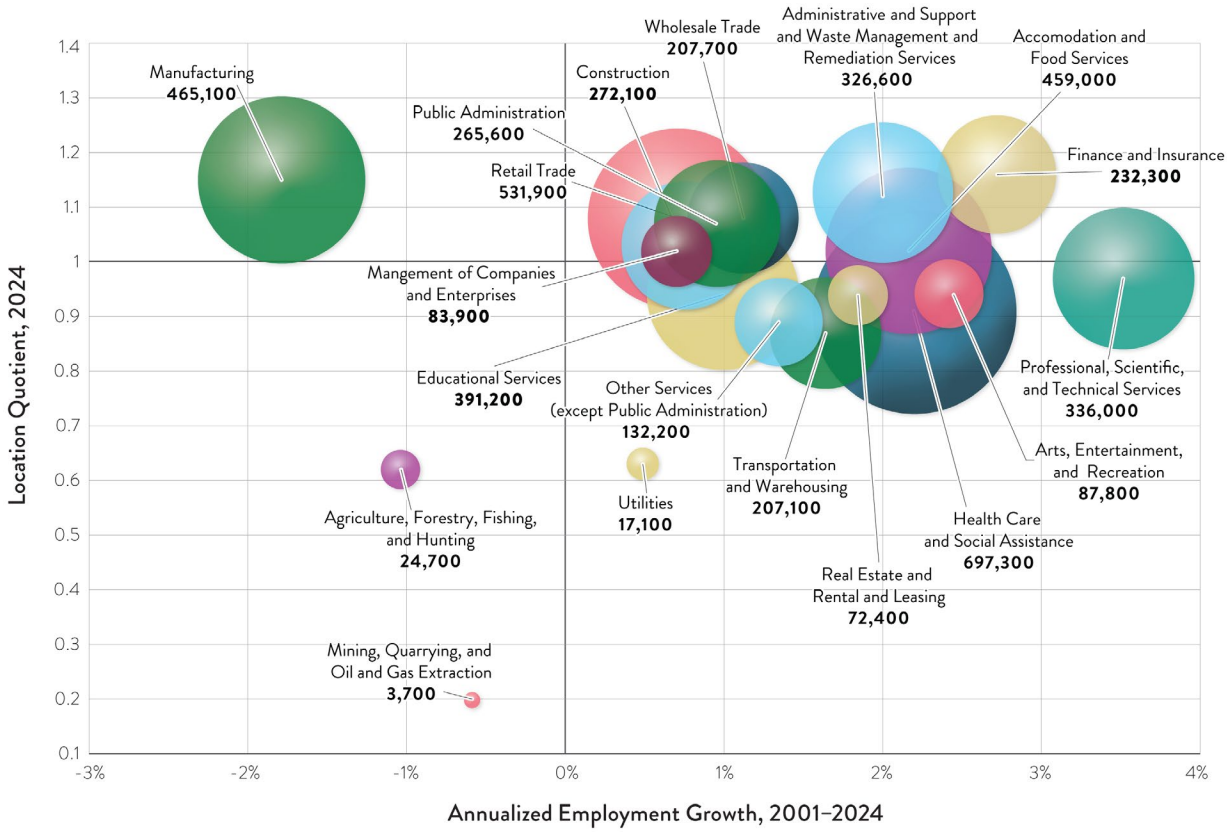
5 The data in table 6.4B are the source for the graphics in chart 6.4A, which simply provides a summary-level pictorial representation of the data, from which it is easier to discern patterns.

6 Each sector consists of a large number of subsectors and an even larger number of industries, of which only a minority (41) is classified as having knowledge- and technology- intensive employment (KTI). See Appendix A for a list of the 41 industries.

7 "Wage" includes wages, salaries, commissions, tips, overtime pay, hazard pay, bonuses, stock options, and severance pay. It does not include supplements, such as employer contributions to 401(k) plans, pensions, insurance funds, and government social insurance (FIA/FUTA). The 2024 average wage in North Carolina is $68,721 (see indicator 1.3).

INDICATOR 6.4: INDUSTRY MIX

6.4A: Industry Employment, Annualized Employment Growth, and Concentration, All Sectors, North Carolina, 2024



Source: Quarterly Census of Employment and Wages (QCEW), Bureau of Labor Statistics (BLS), and NC Department of Commerce Labor and Economic Analysis Division (LEAD).

Note: Employment numbers rounded to nearest hundreds; circle size represents number of employees. Excludes NAICS codes 99 (Undefined Industry) and 51 (Information).

6.4B: Sector Employment, Annualized Employment Growth, Concentration (Location Quotient), and Average Wage, All Sectors, N.C.

2-DIGIT NAICS CODE	SECTOR	EMPLOYMENT					
		Total 2024 (rounded)	Share of Total 2024	Cumulative Share of Total 2024	Annualized Growth Rate (Compound Annual Growth Rate) 2001-2024	Location Quotient 2024	2024 Average Earnings (rounded)
62	Health Care and Social Assistance	697,300	14.2%	14.2%	2.2%	0.91	$67,400
44-45	Retail Trade	531,900	10.9%	25.1%	0.7%	1.08	$39,100
31-33	Manufacturing	465,100	9.5%	34.6%	-1.8%	1.15	$74,600
72	Accommodation and Food Services	459,000	9.4%	43.9%	2.2%	1.02	$25,300
61	Educational Services	391,200	8.0%	51.9%	1.0%	0.94	$60,800
54	Professional, Scientific, and Technical Services	336,000	6.9%	58.8%	3.5%	0.97	$110,900
56	Administrative and Support and Waste Management and Remediation Services	326,600	6.7%	65.4%	2.0%	1.12	$55,900
23	Construction	272,100	5.6%	71.0%	0.8%	1.03	$74,300
92	Public Administration	265,600	5.4%	76.4%	1.0%	1.07	$66,000
52	Finance and Insurance	232,300	4.7%	81.2%	2.7%	1.16	$130,200
42	Wholesale Trade	207,700	4.2%	85.4%	1.1%	1.08	$100,200
48-49	Transportation and Warehousing	207,100	4.2%	89.6%	1.6%	0.87	$61,100
81	Other Services (except Public Administration)	132,200	2.7%	92.3%	1.4%	0.89	$48,900
71	Arts, Entertainment, and Recreation	87,800	1.8%	94.1%	2.5%	0.94	$41,700
51	Information	86,900	1.8%	95.9%	20.2%	0.9	$129,400
55	Management of Companies and Enterprises	83,900	1.7%	97.6%	7.0%	1.02	$144,000
53	Real Estate and Rental and Leasing	72,400	1.5%	99.1%	1.8%	0.94	$69,400
11	Agriculture, Forestry, Fishing, and Hunting	24,700	0.5%	99.6%	-1.0%	0.62	$48,400
22	Utilities	17,100	0.3%	99.9%	0.5%	0.63	$108,600
21	Mining, Quarrying, and Oil and Gas Extraction	3,700	0.1%	100.0%	-0.6%	0.2	$107,900
	Total	**4,900,600**		**100.00%**	**2.4%**		**$78,205**

Source: Quarterly Census of Employment and Wages (QCEW), Bureau of Labor Statistics (BLS).

Note: Employment values and wages rounded to the nearest hundred. Sorted in descending order by number of employees.

Note: Excludes NAICS code 99 (Unclassified Sector); Average Wage, and Employment numbers rounded to the nearest hundreds. Sectors sorted in descending order by employment.

INDICATOR 6.4: INDUSTRY MIX

In terms of the sectors' relative concentration, as measured by location quotients, there are three sectors in North Carolina that have a larger share of activity than we would expect based on national trends:[8] Manufacturing (1.15), Finance and Insurance (1.16), and Administrative and Support and Waste Management and Remediation Services (1.12). While Manufacturing and Finance and Insurance have wages above the state average, only Manufacturing has a substantial share of KTI employment industries. According to the annualized employment growth rate, the Manufacturing sector decreased between 2001 and 2024, whereas Finance and Insurance and Administrative and Support and Waste Management and Remediation Services sectors saw increases during this time period.

