

Optimizing
Innovation
for North
Carolina

To be satisfied is to fall behind.

From our farms, we built research universities.
From our research universities, we built Research Triangle Park.

RTP isn't the end. It's just the beginning.

THE EVOLUTION OF NC INNOVATION

TIMELINE

2018 IDEA DEVELOPMENT

Began in 2018 as a discussion between North Carolina's leading business executives with an interest in bringing C-suite leadership to impact North Carolina's innovation future

FEB 2020 NON-PROFIT CREATION

Created organization as a nonprofit and obtained 501(c)3 status, originally called the Central North Carolina Knowledge Corridor

APRIL 2020 RESEARCH & ANALYSIS

Engaged RTI to conduct several analyses of a North Carolina Innovation Corridor potential, culminating in the comprehensive "Blueprint for an Innovation Corridor"

APRIL 2021 ORGANIZATIONAL ADVANCEMENT

Realized the need for a statewide entity. Engaged strategists to develop supporting materials to secure external funding

JULY 2021-PRESENT CONTINUED OPERATIONS

Hired full time consultant to perform additional market research, build Board of Directors, and initiate strategic plan development. Renamed entity to NC Innovation

Take a moment to consider:

- > A place where ideas come to life, where innovation leads to job creation.
- > An ongoing source of funds that pour into ideas, people, places and businesses that transform lives and solve the most challenging issues impacting our livelihoods today.
- > A state where innovation thrives and produces a high quality of life for citizens in every county and region.

North Carolina can be a global leader where ideas blossom, innovations occur, and jobs are created. This booklet outlines how NC Innovation (NCI) can bring this vision to reality.

More than 60 years ago, North Carolina leaders had a vision to become a world leader in research and life science discovery, leading to the creation of the Research Triangle Park. The key to the Park's success lies in its leadership, preconceived as the only research park in the country where government and academia were equal partners with private industry.

Now, our vision is for North Carolina to become the nation's leading innovation ecosystem with flourishing communities in multiple, targeted economic sectors in all areas of our state. To achieve that end, NCI will strategically coordinate research university and private sector innovation assets and provide a

sustainable revenue stream for promising ideas and activities that lead to job creation.

The initiative will support globally competitive industries, create more job opportunities across the state, and launch North Carolina into the national and global job creation and innovation ranks. Our unique academic, economic, and quality of life assets give us the foundation to become a global leader. North Carolina's history also provides both a legacy of innovation success and a roadmap.

The time is now to tell our story and develop the potential that is not yet fully tapped.

NCI PURPOSE

NCI is different from previous initiatives that aim to improve the economic well-being of North Carolina. Kirk Bradley, President, Chairman, CEO of Lee-Moore Capital Company, says NCI's vision is to work collaboratively with a research-focused university system, an invested private sector, and a supportive public sector, complementing the work of existing economic development entities. The leadership NCI offers can provide prosperity and security to future generations of North Carolinians.

“We’re trying to create an ecosystem that attracts the best talent worldwide by focusing on five targeted economic clusters that make up the broader world of innovation. We want to support the entire life cycle: ideas generated, companies incubated, and businesses headquartered here,” explains Bradley.

WHY NCI IS ESSENTIAL FOR NC

NCI has a substantial advantage in pulling everyone together for the good of the state, the primary differentiator being “the intensity and intentionality in which we will pursue it,” says Kelly King, Executive Chairman of Truist Financial. “This is an opportunity to better balance our economic development standard of life, where the rising tide raises all ships, from center cities to rural areas. In 20–30 years, people across the state will be happy because they will have opportunities where they want to live.”

Vision

North Carolina will be The Innovation State

Enabled by a public-private partnership to accelerate commercialized innovation from NC’s universities

Mission

Commercialize and scale innovation to create jobs and improve economic opportunities in all 100 counties of North Carolina

Values

Innovation

We believe innovation is the lifeblood of growth and prosperity

Collaboration

We view collaboration as central to innovation

Accountability

We will hold ourselves and our partners accountable for measureable results

Integrity

We will demonstrate honesty, trustworthiness, and integrity in all that we do

Inclusion

We will create economic opportunities for all citizens of our state



How We Got Here

RTP: ORIGINAL INNOVATION ECOSYSTEM

Innovation underpins North Carolina's history of economic success. RTP was born from a vision to boost North Carolina's economy, which, in the 1950s, ranked among the lowest in the nation in per capita income. The state's economy relied on declining agriculture, textile, and furniture industries. University graduates went to other states to pursue job opportunities in growing sectors.

RTP's purpose was to attract R&D companies and other industrial research laboratories to the area surrounding the three major research universities. Today, the Research Triangle is among the wealthiest regions in the southeast and remains an exemplar for collaboration.

Research Triangle Park differs from Silicon Valley and Route 128, two other premiere high-tech clusters. Only RTP was preplanned, and only RTP treated government, academia, and private industry as equal partners. This unique alliance of industry, academia, and government was central to RTP's success.

John Hardin, Executive Director, NC Office of Science, Technology and Innovation, authored a book chapter about the history of RTP. In it, he posits that by involving these three, "the (RTP) organization provided the vision and cohesion needed to maximize the common good and minimize the differences among the various interests involved with a stake in the Research Triangle region's economic development."

This cohesion among the invested parties allowed their focus to be on designing the Park for public service rather than private gain. Archie Davis, former chairperson of Wachovia Bank and Trust Co. and one of RTP's founders, looked for investors interested in serving the state of North Carolina. He later recalled, "I am convinced that it is the love of this state that was the motivation for the Research Triangle idea. Motivation derives from dedication and dedication derives from the knowledge of high expectations... Research Triangle is a manifestation of what North Carolina is all about."

Building upon RTP's success to expand the model statewide will not be simple, but it is possible. Kelly Fuller, strategic advisor to NCI, explains that NCI aims to take the state's rich history, lessons learned, and understanding of what "planned" innovation efforts entail to truly become NC Innovation.



EXECUTIVE LEADERSHIP GROUP: MOVING THE NEEDLE

Throughout history, private sector leadership in the public arena has been the major catalyst driving the success of transformational economic initiatives. Examples range from establishing the first public library in Boston to leading the creation of the Research Triangle Park.

A similar effort began in 2013 when a small group of North Carolina business leaders engaged in the state's public policy arena. After successfully guiding major public policy matters, the executives created an informal collaboration of business leaders, The Executive Leadership Group (ELG). These executives focus their efforts on big ideas that will "move the needle" for economic growth opportunities to improve the lives of all North Carolinians.

