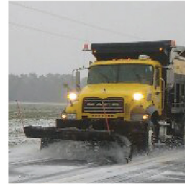


NORTH CAROLINA

Department of Transportation



NC MOVES ²⁰⁵⁰

Drivers and Opportunities - Economic

February 2019

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EXECUTIVE SUMMARY

Executive Summary

The economy of North Carolina is a diverse and dynamic environment. Though influenced by national trends with regard to global competition, trade, technological advances, changing consumer preferences, and employment shifts, the state has grown economically in large part due to a competitive advantage geographically (a mid-Atlantic location), a pleasant 4-season climate, many cultural and recreational activities, a relatively low cost of living and corporate tax rate, and a pool of highly skilled and educated workers through the state's higher education system including three top rated research universities.

The state has also taken steps to diversify and expand its economy with the attraction of future focused industries. These include health care, technology, electronics, pharmaceuticals, chemicals, machinery and auto manufacturing, tourism and entertainment, and agriculture. These are industries in which the state has planned for and invested in developing for several decades and expect significant growth going forward.

The state's population is expected to increase significantly, with the composition reflecting more retirees and immigrants. Most of the future population will concentrate in the larger metropolitan areas.

These all are likely to have a profound impact on the state's economy and its transportation infrastructure.

An expanding economy and a growing population is expected to stress the state's transportation infrastructure in terms of safety, capacity, and maintenance.

Addressing bottlenecks and investing in infrastructure to support increased economic output, trade, and demand for passenger/freight transportation is important to maintaining the state's economic progress and standing. Funding for these investments may continue to challenge the state.



INTRODUCTION

How this Paper Links to NC Moves 2050

The economy of North Carolina has seen many changes over the past several decades. The state has seen a steep decline in manufacturing and construction as compared to the national average. At the same time, retail, import-export trade, and professional industries have expanded.

In the future, increases in the production of electronics, pharmaceuticals, chemicals, machinery, and auto manufacturing are projected. At the same time, North Carolina will likely continue to show robust growth in health care, technology, pharmaceutical manufacturing, tourism and entertainment, and agriculture.

Additionally, the state's demographics and workforce composition is likely to change as the mix of industries change, population concentration grows in urban areas, the percentage of retirees increases, and the state absorbs a larger influx of immigrant persons.

The changing population will likely have a significant impact on the state's economic vitality and transportation systems with increased freight and mobility requirements.

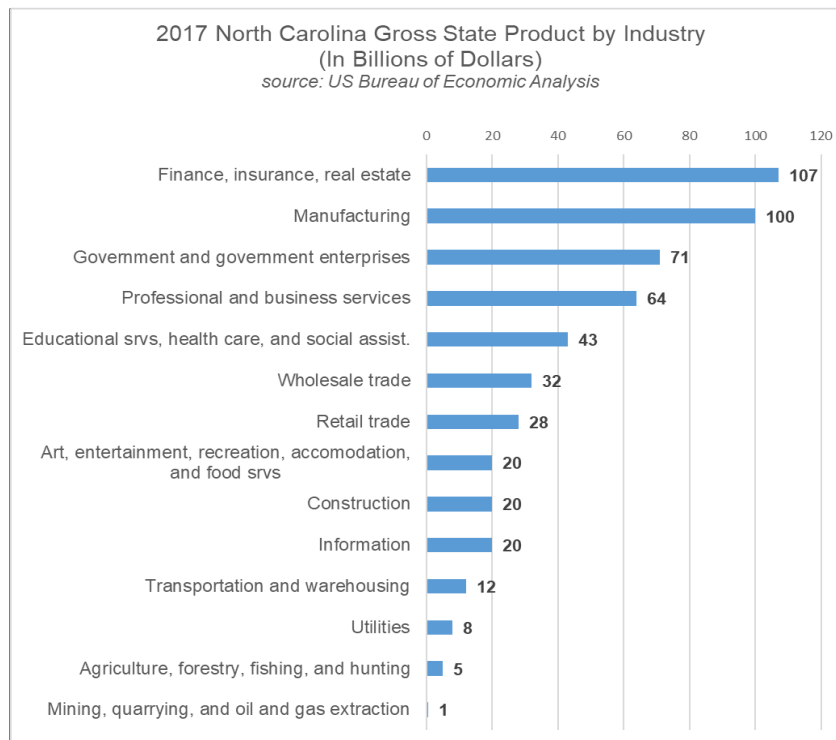
This paper describes the economic drivers in North Carolina and their implications for the economy and transportation planning.



WHERE ARE WE TODAY?

