The Heartland Robotics Cluster - Overarching Narrative

SYNOPSIS

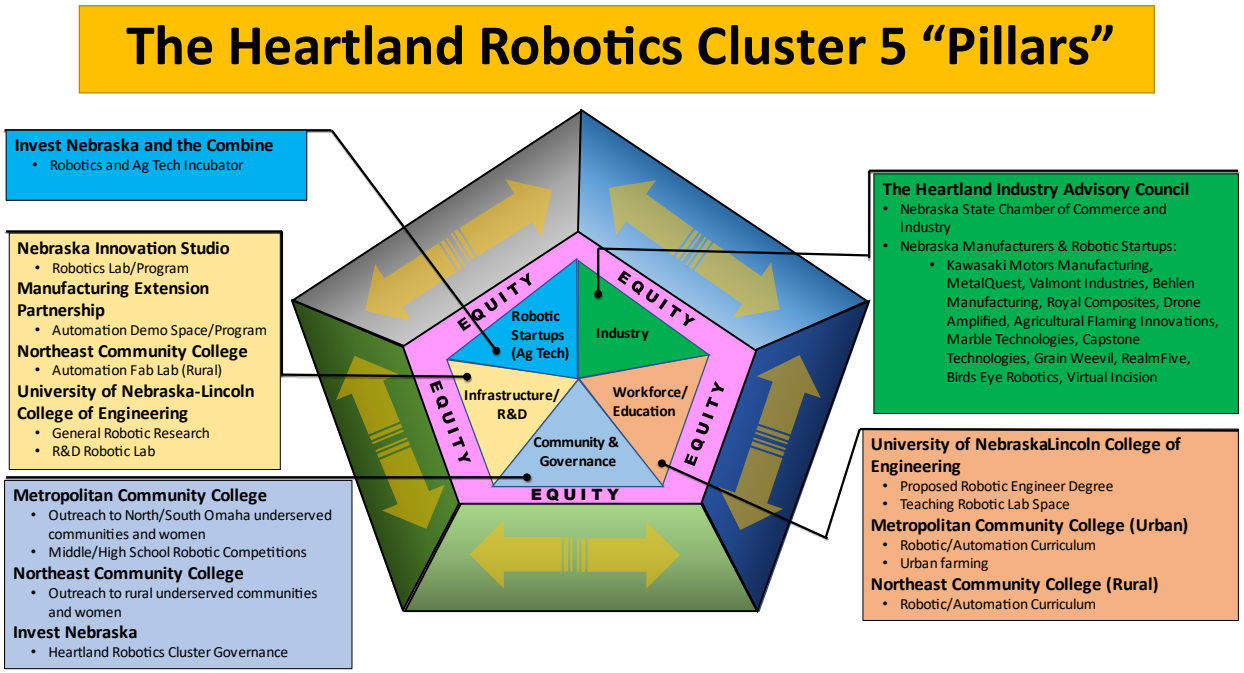
The vision of the Heartland Robotics Cluster is to make Nebraska a leader in robotic technologies and advanced manufacturing automation targeting the agricultural industry.

Description of the Heartland Robotics Cluster (HRC). Utilizing over $28M of EDA funding and over $7M of matching funds, we strongly believe a collaborative approach to labor productivity in agriculture and manufacturing will grow Nebraska's economy in the long run.

Heartland Robotics Cluster - Phase 2 Application

Coalition Project Lead	Type of Component Project	EDA Funding Request	20% Match Amount	Total
University of Nebraska-Lincoln College of Engineering	Non-Construction	$ 7,712,077	$ 1,928,378	$ 9,640,455
	Construction	$ 2,724,043	$ 681,010	$ 3,405,053
Metropolitan Community College	Non-Construction	$ 4,716,763	$ 1,179,600	$ 5,896,363
Northeast Community College	Construction	$ 3,400,000	$ 850,000	$ 4,250,000
	Non-Construction	$ 1,416,883	$ 354,254	$ 1,771,137
Manufacturing Extension Partnership	Non-Construction	$ 1,390,837	$ 347,710	$ 1,738,547
Nebraska Innovation Studio	Non-Construction	$ 4,562,400	$ 1,140,600	$ 5,703,000
Invest Nebraska - The Combine & Governance	Non-Construction	$ 2,700,016	$ 675,004	$ 3,375,020
		$ 28,623,019	$ 7,156,556	$ 35,779,575
			20.00%	

Cluster Component Projects. The HRC coalition partners developed five "Pillars" to mobilize assets and address needs in Nebraska to achieve our vision. The respective cluster coalition projects were categorized under each pillar, bounded by our priority to ensure Equity.