The ELG operates behind the scenes without desire for recognition or accolades. Their collective impact, however, has been significant and continues to thrive in their creation of NC Innovation and other strategic efforts.

RTI STUDY: PURPOSE, VISION, BLUEPRINT

Even as North Carolina secures transformative economic development projects, other states threaten to out-compete us with major investments in innovation infrastructure. Indeed, North Carolina's most recent "State of Innovation Report" ranks our innovation economy just 21st in the country.

RTI International - a research institute founded in 1958 as RTP's first tenant - conducted a four-phased study of North Carolina's innovation landscape. Here, we share RTI's recommendations to launch North Carolina into its next phase of innovation-led growth.

Defining NCI as "a concept for regional development focused on better linking a national innovation hub with small to medium-sized cities to generate more broad-based, long-term economic growth," RTI has identified our challenges and provides an outline for the collective action necessary to capitalize on our strengths and to fill the gaps. Four critical gaps were identified in previous studies and task force efforts, starting in the 1990's. They include:

North Carolina has strong R&D and entrepreneurial activity, as well as actors and entities that support this work. However, the state lacks "alignment (that) requires a driving force to motivate actors to come to the table." In addition to this single driving force, collaboration among a diverse set of actors including business, higher education, capital providers, and the public sector is crucial. RTI reports that "frequent and quality interactions lead to more creative collisions that result in new ideas, products, processes and businesses."

RTI has found that strategies with "broader and more diverse geographies tend to collaborate more readily

- 1** The need for a compelling vision and leadership
- 2** The requirement of a strong, overarching entity driving effort
- 3** Improvement in cooperation across often "siloed" and self-interested efforts among key entities and sectors
- 4** The requirement for a unifying vision, force and supporting funding to drive investment and innovation continually and sustainably

and advance development strategies more effectively if they incorporate an industry cluster focus." As such, the RTI Blueprint proposes focusing on these target clusters: **AgTech, Biohealth, Defense Innovation, and Power Electronics**. The **Cloud Computing** cluster surfaced following the report's publication.

With these findings in mind, NCI aims to drive and expand growth in globally competitive industries, create more job opportunities across a wider geography, strategically coordinate research university and private sector innovation assets, and launch North Carolina into the national and global innovation ranks.

The Vision

DESCRIPTION OF NCI

NC Innovation is North Carolina's transformational private sector-led effort to build and expand our tradition of an engaged business leadership addressing the realities of a dynamic global economy. We have assets and resources at our fingertips, yet leaders have lacked a collective vision for putting the state back atop the innovation and discovery mountain. Until now.

NC Innovation is a private sector-led effort to see around the next corner. RTP attracted a host of stand-alone innovators. But our state can produce so much more than the sum of its parts with leadership by connecting its stand-alone assets.

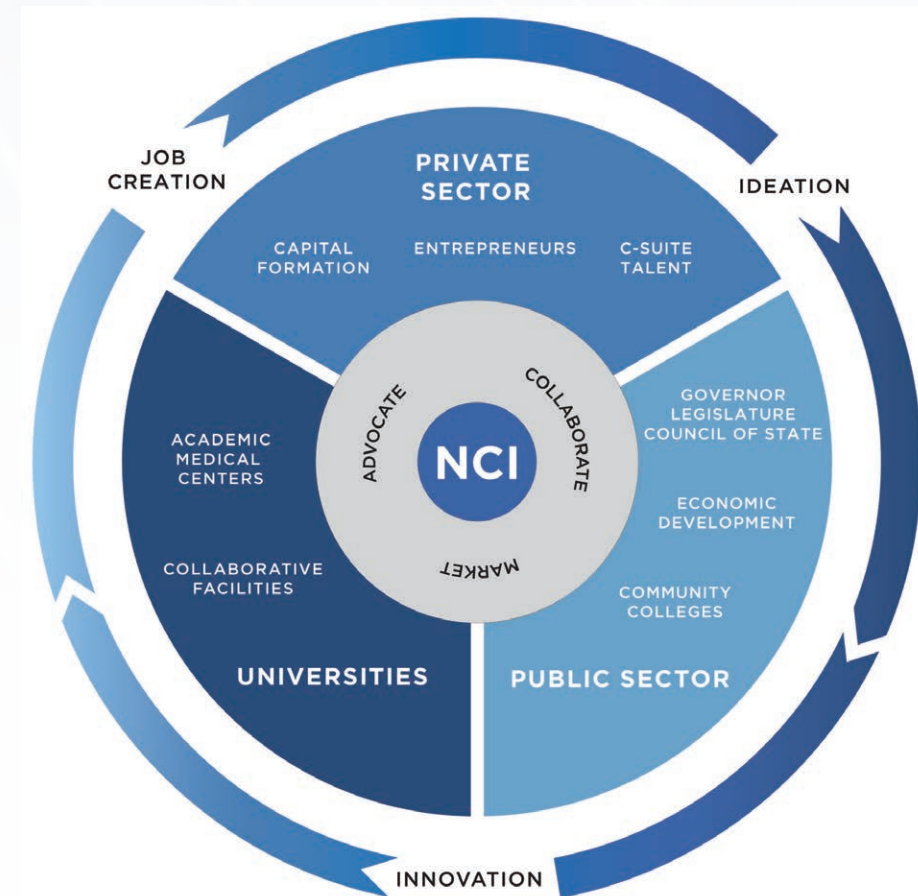
NCI will view our state's R&D initiatives, universities, and industry clusters from a long-term growth perspective, and act with that vision. What does that mean, operationally? NCI will target R&D projects across universities, with an eye towards supporting ventures

that can patent and go to market right here in North Carolina. NCI will grow burgeoning industry clusters, especially in rural areas, first through research partners and then angel-style capital investments.

NCI is a 501(c)(3) with a governing Board of Directors representing private industry, universities, and participants in the innovation ecosystem. The Board will be responsible for fund management, distribution, and oversight.

Focusing on the five targeted economic sectors of AgTech, Biohealth, Cloud Computing, Defense Innovation, and Power Electronics, our leadership will create an environment in which ideas blossom, innovations occur, and jobs are created. These jobs will provide a high quality of life for thousands of North Carolinians and secure North Carolina's position as the leading state for world class innovation.