North Carolina's Economy – A State Profile

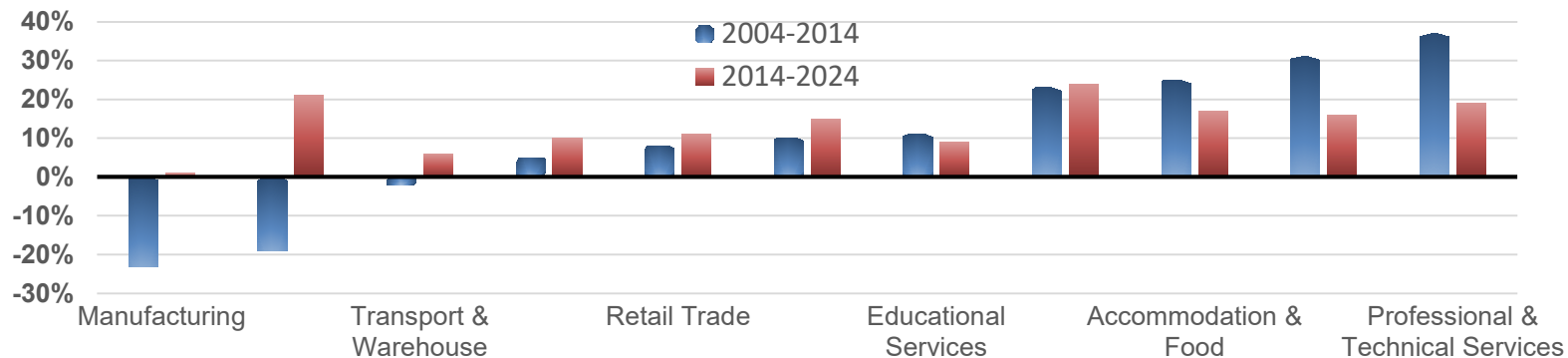
- **The economy of North Carolina is a diverse and dynamic environment.**
- The state has grown economically in past decades in large part due to a competitive advantage geographically (a mid-Atlantic location), a pleasant 4-season climate, many cultural and recreational activities, a relatively low cost of living and corporate tax rate, and a pool of highly skilled and educated workers through the state's higher education system including three research universities.¹
- In 2017, North Carolina's total gross state product (GSP) was \$540 billion which represents about 2.8% of the United States gross domestic product (GDP) of \$19.4 trillion, or 0.8% of the world economy.^{2,3}
- Manufacturing generates 19% of North Carolina's GSP. In total, the goods sector contributes 23% to the State's GSP. The service sectors contribute 77% to GSP.⁴



The Economy is Changing

- In 2004, the Goods Sector industries made up 42% of the employment in North Carolina, the rest being made up of Service Sector employment. By 2014, the Goods Sector industries declined to 36%.⁵
- The State has seen a steeper decline in manufacturing and construction as compared to the national average. **While historic industries such as forest products, textiles, and tobacco are declining, North Carolina is seeing increases in the production of pharmaceuticals, chemicals, machinery, and autos.**
- At the same time, retail, trade, and professional industries have grown, in part to support the expanding population, and also due to growth in highly skilled professional jobs particularly in locations such as Research Triangle Park.
- Looking ahead, **the State will likely continue to shift from a highly goods focused economy to a service-sector economy, with an emphasis on trade.**

North Carolina Employment Trends (2004-2014 & 2014-2024)

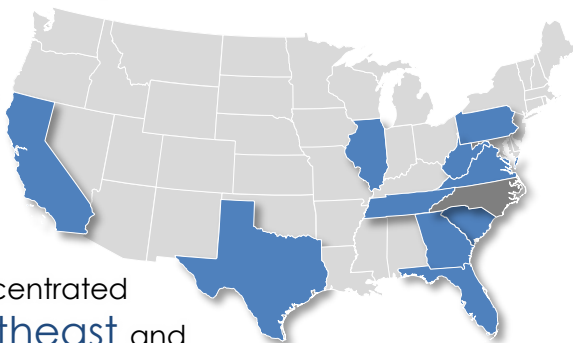


Source: US Bureau of Labor Statistics and NC Department of Commerce

Trade is a Driving Economic Force

Trade is key to the North Carolina economy. According to World's Top Exports, leading exports making up 26.5% of the overall value of the state's global shipments. These include: aircraft and parts, pharmaceutical and related products, military explosives, wood pulp, tobacco, diesel engines, and cotton yarn.⁶

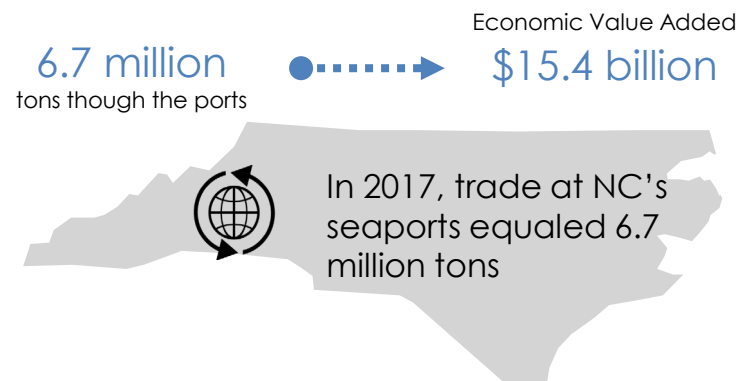
North Carolina's top trading partners (in blue)



