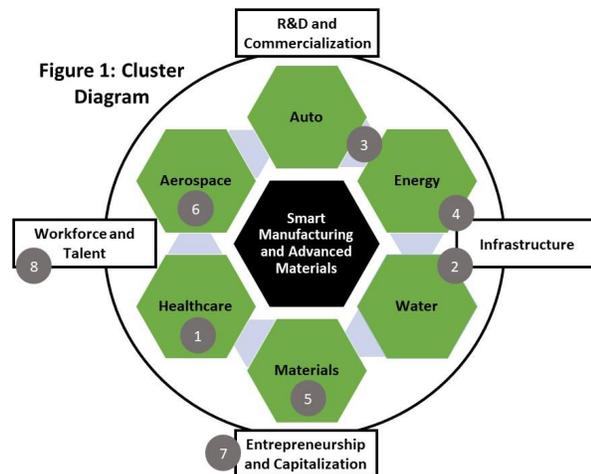


# Project Narrative - Northeast Ohio's Advanced Manufacturing Cluster: Smart Manufacturing and Advanced Materials

## 1) Overall Concept and Anticipated Outcomes

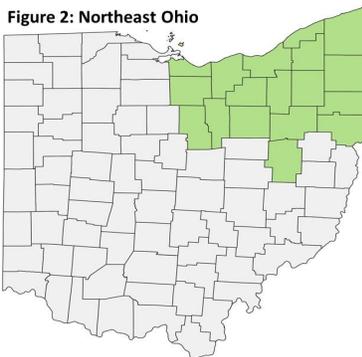
Ohio is the third largest manufacturing state in the nation in terms of jobs and economic output. Northeast Ohio is the powerhouse and epicenter of manufacturing in Ohio. At \$46 billion, Northeast Ohio manufacturing drives nearly 40% of Ohio's Gross Domestic Product, directly employs nearly 300,000 people, and indirectly supports one million jobs.<sup>1</sup> With its robust network of nearly 10,000 manufacturers, Northeast Ohio is central to the nation's supply chain, geographically and economically. Via this application, the region is poised to be a focal solution to national supply chain vulnerabilities revealed by the pandemic.

Within manufacturing, this proposal focuses on a cluster defined around smart manufacturing and advanced materials. The cluster encompasses an estimated 700 firms, 45,000 workers, and \$12 billion Gross Regional Product (GRP), and powers a robust supply chain. Illustrated in Figure 1, the market combining smart manufacturing and advanced materials generates a high degree of interdependence among research and development (R&D) and commercialization, infrastructure, entrepreneurship and capitalization, and workforce and talent pillars. These technologies have integrated applications across the region's driver industries, including aerospace, auto, energy, healthcare, materials, and water. To maximize the high potential for positive ripple effects, projects (1-8) are selected drawing on the region's rich assets to expand the applications of these technologies in specialized market segments and catalyze equitable supply chain growth.



These projects provide an opportunity to address structural inequities that produce extreme conditions of distress in our communities. According to the U.S. Census Bureau, Cleveland is the poorest big city in America with a 32.7% poverty rate.<sup>2</sup> Within the last decade, Youngstown has led all American cities in poverty rate (currently 35.2%).<sup>3</sup> Similarly, Akron (23.5%), Canton (30.8%), and Warren (35.0%) each have extremely high levels of poverty and distress contributing to regional trends of long-term population decline, high unemployment, and low per capita income with large gaps along racial lines. In response, equity is centered and operationalized in the proposed projects. This application, which spans an 18-county Northeast Ohio region, is submitted by the Manufacturing Advocacy and Growth Network ("MAGNET"), a nonprofit economic development organization dedicated to growing Northeast Ohio's manufacturing industry, in collaboration with leading public and private partners.

Figure 2: Northeast Ohio



<sup>1</sup> Team NEO, Manufacturing Quarterly Economic Report, October 2021.

<sup>2</sup> Campbell, E. "Cleveland poorest big city in the country." September 21, 2020. Center for Community Solutions.

<sup>3</sup> Skolnick, D. "Youngstown leads nation in poverty rate." Youngstown Vindicator, November 3, 2011.