Innovation Ecosystem



OBJECTIVES

A focused, intentional beginning phase is critical to the success of a fully built-out NCI. Funded by \$20 million of private sector and nonprofit start-up funds, NCI has three main early phase purposes:

- 1 Market**
Champion the strategic vision and share North Carolina's story with the world to foster a broad support and resource network
- 2 Collaborate**
Facilitate statewide coordination among academic institutions and targeted industry sectors
- 3 Advocate**
Communicate and educate about the need for a sustainable, public funding source of **at least \$250 million per year for 10 years**

The three-pronged partnership between business, academia, and government, together with secured start-up funds, will position NCI to launch North Carolina into its next phase of innovation-led growth.

3 PILLARS OF INNOVATION ECOSYSTEM DEVELOPMENT

NC Innovation is built upon the three pillars of innovation ecosystem development: facilities, funding, and talent.

Facilities

North Carolina's existing facilities promote co-location and collaboration spaces.

Funding

NCI will secure initial private, university and other funding and lead a sustained effort to champion a long-term funding commitment from the state.

Talent

We can leverage the immense talent and experience from entrepreneurs and C-suite leaders in our state.

North Carolina must capitalize on current innovation-oriented opportunities in targeted economic sectors.

NC Innovator Spotlight

FRED ESHELMAN: ACHIEVING THE FULL INNOVATION CYCLE

Fred Eshelman, Pharm. D., is a leading example of what can be achieved as an innovator in North Carolina. From a one-man consulting firm, "me and the dog, literally," he recalls, to the founder of two thriving organizations, Eshelman embodies the commitment and insight needed to succeed.



Professional and Personal Growth

A North Carolina native, Eshelman is founder and former CEO and Executive Chairman of Pharmaceutical Product Development (PPD) based in Wilmington. He started PPD as a one-man regulatory consulting firm. Because of his experience in the pharmaceutical industry, particularly his work with the former Glaxo, Inc., Eshelman became a sought-after expert and soon expanded his business scope to include development services. Today, PPD is a global contract research organization with 24,000 employees and offices in 46 countries.

After his tenure at PPD, he served as Founding Chairman and largest shareholder of Furiex Pharmaceuticals before establishing Eshelman Ventures LLC in 2014. Primarily interested in private healthcare companies, Eshelman Ventures invests in a variety of ways, often in the initial stages of development or clinical trials. Eshelman says, "For people starting a business of any scale, the financing is a large piece of the planning."

Investing in the Future

In addition to assisting start-ups and R&D firms as part of his professional portfolio, Eshelman supports the UNC Eshelman School of Pharmacy. A 1972 graduate from the school, which was named for him in 2008, he pledged \$100 million in 2014, the largest gift from an individual in the University's history and the largest ever made to a pharmacy school in the US.

That donation was designated to create a center within the school named the Eshelman Institute for Innovation. According to UNC Alumni News, "Through strategic collaborations inside and outside the University, the

institute will help fuel innovation, create jobs and spur economic development in the state, while enabling the school to pursue new ways to enhance its position as a national and international leader."

Driving Innovation in NC

Eshelman believes the education system is key to North Carolina becoming a global leader in innovation, particularly the constellation of NC State, UNC-Chapel Hill, and Duke, in addition to Wake Forest and others. "There's terrific talent here, a terrific knowledge base," comments Eshelman. There is also a growing cadre of venture capital firms in North Carolina, attracting VC dollars from other industries.

Betting on the future of North Carolina is one of the "best investments we can make for our children, neighbors, friends, and fellow citizens," he concludes.

A native North Carolinian, Eshelman exemplifies the essence of a full innovation cycle: he was educated here, started a business here, grew and headquartered the business here, and reinvested in innovation here via academia and venture capital support.

How We Execute

LET'S GET STARTED

NC Innovation will champion North Carolina's assets and potential, leverage existing resources and people through collaboration, and be a collective voice for knowledge worker clusters.

In **Phase I**, we are spearheading a privately funded initiative of \$20 million to support the leadership, staff, and other costs to develop the necessary organizational plan and structure to create an innovation engine. A **dedicated CEO** will lead this effort to increase funding

and coordination among North Carolina's academic, private, and public assets throughout the state.

In **Phase II**, NCI will lead a **sustained advocacy effort** to secure at least a \$250 million annual public commitment over a minimum of 10 years, or \$2.5 billion total, supplemented with private resources. The funding, through NCI, will support myriad efforts and initiatives to become a resource hub for development of five industry clusters.

Phase II Activities include:

- Research funding opportunities, such as \$50-\$250k grants to young researchers
- Incentives for academic collaboration
- Physical space (wet labs, incubators, flexible lease office)
- Ecosystem development through company and research entity collaboration
- C-Suite + entrepreneurial talent availability
- Mentorship, business resources for entrepreneurs, early-stage companies
- Workforce pipeline investment

ECONOMIC CLUSTERS

The 2020 RTI report identified four economic industry clusters that can help transform the region's economy; NCI added a fifth. These clusters have regional assets in place that could be leveraged for growth; emerging signals of growth and innovation such as patents, research, or job growth in the region; potential to have a wide reach across tech-focused cities, medium-sized cities, and rural areas; and global market potential.

AgTech applies the tools of life science, digital technology, machine learning, and other forms of technology to improve or disrupt the global agricultural sector. These technologies typically focus on enhancing the productivity, efficiency, sustainability, and/or profitability of the global agriculture industry.

Existing AgTech Innovation

- In 2021, Big Idea Ventures LLC launched its **Generation Food Rural Partners (GFRP)** fund, a \$125 million target fund that will fuel economic development in rural areas.
- UNC-Chapel Hill Research startup **AgBiome** researches and develops innovative biologicals that can be used to protect crops.
- **Avalo**, a Durham-based startup with ties to Duke University, uses a novel AI approach to scan and identify plant genes to create new elite varieties.

ECONOMIC CLUSTERS (CONT.)

Biohealth Technology encompasses the discovery, development, and manufacture of medical devices, pharmaceuticals, and other applications of biotechnology, engineering, and health technology to solve biological or medical problems related to human health.

Existing Biohealth Innovation

- Funded by the NC General Assembly for three decades, the RTP-based **NC Biotechnology Center** works as part of the North Carolina innovation ecosystem to accelerate life sciences technology-based economic development.
- Durham-based **StrideBio** develops advanced-generation gene therapies, transforming innovative science into potentially life-altering treatments for patients with rare diseases.
- Started with East Carolina University research in Greenville, **Perfusio** created a device to reduce surgical complications by monitoring perfusion in real time.