Most are concentrated in the **Southeast** and **Mid-Atlantic** regions

Source: North Carolina Statewide Multimodal Freight Plan

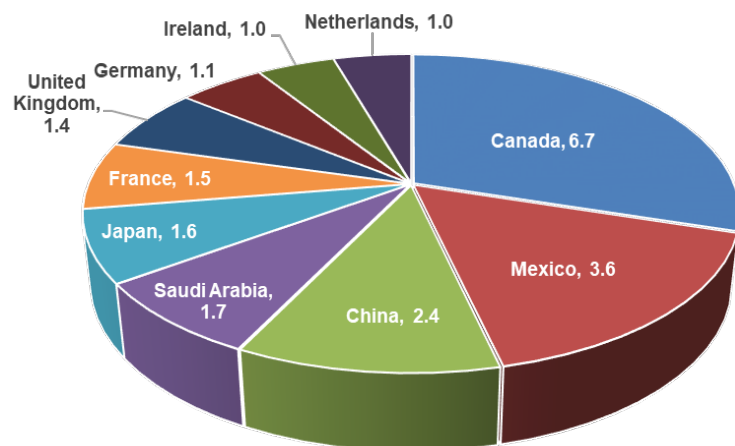
North Carolina's **consumer market means that imports are growing and will continue to grow.** In 2017, 6.7 million tons of goods were moved through NC ports, contributing \$15.4 billion in value-added economic output, 87,700 jobs, \$4.3 billion in employee compensation, and \$687 million in local and state tax revenue.



Growing International Exports

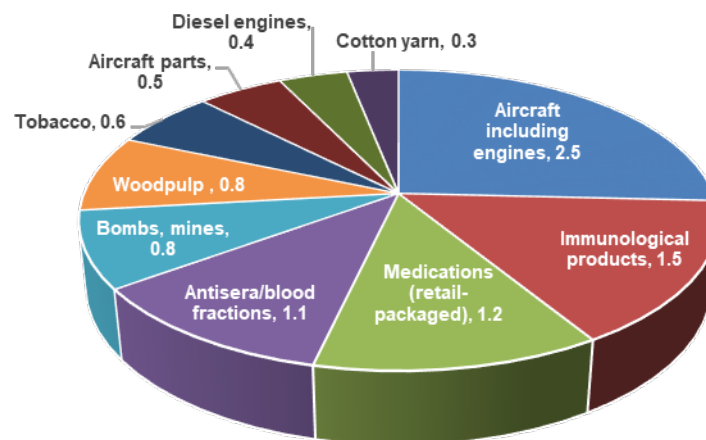
The top 10 international customers purchased **66% of the total value of products exported from North Carolina** during 2017. Canada and Mexico continue to be North Carolina's largest export markets, followed closely by China.⁷

2017 Export Top 10 Customers (Billions \$)



North Carolina's 2017 top 10 exports accounted for **27% of the overall value of the state's global shipments**. These shipments are primarily of goods in which North Carolina industries are specialized: aircraft, medical products, and agriculture.⁷

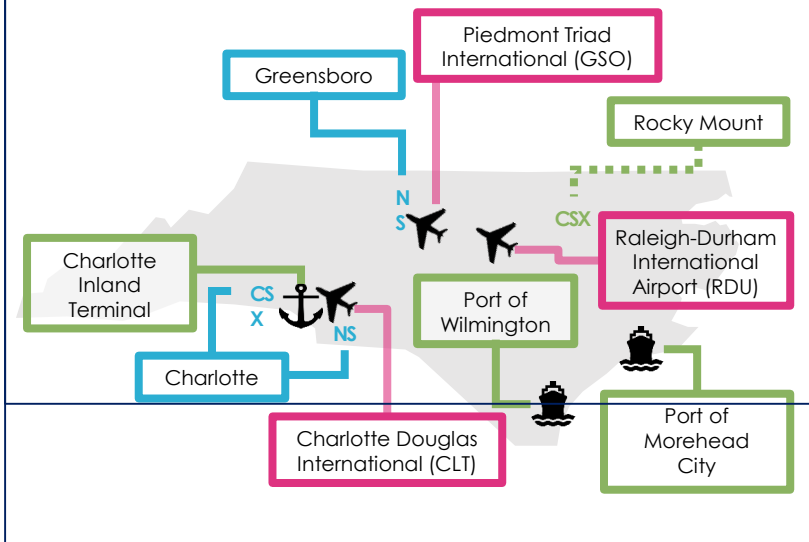
2017 Exports (Billions \$)