In terms of KTI industries, the largest in terms of employment in North Carolina in 2024 were Computer Systems Design and Related Services (23.2 percent), Scientific Research and Development Services (10.9 percent), and Software Publishers (9.3 percent), all of which have wages approximately double the state average annual wage and have grown in employment substantially since 2001 **[6.4C, 6.4D, following pages]**. Out of the major industry sectors, Manufacturing has the most knowledge- and technology-intensive industries associated with it, as shown by the large number of NAICS codes starting with 31, 32, and 33. In particular, the Manufacturing KTI industries of Computer and Electronics Manufacturing, Pharmaceutical and Medicine Manufacturing, and Electrical Equipment, Appliance, and Component Manufacturing are also in the top KTI employers for North Carolina. Together, these six KTI industries, half in manufacturing and half not, account for two-thirds of North Carolina's total employees in KTI industries. The remaining one-third is spread across 29 other KTI industries.[9]

Concentration of KTI industries as measured by location quotients, shows that North Carolina has 16 KTI industries with a larger share of activity than expected based on national trends. Pharmaceutical and Medicine Manufacturing had the largest location quotient (2.36) out of KTI industries, a value more than double what is expected based on the national average. In total, the 35 KTI industries have an average annual wage of $91,942 which is more than $23,000 higher than the North Carolina average annual wage.[10]

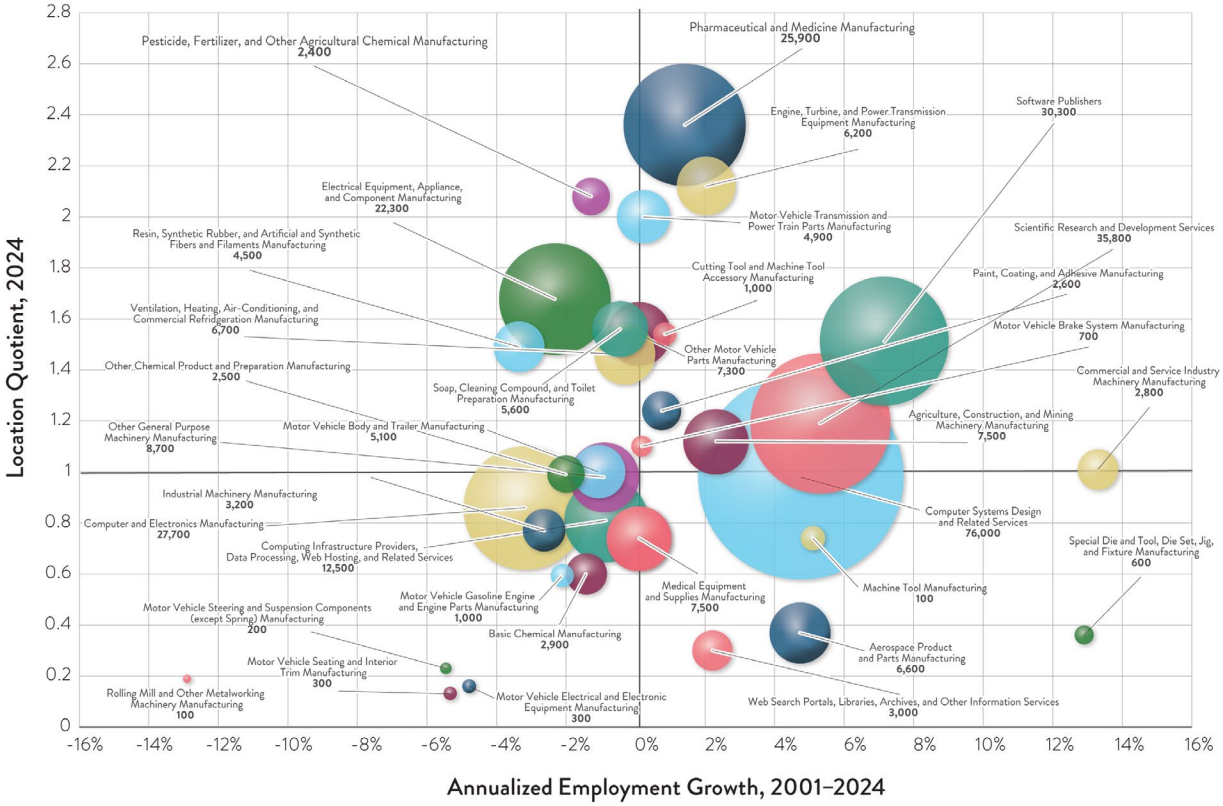
8 For the purposes of this report, location quotients of at least 1.1 designate industries in which North Carolina has a larger share of activity sector than we would expect based on national trends. See Methodological Note below for more detail.

9 The Bureau of Labor Statistics suppressed data for three subsectors (motor vehicle manufacturing, railroad rolling stock manufacturing, and ball and roller bearing manufacturing) for North Carolina for the 2024 time period. Historical data exist for these three subsectors for North Carolina. Data is suppressed to protect the identity, or identifiable information, of cooperating employers. Most of the suppressed data are often provided by or are substantially attributable to a single large employer. Suppressions may also be necessary for otherwise disclosable data that may be used to derive sensitive information from another industry or area.

10 Although North Carolina is well known for having a strong financial services and banking sector, major portions of those sectors do not appear here because this analysis includes only the portions defined as having KTI employment. Additionally, a considerable portion of those jobs are classified in other sectors, such as Management of Companies and Enterprises, which does appear here and in which North Carolina performs well.

INDICATOR 6.4: INDUSTRY MIX

6.4C: Industry Employment, Annualized Employment Growth, and Concentration, KTI Employment Industries, N.C., 2024



Source: Quarterly Census of Employment and Wages (QCEW), Bureau of Labor Statistics (BLS), and NC Department of Commerce Labor and Economic Analysis Division (LEAD).

Note: Employment numbers rounded to nearest hundred;Circle size represents number of employees. NAICS codes 332913, 3369, 3361, 3365, and 332991 not included

INDICATOR 6.4: INDUSTRY MIX

6.4D: Employment and Wages in KTI Employment Industries, N.C.

NAICS CODE	SECTOR	EMPLOYMENT					
		Total 2024 (rounded)	Share of Total 2024	Cumulative Share of Total 2024	Annualized Growth Rate (Compound Annual Growth Rate) 2001-2024	Location Quotient 2024	2024 Average Earnings (rounded)
5415	Computer Systems Design and Related Services	76,000	23.2%	23.2%	4.8%	0.98	$131,400
5417	Scientific Research and Development Services	35,800	10.9%	34.1%	5.3%	1.19	$150,700
5132	Software Publishers	30,300	9.3%	43.4%	7.2%	1.51	$175,400
334	Computer and Electronics Manufacturing	27,700	8.5%	51.8%	-3.2%	0.86	$139,900
3254	Pharmaceutical and Medicine Manufacturing	25,900	7.9%	59.8%	1.4%	2.36	$117,800
335	Electrical Equipment, Appliance, and Component Manufacturing	22,300	6.8%	66.6%	-2.3%	1.68	$79,100
518	Computing Infrastructure Providers, Data Processing, Web Hosting, and Related Services	12,500	3.8%	70.4%	-0.8%	0.81	$148,400
3339	Other General Purpose Machinery Manufacturing	8,700	2.7%	73.0%	-0.9%	0.98	$82,500
3331	Agriculture, Construction, and Mining Machinery Manufacturing	7,500	2.3%	75.3%	2.3%	1.12	$76,000
3391	Medical Equipment and Supplies Manufacturing	7,500	2.3%	77.6%	0.1%	0.74	$75,100
33639	Other Motor Vehicle Parts Manufacturing	7,300	2.2%	79.8%	0.1%	1.54	$68,000
3334	Ventilation, Heating, Air-Conditioning, and Commercial Refrigeration Equipment Manufacturing	6,700	2.0%	81.9%	-0.3%	1.46	$80,600
3364	Aerospace Product and Parts Manufacturing	6,600	2.0%	83.9%	4.7%	0.37	$113,300
3336	Engine, Turbine, and Power Transmission Eqiupment Manufacturing	6,200	1.9%	85.8%	2.0%	2.12	$94,800
3256	Soap, Cleaning Compound, and Toilet Preparation Manufacturing	5,600	1.7%	87.5%	-0.4%	1.56	$75,700
3362	Motor Vehicle Body and Trailer Manufacturing	5,100	1.6%	89.1%	-1.1%	1	$69,400
33635	Motor Vehicle Transmission and Power Train Parts Manufacturing	4,900	1.5%	90.6%	0.2%	2	$71,500
3252	Resin, Synthetic Rubber, and Artificial and Synthetic Fibers and Filaments Manufacturing	4,500	1.4%	91.9%	-3.3%	1.49	$128,600
3332	Industrial Machinery Manufacturing	3,200	1.0%	92.9%	-2.6%	0.77	$78,200
519	Web Search Portals, Libraries, Archives, and Other Information Services	3,000	0.9%	93.8%	2.2%	0.3	$167,200
3251	Basic Chemical Manufacturing	2,900	0.9%	94.7%	-1.4%	0.6	$102,700
333310	Commercial and Service Industry Machinery Manufacturing	2,800	0.9%	95.6%	13.3%	1.01	$78,500
3255	Paint, Coating, and Adhesive Manufacturing	2,600	0.8%	96.4%	0.8%	1.24	$77,300
3259	Other Chemical Product and Preparation Manufacturing	2,500	0.8%	97.1%	-2.0%	0.99	$81,100
3253	Pesticide, Fertilizer, and Other Agricultural Chemical Manufacturing	2,400	0.7%	97.9%	-1.3%	2.08	$132,400
332913	Plumbing Fixture Fitting and Trim Manufacturing	1,100	0.3%	98.2%	-	3.04	$61,300
33631	Motor Vehicle Gasoline Engine and Engine Parts Manufacturing	1,000	0.3%	98.5%	-2.1%	0.59	$64,600
333515	Cutting Tool and Machine Tool Accessory Manufacturing	1,000	0.3%	98.8%	0.8%	1.54	$63,900
333517	Machine Tool Manufacturing	1,000	0.3%	99.1%	5.1%	0.74	$83,200
3369	Other Transportation Equipment Manufacturing	700	0.2%	99.3%	-	0.59	$71,300
33634	Motor Vehicle Brake System Manufacturing	700	0.2%	99.5%	0.2%	1.1	$63,800
333514	Special Die and Tool, Die Set, Jig, and Fixture Manufacturing	600	0.2%	99.7%	12.9%	0.36	$61,900
33632	Motor Vehicle Electrical and Electronic Equipment Manufacturing	300	0.1%	99.8%	-4.8%	0.16	$63,900
33636	Motor Vehicle Seating and Interior Trim Manufacturing	300	0.1%	99.9%	-5.3%	0.13	$51,000
33633	Motor Vehicle Steering and Suspension Components (except spring) Manufacturing	200	0.1%	100.0%	-5.5%	0.23	$54,100
333519	Rolling Mill and Other Metalworking Machinery Manufacturing	100	0.0%	100.0%	-12.9%	0.19	$75,300
3361	Motor Vehicle Manufacturing	-	0.0%	100.0%	-100.0%	0	NA
3365	Railroad Rolling Stock Manufacturing	-	0.0%	100.0%	-	0	NA
332991	Ball and Roller Bearing Manufacturing	-	0.0%	100.0%	-100.0%	0	NA
	Total	**327,500**		**100.00%**	**-5.2%**		**$91,942**