Defense Innovation is the application of new technologies and processes to solve national security needs and enable technical superiority for the US Department of Defense (DoD). This innovation addresses the DoD's need for agile, modern, and soldier-centric solutions to enable a strong national security by focusing new research, technology, products, and processes to support their missions.

Existing Defense Innovation

- In partnership with the National Security Agency (NSA), NC State is home to the **Laboratory for Analytic Sciences (LAS)** and a **Science of Security Lablet**. LAS utilizes research and discoveries to help analysts solve their most pressing challenges related to national security and technology.
- NSA named **North Carolina A&T State University** a “Featured School,” a designation demonstrating success in developing talent and tools to meet national security challenges. The school is also in the NSA's **Campus Ambassador Program (CAP)**.
- **Honeywell**, headquartered in Charlotte since 2019, is a major manufacturer of aerospace electronics, building technologies, and safety and productivity solutions.

Cloud Computing is on-demand access to computing services, such as servers, storage, databases, software, and networking capabilities, over the internet. The IT infrastructure is hosted and managed by a remote data center, using “the cloud” rather than on-site equipment, allowing businesses to pay for only the services they use, helping to cut down on cost and increase efficiency and speed.

Existing Cloud Computing Innovation

- Headquartered in Morrisville, **JupiterOne** was founded by NC State graduate Erkang Zheng and raised \$30 million in new funding in 2021 to “grow its engineering, product development, and go-to-market capabilities.”
- Greensboro-based **Qorvo Biotechnologies** offers its core technologies and radio frequency (RF) solutions to connect and protect the world.
- **SAS Institute** in Cary supplies analytics, artificial intelligence, and data management software and services globally that transform data into intelligence.
- Raleigh-based **Red Hat** is a global provider of enterprise open source solutions.

Power Electronics uses wide-bandgap materials enabling next-generation electric vehicles that will replace internal combustion engine-powered vehicles, transforming the automotive industry and the transportation sector in general.

Existing Power Electronics Innovation

- **Cree/Wolfspeed** is an industry leader in silicon carbide power electronics and is headquartered in Durham.
- NC State houses research institutes **FREEDM Systems Center** and **PowerAmerica**, key players in the commercialization of WBG power electronics applications in EVs, charging systems, and supporting electric power infrastructure.
- Greensboro-based **HondaJet** is innovating aviation, using its technology to bring the benefits of private aviation to a wider audience.
- **Soelect** in Greensboro develops advanced solid-state battery components designed to power the next generation of electric vehicles, consumer electronics, and drones and aircraft.

NC + US Innovation Spotlights

INNOVATION SUSTAINED BY PUBLIC INVESTMENT SUCCESS: UNC CANCER CENTER

To create a nation-leading cancer research hub and address the impacts of the state's leading cause of death, the NC General Assembly created the University Cancer Research Fund (UCRF) in 2007 to provide ongoing state support for cancer research and accelerate the battle against cancer in North Carolina.

The UCRF is about investing in people, allowing leading researchers, clinicians, and other experts to develop targeted strategies to better understand the causes and course of cancer; to create new and better ways to prevent, diagnose and treat cancer; and to deliver improved cancer care, screening, and prevention across the state.

The Fund began with \$25 million in 2007, and according to the Annual State Legislative Report, it has grown exponentially, generating \$679.2 million of total economic benefit to North Carolina in FY 2021, with the state reaping over \$12 for every \$1 UCRF invests. UCRF supported more than 3315 jobs in the state, including 1333 direct jobs and 1982 indirect and induced impacts from those jobs.

This UCRF data demonstrates sustained governmental funding can equal sustained innovation and job growth for North Carolina. UNC-Chapel Hill has received on average \$50 million per year in research funds since 2009 and therefore was propelled from being a



moderate research fund recipient to a consistent top 10 recipient within 3 to 4 years of funding.

Sustained public investment has provided the opportunity for UNC Lineberger to become home to the nation's leading public comprehensive cancer center. “It's an investment in making the best care in the world available right here in North Carolina.”

INNOVATION LIFECYCLE: ASKBIO > BAMBOO THERAPEUTICS > PFIZER

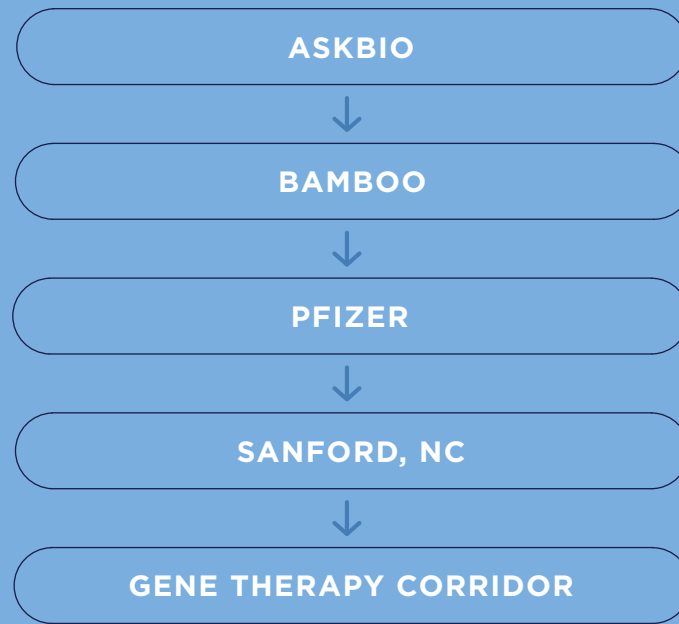
The AskBio + Bamboo Therapeutics story is yet another example of the type of innovation lifecycle NCI aims to foster—from research university and start-up to full-scale company and acquisition—all in North Carolina. Three years after Pfizer's acquisition of Bamboo

Therapeutics, the company, aiming to expand its gene therapy footprint, announced a \$500 million facility expansion in Sanford, North Carolina, adding 300 jobs to the existing workforce of 650.

Headquartered in Chapel Hill, Bamboo Therapeutics, Inc. was a biotechnology company focused on developing gene therapies for rare neuromuscular and central nervous system disorders. A spinout of Chapel Hill-based Asklepios Biopharmaceutical (AskBio), Bamboo Therapeutics was founded in 2014 to advance the research and work of Dr. Jude Samulski, UNC-Chapel Hill professor of pharmacology and director of the UNC Gene Therapy Center.