Coalition Members and Partners. In addition to the Coalition Project Leads mentioned previously, the HRC is comprised of the Heartland Industry Advisory Board (see table on page 5 and signed support letters attached) and coalition partners: the Metropolitan Area Planning Agency, the Nebraska Department of Economic Development, the Nebraska Farm Bureau, and the Nebraska Chamber of Commerce and Industry (signed support letters attached).

Alignment with CEDS/Equivalent Strategy. The collection of cluster component projects supports the economic development strategies identified in a 2019 report by McKinsey & Company titled "Blueprint Nebraska" to grow Nebraska's economy:

- Promote diversity and inclusion to retain and attract talent and connect communities across the state (page 22).
- Diversify, expand, and improve the productivity of Nebraska's agri-business cluster (page 41).
- Create a multi-partner manufacturing innovation Center of Excellence focused on Industry 4.0/Automation (page 41).
- Build a pipeline of tech founders in sectors linked to Nebraska's core industries like agriculture and manufacturing (page 41).

The project supports EDA Investment Priorities that include equity, recovery and resilience, workforce development, manufacturing, and technology-based economic development. These are addressed through outreach, training and programming, coordination with private sector, and development of robust and well-supported spaces.

Complementary Initiatives. The HRC complements the following initiatives underway in Nebraska.

Legislative Initiatives - 2022 Legislative Session	
LB 450	Create ihubs in census tracts of high unemployment (150% of state average) and high poverty (20% or more). Would provide state grants to ihubs focused on high-growth startups.
LB 1014	Introduced on behalf of the Governor - to appropriate $90M to community colleges for workforce development and $50M for rural workforce housing.
LB 1114	Startups located in census tracts of high unemployment (150% of state average) and high poverty (20% or more) would receive priority under the state's Business Innovation Act.
LB 1163	Appropriate and additional $20M of ARPA funds to the state's Business Innovation Act for startups and entrepreneurs.
LB 1167	Appropriate $30M of ARPA to the Department of Economic Development for enhancing and retaining Nebraska's workforce through an internship grant program for private businesses.
Other Initiatives	
Peter Kiewit Foundation pledged $50M to the University of Nebraska to support College of Engineering scholarships for women and minorities.	
Nebraska Promise - University of Nebraska will provide free tuition for students who meet academic qualifications and have a family income of $60,000 or less (Adjusted Gross Income).	

Specific Metrics of Success. These metrics will include: 1) an increase in Nebraska's economic output for agriculture and manufacturing, 2) an increase in average wages in the manufacturing sector (greater productivity, less labor), 3) an increase in venture capital coming to Nebraska-based agtech and robotic startups, 4) a greater percentage of women and minority students entering the

University of Nebraska-Lincoln College of Engineering, 5) an increase in the number of students earning a 2-year robotic/automation degree at the state's community colleges, and 6) an increase in the number of prototypes produced by agtech and robotic startups.

General Timeline. The Heartland Robotics Cluster will continue to meet with the expectation that if we receive a Phase 2 award, work can start immediately in Q4 2022 with wind down occurring for all grant projects in Q3 2027. Program funding is for a 4-year period, but the projects will continue to accumulate data into Q3 2027. While the completion of construction projects and projects involving new equipment/space are noted in blue, these labs and space will continue to be used during the projects' program phases.

