Strengthening Innovation, Talent & Equity in Next-Generation Manufacturing
SITE Next-Gen: A Piedmont Triad Cluster Strategy

This SITE Next-Gen strategy will spark equitable innovation to invigorate Next-Generation Manufacturing in the Piedmont Triad region, increasing the number of high-paying manufacturing jobs across all demographics and geographies. The strategy, implemented through seven interwoven component projects, focuses on the prototyping, simulation, initial product development, and testing required for the Triad to elevate its position among the nation’s leading manufacturing hubs. Strengthened connectivity between related efforts will catalyze innovation in long-established industries like furniture, in newly-strong industries like aviation, in cutting-edge subsectors like regenerative medicine, and in small-scale manufacturing by entrepreneurs and small businesses. For this to succeed, intentional efforts to connect underserved rural places and underrepresented people to opportunity will be improved, expanded, and integrated into the talent pipeline and entrepreneurial ecosystem.

The Piedmont Triad is a central North Carolina region with a population of 1.7 million¹, including the cities of Greensboro, Winston-Salem, and High Point, small towns, and rural counties. Among the region’s assets are 11 colleges and universities enrolling 63,000, and nine community colleges serving 93,000. Three historically Black universities are located in the region, including North Carolina A&T State University, America’s top producer of undergraduate and master’s engineering degrees for Black students.² Twelve counties and 63 municipalities form the Piedmont Triad Regional Council (PTRC), this application’s lead institution. The Triad is experiencing COVID-related distress, with data showing all 12 county economies worse off in May 2021 than they were in January 2020.³ The region has also suffered from the coal industry’s decline. The region has five coal-impacted counties and suffered significant job losses at Caterpillar’s Forsyth County plant, once dedicated to mining industry support.⁴

Manufacturing has been the heart of the Triad’s economy for over a century. Long led by furniture (North Carolina is still the nation’s leading employer in furniture manufacturing), textiles, and tobacco, the region has new strengths in aviation and automotive, and is emerging as a national leader in regenerative medicine. As is true across the nation, manufacturing in the region has survived periods of great distress. Between 2002 and 2013 the Triad lost a staggering 40% of its manufacturing jobs.⁵ Employment in the sector rose eight percent in subsequent years but suffered another dip in the COVID-induced recession.⁶ Still, manufacturing occupies a position of great importance in the Triad. Its regional location quotient is 1.61.⁷ The region today accounts for 21% of all manufacturing jobs in the state.⁸ The average manufacturing wage in the Triad, $57,668, is 17% higher than the regional average wage for all jobs.⁹ It is also higher than the average wage in North Carolina, a figure boosted by the many tech and financial sector jobs in Charlotte and the Research Triangle.¹⁰

Metrics of success for SITE Next-Gen will include manufacturing job growth, average sector wages, and new business starts. Although state and Triad manufacturing employment are projected to decline over the next five and 10 years¹¹, SITE Next-Gen will strive to create
positive regional job growth in five years and 2,000 net new jobs in 10 years, with average wages rising faster than the currently-projected 2.2% annual increase. In addition, equity measures will focus on increasing underrepresented individuals in training, certificate, and degree programs; accessing entrepreneurship programs and obtaining business loans; and employer commitments to diversify their manufacturing workforce and supply chain contracts. SITE-Next Gen will aim to achieve a 15% increase in each of these equity measures.

Most of the work to create facilities that enable prototyping, simulation, and testing of manufacturing innovations - along with staffing and related training programs - will be completed in the first three years of the Phase II grant period. The full development of the Regenerative Medicine Hub and full alignment of talent and small business development strategies will take place over five years. Potential barriers to implementation include the ambitious scope of projects, the degree of coalition coordination required, and intellectual property issues among universities, entrepreneurs, and large manufacturers. The strength of the coalition will mitigate these obstacles. For example, North Carolina A&T, Wake Forest University, and Alamance Community College have complimentary projects to improve manufacturing processes and product development and can share expertise on intellectual property and commercialization of new technologies. For manufacturing entrepreneurs, area makerspaces will share a cohort of expert mentors and private entrepreneur supports.