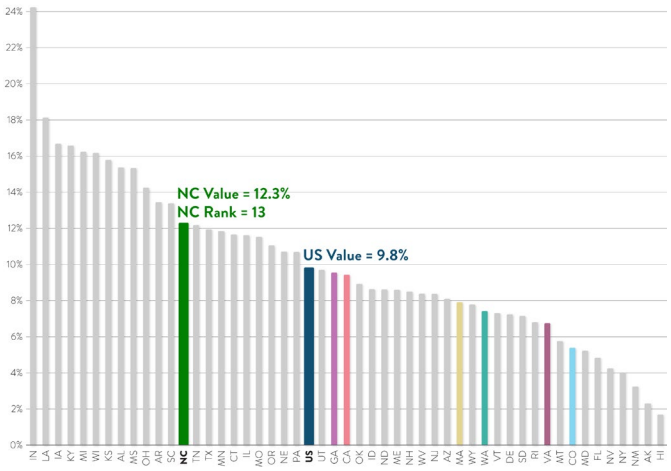
Source: QCEW Employees, Non-QCEW Employees, Self-Employed & Extended Proprietors - EMSI 2021.3 Class of Worker.

Note: Average Wage and Employment numbers rounded to the nearest hundreds. Sorted in descending order by number of employees.

INDICATOR 6.4: INDUSTRY MIX

Due to the large presence of the manufacturing sector and manufacturing related KTI industries in North Carolina, it is not surprising to see North Carolina's manufacturing GDP accounts for 12.3 percent of the state's total GDP **[6.4E]**. This value is 148 percent of the U.S. average (9.3 percent) and 50.8 percent of the top state, Indiana (24.2 percent). Among comparison states, North Carolina is the only state to have manufacturing GDP as a percentage of total state GDP be above the U.S. average.

6.4E: Manufacturing GDP as a Percentage of State GDP, All U.S. States, 2024

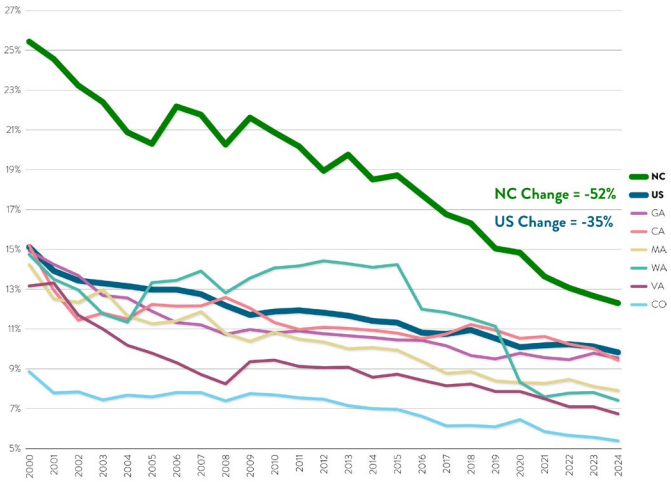


Source: U.S. Bureau of Economic Analysis.

INDICATOR 6.4: INDUSTRY MIX

Since 2000, North Carolina's manufacturing GDP as a percentage of the state GDP has been above the U.S. average and all other comparison states **[6.4F]**. North Carolina's maximum value was in 2000, with a value of 25.4 percent of total state GDP coming from manufacturing. North Carolina, like all comparison states and the U.S. average, saw a large drop in the share of manufacturing GDP in state total GDP between 2000 and 2004, with a 52 percent decrease. Among comparison states, this is the largest decrease, but Washington and Virginia closely follow with decreases of 49.7 percent or 48.8 percent, respectively. The decrease seen in manufacturing in the U.S. average is likely a component of manufacturing in other countries to lower costs of products.

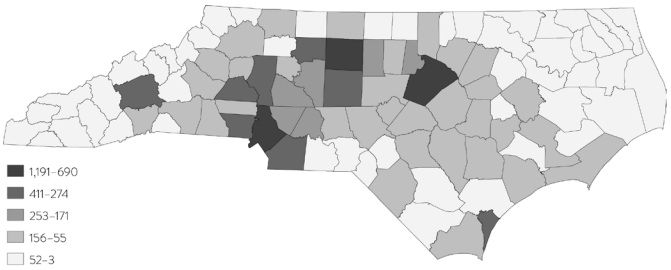
6.4F: Manufacturing Percentage of State GDP, Comparison States, 2000–2024



Source: U.S. Bureau of Economic Analysis.

The number of manufacturing establishments in counties across North Carolina varies greatly, but there is a large presence of manufacturing establishments in the Piedmont and Western regions of the state **[6.4G]**.[11] The county with the largest number of manufacturing establishments is Mecklenburg (1,191), whereas Camden County has the lowest number of establishments with three. The top five counties for manufacturing presence are Mecklenburg, Wake, Guilford, Catawba, and Buncombe. These are closely followed by Iredell, Forsyth, Gaston, Union, Randloph, and New Hanover. As of 2025, 28 counties in North Carolina had 100 or more manufacturing establishments in the county. The remaining 72 counties had a range of three to 98, with an average of 39 manufacturing establishments per county. Notably, the northeastern region of the state and the farthest west counties had the lowest number of manufacturing establishments.

6.4G: Number of Manufacturing Establishments, N.C. Counties, 2025



Source: Lightcast.

11 Number and location of manufacturing establishments were determined using NAICS codes 31-33.

INDICATOR 6.4: INDUSTRY MIX

What Does this Mean for North Carolina?

North Carolina's industry mix with positions the state to be an innovation leader in only small number of sectors and industries. Specifically, as mentioned previously in indicators 4.1 (KTI Employment Establishments) and 4.2 (Employment in KTI Establishments) and illustrated in more detail here, much of the state's employment does not come from KTI industries or businesses, suggesting room for growth in both the number and variety of KTI sectors and industries. Among the KTI establishments in North Carolina, nearly 75 percent have average annual wages higher than the state's average annual wage. Slightly less than half are increasing in employment, but overall KTI employment as a percentage of total employment is increasing.

The majority of the state's KTI industries are in the Manufacturing sector. In general, manufacturing (particularly technology-based advanced manufacturing) remains the key source of U.S. traded-sector strength.[12] This is important because traded-sector establishments provide the economic foundation on which the rest of the economy grows. Manufacturing jobs also have large employment multiplier effects (nationally, each manufacturing job supports approximately 2.9 other jobs in the rest of the economy).[13] While North Carolina has lost a large number of manufacturing jobs since 2000, it is notable that most of those job losses have been in low-technology, low-skill industries, while productivity and job gains have been the case in KTI employment, high-skill industries. In North Carolina, overall, manufacturing wages are higher than the U.S. average, and for KTI manufacturing industries, even higher.

12 The traded sector comprises those industries and establishments that produce goods and services (e.g., electronics, management consulting, advertising) that have a high potential to be consumed outside the region of production. The non-traded sector comprises local-serving industries (e.g., construction, personal services, real estate).

13 For more information, see Bivens, J., "Updated Employment Multipliers for the U.S. Economy," Economic Policy Institute, January 2019. https://www.epi.org/publication/updated-employment-multipliers-for-the-u-s-economy/ (PDF: https://files.epi.org/pdf/160282.pdf).

INDICATOR 6.4: INDUSTRY MIX

Within North Carolina, only 36.5 percent of the manufacturing jobs are currently in KTI employment industries.[14] Given the importance and impact of KTI manufacturing, and given that manufacturing establishments perform approximately two-thirds of industry R&D (see table 2.2C, Business-Performed R&D Expenditures in U.S. and N.C. by Industry), North Carolina should work to ensure that new KTI employment manufacturing industries are forming in or relocating to the state. North Carolina should also work to ensure that existing manufacturing industries are innovating and incorporating new technologies to increase their productivity. Similar efforts should also be devoted to KTI employment industries not in the manufacturing sector, such as Professional, Scientific, and Technical Services. Such efforts would expand innovation in North Carolina, thereby improving the economic well-being and quality of life of all its citizens. ▸

14 This percentage results from dividing the number of KTI manufacturing jobs (i.e., those with 3 to 6-digit NAICS codes within the 2-digit range 31–33) in table 6.4D (169,900) by the total number of manufacturing jobs (465,100) in table 6.4B.