	General Timeline for implementation, including completition of construction (20 quarters beginning Q4 2022 and ending Q3 2027)																				
		Year 1				Year 2				Year 3				Year 4				Year 5			
Coalition Partner	**Component Projects**	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3
University of Nebraska-Lincoln College of Engineering	Robotic Teaching and R&D																				
	Construction - Teaching and R&D Labs																				
Metro Community College	Develop robotic/automation curriculum																				
	K-12 Robotic Competitions and STEM programs																				
Northeast Community College	Develop robotic/automation curriculum																				
	Rural Robotic-Automation Outreach																				
	Construction - Fab Lab Space																				
Manufacturing Extension Partnership	*Manufacturing Automation Demo Space*																				
	Automation Demo Space Program																				
Nebraska Innovation Studio	*Create Robotic Lab Space*																				
	Robotic Lab Space Program																				
Invest Nebraska - The Combine	Governance of the Heartland Robotic Cluster																				
	The Combine: Entrepreneurship TA-Agtech Robotics																				
	Financial Closeout Preparation																				

Ramp Up	
Execution	
Completion	
Wind Down	

Description of Geographical Region(s) Served. The state of Nebraska represents the entire Heartland Robotics Cluster region. The project will cover the state's 93 counties, 89 of which have a population of less than 50,000 (see attached spreadsheet with counties/FIPS codes). While the entire state is served by the Cluster, various component projects may serve specific counties or be located in specific counties.

The Covid-19 pandemic these past two years has caused severe disruptions to agriculture supply chains, significantly reduced the rural labor force (which was already under severe duress due to population out-migration) and constrained the state's economic growth. The state's minority populations were disproportionately impacted by the pandemic. December 2021, Nebraska recorded an unemployment rate of ***1.7%,*** *a historical low for any state in the country since the Bureau of Labor Statistic began the data series in 1976.* Last decade, Nebraska's population grew at 7.4% (tied for 20th in the country with Massachusetts) - equal to the U.S. rate. As of December 2021, Nebraska had the 2nd highest Labor Participation Rate at 68.5% (behind the District of Columbia at 70.5%.).

Regional assets. Agriculture is the leading industry in Nebraska with 1 out of every 4 jobs related to the sector. Nebraska agriculture accounts for more than 25% of the state's labor income, 40% of the state's economic output, and $23 billion in cash receipts (Nebraska is the 3rd largest

agriculture producing state in the nation). Manufacturing is the 2nd largest industry in the state, employing about 100,000 Nebraska workers and contributing more than $13 billion annually to the state's total economic output. According to the Nebraska State Chamber of Commerce and Industry, those working in manufacturing receive annual compensation of around $60,000 – about $17,200 more than the state's average non-farm wages.

As with other rural, agriculture dominant states in the Midwest, a stagnant labor force requires concentrated efforts to increase labor productivity to grow GDP. Yet the challenge for agriculture has never been more evident. A 2014 AgTech report released by the Ewing Marion Kauffman Foundation stated: "…we must produce more food in the next forty years than during the entire course of human history to date, and must do so on a planet showing signs of severe environmental stress." In addition to labor supply issues, this reality was made worse due to the pandemic: supply chain disruptions in the animal protein value chain, 25% of workers absent from work at meat processing facilities, and a diminishing rural labor force reflected in the 2020 census that has continued over the past 50 years. Nebraska experienced an 11.5% decline in real GDP from 2019 to 2020 while the United States saw a 2.2 percent decline in real GDP for the same period.

Yet the state's core human capital is thriving - The Milken Institute 2020 State Technology and Science Index - Nebraska ranked 12th in the nation for the Concentration of Computer & Information Science Experts per 100,000 Workforce; and U.S. News and World Report 2020 – Nebraska ranked 12th in the nation for high school graduation rate. In September 2021, Brookings Institution identified Lincoln as 1 of 13 "early adopter" metro areas (the only in the Midwest) that have shown above-average involvement in AI activities based on substantial university R&D and major commercial activity in close proximity. Finally, Nebraska is ideal for agtech robotic innovation because of its rich and vibrant agriculture history and an ag-related workforce that is transitioning from aging (average age of farmers in US is 58) to a younger, tech-minded future generation of farmers.