Component Projects:
A. Innovation in Next-Generation Aviation, Automotive, and Digital Manufacturing
Aviation & Aerospace Manufacturing has a 1.68 location quotient (LQ) in the Triad[^1], with average wages of $82,013.[^2] Regional aviation manufacturing employment is projected to grow by 30% over the next 10 years.[^3] Led by North Carolina A&T State University, the Center for Innovative Aviation & Automotive Manufacturing will bring together businesses and academic institutions to create state-of-the-art capabilities for aviation and automotive manufacturing. The Center will be a one-stop shop for the design, prototyping, and testing of aviation and automotive advancements, especially the development of high performance, lightweight materials. It will emphasize economic development through the commercialization of these innovations. NC A&T will also develop an open-source repository of industry-focused research on digital manufacturing and cybersecurity, dubbed the NC Industry 4.0 Portal.

Coalition member NC A&T is the nation’s largest historically Black university (HBCU) and ranked as America’s best HBCU in 2020 and 2021.[^4] The budget is approximately $7.5 million for the Center for Innovative Aviation & Automotive Manufacturing and $3 million for NC Industry 4.0. Funds will be used for equipment and staffing. Matching funds could come from space donated at Piedmont Triad International Airport, or a combination of public and private sources.

B. Creating a National Hub for Regenerative Medicine Manufacturing
Coalition members Wake Forest Institute for Regenerative Medicine and RegenMed
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Development Organization are meeting biomanufacturing challenges in this cutting-edge field by creating the Regenerative Medicine Hub. Regenerative medicine grows new cells and tissues with life-saving implications by repairing or replacing organs that do not function properly. The Hub will be a national destination for regenerative medicine innovation and production, creating a new economic development engine for the Triad and North Carolina. In the Triad, pharmaceutical and medical product manufacturing jobs average $83,282\textsuperscript{xvi} and are projected to grow by 35% in the next 10 years.\textsuperscript{xvii} With adjacent Research Triangle Park counties included, the expanded region has an LQ of 2.4.\textsuperscript{xviii} The proposal focuses on three aspects of the Hub:
1. Test Bed – a physical space and equipment for start-ups and small, growing firms for prototyping and initial product development. It also provides a unique training environment.
2. Business Incubator – space and support for regenerative medicine firms offering market potential validation, benefit analysis, financial planning, budgeting, and business planning.
3. Workforce Development – connecting educational programs with biomanufacturers to furnish companies with a pool of trained workers and offer upskilling for existing employees.

The budget is $20 million with funds covering facility operations, equipment, and personnel. Match is anticipated to come from Atrium Health Wake Forest Baptist or a combination of public and private sources.

C. Center of Excellence for Manufacturing Systems Simulation
Coalition member Alamance Community College’s (ACC’s) proposal will advance science-based manufacturing by using simulation to replicate and improve manufacturing processes. Next-Gen Manufacturing simulation will be achieved physically and digitally, and industry partners will help to design programming. The Center will train manufacturing techs to earn certificates or associate degrees at ACC, with some transferring to engineering degree programs at NC A&T. Training will focus on employee interactions with technology – from robotics to artificial intelligence to virtual reality. This project builds upon a previous EDA grant made to ACC. The budget is $4.66 million. Funds will be used for technology and equipment, staffing, partnership coordination, and wrap-around student services. Matching funds will come from ACC.

D. Next-Generation Furniture Design & Manufacturing
The Generator at Congdon Yards is a first-of-its-kind, state-of-the-art furniture prototyping and production facility. With prototyping, small batch production, and technical assistance, it helps regional firms to scale up quickly. The Generator’s goal is to re-establish the region as a global design and innovation center for furniture and interior design. With the number of furniture suppliers in small-town North Carolina, the Generator benefits both rural and urban parts of the state. This project will expand the Generator with a cutting-edge makerspace, allowing all parties involved with getting new products to market to collaborate. The High Point Chamber Foundation manages the Generator. The property is owned by a family foundation. Project costs are $3.7 million. Funds would go toward upfit, equipment, and staffing. Match would come from fundraising by coalition member Business High Point and state grant funds.
E. Catalyzing Small-Scale Product Development and Manufacturing
Part 1: The Nussbaum Center for Entrepreneurship (NCFE) will redevelop a 75,000 square foot industrial space at the Steelhouse in Greensboro to provide flexible, smaller spaces for start-ups and small businesses in advanced manufacturing. For manufacturing entrepreneurs, this space would be the next step after using the area’s Forge makerspace. Taking a prototype from the Forge, start-ups could use the Steelhouse for initial production and distribution. The non-profit NCFE, a coalition member, has a 35-year track record as a resource for entrepreneurship in rural and urban counties. The space renovation budget is $9.44 million. Matching funds will come from prior grants, building donation, and no-interest loans from foundations.