INDICATOR 6.4: INDUSTRY MIX

METHODOLOGICAL NOTE

Relative concentration is measured using a simple descriptive measure called a location quotient. For a given industry, the location quotient is the ratio of the industry's share of employment in North Carolina to its share of employment in the U.S. as a whole. A location quotient equal to 1.0 indicates that the industry's share in North Carolina matches the comparable share for the U.S. as a whole. A location quotient significantly above 1.0 (i.e., more than 10 percent higher) signifies state specialization, i.e., the state has a larger share of activity (more concentration) in the industry than we would expect based on national trends. Conversely, a location quotient significantly below 1.0 (i.e., more than 10 percent lower) signifies state lack of specialization, i.e., the state has a smaller share of activity (less concentration) in the industry than we would expect based on national trends. The formula for computing a location quotient is as follows:

$$\frac{\text{EMPLOYMENT INDUSTRY i, NC}}{\text{(TOTAL EMPLOYMENT, NC)}} \div \frac{\text{EMPLOYMENT INDUSTRY i, US}}{\text{(TOTAL EMPLOYMENT, US)}}$$

Appendices, etc.

Appendix A

KNOWLEDGE- AND TECHNOLOGY-INTENSIVE (KTI) EMPLOYMENT INDUSTRIES

To define knowledge-and technology-intensive (KTI) employment industries, this report uses the approach employed by the National Science Foundation (NSF) in its Science & Engineering Indicators report.[1] NSF's approach is based on the R&D intensity of an industry, which is determined by the ratio of the industry's R&D expenditures to its value-added output. This approach uses an Organization for Economic Co-operation and Development (OECD) taxonomy of economic activities based on research and development (R&D) intensity developed by Galindo-Rueda and Verger (2016).[2]

KTI employment occupations center around high and medium-high R&D intensity industries based on manufacturing and services occupations. These occupations employ workers who possess an in-depth knowledge of the theories and principles of science, engineering, and mathematics, which is generally acquired through postsecondary education in some field of technology. An industry is considered a KTI employment industry if R&D expenditures as a percent of Gross Value Added is five percent or higher based on OECD classification of three-digit International Standard Industrial Classification (ISIC) Rev.4 codes.

In this report, the category "KTI employment industries" refers only to private sector businesses. Each industry is defined by a three to six-digit code that is based on the North American Industry Classification System (NAICS). The NAICS classifications are periodically revised, thereby affecting the trend data presented in the tables. Relevant NAICS codes were used for the appropriate years of data presented (so in time-series analyses, multiple versions of the NAICS codes were used.) The list of KTI employment industries used in this report includes the 41 codes from the 2012 NAICS listing, as well as a crosswalk to codes from 2002, 2007, 2012, 2017, and 2022, as outlined below[SN1.1], for time-series charts.[3]

1 See "Knowledge- and Technology-Intensive Industry Employment" in the Technical Notes section: ncses.nsf.gov/indicators/states/technical-notes.

2 Galindo-Rueda F, Verger F, OECD Taxonomy of Economic Activities Based on R&D Intensity, OECD Science, Technology and Industry Working Papers, 2016/04, OECD Publishing, Paris (2016).

3 The two additional codes (beyond the first 41 codes) at the bottom of the table—333515 and 333518—are crosswalks from the 2002 and 2007 NAICS versions, as those industries were separate in those NAICS versions.

Appendix A

KTI NAICS Codes

*Indicates when a code was merged with, or converted to, another code.

2002 NAICS	2007 NAICS	2012 NAICS (NSF Standard)	2017 NAICS	2022 NAICS	Industry
334	334	334	334	334	Computer and Electronic Manufacturing
335	335	335	335	335	Electrical Equipment, Appliance, and Component Manufacturing
518	518	518	518	518	Computing Infrastructure Providers, Data Processing, Web Hosting, and Related Services
519	519	519	519	519	Web Search Portals, Libraries, Archives, and Other Informational Services
3251	3251	3251	3251	3251	Basic Chemical Manufacturing
3252	3252	3252	3252	3252	Resin, Synthetic Rubber, and Artificial and Synthetic Fibers and Filaments Manufacturing
3253	3253	3253	3253	3253	Pesticide, Fertilizer, and Other Agricultural Chemical Manufacturing
3254	3254	3254	3254	3254	Pharmaceutical and Medicine Manufacturing
3255	3255	3255	3255	3255	Paint, Coating, and Adhesive Manufacturing
3256	3256	3256	3256	3256	Soap, Cleaning Compound, and Toilet Preparation Manufacturing
3259	3259	3259	3259	3259	Other Chemical Product and Preparation Manufacturing
3331	3331	3331	3331	3331	Agriculture, Construction, and Mining Machinery Manufacturing
3332	3332	3332	3332	3332	Industrial Machinery Manufacturing
3334	3334	3334	3334	3334	Ventilation, Heating, Air-Conditioning, and Commercial Refrigeration Equipment Manufacturing
3336	3336	3336	3336	3336	Engine, Turbine, and Power Transmission Equipment Manufacturing
3339	3339	3339	3339	3339	Other General Purpose Machinery Manufacturing
3361	3361	3361	3361	3361	Motor Vehicle Manufacturing
3362	3362	3362	3362	3362	Motor Vehicle Body and Trailer Manufacturing
3364	3364	3364	3364	3364	Aerospace Product and Parts Manufacturing
3365	3365	3365	3365	3365	Railroad Rolling Stock Manufacturing
3369	3369	3369	3369	3369	Other Transportation Equipment Manufacturing
3391	3391	3391	3391	3391	Medical Equipment and Suppliers Manufacturing
5112	5112	5112	5112*	5132	Software Publishers
5415	5415	5415	5415	5415	Computer Systems Designs and Related Services
5417	5417	5417	5417	5417	Scientific Research and Development Series
33631	33631	33631	33631	33631	Motor Vehicle Gasoline Engine and Engine Parts Manufacturing
33632	33632	33632	33632	33632	Motor Vehicle Electrical and Electronic Equipment Manufacturing

Appendix A

2002 NAICS	2007 NAICS	2012 NAICS (NSF Standard)	2017 NAICS	2022 NAICS	Industry
33633	33633	33633	33633	33633	Motor Vehicle Steering and Suspension Components (escept Spring) Manufacturing
33634	33634	33634	33634	33634	Motor Vehicle Brake System Manufacturing
33635	33635	33635	33635	33635	Motor Vehicle Transmission and Power Train Parts Manufacturing
33636	33636	33636	33636	33636	Motor Vehicle Seating and Interior Trim Manufacturing
33639	33639	33639	33639	33639	Other Motor Vehicle Parts Manufacturing
332913	332913	332913	332913	332913	Plumbing Fixture Fitting and Trim Manufacturing
332991	332991	332991	332991	332991	Ball and Roller Bearing Manufacturing
333314	333314	333314	333314*	333310	Commercial and Service Industry Machinery Manufacturing
333315	333315*	333316	333316*	333514	Commerical and Service Industry machinery Manufacturing
333319	333319*	333318	333318*	333515	Commerical and Service Industry machinery Manufacturing
333318	333318*	333514	333514*	333517	Special Die and Tool, Die Set, Jig, and Fixture Manufacturing
333512	333512*	333515	333515*	333519	Cutting Tool and Machine Tool Accessory Manufacturing
333513	333513*	333517	333517		Machine Tool Manufacturing
333514	333514*	333519	333519		Rolling Mill and Other Metalworking Machinery Manufacturing
333515	333515*				Cutting Tool and Machine Tool Accessory Manufacturing
333518	333518				Other Metalworking Machinery Manufacturing

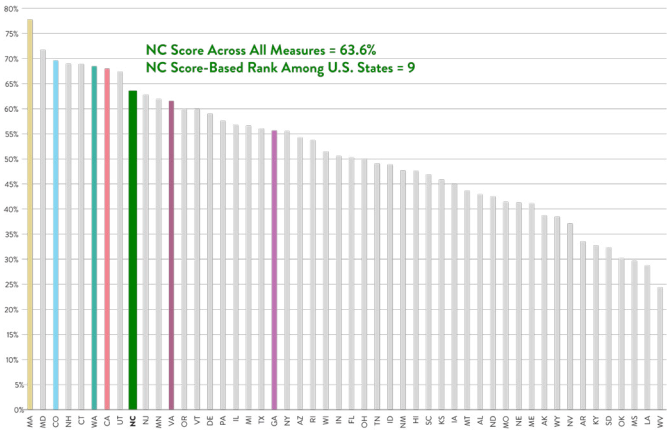
Appendix B

SCORE-BASED RANKINGS

Previous editions of the *Tracking Innovation* report have used a ranking method in which North Carolina's overall rank is the average of its rank across all the individual measures. This average-ranking method provides an estimate of the average performance of the state across those measures but does not allow for an interval-level comparison to other states.[1] With 41 measures across 50 states, many states' averages fall within each other's standard deviation of their average rank,[2] meaning that the significance of a summary average rank across all measures may be limited. On many measures, there is very little statistically significant variation between state ranks. This is most applicable to rankings with a low level of variation across the distribution, in which case the difference between the top-ranked state and the lowest-ranked state may be small and not particularly meaningful.[3]

An alternative approach is to use the rankings on each measure to determine a total "score" for each state and then rank and array the states in order of their score. Specifically, for a given state, the overall state rank is determined first by having each measure's rank serve as a score out of 100 (e.g., for each measure, at the top of the distribution a state rank of 1 scores 100, a rank of 2 scores 98, a rank of 3 scores 96, etc.; at the other end of the distribution, a rank of 50 scores a 2, a rank of 49 scores a 4, a rank of 48 scores a 6, etc.). These scores are then summed across all

Score-Based State Rankings, All U.S. States, *Tracking Innovation* 2026 Data



41 measures for each state, and the sum for each state is divided by the total possible points (4,100) to create an interval-level percentage score relative to 100 percent for each state.