Sources: Economic Development Partnership of North Carolina; World's Top Exports

Trade and Transportation Infrastructure: Domestic and International Gateways

North Carolina's multimodal infrastructure and terminals support a strong trade based economy. The State has 8 key water, air, and intermodal ports/terminals, and a robust rail and highway system serving customers throughout the state. One additional intermodal terminal is planned for Rocky Mount.⁶



Source: North Carolina Statewide Multimodal Freight Plan

Port of Morehead City

cargo types include:

- breakbulk
 - bulk
- includes access to one Class I rail line



fertilizers ores & minerals rubber

are Morehead City's **Top 3 Commodities** by total tons

Port of Wilmington

cargo types include:

- intermodal containers
 - breakbulk
 - bulk
- includes access to one Class I rail line



forest products chemicals fertilizers

are Wilmington's **Top 3 Commodities** by total tons



Electronics



Pharmaceuticals

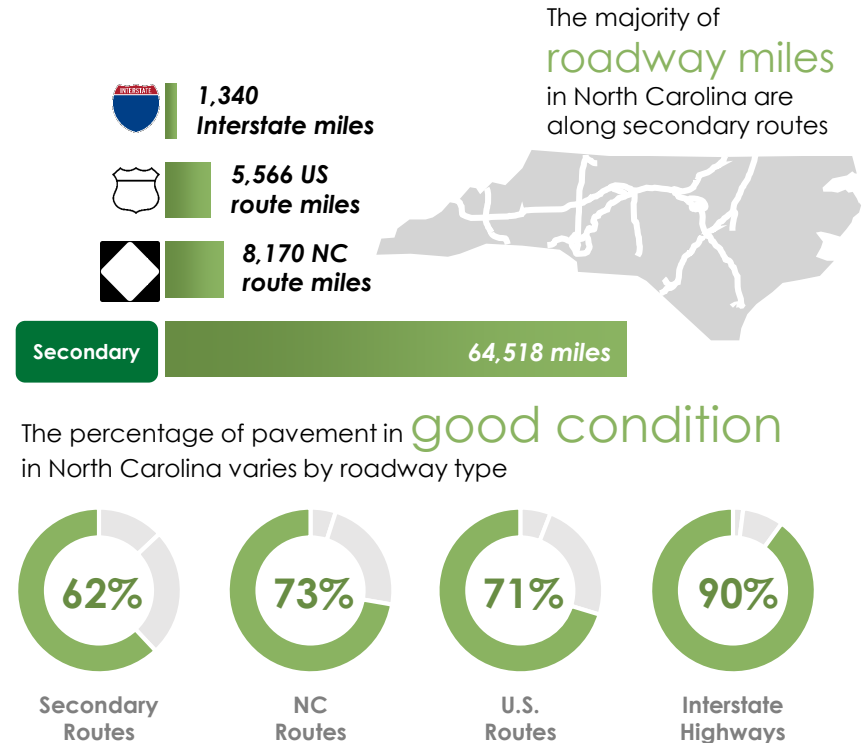


Machinery

are North Carolina air cargo's **Top 3 Commodities** by total value

Trade and Transportation Infrastructure: Roadways and Bridges

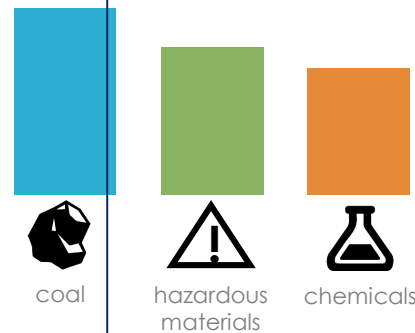
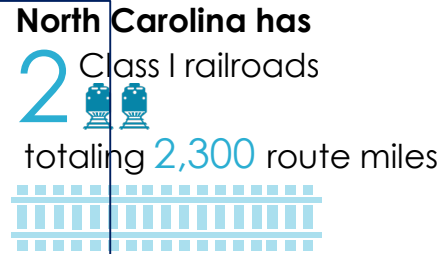
- NCDOT operates the **second largest statewide highway system** after Texas with over 80,000 miles of roadway and ranks 14th in the nation for bridge surface area.⁸
- Currently, the state's highways were rated in fair to good condition, but this varies by roadway within the state. With a **rapidly growing population congesting roadways and future gas-tax revenues becoming less predictable**, tolls are becoming an increasingly important solution to financing new road projects in North Carolina.^{8,9}
- Since 2002, the Turnpike Authority has worked to advance toll facilities to **give drivers more choices** in how they reach critical destinations while also reducing congestion along heavily traveled routes.⁸