Vision for the regional growth cluster. **The vision is to grow an equitable and CEDS-aligned<sup>4</sup> smart manufacturing and advanced materials cluster in Northeast Ohio that fortifies supply chain resilience.** This will be done by capitalizing on competitive advantages in transformative technologies, local proximity of key assets, supply chain strengths, and unique interdependencies that spur continuous innovation. The vision derives from the Blueprint for Manufacturing in Northeast Ohio -- a regional strategic plan developed by over 250 public and private partners, including 150 manufacturing CEOs.<sup>5</sup> The proposed component projects target opportunities to catalyze ripple effects and growth:

- The cluster ecosystem generates a high degree of interdependence among R&D and commercialization, infrastructure, entrepreneurship and capitalization, and workforce pillars.
- Despite the existence of transformative assets in the region, a majority of Northeast Ohio manufacturers are moving slowly to adopt and innovate around these driver technologies.
- Economic success has not been equitable and opportunities to prosper have not been equal for all members of the Northeast Ohio community, particularly people of color.
- Northeast Ohio has unique and underutilized natural assets, infrastructure, and logistics capabilities, which provide enormous potential for supply chain growth.
- Talent shortfalls are critical to address. Nearly two-thirds of the survey-respondent businesses in the cluster report that they struggle to find the skilled workers needed for growth.

Economic opportunity presented by the regional growth cluster in relation to the target industry.

The potential of this cluster derives from two sources. First, Northeast Ohio has unique opportunities to invest in R&D and commercialization assets to propel the economy in new directions. Proposed projects 1, 3, 5, and 6 seek to expand the applications of cluster technologies into specialized market segments. Since 2010, tech startups in aligned technologies have generated at least \$9.1B in economic impact including \$5.3B in revenues, \$2.3B in wages, and over \$2B in exit value. This cluster will produce results on at least this scale through 2030. Second, the manufacturing supply chain of 10,000 companies in Northeast Ohio is undergoing a generational transformation as firms innovate, adopt, and modernize around cluster technologies. Proposed projects 2, 4, 7, and 8 seek to fortify and improve the region's supply chain through entrepreneurship and capitalization, infrastructure, and workforce pillars. An impact analysis conducted by academic researchers estimated potential for over \$15B in GRP growth within seven years resulting from a focused strategy on supply chain modernization around this cluster.<sup>6</sup>

Coalition members, roles, and commitment to economic growth. MAGNET is the lead applicant and will administer Phase 1, including housing the Regional Economic Competitiveness Officer (RECO). Additionally, MAGNET will lead component Project 8. Other project leads are listed in the table below; additional coalition members providing leadership in pillar areas are footnoted.<sup>7</sup>

---

<sup>4</sup> 9 of the 18 counties are covered by CEDS; Eastgate Regional CEDS 2020-2022; Ohio Mid-Eastern Govs. Assoc. 2020 CEDS; Northeast Ohio Four County CEDS 2021. These and other CEDS-like plans support these priorities.

<sup>5</sup> MAGNET. Make It Better: Blueprint for Manufacturing in Northeast Ohio. 2021. [www.makeitbetterohio.org](http://www.makeitbetterohio.org).

<sup>6</sup> TeamNEO. Smart Manufacturing- Industrial Internet of Things Roadmap for Northeast Ohio. 2018.

<sup>7</sup> Aerozone Alliance, Akron Urban League, America Makes, Youngstown State U, Bounce, Case Western Reserve U, Cleveland State U/ Internet of Things Collaborative, Cleveland Urban League, Cuyahoga Comm. College, Greater Akron Chamber of Commerce, Greater Cleveland Partnership, Hispanic Center for Economic Development, Kent State U, Lakeland Comm. College, Lorain County Comm. College, Manufacturing Works, Mezzanine Fund, Minority Business Assistance Center, Port of Cleveland, Presidents' Council and African American Chamber of Commerce, Stark County Minority Business Association, Stark Economic Development Board, Stark State College, TeamNEO, Youngstown Business Incubator, Youngstown/ Warren Regional Chamber.

In this unprecedented level of regional collaboration, the Ohio Department of Development, Northeast Ohio Four County Regional Planning Organization, and 30 public sector leaders and political subdivisions are partners.