Using this score-based method and the most recent data available, North Carolina scores 63.6 percent, ranking it 9th among all U.S. states; the average score for all states is 49.2 percent **[Score-Based State Rankings]**. This indicates that North Carolina's rank is above the U.S. average and in the top quintile of all U.S. states. Among the six comparison states referenced in this report,[4] Massachusetts is the highest-scoring state (77.8 percent) in the nation. Three other comparison states (Colorado, 69.6 percent; Washington, 68.5 percent; California, 68.0 percent) also score above North Carolina, and two (Virginia, 61.6

1 The average-ranking method produces ordinal-level measures, which allow only for the rank order (1st, 2nd, 3rd, etc.) by which data can be sorted, but does not allow for relative degree of difference between the data. In contrast, the scoring method explained here allows for rank order and also yields more meaningful differences between data values.

2 The average standard deviation across all the states' average rank is 12.99. The minimum standard deviation is 8.49; the maximum is 16.65.

3 This causes a situation in which many states have the same summary average rank and are essentially "tied" with other states. For example, New Jersey, Minnesota, and Virginia have the same summary average rank of 20th. For more detail, see the "Interpreting the Data" section in the Introduction. As explained there, rankings tend to divert attention from the actual value of a given measure, which often is more important. Care must be taken not to overinterpret rankings.

4 For more discussion of the comparison states, see the Introduction.

percent; Georgia, 55.7 percent) score below North Carolina. Overall, the score-based ranks show which states are most competitive relative to North Carolina and provide more detail regarding their degree of separation.[5]

The 2013 *Tracking Innovation* report was the first to calculate and report average ranks, and the five reports since then have continued that practice. The 2024 *Tracking Innovation* report was the first to calculate and report score-based ranks using current data as well as data from the previous reports, and this report continue that reporting for consistency.

Both the average-rank and score-based rank methods show North Carolina consistently in at least the second quartile of all U.S. states and improving over time **[North Carolina Rank Over Time]**.[6] While the two methods show similar results for the years 2013-2017, the score-based method indicates greater improvement for North Carolina in recent years. This is because scores are more discerning of the relative degree of difference between North Carolina and several states that have the same or a proximate summary average rank. To the extent North Carolina has made improvements relative to states in its peer group in recent years, the score-based rank is better able to measure the cumulative impact of those improvements.

N.C. Rank Over Time: Average Rank vs. Score-Based Rank, 2013-2026

Note: Lower numbers indicate a higher rank.

5 Two innovation indexes produced by other organizations use score-based ranking methods and show similar levels of performance for North Carolina. Using 25 measures, the Information Technology & Innovation Foundation's (ITIF) 2020 State New Economy Index yields a score of 62.2 for North Carolina and a state rank of 19th (itif.org/publications/2020/10/19/2020-state-new-economy-index). Using 106 measures, the Milken Institute's 2022 State Technology and Science Index yields a score of 62.5 and a rank of 11th for North Carolina (milkeninstitute.org/content-hub/research-and-reports/research-and-data-tools/state-technology-and-science-index-2022).

6 In rank order across the 50 states, the first quartile ranges from 1 to 12.5, the second quartile ranges from 12.5 to 25, the third quartile ranges from 25 to 37.5, and the fourth quartile ranges from 37.5 to 50.

Appendix C

MEASURES RANKED BY NORTH CAROLINA PERCENTAGE OF U.S. AVERAGE VALUE

The following table presents the same measures summarized in the **Statewide Summary Chart in the Executive Summary**. However, the table below arranges the order in descending order based on North Carolina's # of U.S. Average Value rather than by Indicator Category (as in the Executive Summary).

MEASURE	N.C. RANK	N.C. % OF U.S. AVERAGE VALUE	PERFORMANCE OVER TIME[1] N.C.	PERFORMANCE OVER TIME[1] U.S.
		0% 20% 40% 60% 80% 100% 120% 140% 160% 180% 200%		
Population growth, 2000–2025	8	183%	↑	↑
Approp. of State Tax Funds for Higher Education as a Percentage of State GDP, 2024	6	164%	↓	↓
Manufacturing GDP a Percentage of State GDP, 2024	13	148%	↓	↓
Academic Science & Engineering R&D per $1,000 of State GDP, 2023	5	141%	↑	↑
Avg. Number of University Startups Formed per $1 M of Academic S&E R&D Expend., 2022–2023	10	128%	↑	↑
Average Annual SBIR & STTR Funding per $1 Million of GDP, 2022–2024	14	127%	↑	↑
Ethnic Diversity in KTI Industries, 2024	22	127%	↓	↓
Academic License Inc. (Running) as a Percentage of Acad. S&E R&D Expend., 2022–2023	9	122%	↑	↓
In-Migration of College Educated Adults as a Percentage of Total State Population, 2024	19	122%	↑	↑
KTI Employment Establishments as Percentage of All Business Establishments, 2024	20	116%	↑	↑
Academic S&E Article Output per 1,000 SEH Doctorate Holders in Academia, 2023	5	112%	↑	↑
Gender Diversity in KTI Industries, 2024	7	107%	↓	↑
Average Opportunity Share of New Entrepreneurs, 2024–2025	22	105%	↑	↓
Percentage of Citizens in Poverty, 2024	35	103%	↓	↑
Employment in KTI Employment Establishments as a Percentage of Total Employment, 2024	19	103%	↓	↓
Educational Attainment of Residents Aged 25 and Over (Composite Score), 2024	18	102%	↑	↑
Individuals in S&E Occupations as a Percentage of the Workforce, 2020	15	101%	↑	↑
S&E Degrees as a Percentage of Higher Education Degrees Conferred, 2023	22	101%	↑	↑
Average Years of Education Among In-Migrants, 2024	25	100%	↑	↑
Percentage of Homes with a Broadband Subscription, 2024	19	100%	↑	↑
Percentage of Homes with an Internet Accessible Device, 2024	25	100%	↑	↑
Employed SEH Doctorate Holders as a Percentage of the Workforce, 2023	16	98%	↑	↑
Cost of Living Index, 2025	12	96%	N/A	N/A
Engineers as a Percentage of All Occupations, 2020	27	94%	↑	↑
Average Annual Wage, 2024	21	91%	↑	↑
Median Household Income, 2024	36	91%	↑	↑
Academic License Inc. (Gross) as a Percentage of Academic R&D Expend., 2022-2023	9	91%	N/A	N/A
Unemployment Rate, 2024	26	90%	↓	–
Bachelor's Degrees in S&E Conferred per 1,000 Individuals 18–24 Years Old, 2023	29	90%	↑	↑
Per Capita Income, 2024	34	90%	↑	↑
Total R&D Expenditures as a Percentage of GDP, 2022	13	89%	↑	↑
Per Capita Gross Domestic Product, 2024	31	88%	↑	↑
Academic Patents Awarded per 1,000 S&E Doctorate Holders in Academia, 2023	16	88%	↑	↑
Average Monthly Number of Entrepreneurs per 100,000 People, 2024–2025	27	86%	↑	↑
Venture Capital Dispersed per Venture Capital Deal, 2024	8	82%	↑	↑
Elementary & Secondary Public School Current Expend. as a Percentage of State GDP, 2023	47	78%	↓	↓
Exports as a Percentage of GDP, 2024	26	73%	↑	↑
Patents Awarded per 1,000 Residents, 2022	21	72%	↑	↑
Business-Performed R&D as a Percentage of Private-Industry Output, 2022	15	69%	↓	↑
Federal R&D Obligations per Employed Worker, 2023	25	63%	↑	↑
Venture Capital Dispersed per $1 Million of GDP, 2024	9	57%	↑	↑
AVERAGE N.C. RANK ACROSS ALL MEASURES	19[2]			

↑ Improving ↓ Worsening[3]

1 For most measures, "over time" refers to the period between the year 2000 and the year listed to the right of the measure. In the rare cases when data were not available starting in 2000 for a measue, the starting year is typically few years after 2000.

2 Assumes measures are weighted equally.

3 For the Unemployment Rate and Percentage of Citizens in Poverty, increases represent worsening, while decreases represent improving.

Sources

Introduction

Atkinson, Robert D., and Caleb Foote. 2020. *The 2020 State New Economy Index: Benchmarking Economic Transformation in the States*. Washington, D.C.: Information Technology & Innovation Foundation. itif.org/publications/2020/10/19/2020-state-new-economy-index.

Atkinson, Robert D., and Stephen J. Ezell. 2012. *Innovation Economics: The Race for Global Advantage*. New Haven, Conn.: Yale University Press.