Source: North Carolina Statewide Multimodal Freight Plan

Trade and Transportation Infrastructure: Rail

- There are over 3,200 miles of railroad in North Carolina, serving 86 of the state's 100 counties.⁶
- **North Carolina is served by six intercity passenger routes with stops in 16 cities and towns.** Nine of those stops are along the busy, 174-mile Piedmont Corridor between Charlotte and Raleigh.⁶
- **The North Carolina Railroad is a 317-mile state-owned rail corridor extending from Morehead City to Charlotte** and carries over 70 freight trains offered by the Norfolk Southern Railway and eight passenger trains daily.⁸
- **More than 70% of the state's population is within a 30-mile radius of a passenger station,** with an additional 11% of North Carolina residents residing within a 30-mile radius of stops served by Amtrak's bus service.¹⁰



are North Carolina rail's
Top 3 Carload Commodities
 by total tons



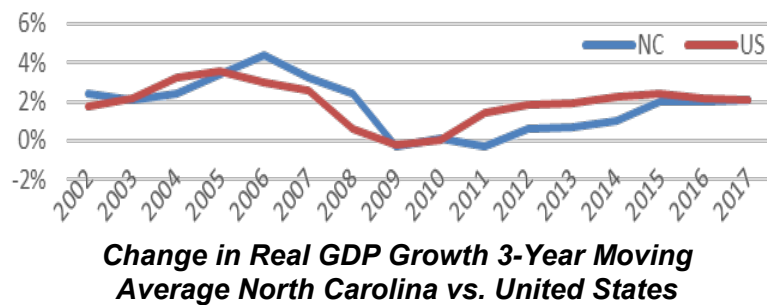
are North Carolina rail's
Top 3 Intermodal Commodities
 by total tons

Source: North Carolina Statewide Multimodal Freight Plan

WHERE WE ARE GOING

A Steady Growth North Carolina Economy

- As illustrated below, North Carolina's Gross State Product (GSP) has **tracked somewhat closely to that of the United States as a whole**, with a slower but ultimately similar recovery from the 2009 recession.⁴
- Gross Domestic Product (GDP) growth for the U.S. is likely to average 2.4% a year, to \$34 trillion (in 2016 dollars) in 2050, an increase of 83%. Forecasts indicate a **slowing of GDP growth** to less than 1% a year approaching 2050.⁷
- Impacting GDP growth may be **global competition**, shifts in the industry mix of the U.S moving from manufacturing to service-based economy, and an aging U.S. labor force.⁷

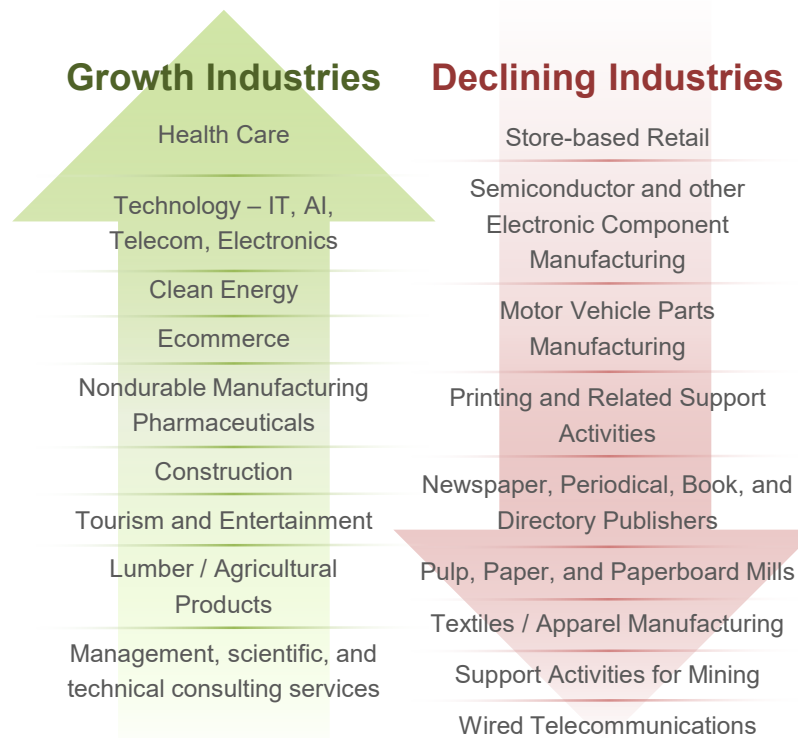


- North Carolina has a very competitive business climate, ranking 2nd in the nation in a 2016 survey by Site Selection magazine.¹¹ This trend is expected to drive future growth in the short term. Longer term, NC's economic future is expected to be closely correlated with that of the nation, in particular impacted by global trade and demographic trends. Worth noting is the state's efforts to **diversify its industrial mix and invest in future growth industries** which will provide the state, not only growth, but economic stability over time.¹
- A key fast growing industry is tourism which in 2017 saw \$24 billion spent in the State, employed 225,170 people and generated nearly \$2 billion in state and local tax revenue.¹²
- In spite of heavy competition, **exports to developing markets are expected to increase**, especially for meats and fish, pharmaceuticals, electronics, aircraft and parts and other transportation equipment.^{2, 13}
- Increasing Federal deficits may **negatively impact funding** for research, education, and transportation infrastructure.