<b>Project Leads</b>	<b>Commitment to Regional Economic Growth</b>
University Hospitals (UH) Ventures (Project 1)	UH Ventures is a nonprofit organization that works with innovators in the healthcare industry investing in new entities, joint ventures, and innovations that result in new products, companies, and growth.
Cleveland Water Alliance (CWA) (Project 2)	CWA is a nonprofit organization that leverages technology to impact economic development and spark innovation around water in Northeast Ohio. It accelerates promising technologies and helps them grow.
BRITE Energy Innovators (Project 3)	BRITE Energy Innovators – Ohio’s energy tech incubator – is a nonprofit organization dedicated to ensuring the success of startups driving innovation in energy tech.
County of Cuyahoga (Project 4)	The County of Cuyahoga provides public-sector services for 1.2 million people, including the City of Cleveland. Development priorities include energy grid enhancements for a more resilient industry base.
U. of Akron, College of Eng. and Polymer Science (Project 5)	UA College of Engineering and Polymer Science is a world leader in polymer technology research that collaborates extensively with public and private partners to spur economic growth in polymeric materials.
Ohio Aerospace Institute (OAI) (Project 6)	OAI collaborates with public and private partners to accelerate Ohio’s aerospace industry development through growth partnerships, programs, and networks.
Jumpstart, Inc. (Project 7)	JumpStart is a nonprofit accelerator that unlocks the potential of entrepreneurs to transform communities. They provide venture capital and intensive assistance to entrepreneurs and businesses.

Description of component projects. The eight proposed component projects are:

- Project 1: Smart Healthy@Home. This non-construction project seeks to establish new capacity to provide R&D and commercialization technical assistance to manufacturers developing remote health devices in the 18-county region. Rough cost: \$5,000,000.
- Project 2: Smart Port & Waterway Sensor Deployment. This construction project seeks to deploy a network of smart sensors throughout Lake Erie’s ports and waterways to inform and improve freight backlogs and supply chain disruptions. Rough cost: \$5,000,000.
- Project 3: Sub-scale to Scale Energy Storage Innovation. This construction project seeks to establish a needed R&D and commercialization space supporting businesses innovating batteries and energy storage technologies, especially in automotive. Rough cost: \$8,000,000.
- Project 4: Resilient Energy Infrastructure. This construction project seeks to improve resilience by evolving electrical microgrids serving key industrial districts for improved security, uptime, and usage of green resources. Rough cost: \$7,000,000.

- Project 5: Polymer R&D and Production Facility. This construction project seeks to establish R&D and commercialization space to innovate and test new smart materials for use in advanced manufacturing products, especially polymeric materials. Rough cost: \$15,000,000.
- Project 6: Advanced Materials in Aerospace. This non-construction project seeks to establish capacity to provide R&D and commercialization assistance in the aerospace ecosystem around the NASA Glenn Research Center and throughout the region. Rough cost: \$15,000,000.
- Project 7: Capitalization Growth & Access for Smart Manufacturing in NEO. This non-construction project will expand capitalization capabilities across the region to increase supplier diversity and minority businesses' growth. Rough cost: \$10,000,000.
- Project 8: Diverse Workforce and Talent Initiative. This non-construction project will launch a business technical assistance program supporting the adoption of manufacturing learn and earn programs that engage underrepresented groups. Rough cost: \$10,000,000.

Preliminary specific metrics of success for proposed projects. Cumulatively, the following outcomes are estimated over a 48-month period. Within these metrics, equity outcomes are identified in the Equity Plan Attachment.

- 1,000 companies served with technical assistance via R&D and commercialization efforts.
- \$1 billion raised by client and portfolio companies via capital access efforts.
- 2,500 people prepared with in-demand skill sets and connected to jobs.
- 20,000 jobs created or retained across the portfolio of projects.

Accessibility of matching funds for Phase 2 and any other complementary investments.

Accessible matching funds identified in Letters of Support exceed \$25,000,000 representing over 33% of the total estimated project costs. Sources include cash; local, state, and philanthropic grants; corporate donations; concurrent projects; and capital and public financing initiatives. Described in the Sustainability attachment, numerous federal investments are leveraged.