Hecker, Daniel E. 2005. "High-Technology Employment: A NAICS-Based Update." *Monthly Labor Review*. July: 57–72.

Jones, Charles I. and John C. Williams. 2000. "Too Much of a Good Thing? The Economics of Investment in R&D." *Journal of Economic Growth*. 5: 65–85.

Jones, Charles I., and John C. Williams. 1998. "Measuring the Social Return to R&D." *The Quarterly Journal of Economics*. 113, No. 4: 1119-135.

Tassey, Gregory. 2007. *The Technology Imperative*. Cheltenham, UK: Edward Elgar.

United States Department of Commerce. 2012. *The Competitiveness and Innovative Capacity of the United States*. Washington, D.C.: U.S. Dept. of Commerce.

Indicators

The indicators in this report were compiled using existing secondary data sources. The specific measures within the various indicators typically required reconfiguration of existing datasets. Because the measures were derived from a wide range of sources, there are variations in the time frames used and in the specific data that define the indicators being measured. The information below provides detailed notes on data sources used for each indicator. When available, website addresses are provided. Where relevant for an indicator, the citations of publications referenced in the indicator explanation are also presented.

1.1: Gross Domestic Product (GDP)

State-level GDP data were obtained from the National Science Foundation using data from State Higher Education Executive Officers Association, State Higher Education Finance, U.S. Bureau of Economic Analysis (BEA), U.S. Department of commerce, accessed September 18, 2025, ncsesdata.nsf.gov/indicators/states/indicator/state-tax-appropriations-for-higher-ed-operations-to-state-gdp. State-level GDP data are normalized using population data from the U.S. Census Bureau (see 1.6: Population Growth).

County-level GDP data are from Real GDP by county dataset, U.S. BEA, U.S. Department of Commerce, bea.gov/iTable/index_regional.cfm, accessed April 21, 2026. County-level GDP was normalized using population data from the U.S. Census Bureau (see Indicator 1.6: Population Growth). Subnational over-time data are adjusted for inflation using the BEA's GDP deflator.

Sources

1.2: Income

State-level per-capita income data are from the U.S. Bureau of Economic Analysis (BEA), U.S. Department of Commerce, Per Capita Personal Income dataset, accessed January 21, 2026, bea.gov/iTable/index_regional.cfm.

State-level median household income data are from the U.S. Census Bureau, American Community Survey, S1093-Median Income in the Last 12 Months dataset, 1-Year Estimates, accessed December 12, 2025, data.census.gov/cedsci/all?q=s1903.

County-level median household income data are from the U.S. Census Bureau, American Community Survey, S1903-Median Income in the Last 12 Months dataset, 5-Year Estimates, accessed April 27, 2026, data.census.gov/cedsci/all?q=s1903.

Over-time data are adjusted for inflation using the Bureau of Labor Statistics (BLS), U.S. Department of Labor, All Urban Consumers Consumer Price Index (CPI), accessed January 13, 2026, bls.gov/cpi/data.htm.

U.S. Bureau of Economic Analysis, "Personal Income Summary, County," 2024, bea.gov/data/special-topics/distribution-of-personal-income.

1.3: Average Annual Wage

State and county-level average annual wage data are from the Bureau of Labor Statistics (BLS), U.S. Department of Labor, Quarterly Census of Employment and Wages program, accessed September 16, 2025, data.bls.gov/PDQWeb/en.

Over-time data are adjusted for inflation using the Bureau of Labor Statistics (BLS), U.S. Department of Labor, Consumer Price Index (CPI), accessed January 13, 2026, bls.gov/cpi/data.htm.

1.4: Unemployment

State and county-level unemployment data are from the Bureau of Labor Statistics (BLS), U.S. Department of Labor, Local Area Unemployment (LAU) Statistics, LAU Tables, accessed September 16, 2025, bls.gov/lau/#tables.

Total U.S. unemployment is from the Current Population Survey, U.S. BLS, U.S. Department of Labor, Employment status of the civilian noninstitutional population, 1950 to date, bls.gov/cps/tables.htm#empstat, accessed September 16, 2025.

1.5: Poverty

State-level poverty data are from the U.S. Census Bureau, American Community Survey, S1701: Poverty Status in the Last 12 Months dataset, 1-Year Estimates. 2005 to 2009 data were accessed August 12, 2019, factfinder.census.gov/faces/nav/jsf/pages/searchresults.xhtml?refresh=t#none; 2010 to 2022 data were accessed October 16, 2023, data.census.gov/cedsci/table?q=s1701; 2023 to 2024 data were accessed January 8, 2026, data.census.gov/cedsci/table?q=s1701.

County-level poverty data are from the U.S. Census Bureau, American Community Survey, S1701: Poverty Status in the Last 12 Months dataset, 5-Year Estimates, accessed April 27, 2026, data.census.gov/cedsci/table?q=s1701.

Sources

1.6: Population Growth

State-level 2020 to 2025 population data are from the Annual Estimates of the Residential Population for the United States, Regions, States, District of Columbia, and Puerto Rico: April 1, 2020 to July 1, 2025, accessed April 15, 2026, National Population Totals: 2020-2025 (census.gov).

State-level 2010 to 2019 population data are from the U.S. Census Bureau, Population Division, Annual Estimates of the Resident Population for the United States, Regions, States, the District of Columbia, and Puerto Rico: April 1, 2010 to July 1, 2019, accessed November 28, 2023, census.gov/programs-surveys/popest/technical-documentation/research/evaluation-estimates/2020-evaluation-estimates/2010s-totals-national.html.

State-level 2000 to 2010 population data are from the U.S. Census Bureau, Intercensal Estimates of the Resident Population for the United States, Regions, States, and Puerto Rico: April 1, 2000 to July 1, 2010, accessed November 28, 2023, census.gov/data/tables/ time-series/demo/popest/intercensal-2000-2010-state.html.

County-level population data are from the Annual Estimates of the Resident Population for Counties: April 1, 2020 to July 1, 2025, accessed April 15, 2026, County Population Totals: 2020-2025 (census.gov).

Historical total population data are from the U.S. Census Bureau, via the North Carolina State Demographer, Historic Census dataset, accessed January 9, 2026, demography.osbm.nc.gov/explore/?sort=modified.

Total population projections are from the North Carolina Office of State Budget and Management, Demographic and Economic Analysis Section, Population Overview, 2010-2050, accessed January 9, 2026, osbm.nc.gov/facts-figures/population-demographics/state-demographer/countystate-population-projections.

2.1: Total Research & Development (R&D)

State-level total R&D data are from the National Science Board, *Science and Engineering State Indicators*, State Indicator S-41: R&D as a Percentage of Gross Domestic Product dataset, accessed September 18, 2025, nsf.gov/statistics/state-indicators/indicator/rd-performance-to-state-gdp.

County-level business R&D data are from Lightcast, accessed May 29, 2026, lightcast.io.

University-level R&D data are from the National Science Foundation, National Center for Science and Engineering Statistics, Higher Education Research and Development Survey, FY 2024, Table 4, accessed January 7, 2026, ncses.nsf.gov/surveys.

National Science Board, Committee on National Science and Engineering Policy, National Science Foundation. 2026. Science and Engineering Indicators 2026: The State of U.S. Science and Engineering. NSB-SEP-2026-1. Alexandria, VA. Available at ncses.nsf.gov/pubs/nsbsep20261.

For more information regarding the BERD survey, see National Science Foundation, National Center for Science and Engineering Statistics, Business Research and Development Survey, 2021, ncses.nsf.gov/surveys/business-enterprise-research-development/2021.

2.2: Business-Performed R&D

State-level business-performed R&D data are from the National Science Board, *Science and Engineering Indicators*, State Indicator S-45: Business-Performed R&D as a Percentage of Private-Industry Output (Percent) dataset, accessed September 18, 2025, ncsesdata.nsf.gov/indicators/states/indicator/business-performed-rd-to-private-industry-output.

Industry-specific business R&D data is from the 2023 Business Research & Development Survey, Table 28-B, accessed December 29, 2025, ncses.nsf.gov/surveys.

Business R&D location data is from Lightcast, accessed May 29, 2026, lightcast.io.

National Science Board, Committee on National Science and Engineering Policy, National Science Foundation. 2026. Science and Engineering Indicators 2026: The State of U.S. Science and Engineering. NSB-SEP-2026-1. Alexandria, VA. Available at ncses.nsf.gov/pubs/nsbsep20261.

2.3: Academic Science & Engineering R&D

State-level academic science & engineering R&D data are from the National Science Board, *Science and Engineering Indicators*, State Indicator S-46: Academic Science and Engineering R&D per $1,000 of Gross Domestic Product dataset, accessed September 18, 2025, ncsesdata.nsf.gov/indicators/states/indicator/academic-rd-per-1000-state-gdp.

University-level R&D data are from the National Science Foundation, National Center for Science and Engineering Statistics, Higher Education Research and Development Survey, FY 2024, Table 4, accessed January 7, 2026, ncses.nsf.gov/surveys.

National Science Board, Committee on National Science and Engineering Policy, National Science Foundation. 2026. Science and Engineering Indicators 2026: The State of U.S. Science and Engineering, Chapter 4, "U.S. R&D Performance and Funding," NSB-SEP-2026-1. Available at ncses.nsf.gov/pubs/nsbsep20261.