Sources: U.S. Bureau of Economic Analysis; Visit North Carolina - Economic Development Partnership of North Carolina

Continued Shifts in Industries

- In the future, North Carolina is expected to buck national trends with **increases in the production** of electronics, chemicals, and machinery and auto manufacturing.²
- Following national trends, North Carolina will experience **growth** in health care, technology, clean energy, pharmaceutical manufacturing, tourism and entertainment, and lumber and agricultural products. These are industries in which the state has planned for and invested in developing for several decades.^{2, 14}
- Due to its diversified economy, North Carolina may **continue to be better insulated from economic downturns than many states**, although threats to the U.S. economy such as the ballooning Federal deficit and global competition/trade wars can have significant impacts on the future of the state.

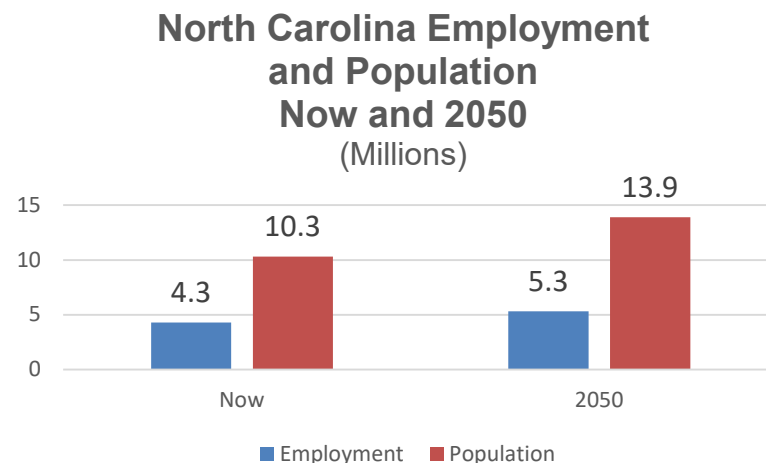


Sources: U.S. Bureau of Economic Analysis & FHWA Freight Analysis Framework

A Changing Population and Workforce

- Demographic trends in the State will likely have a **profound impact on the economy and transportation system**. The degree of impact will depend on the rate of population growth.
- The labor force is expected to grow 23% to 5.3 million workers. The working age (18 to 64 year olds) population will represent approximately 57% of the population in 2050, down from 62% presently.⁵
- Nationally, and in North Carolina, the **elderly population is expected to more than double** and the gap between the number of working-age people versus seniors will widen as boomers age.¹⁵
- Although cars will likely continue to be a predominant method for commuting, a trend among the millennial population is an **increasing preference for public transportation and ridesharing options** if available. This may mitigate congestion, but also challenges planners to focus more on alternative modes to the automobile.

- Projections show that future population growth is expected to be similar to that of the nation as a whole, growing from 10.3 million in 2018 to 13.9 million by 2050 (35% state-wide growth versus 34% nationally).¹⁶



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

A Growing and Aging Population

- North Carolina's population has grown **almost twice as fast as the national average** (51% growth since 1990, compared to 29% nationally), but slowing to near national rates going forward.¹⁷
- North Carolina is also expected to see an **overall more aged population** as baby boomers retire and as more retirees move into the state, due to its agreeable climate and relatively inexpensive cost of living. By 2050, it is estimated that 25% of the population will be 65 or older.¹⁷
- The influx of retirees will **increase economic activity and transportation demand**, particularly to the southeast coast and the mountain regions.
- The aging population will likely **require non-driving transportation options and/or accommodation for age-related reduced driving capabilities**.¹⁴

Within the State, the **Piedmont Region** is expected to see **the fastest population growth** compared to other regions by 2050 (44%).¹⁷

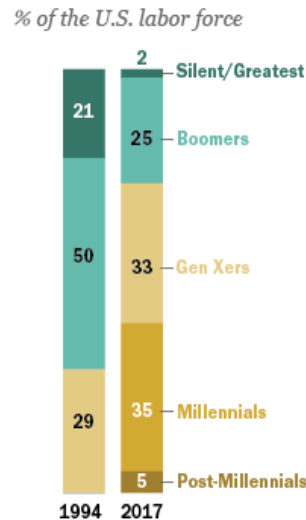
Region	2050 Population and % Population Change from 2018 (U.S. Census Bureau)		
	Under 18 Years	18 to 64 Years	65 Plus Years
	Piedmont	1.8 +39%	4.7 +28%
Coastal Plains	0.7 +17%	1.9 +13%	0.8 +54%
Mountain	0.3 +24%	1.0 +11%	0.5 +45%
North Carolina	2.9 +23%	7.9 +24%	3.2 +93%