Under Samulski's leadership as executive chairperson and chief scientific officer, Bamboo Therapeutics quickly grew with support from the North Carolina Biotechnology Center. As a result, the company made immediate strides in the gene therapy community, leading to its acquisition of UNC-Chapel Hill's Vector Core, an 11,000-square-foot gene therapy manufacturing facility, in 2016.

In late 2016, Pfizer bought Bamboo Therapeutics in a \$645M deal, eager to expand its expertise in gene therapy. With Pfizer's newly acquired access to clinical assets, advanced technology and a manufacturing facility in Sanford, the company was optimistic to bring "true disease modification for patients suffering from devastating diseases," as stated in a Genetic Engineering and Biotechnology News release.



This company, and the infrastructure necessary to grow this industry, facilitated the growth of gene therapy manufacturing in North Carolina. Due to AskBio's and Bamboo Therapeutics' diligent leadership and UNC Cancer Center's critical research, North Carolina is recognized as a gene therapy development and manufacturing epicenter.

INNOVATION PRECEDENT OUTSIDE OF NC

The **Massachusetts Life Sciences Center (MLSC)** is an economic development and investment agency with a mission of supporting the growth and development of the life sciences in Massachusetts. Through public-private funding initiatives, the MLSC supports innovation, research and development, commercialization, and manufacturing activities in the fields of biopharma, medical device, diagnostics, and digital health. It also offers programs that fund in-state innovation-driven economic and workforce development initiatives.

Since its inception, Massachusetts has committed \$1.6 billion into the life sciences ecosystem. It was based on an initial commitment of \$1 billion over 10 years announced by then Gov. Duval Patrick in 2008. It has since been renewed for another \$623 million over 5 years.

The impact of MLSC investments since its establishment are staggering. They are responsible for **generating \$3.3 billion of leveraged investments and creating more than 13,000 jobs in Massachusetts** through tax incentive and capital programs over the last ten years.

Why Now

NC Innovation addresses a myriad of critical issues and unexplored opportunities.

Closing the Gap

North Carolina has a history of economic inequality across the state. Following the 2008 recession, the Triangle experienced growth, but the Piedmont Triad and areas in the east and west struggled. In fact, North Carolina has cities and counties with some of the poorest economic mobility in the country. The effects of the pandemic have only exacerbated the issue.

Economic and opportunity disparity between North Carolina's urban and non-urban areas is a major challenge. Outside of I-95 and I-77, the situation is particularly acute, except for communities like Asheville, Greenville and Wilmington. According to the 2020 Census, 50 North Carolina counties lost population. Public and private efforts to correct this gap have not produced sustainable remedies. NC Innovation can be part of the solution.

Once cooperation of various ecosystems across North Carolina is achieved, NCI aims to provide incentives, funding, and encouragement for rural North Carolina jobs by utilizing major tax incentives or significant early-stage funding grants. Further, accelerator studios delivering accounting, legal, HR and other scalable support services could be in a hub community affiliated with a UNC System school, such as Elizabeth City with Elizabeth City State University, Lumberton with UNC Pembroke, and Hickory with Appalachian State University.

Aiming to close the gap, NCI will pursue balanced growth across the state by leveraging our unique academic, economic, and quality of life assets.

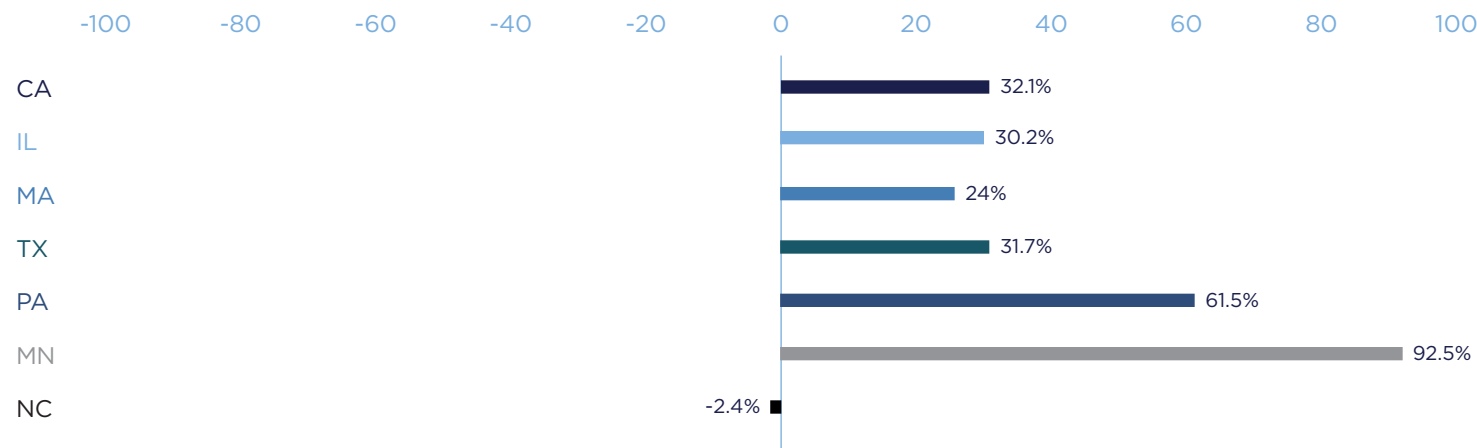
Untapped Potential

We have the foundation to become a thriving innovation ecosystem with our respected 17-campus university system and private universities, extensive community college system, desirable climate, reasonable cost of living, and collaborative culture.

In addition, attitudes toward entrepreneurship and innovation have shifted as more investors recognize the importance of these pillars of economic development. For every one innovation job created, five additional jobs in local non-tradable or support sectors are created, according to economist Enrico Moretti.

However, the state is not maximizing its potential, both from a research translation and from a job creation standpoint. North Carolina should be positioned to serve as an Independent Research and Development (IR&D) hub for the U.S. According to TEconomy Partners, between 2015 and 2020, the level of business-funded academic R&D declined in North Carolina by 2.4%, compared to the U.S., which grew by 29.5%.

Business-Funded Academic R&D By State



Let's Go

To successfully address gaps in the statewide innovation network, NCI will provide the needed vision and leadership, including a resolute, influential CEO and a strong, overarching entity to steer the effort. NCI will also improve cooperation among soiled entities by supporting research initiatives across, rather than within, institutions.