2.4: Federal R&D

State-level federal R&D obligations data are from the National Science Board, *Science and Engineering Indicators*, State Indicator S-42: Federal R&D Obligations per Employed Worker dataset, accessed September 22, 2025, nsf.gov/statistics/state-indicators/indicator/federal-rd-obligations-per-employed-worker. This indicator draws from the National Center for Science and Engineering Statistics, Federal Funds for Research and Development: Fiscal Year 2023-24 report, available at ncses.nsf.gov/surveys/federal-funds-research-development/2023-2024.

Sources

National Center for Science and Engineering Statistics (NCSES). 2025. Federal R&D Obligations Declined 2.1% in FY 2023; Estimated to Increase in FY 2024. Available at ncses.nsf.gov/pubs/nsf25329.

2.5: Academic Articles

State-level academic articles data are from the National Science Board, Science and Engineering Indicators, State Indicator S-48: Academic Science and Engineering Article Output per 1,000 Science, Engineering, and Health Doctorate Holders in Academia dataset, accessed September 24, 2025, nsf.gov/statistics/state-indicators/indicator/academic-se-articles-per-1000-seh-doctorate-holders-in-academia.

3.1: SBIR & STTR Funding

State-level SBIR data are from the National Science Board, *Science and Engineering Indicators*, State Indicator S-55: Average Annual Federal Small Business Innovation Research and Small Business Technology Transfer Funding per $1 Million of Gross Domestic Product dataset, accessed September 24, 2025, ncsesdata.nsf.gov/indicators/states/indicator/ave-sbir-and-sttr-funding-per-1-million-state-gdp.

City- and county-level SBIR and STTR data are from SBIR.gov, Awards Search, accessed September 24, 2025, sbir.gov/awards.

Additional information regarding Federal SBIR and STTR programs available at sbir.gov/about/policies.

Additional information regarding One North Carolina Small Business Program available at commerce.nc.gov/grants-incentives/technology-funds/one-north-carolina-small-business-program.

3.2: Academic Patents

State-level academic patents data are from the National Science Board, Science and Engineering Indicators, State Indicator S-50: Academic Patents Awarded per 1,000 Science, Engineering, and Health Doctorate Holders in Academia dataset, accessed September 30, 2025, nsf.gov/statistics/state-indicators/indicator/academic-patents-per-1000-seh-doctorate-holders-in-academia.

University-level academic patents data are from the Association of University Technology Managers (AUTM), FY 2024 Licensing Survey, accessed January 28, 2026, autm.net/surveys-and-tools/surveys/licensing-survey.

Office of Science, Technology & Innovation. March 2015. Recommendation of the Governor's Innovation-to-Jobs Working Group. The North Carolina Department of Commerce. Available at: commerce.nc.gov/governors-innovation-jobs-working-group-recommendations/open.

3.3: Patents

State-level patents data are from the National Science Board, Science and Engineering Indicators, State Indicator S-51: Patents Awarded per 1,000 Individuals in Science and Engineering Occupations dataset, accessed March 13, 2026, nsf.gov/statistics/state-indicators/indicator/patents-per-1000-se-occupation-holders.

Sources

County-level patents data are from the U.S. Patent and Trademark Office (USPTO), Source: U.S. Patent and Trademark Office, via Neo IP Intellectual Property Law Firm and Magic Number, Inc. software, accessed March 13, 2026, neoipassets.com.

3.4: Venture Capital

State-level venture capital data are from the National Science Board, *Science and Engineering Indicators*, State Indicator S-58: Venture Capital Disbursed per $1 Million of Gross Domestic Product dataset, accessed September 15, 2025, nsf.gov/statistics/state-indicators/indicator/venture-capital-per-1-million-state-gdp and State Indicator S-60: Venture Capital Disbursed per Venture Capital Deal dataset, accessed October 6, 2025, ncses.nsf.gov/indicators/states/indicator/venture-capital-per-deal. County-level venture capital data are from PitchBook Data, Inc., accessed October 8, 2025, pitchbook.com.

3.5: Technology License Income

State and university-level license income data are from the Association of University Technology Managers (AUTM), FY 2024 Licensing Survey, accessed January 28, 2026, autm.net/surveys-and-tools/surveys/licensing-survey.

Academic science & engineering R&D data are from the National Science Board, *Science and Engineering Indicators*, State Indicator S-46: Academic Science and Engineering R&D per $1,000 of Gross Domestic Product dataset, accessed September 15, 2025, nsf.gov/statistics/state-indicators/indicator/academic-rd-per-1000-state-gdp.

3.6: University Startups

University startup data are from the Association of Association of University Technology Managers (AUTM), FY 2024 Licensing Survey, accessed January 28, 2026, autm.net/surveys-and-tools/surveys/licensing-survey.

State-level academic science & engineering R&D data are from the National Science Board, *Science and Engineering Indicators*, State Indicator S-46: Academic R&D per $1,000 of Gross Domestic Product dataset, accessed September 15, 2025, nsf.gov/statistics/state-indicators/indicator/academic-rd-per-1000-state-gdp.

4.1: Knowledge- and Technology- Intensive (KTI) Employment Establishments and Formations

KTI employment business establishments by state and county data are from the Bureau of Labor Statistics (BLS), U.S. Department of Labor, Quarterly Census of Employment and Wages program, accessed March 10, 2026, data.bls.gov/cew/apps/data_views/data_views.htm#tab=Tables. The data pertaining to establishments are based on their classification according to the 2012 edition of the North American Industry Classification System (NAICS). See Appendix A for a list of the 41 industries that are defined as having KTI employment.

Sources

4.2: KTI Employment

KTI business employment by state and county data are from the Bureau of Labor Statistics (BLS), U.S. Department of Labor, Quarterly Census of Employment and Wages program, accessed March 10, 2026, data.bls.gov/cew/apps/data_views/data_views.htm#tab=Tables. The data pertaining to establishments are based on their classification according to the 2012 edition of the North American Industry Classification System (NAICS). See Appendix A for a list of the 41 industries that are defined as having KTI employment.

4.3: Entrepreneurial Activity

State-level monthly rate of new entrepreneurs and opportunity share of entrepreneurs data are from the Kauffman Foundation, Kauffman Indicators of Entrepreneurship, accessed March 23, 2026, indicators.kauffman.org/data-tables.

Newly formed businesses in North Carolina data are from the Secretary of State Business Records Search Database, accessed January 13, 2026, sosnc.gov/online_services/search/by_title/search_Business_Registration.

2024 *Tracking Innovation* Report, available at commerce.nc.gov/tracking-innovation-nc-innovation-index-2024/open.

4.4: Exports

State-level export data are from USA Trade Online, U.S. Census Bureau, State Exports, World Total, Total Exports Value, accessed March 24, 2026, USA Trade Online * Home (census.gov).

State-level GDP data are from the State-level academic science & engineering R&D data are from the National Science Board, *Science and Engineering Indicators*, State Indicator S-26: Appropriations of State Tax Funds for Higher Education as a Percentage of Gross Domestic Product dataset, accessed September 15, 2025, ncsesdata.nsf.gov/indicators/states/indicator/state-tax-appropriations-for-higher-ed-operations-to-state-gdp.

4.5: Tech Diversity

State-level data for gender and racial and ethnic demographics of workers in KTI industries are from Lightcast Q3 2025, QCEW Employees, Non-QCEW Employees, and Self-Employed Industry Demographics Table, accessed October 16, 2025, Industry Demographics Table « Lightcast Developer. State-level data for the population of workers in KTI industries are from Lightcast Q3 2025 Data Set, Population of North Carolina Population Demographics Table, accessed October 16, 2025, Population Demographics Table « Lightcast Developer. *Subscription required to access.*

5.1: Science & Engineering Workforce

2003-2020 state-level science & engineering workforce data are from the National Science Board, *Science and Engineering Indicators*, State Indicator S-32: Individuals in Science and Engineering Occupations as a Percentage of All Occupations dataset, accessed January 03, 2022, nsf.gov/statistics/state-indicators/indicator/se-occupations-to-all-occupations.

Sources

2021-2023 state-level science & engineering workforce data are from the National Science Board, *Science and Engineering Indicators*, State Indicator S-66: Individuals in Science and Engineering Occupations as a Percentage of All Occupations dataset, accessed July 15, 2026, ncsesdata.nsf.gov/indicators/states/indicator/occupation-se-to-occupation-all.

5.2: Employed Science, Engineering and Health Doctorate Holders

State-level employed science, engineering and health doctorate holders data are from the National Science Board, *Science and Engineering Indicators*, State Indicator S-33: Employed Science, Engineering, and Health Doctorate Holders as a Percentage of the Workforce dataset, accessed September 15, 2025, nsf.gov/statistics/state-indicators/indicator/seh-doctorate-holders-in-workforce.

5.3: Engineers as a Percentage of All Occupations

2003-2020 state-level engineers as a percentage of all occupations data are from the National Science Board, *Science and Engineering Indicators*, State Indicator S-38: Engineers as a Percentage of All Occupations dataset, accessed January 16, 2024, nsf.gov/statistics/state-indicators/ indicator/engineers-to-all-occupations.