Source: U.S. Census Bureau

Demographics Will Have a Significant Impact

- The Triangle, Metrolina, and Triad areas are expected to grow **faster both in terms of population and offered economic opportunities** compared to the rest of the state.¹⁵
- These large and diverse metro areas (similar to national trends) are viewed as **more attractive by persons in their 20s to their early 40s** who make up a majority of the current workforce.¹⁰
- In the future, North Carolina's urban areas are likely to experience **increasing traffic congestion, commuting times, and other "big city" challenges.**

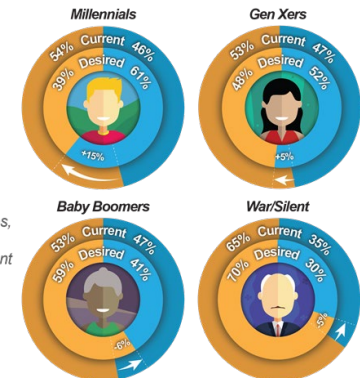
More than a third of the workforce are Millennials



- Aging populations in North Carolina and the U.S. as a whole report that they are more likely to prefer smaller, more rural cities.
- **Non-urban areas can be particularly challenging for residents with accessibility and mobility needs.** Aging populations are more likely to need transportation options that do not require driving. Autonomous vehicle technology and/or shared mobility offer potential solutions for an aging population.¹⁸
- Smaller, rural population centers will **also require additional investment in transportation infrastructure** and utilities to be economically competitive with larger markets.

RURAL VS. URBAN

For those who want to live in cities, millennials want to move into bigger cities while those in different generations want to move into medium sized cities.



Sources: North Carolina Statewide Multimodal Freight Plan

Strengthening Rural Communities

- While the majority of population growth is expected to be in the state's metropolitan areas, North Carolina's rural communities will be no less important to the vitality and character of the state.
- Home to nearly a quarter of North Carolina's population, the state's rural areas are rich in history and culture, provide valuable recreational and tourism opportunities, and are home to much of the state's agriculture and manufacturing industries.
- **The state's rural communities have unique issues and needs**, requiring strong partnerships between the communities and the state government.
- In January 2018, Governor Cooper launched the **Hometown Strong** initiative to partner with local governments to support local economies, improve infrastructure, and strengthen rural communities. ¹⁹
- **Hometown Strong** is working with local leaders to stimulate economies and help businesses thrive in North Carolina's rural communities by focusing on projects such as infrastructure improvements, broadband access, and workforce training.

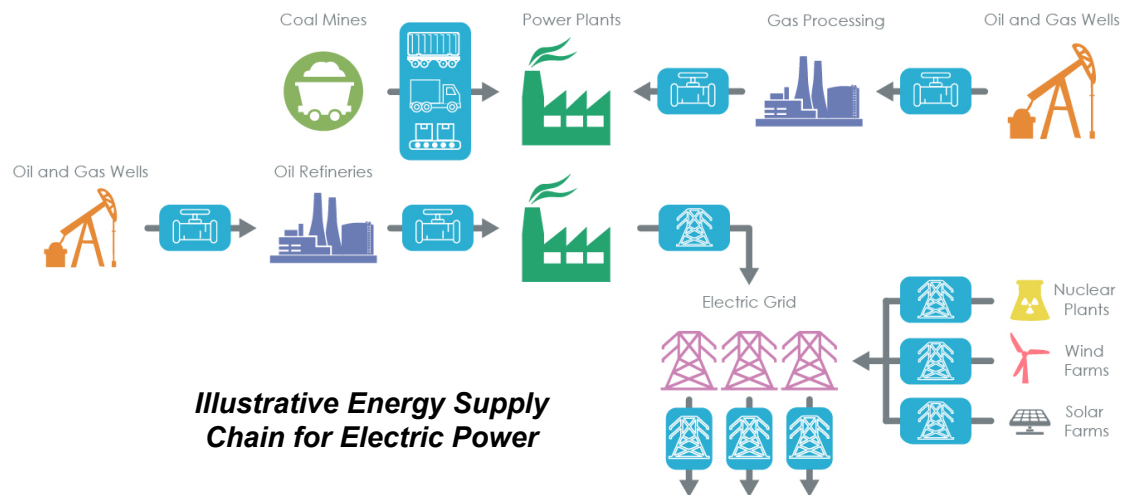


Hometown Strong Action Teams Have Visited the Counties in Blue

Source: <https://hometownstrong.nc.gov/>

Energy Markets Will Shape the Future

- **Fossil fuels**, primarily coal and natural gas, play a significant role in North Carolina's economy. Yet these markets can be risky and volatile, affected by both political and market actions and the emergence of renewable energy sources. In the foreseeable future the state will continue to be a national leader in the production of photovoltaic energy/solar panels and is expected to increase investment in wind turbines and wind energy in the northeast and coastal portions of the state.
- In addition, **adoption of electric motor vehicles** may prompt the need for constructing charging stations throughout the state and along major highway corridors if adoption rates are high.
- Electric vehicles, connected or autonomous vehicles, and other technology advances may impact not only how North Carolinians travel, but also future fuel-tax revenues. **New funding sources** may need to be used to support infrastructure and preservation projects.