EXISTING TALENT + EDUCATIONAL ACCESS

North Carolina is known as one of the best U.S. states for higher education. North Carolina has 53 colleges and universities, including three Tier 1 research universities: Duke University, NC State University, and University of North Carolina at Chapel Hill. The state also has the highest Historically Black Colleges and Universities (HBCU) undergraduate enrollment in the country.

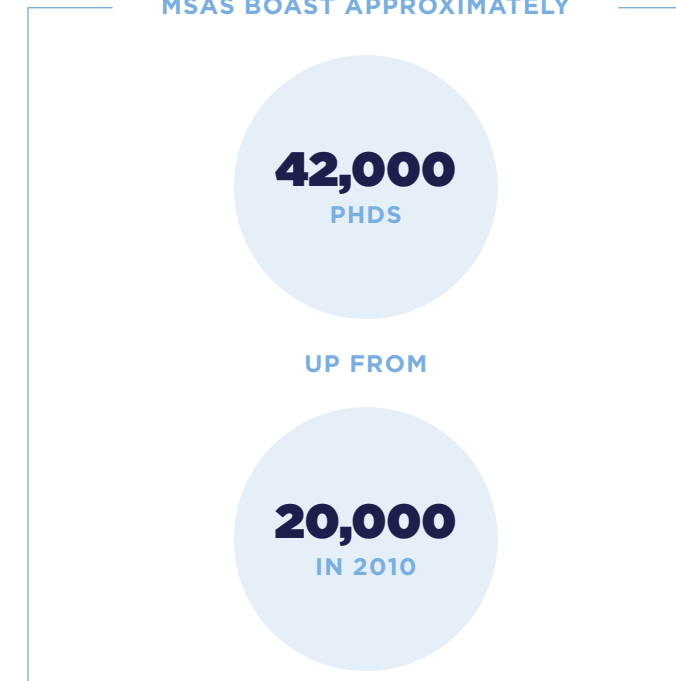
The entire UNC System, in addition to private colleges and universities, plus the 58 campuses of the NC Community College System, produce top talent ready to enter the workforce. These diverse graduates with advanced degrees and highly skilled vocationally trained workers are already within our state; we need job opportunities to keep them here.

**DR. VINCENT PRICE,
PRESIDENT OF DUKE UNIVERSITY**

“Future prosperity and equity among citizens of North Carolina depend upon our state’s ability to create jobs within industries that are driven by innovation. We have a solid foundation, but we will not achieve our potential without wise, decisive, and well-coordinated efforts among our universities, our business leaders, and state and local governments.”



RALEIGH-CARY AND DURHAM-CHAPEL HILL MSAS BOAST APPROXIMATELY



Source: Jeff DeBellis, Director of Economic & Policy Analysis, NC Department of Commerce LEAD

“Several other states... caught an unprecedented wave of available capital and investor enthusiasm for innovative companies. I strongly believe that North Carolina should follow their lead—and that we can do this in a more effective, equitable way that improves the lives of everyone who calls our region home.”

HBCUS, DR. MARTIN, + NC A&T: DRIVING INNOVATION

Historically Black Colleges and Universities (HBCUs) play a critical role in supporting the national economy. According to the United Negro College Fund, HBCUs generate approximately 134,000 jobs nationwide for their local and regional economies each year. Here in North Carolina, we are home to 13 percent of the country's HBCU campuses and enroll more HBCU students than any other state.

North Carolina Agricultural and Technical State University (NC A&T) is one such institute that is helping to fuel an innovation-driven economy. According to

a study that ranked institutions based on production for minority students, NC A&T produces the most minority engineers in the country. It also ranks second in engineering master's degrees and fourth for doctoral degrees in engineering.

Harold Lee Martin, Sr., Ph.D., chancellor of NC A&T since 2009, believes North Carolina can capitalize on its leadership in HBCUs. "As other states turn a belated eye to increasing diversity within their own workforces, we already enjoy an abundance of riches—a pipeline of exceptionally well-educated graduates who, in most instances, also bring an element of diversity to the workforce. That could make North Carolina not only a national leader in the innovation economy but also a national leader in a diverse and representative national economy that truly leaves no communities behind," he says.

Dr. Martin adds, "Without a doubt, the most important ingredient to drive innovation in North Carolina is a healthy research sector." NC A&T has been one of the three most productive public research universities in the state for more than a decade. It now has seven centers of excellence, including four new ones added over the past two years, in areas such as cybersecurity, autonomous vehicles, bioenergy, and post-harvest technologies.



ELIZABETH CITY STATE UNIVERSITY + TRANSPORTATION

With over 150 students enrolled in its aviation program, Elizabeth City State University leads the way in training new generations of aviation professionals, with a focus on recruiting minorities and women to the field.

UNC PEMBROKE + AGRICULTURE

At UNC Pembroke, students enrolled in the agricultural science education and research programs learn modern techniques of sustainable agriculture through classroom theory and firsthand practical experience.

ECU + EASTERN REGION PHARMA CENTER

East Carolina University received a \$1.9 million grant from the Golden LEAF Foundation to create the Eastern Region Pharma Center (ERPC). The center will teach students advanced pharmaceutical manufacturing techniques and provide continuing education to current pharmaceutical employees.



CURRENT MOMENTUM

North Carolina is currently experiencing tremendous momentum in innovative growth.

Hotbed for Life Sciences

BioSpace recently named Research Triangle Park as one of nine "hotbed" life science markets in the United States. The organization listed what it's calling "Bio NC" alongside San Francisco, San Diego, and Boston. The map notes that the region houses approximately 11.4 million square feet of lab space. Within that space, 5,413 companies employ 86,216 people with average salaries of \$118,944.

In addition, RTP is positioned 8th on the global Top 20 Science Cities list curated by Savills, who ranked the top 20 cities for life sciences based on their human capital, investment into health and R&D, the flow of funding into the cities, their openness for business, lifestyle indicators, and the cost of property in each market.

Opportunities Grow Across State

While RTP is certainly an innovation hub, opportunities are growing across the state. By June 2021, North Carolina reported that investment in life science projects totaled \$2.9B, which will lead to thousands of life sciences, construction, and other related workforce jobs.