Barriers to implementation as well as strategies to mitigate. There are no major barriers to implementation anticipated. The proposed Phase 1 budget supports needs for technical assistance and due diligence for each project including the refinement of cost estimates for construction and non-construction projects.

General timeline for implementation, including completion of any construction. The general project timeline is envisioned as:

- First six months: Project readiness, contract and subaward processes, permits (as needed for construction). All projects launch/construction begins within six months of Phase 2 award.
- Construction projects complete within 30 months of award.
- Non-construction projects will be implemented for 48 months.

**2 - 5) Regional Assets, Industry Leadership, Sustainability, and Equity.** See attachments for descriptions and approaches for each dimension.

## **6) Feasibility**

The projects were selected on the basis of alignment with the regional vision, readiness for implementation, capacity of the lead to execute the scope of work upon award, demonstration of resource accessibility and partnerships, and reasonableness of budgets and timeframes in relation to proposed outcomes. Construction projects have strategies for site control.

## **7) Capacity**

MAGNET will serve as the lead applicant, housing the RECO and leveraging its facilities, communications capacity, accounting and finance team, and information technology team to support the project. The RECO will be onboarded immediately during Phase 1. The individual will have at least 10 years of relevant experience and demonstrated effectiveness leading regional growth initiatives and federally funded projects. Leads for Workforce Equity and Entrepreneurship Equity have been identified and will be onboarded immediately in Phase 1 to fulfill the grant's equity vision (see Equity Attachment). MAGNET has a track record of grant performance and fiscal excellence, having successfully completed scopes of work on all federal grants and receiving clean audits, including annual Uniform Guidance single audits of its federal portfolio. Its finance team has demonstrated success in managing federal grants including from the Department of Defense, Department of Labor, EDA, and National Science Foundation.

Described in the Regional Assets attachment, the coalition and partners incorporate the region's fullest capabilities in the public, civic, academic, equity-focused, and industry domains.

## **8) Distress**

This proposal serves an 18-county region in Northeast Ohio with an overall \$238 billion GRP economy, 4.3 million residents, and 2.2 million workers. Per EDA's StatsAmerica tool, the overall poverty rate in the region is 14.26%. The region has experienced slightly higher unemployment (threshold 0.51) and slightly lower Per Capita Money Income (threshold 92.3) than the U.S.<sup>8</sup> Within the region, there are areas of extreme distress. In total, throughout the region there are 126 Opportunity Zones.<sup>9</sup> For example, in addition to Cleveland's status as the poorest big city in America, its population has declined 24.6% (-124,607 people) and poverty rates have not been lower than 26% since 1990. In Cleveland, the 24-month unemployment rate is 13.7% (threshold 8.4) and Per Capita Money Income is \$21,720 (threshold 63.7) indicating high distress. As noted previously, Akron, Canton, Warren, and Youngstown all have extremely high levels of poverty and distress producing the similar economic trends and StatsAmerica unemployment and income threshold measures. Economic distress stretches into rural areas, as well. For example, Erie and Huron Counties have 24-month unemployment thresholds above 2 and Per Capita Money Income thresholds below 80, per StatsAmerica.

The pandemic greatly impacted the region. In total, the region's 2020 GRP declined by \$11 billion compared to 2019. The distribution of unemployment was uneven across industry sectors, geographies, and demographics. Distressed areas Akron (17.6%), Canton (17%), Cleveland (26.1%), Warren (23%), and Youngstown (20.8%) all experienced high rates of unemployment at the height of the pandemic. Rural areas such as Erie County (25.5%) also experienced high unemployment rates. Prior to the pandemic African Americans had 2.5 times higher unemployment rates than whites (12% vs 5%); during the pandemic, Black unemployment exceeded 14% regionally in the latter half of 2020 compared to 8% white unemployment.<sup>10</sup>

**9) Regional Investment.** In total, 192 public and private partners are contributing and supporting this application. See Regional Assets attachment and Letters of Support.

---

<sup>8</sup> StatsAmerica. The Regionizer. Accessed October 10, 2021. <https://www.statsamerica.org/regions/>

<sup>9</sup> Internal Revenue Service. Designated Qualified Opportunity Zones Notice 2018-48

<sup>10</sup> TeamNEO. Post Pandemic Economic Projections. March 2021.