Source: North Carolina Statewide Multimodal Freight Plan

Beyond North Carolina's Borders

- **Shifting global trade patterns** have brought significant changes to North Carolina's economy and will continue to play a transformative role as globalization intensifies. Automation of routine labor and distribution, robotics, 3D printing, and artificial intelligence, among other technologies, have significantly reduced production costs, shifting emphasis to supply chain efficiency and access to raw materials. Reshoring trends suggest **continued growth of domestic manufacturing industries and additional demand on the transportation system**.
- **Regional competition from other states** through aggressive economic development efforts of neighboring states are vying for new industries to relocate to or start up in their states, rather than in North Carolina. North Carolina is continuing to strengthen its economic base and competitive position through ongoing efforts to create **synergistic business clusters and economic development** via partnership organizations such as Research Triangle Regional Partnership, InnovateNC, or the Economic Development Partnership of North Carolina (EDPNC).
- **Extreme weather events** may continue to affect the North Carolina economy in terms of **negative impacts on tourism, real estate, and agricultural industries** in the state as well as the severe impacts to residents and state transportation systems. Investment to mitigate the impacts of the extreme weather events will be needed to preserve and harden the state's infrastructure.



Aftermath of Hurricane Florence, 2018

Source: ABC News, 2018

FINDINGS AND FUTURE DIRECTION FOR NORTH CAROLINA

Economic Opportunities and Challenges

- North Carolina has a diverse and thriving economy which is expected to grow through 2050, albeit at slowing rates farther out in time. **While much economic growth will be driven by the consumer and service economy, cultivating the manufacturing and trade sectors will continue to be important to maintaining economic health.** Exports will likely continue to be key for economic growth, though global competition and possible “trade wars” are possible threats.
- The state’s population will continue to grow, though growth rates will be influenced by the overall vitality of the State’s economy. Working-age North Carolinians are likely to drive growth in urban areas, while at the same time the state’s proportion of older residents will also increase. These complex demographic trends will **drive the need for investments to ensure accessibility and mobility throughout the state.**
- Increased industrial output and trade, as a result of an expanding economy and a growing population, will likely put increasing demand on the State’s transportation infrastructure in terms of capacity, safety and maintenance. **Bottlenecks**, both current and future, are an issue to be addressed to maintain **competitiveness and economic growth.**



Source: psdgraphics.com

Economic Opportunities and Challenges

- **Investments in transportation gateways will need to be maintained to support higher levels of economic competitiveness.** For example, assuring that water ports are able to berth increasingly larger container ships is important to the state's growth in international trade and exports, a key driver of economic growth. Improving the access to and robustness of intermodal transportation are key to keeping NC industries competitive.
- North Carolina will continue to be **impacted by global trends from shifting trade patterns to severe weather.** While these trends are outside the control of the state, North Carolina can take proactive steps, such as strengthening trading partnerships or making the infrastructure more resilient, to reduce impacts of these events to the state's residents and economy.
- **Technological change continues to be a major factor shaping the state's economy,** particularly the warehousing, distribution, transportation, and trade sectors.
- North Carolina's **growing population** and consumer market means that ecommerce, ride share, and/or shared mobility trends will likely impact overall transportation trends and needs. Increased access to **rural quality of life aspects** will be particularly relevant for connecting urban populations to outdoor recreation opportunities.

- **Infrastructure improvements to meet future demands may require new and innovative funding mechanisms** as traditional sources of finance may be constrained and funding requirements increase.



APPENDICES

End Note Sources

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17. U.S. Census Bureau.
18. US DEMOGRAPHIC OUTLOOK 2005-Z2050 - Infrastructure Implications of a Larger, More Concentrated, More Diverse Population; Messner Project Team Meeting – Georgia Tech; Barrella & Beck; June 29, 2009.
19. North Carolina Hometown Strong; <https://hometownstrong.nc.gov/>

Summary of Interviews

Dr. Michael Walden, University of North Carolina. Dr. Walden was interviewed regarding his analyses of the key drivers that will play a role in shaping North Carolina over the coming decades and what that will likely mean for North Carolina's economy and institutions.

Joy Davis and Daniel Findley, Institute for Transportation Research and Education North Carolina State University. Ms. Davis and Mr. Findley provided their insights on the economic impacts of transportation facilities and policies in North Carolina.