2021-2023 state-level engineers as a percentage of all occupations data are from the National Science Board, *Science and Engineering Indicators*, State Indicator S-71: Engineers as a Percentage of All Occupations dataset, accessed July 15, 2026, ncsesdata.nsf.gov/indicators/states/indicator/occupation-engineer-to-occupation-all.

5.4: Bachelor's Degrees in Science, Engineering and Technology

State-level bachelor's degrees in science, engineering and technology data are from the National Science Board, *Science and Engineering Indicators*, State Indicator S-19: Bachelor's Degrees in Science and Engineering Conferred per 1,000 Individuals 18–24 Years Old dataset, accessed October 1, 2025, nsf.gov/statistics/state-indicators/indicator/se-bachelors-degrees-per-1000-18-24-year-olds.

University of North Carolina System (2026). *UNC System Workforce Alignment Report*.

Hujber, M. (2026, April 8). A region's high concentration of bachelor's degree-holders predicts future economic growth. SSTI. ssti.org/blog/regions-high-concentration-bachelors-degree-holders-predicts-future-economic-growth?utm_source=SSTI+Weekly+Digest.

5.5: Science, Engineering, and Technology Degrees

State-level science, engineering, and technology degree data are from the National Science Board, *Science and Engineering Indicators*, State Indicator S-20: Science and Engineering Degrees as a Percentage of Higher Education Degrees Conferred (Percent) dataset, accessed October 6, 2025, nsf.gov/statistics/state-indicators/indicator/se-degrees-to-all-higher-education-degrees.

Sources

5.6: Educational Attainment

State-level educational attainment data are from the U.S. Census Bureau, American Community Survey, S1501: Educational Attainment for the Population 25 Years and Over, American Community Survey 1-Year Estimates datasets, accessed November 26, 2025, data.census.gov/cedsci/table?q=S1501.

County-level educational attainment data are from the U.S. Census Bureau, American Community Survey, S1501 Educational Attainment; North Carolina and all Counties, 2020-2024 American Community Survey 5-Year Estimates dataset, accessed May 26, 2026, data.census.gov/cedsci/table?q=S1501.

5.7: Educational Attainment of In-Migrants

State-level educational attainment of in-migrants data are from the U.S. Census Bureau, American Community Survey, Geographic Mobility in the Past Year by Educational Attainment for Current Residence in the United States, Population 25 Years and Over in the United States, American Community Survey 1-Year Estimates dataset, Table B07009, accessed November 26, 2025, data.census.gov/cedsci/table?q=b07009&tid=ACSDT1Y2019.B07009.

State-level total population (all ages) data are from the U.S. Census Bureau, 2024 American Community Survey, Total Population, 1-year estimate, Table B01003, accessed November 26, 2025, data.census.gov/cedsci/table?q=population&g=0100000US%240400000&tid=ACSDT1Y2019.B01003&hidePreview=true&tp=true&moe=false.

County-level educational attainment data are from the U.S. Census Bureau, American Community Survey, Geographic Mobility in the Past Year by Educational Attainment for Current Residence in the United States, Population 25 Years and Over in the United States, 2020-2024 American Community Survey 5-Year Estimates dataset, Table B07009, accessed May 26, 2026, data.census.gov/cedsci/table?q=b07009&g=0400000us37,37%240500000&tid=acsdt5y2019.b07009&hidepreview=true&moe=false&tp=true.

6.1: Public Investment in Education

State-level elementary and secondary public school current expenditures data are from the U.S. Census Public Elementary- Secondary Education Finance Data, Table 1. Summary of Public Elementary- Secondary School System Finances by State: Fiscal Year 2024 dataset, accessed September 9, 2025, census.gov/programs-surveys/school-finances.html. 2024 Public Elementary-Secondary Education Finance Data (census.gov) normalized by State-level GDP data from the Real GDP in Chained Dollars dataset, U.S. Bureau of Economic Analysis (BEA), U.S. Department of Commerce, accessed September 9, 2025, bea.gov/iTable/ index_regional.cfm.

Sources

State-level appropriations of state tax funds for operating expenses of higher education data are from the National Science Board, Science and Engineering Indicators, State Indicator S-26: Appropriations of State Tax Funds for Higher Education as a Percentage of Gross Domestic Product (Percent) dataset, Accessed October 18, 2025, nsf.gov/statistics/state-indicators/indicator/state-tax-appropriations-for-higher-ed-operations-to-state-gdp.

García, E., & Levin, H. M. (2025). Investing in Our Nation's Future: Advancing Educational Opportunity for Underserved Students. *www.civilrightsproject.ucla.edu*. Retrieved from escholarship.org/uc/item/29h9c9dn.

6.2: Broadband

State-level data for internet accessible devices and broadband subscription rates are from the 2024 American Community Survey, 1-year estimates, table S2801, accessed September 15, 2025, data.census.gov/table/ACSST1Y2022.S2801?q=broadband&g=010XX00US$0400000&tp=true.

County level rates for internet access and the digital divide index use data from the 2020-2024 American Community Survey, 5-year estimates, table S2801, accessed May 11, 2026, data.census.gov/table/ACSST5Y2024.S2801?q=broadband.

For information regarding high-speed internet access stop-gap funding, see governor.nc.gov/news/press-releases/2026/03/23/governor-josh-stein-announces-high-speed-internet-access-coming-2026-5161-rural-north-carolinians.

6.3: Cost of Living Index

State-level and county-level 2025 Cost of Living Index data are from the Council for Community and Economic Research (C2ER) and were obtained using Lightcast, accessed March 10, 2026, lightcast.io.

For more information on Cost of Living Index, see coli.org.

6.4: Industry Mix

Industry mix data are from the Quarterly Census of Employment and Wages (QCEW) produced by the Bureau of Labor Statistics (BLS), accessed on March 10, 2026, and provided by the Labor & Economic Analysis Division (LEAD) in the North Carolina Department of Commerce. Data from the fourth quarter of 2024 were used to produce the estimates provided in indicator 6.4. Projections for QCEW and Non-QCEW Employees are informed by the National Industry-Occupation Employment Matrix and long-term industry projections provided by individual states. The average earnings, also called "Current Total Earnings," is the total industry earnings for a region divided by number of jobs. It includes wages, salaries, supplements (additional employee benefits), and proprietor income.

Sources

The National Science Foundation (NSF) created a table that showed a list of 2012 NAICS codes that constitute Knowledge- and Technology-Intensive (KTI) or high-technology industries. Like the 2021 *Tracking Innovation* data, we utilized Census NAICS crosswalks from 2012 NAICS codes to compare the vintage codes for the high-technology industries

State-industry combinations whose employment data are reported as "<10" were adjusted to 0. A complete list of NAICS codes with the year appropriate crosswalk can be seen in Appendix A.

Gross Domestic Product by manufacturing and all industries data are from the GDP by state dataset, Bureau of Economic Analysis, U.S. Dept. of Commerce, accessed March 12, 2026, apps.bea.gov/itable/index.cfm. Manufacturing industries are defined as those industries whose 2-digit NAICS code ranges from 31-33. Manufacturing locations as defined by 2-digit NAICS codes 31-33 data are from Lightcast, accessed on May 29, 2026, lightcast.io.

U.S. Census Bureau. (2022). North American Industry Classification System (NAICS) 2022 manual. U.S. Department of Commerce. census.gov/naics/reference_files_tools/2022_NAICS_Manual.pdf

Bivens, J., "Updated Employment Multipliers for the U.S. Economy," Economic Policy Institute, January 2019. epi.org/publication/updated-employment-multipliers-for-the-u-s-economy (PDF: files.epi.org/pdf/160282.pdf).

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PROJECT DIRECTOR & EDITOR

John Hardin, Executive Director, Office of Science, Technology & Innovation, NC Department of Commerce

LEAD RESEARCHER & AUTHOR

Natalie Schulte, NC STEM Policy Fellow (2025-2026), Office of Science, Technology & Innovation, NC Department of Commerce

CONTRIBUTING RESEARCHER

Andrew Berger-Gross, Senior Economist, Labor & Economic Analysis Division, NC Department of Commerce

COPY EDITOR

Riley Lawson, NC STEM Policy Fellow (2026-2027), Office of Science, Technology & Innovation, NC Department of Commerce

GRAPHIC DESIGN

Laura Murray, Graphic Designer, NC Department of Commerce

GEOGRAPHIC INFORMATION SYSTEMS

Jamie Vaughn, Senior Analyst for Market Intelligence, Labor & Economic Analysis Division, NC Department of Commerce

Dylan Craig, Social Research Specialist III, Labor & Economic Analysis Division, NC Department of Commerce

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Vijendra Nalamothu, Founder and CEO, ApoStrata, LLC

Amy Olli, Retired General Counsel, VMware

Olga Pierrakos, Founding Professor and Former Founding Chair of Engineering, Wake Forest University

Will Quick, Partner, Brooks Pierce LLP

Michael Quillen, Vice President of Academic Programs, Rowan-Cabarrus Community College

Antwan Thornton, Patent Attorney and Partner at Brooks, Cameron & Huebsch

Claudia Walker, Multi Classroom Coach – Math, George C. Simkins Jr Elementary School, Guilford County Schools

Krista Walton, Vice Chancellor for Research and Innovation, North Carolina State University

Thomas J. Williams, President, Strategic Educational Alliances, Inc.

EXECUTIVE STAFF

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