From Raybow USA's plans for a \$15.8 million expansion in its Brevard headquarters; to Audentes Therapeutics' investment of \$110 million in a 209-job gene therapy facility in Sanford; to Thermo Fisher's addition of 290 jobs and \$154 million investment in its Greenville campus; to Lilly investing \$1 billion and adding 600 new jobs to a pharmaceutical plant in Cabarrus County, skilled workers will have their choice to pursue careers both within and outside of RTP.

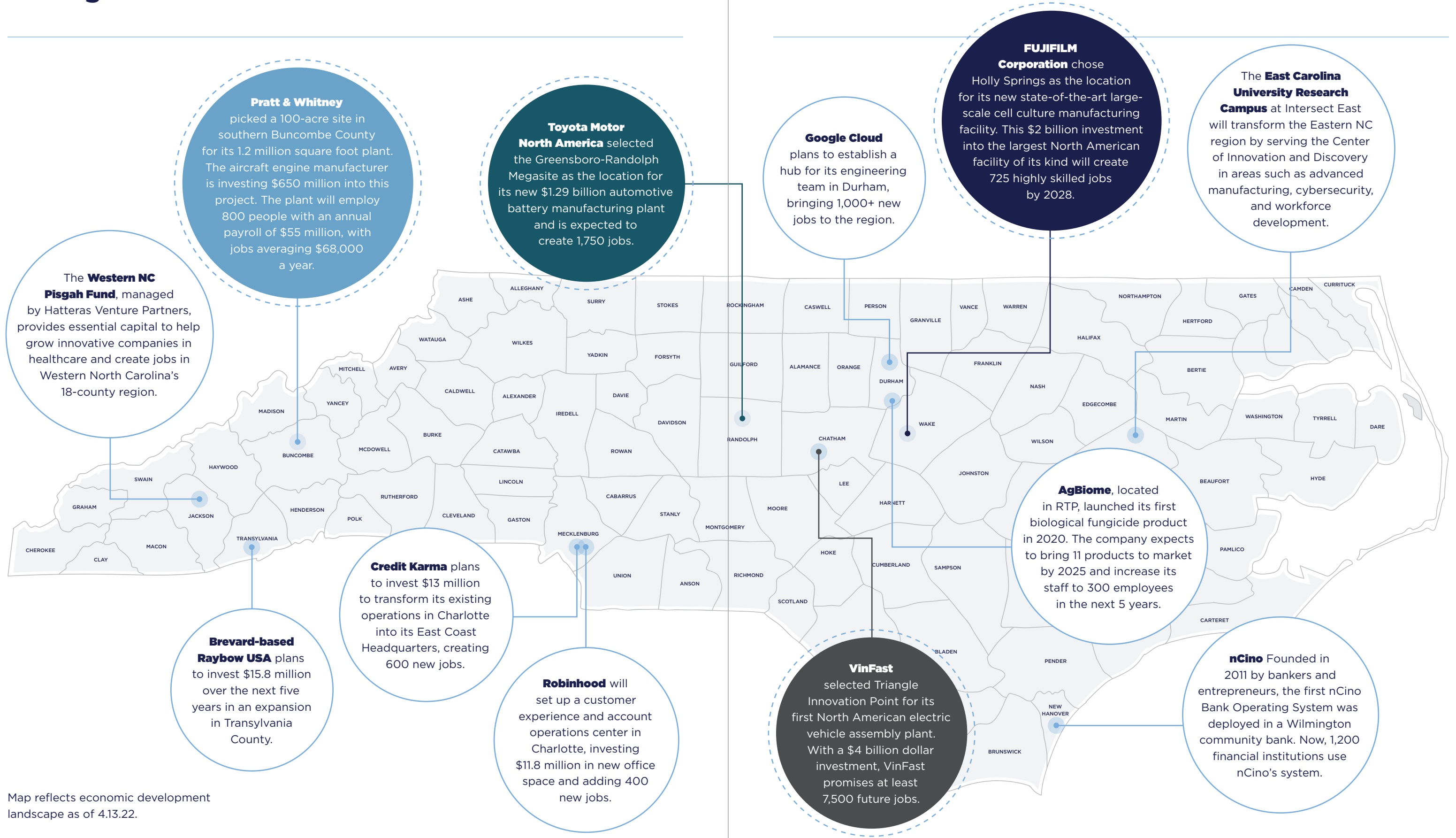
Entrepreneurship Booming

In addition to established organizations, data from the North Carolina Secretary of State's business registration division shows that entrepreneurship via startups is booming. A total of 178,300 new businesses were filed in 2021, more than in any other prior year on record.

In a statement on WRAL TechWire, North Carolina Secretary of State Elaine F. Marshall stated, "North Carolina is a place where people want to do business, and we are doing everything we can to help them turn their dreams into dollars in their pockets."



Existing Innovative Growth



Map reflects economic development landscape as of 4.13.22.

NC Up + Coming Innovation Spotlights

ATRIUM HEALTH + WAKE FOREST MEDICAL SCHOOL

Atrium Health, Wake Forest Baptist, and Wake Forest University are eager to break ground on the new Wake Forest School of Medicine - Charlotte.

As the largest U.S. city without a four-year medical school, Charlotte and the entire southeast look to benefit tremendously from the sprawling midtown campus and its accompanying state-of-the-art innovation district that will serve as “a catalyst for innovation, economic development, and social impact,” said Atrium CEO Gene Woods.

Young people also drive innovation, believes Julie A. Freischlag, MD, FACS, FRCSEd (Hon), DFSVS, chief executive officer of Wake Forest Baptist Health, dean of Wake Forest School of Medicine, and chief academic officer of Atrium Health Enterprise. She states, “More young people want to come to North Carolina—which drives innovation and job creation, advances research and leads to the development of more companies.”



G1 THERAPEUTICS: UNIVERSITY IDEA TO COMPANY SUCCESS

G1 Therapeutics, a commercial stage biotech in RTP, improves the lives of those impacted by cancer by developing next generation therapies. Early research that led to G1's formation in 2008 was based on discoveries at UNC Lineberger Comprehensive Cancer Center, which is supported by the University Cancer Research Fund. After receiving a KickStart grant, the first company to do so, G1 raised approximately \$108.6 million in an initial public offering of its stock in 2017.

Michelle Bolas, UNC chief innovation officer and executive director, Innovate Carolina, said, “The success of G1 reflects the power of translating University-born ideas and research into commercial enterprises. It came out of the University, local firm Hatteras Venture Partners led funding, and it is headquartered in the state.”