Part 2: Expand opportunity and support for small manufacturing businesses in the Southwest Quadrant (SWQ) neighborhood of High Point, one of the region’s poorest. A redeveloped warehouse will offer low-cost small manufacturing spaces for small businesses, targeted for MWBEs. Services will include skills training, business coaching, access to financing, and MWBE certification. As suggested by EDA Smart Growth America research in 2019, this facility will serve as a feeder for businesses to grow into the nearby Generator, and a catalyst for neighborhood revitalization. The City of High Point, a coalition member, has identified a former hosiery mill to purchase. Project costs are $6.1 million, with funds going toward building purchase and upfit. Matching fund sources include private fundraising and state grant funds.

F. Talent Development for Next-Generation Manufacturing
This will implement key parts of the 2018 Triad Talent Alignment Strategy, aligning workforce education and training efforts with employer needs and linking to entrepreneur development, with a focus on equity and inclusion. Improved coordination across the region will build the talent pipeline for Next-Generation Manufacturing, engaging underserved places and underrepresented groups. Strategies include:

- A robust Next-Generation Manufacturing sector partnership and Leadership Council;
- Expand the Dream It Do It initiative (educating people about modern manufacturing careers), scaling up the Ambassador Program to reach underserved parts of the Triad;
- Implement Finish Triad, a program that uses navigators to help underrepresented people finish degree and certificate programs in Next-Generation Manufacturing;
- Connect workforce initiatives with adult credential, degree completion and employment programs, like Guilford Jobs 2030. Set regional goals based on the MyFutureNC initiative;
- Increase outreach to rural areas and underserved communities, by placing Finish Triad navigators in NCWorks offices throughout the region and using a mobile career center;
- Expand the Triad Career Connect apprenticeship model for underserved populations;
- Connect with the entrepreneurial ecosystem strategy by a) developing an entrepreneurial support organization (ESO) regional web portal, with outreach and marketing for manufacturing entrepreneurs; b) building a network of local business ambassadors to connect area entrepreneurs (especially from underrepresented communities) to the ESO.
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network and digital resources; and c) creating a scholarship program for entrepreneurs.

Lead coalition entity the Piedmont Triad Regional Council (PTRC) will direct the project, building on existing relationships with nine community colleges, NCWorks centers, the regional collaborative of Workforce Boards, and entrepreneur support organizations. The project budget is $4.04 million. Match is anticipated to come from state funds and foundation support.

G. Strengthening the Triad’s Entrepreneurial Ecosystem for Next-Generation Manufacturing
Part I: This effort will expand access to high-quality support for Next-Gen Manufacturing entrepreneurs across the region. Key aspects include: 1) recapitalization of a revolving loan fund to improve capital access for underrepresented groups; 2) a capacity-building fund for entrepreneurial support organizations (ESOs) to improve technical assistance for manufacturing entrepreneurs in rural and urban areas; 3) an ESO Network established across the Triad to formalize coordination and collaboration, data sharing, and unified outreach; 4) implementing the Ice House Entrepreneurship Training Program – championed by the Kauffman Foundation – with community college Small Business Centers; and 5) supporting local backbone organizations to manage and align strategic initiatives. The non-profit coalition member Piedmont Triad Regional Development Corporation (PTRDC) will lead this effort. The budget is $18 million (40% revolving loan fund, 40% ESO capacity building, 20% other systems and support networks). Matching funds will come from local governments, philanthropies, bank community reinvestment financing and CDFIs.

Part II: Teams of experienced mentors and related programming will be developed at three regional makerspaces to enhance entrepreneurship. Each mentor will lead training and on-the-job experience for groups of apprentices and pre-apprentices, and career discovery workshops for school students across the region. They will assist in developing 3D prototypes and initial products. The lead organization for the makerspace mentor program is the Forge, a non-profit. The project budget is $4.88 million, 61% for equipment, 30% for mentor pay, and 9% for a coordinator position. Matching funds are anticipated from city government and foundations.

Summary
The SITE Next-Gen strategy will produce a collective impact greater than the sum of its individual parts. In this proposal, catalytic projects are supported by workforce development and entrepreneurial ecosystems that will be strengthened across the region, benefitting all manufacturing. The projects share a place-based focus and the goal of driving manufacturing innovation. These projects are highly feasible to complete by September 2027, and transformative to move the Triad beyond a long history of manufacturing strength to a new era of Next-Generation Manufacturing innovation focused on high-growth industries, high-paying jobs, resiliency, and equity. By accelerating advances in equitable innovation and bringing new products to market, the Triad will bolster its resilience and address generational racial and geographic disparities.