Jack Bailey, G1 Therapeutics CEO and former president, US Pharmaceuticals at GSK, believes North Carolina is uniquely positioned to grow successful biotech companies by leveraging assets, such as a reasonable cost of living compared to other life science cities, and renowned universities that create a strong workforce and support the highest concentration of PhDs nationwide.

“While RTP is a top five area for Life Sciences, the bar is being raised across the globe. Everyone wants these jobs. They’re the future,” Bailey comments.



What This Means for NC

REASONS TO INVEST

If realized, NC Innovation positions North Carolina as beneficiary of:

14,840

INNOVATION
SECTOR JOBS*

\$955 million

IN EXTERNAL FUNDING*

AND

\$2.156 billion

IN ECONOMIC IMPACT
PER YEAR*

**Based on experience of UNC's University Cancer Research Fund impact analysis*



Sixty-five years ago, RTP leaders had a vision for significant economic growth and involved private, public, and academic leaders to create the now globally recognized Research Triangle Park. RTP's success proves that it can be done, and this time, we can do it on a grander scale by providing economic opportunity across the state.

The ROI potential is enormous. If we are intentional in our efforts, we can follow in the footsteps of other intentional entities, like Carolina Core and Winston-Salem Innovation Quarter, who've brought major announcements like Toyota Battery and Boom Aerospace to the state.

NC INTENTIONAL INNOVATION EFFORTS

Winston-Salem's **Innovation Quarter**, envisioned and brought to life by a group of academic, business, and government leaders, is a thriving innovation district. This mixed-use space of business, housing, academia, and green space creates an environment ripe for collaborating, networking, and living, driving economic growth and forging a vibrant community.

The Carolina Core, home to companies like Honda Aircraft Company, Pfizer, FedEx, HAECO and Aetna, continues to grow. This 120+ mile stretch from Fayetteville through Winston-Salem is rich with skilled talent, affordability, and market access. International corporations are recognizing the tremendous value in central North Carolina, such as Toyota and Boom Supersonic.

➤ **Toyota** will build its first North American battery manufacturing plant for a new generation of electric vehicles at the Greensboro-Randolph Megasite. The \$1.29 billion project will create at least 1,750 jobs and boost the state's economy by an estimated \$9.5 billion over 20 years.

➤ **Boom Supersonic**, working to design and build sustainable supersonic airliners for commercial service, will develop a 64-acre site located at the Piedmont Triad International Airport in Greensboro. This "Superfactory" will employ 2,400 workers, bringing an estimated \$32.3 billion in economic impact to North Carolina over the next 20 years.

➤ Vietnam-based **VinFast** plans to deliver smart, safe and environmentally friendly EVs. The company selected Chatham County to build its first US electric vehicle assembly plant. With a \$4 billion dollar investment and the promise of 7,500 jobs, this project is estimated to grow the state's economy by at least \$71.59 billion over 32 years.

Stan Kelly, CEO of the Piedmont Triad Partnership, believes NCI gives North Carolina a competitive advantage to bring attention to who we are and what we have to offer:

"North Carolina has invested in substantial assets: university systems, highway structure, and infrastructure. Now is the time to think about this holistically and leverage what we've spent the last 100 years building."



Time is Now



North Carolina needs unifying vision, force, and funding to drive investment and innovation.

NCI will leverage the assets we already have at our fingertips, whether that's medical, academic, research, or manufacturing resources, allowing us to harness the momentum of innovation efforts across the state.

To ensure a thorough and varied knowledge base, we will partner with seasoned corporate and business leaders, top research university experts, and invested private and public entities.

To yield the highest potential economic impact, we will focus on five clusters: AgTech, Biohealth, Cloud Computing, Defense Innovation, and Power Electronics.

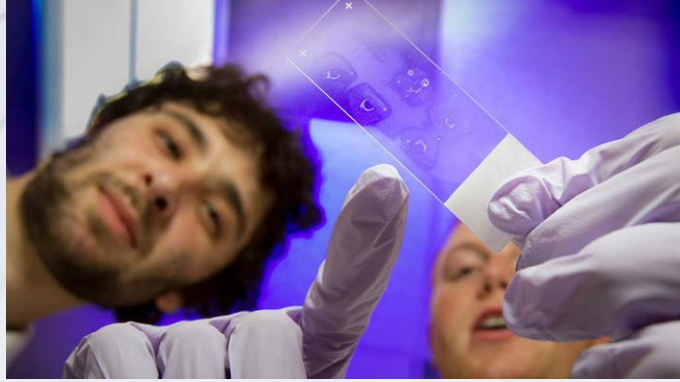
To champion sufficient funding, we will have a dedicated CEO who will lead this effort to increase funding and coordination within the state, secure both public and private funding, and strengthen relationships with our university partners.

NCI will Collaborate. Market. Advocate.

CAN YOU ONLY IMAGINE?

Bob Ingram, General Partner at Hatteras Venture Partners and former CEO and Chairman of GlaxoWellcome, served on various committees in the past related to economic development and innovation growth for North Carolina. Those initiatives lacked the necessary resources, focus, and collaboration. Now, assets are in place and leadership has a shared vision: Become the leader in Ideation > Innovation > Job Creation.

"I see NCI as an opportunity that we should grab. It is worth our time and best effort," says Ingram. NCI is a prime example of a great public-private partnership. Private companies collaborating with state government and academia can make this more than an idea, but a reality. Research Triangle Park serves as a model for what we can achieve.



"Companies wanted to come here because we sit in the middle of great universities, both public and private. Those universities were a source of talent, innovation, and intellectual property, all of which were key ingredients in companies like IBM, Glaxo, and Cisco," Ingram comments. "Just as RTP became a huge economic engine and driver of growth in the 50s and 60s, NCI can be an economic engine of real growth for the 20s, 30s, 40s and beyond."

Take a moment to consider:

A place where ideas come to life, where innovation leads to job creation.

An ongoing source of funds that pour into ideas, people, places and businesses that transform lives and solve the most challenging issues impacting our livelihoods today.

A state where innovation thrives and produces a high quality of life for citizens in every county and region.

North Carolina will be a global leader where ideas blossom, innovations occur, and jobs are created.

To be satisfied is to fall behind.

From our farms, we built research universities.
From our research universities, we built Research Triangle Park.

RTP isn't the end. It's just the beginning.

THE TIME IS NOW.



NCINNOVATION.ORG