Detailed Overview of Private-Sector Engagement. The Heartland Robotics Cluster received input from the private manufacturing sector prior to the submission of the Phase 1 grant in mid-October. The Nebraska Chamber of Commerce & Industry manages the Nebraska Manufacturing Advisory Council – an industry-driven advocate and advisory council that provides a forum for discussing industry-related problems and resolutions and serves as a voice for manufacturers to strengthen Nebraska's second largest economic driver.

Following notice of the Phase 1 award, the Heartland Robotics Cluster convened the *Heartland Robotics Industry Advisory Board* comprised of thirteen private companies (robotic startups and existing manufacturers) and the Nebraska Chamber of Commerce & Industry. The Advisory Board met weekly to provide input to the coalition partners on their respective labor needs, trends in the industry, and supply chain connections. These private sector companies have committed to hire 1,030 new employees (see industry support letters) and invest over $100M in R&D through the Heartland Robotics Cluster projects (see table on next page).

Private philanthropy in the region has also stepped forward to lend its support to this initiative. While funding commitments are not possible at this time due to grant cycles, the letters of support from the Peter Kiewit Foundation, Omaha Community Foundation, and the Aksarben Foundation

indicate that the Heartland Robotics Cluster's component projects fall within their respective foundation missions.

Detailed Plan for Regional Growth Cluster Sustainability. The component projects of the Heartland Robotic Cluster are administered by either university and community college institutions or by a non-profit organization (Invest Nebraska). We anticipate that after year 4, all component projects will be able to be absorbed within existing budgets. Due to Invest Nebraska's investments in startups, it is in the position to use future investment earnings to cover projects costs after year 4. However, external support through private philanthropy may be needed. Private philanthropy is engaged with the HRC (attached support letters) and will continue to be involved in the cluster development as projects commence and outcomes are gathered.

Private Industry New Employee Commitments and R&D Spending

Private Company (Location and Community Population)	Total New Jobs Committed to Hire by Company 2022-2027	Estimate of R&D spending in Nebraska 2022-2027 (in millions)
Kawasaki (Lincoln, NE - 293,446)	500	$ -
Reinke (Deshler, NE - 737)	50	$ -
Behlen (Columbus, NE - 23,274)	50	$ -
Drone Amplified (Lincoln, NE)	14	$ 2.00
Ag Flaming Innovations (Lincoln, NE)	72	$ -
Marble Technologies (Lincoln, NE)	52	$ 22.00
Capstone Technologies (Lincoln, NE)	35	$ 1.00
Grain Weevil (Aurora, NE - 4,533)	50	$ 2.00
RealmFive (Lincoln, NE)	135	$ 25.00
Birds Eye (Herman, NE - 267) (you read that correctly!)	14	$ 1.25
Virtual Incision (Lincoln, NE)	28	$ 40.00
MetalQuest (Hebron, NE - 1,505)	15	$ 5.00
Royal Engineered Composites (Minden, NE - 2,977)	15	$ 5.00
Total	**1030**	**$ 103.25**

Invest Nebraska, as lead organization, indicated in its outcomes that it will actively pursue additional federal and state government funding in addition to private philanthropy funds to ensure the success of the cluster. This may involve seeking an ongoing state appropriation once the cluster's metrics are gathered and the economic impact of the cluster can be substantiated through an independent economic impact analysis. With private sector industry support and advocacy at the University of Nebraska level (see support letter), the HRC strongly believes this regional growth cluster will be sustainable after September 30, 2027.

Detailed Plan for Engaging Specific Organizations. In the Omaha metropolitan area, Metropolitan Area Planning Agency and Metro Community College plan to engage community partners through the creation of a Community Partner Advisory Board consisting of the Latino Center of the Midlands, the Urban League, Heartland Workforce Solutions, Prairie STEM, the city of Omaha Mayor's Office for Diversity, Equity, and Inclusion (see attached community support

letters). These partners will provide additional input to implement the programs outlined in the MCC component project narrative and address barriers that prohibit access to the cluster's opportunities. These barriers may include transportation, language, and income.

Northeast Community College will continue to engage community partners through the established Steering Committee of Growing Together Initiative (www.growingtogetherne.com) consisting of representatives from public and private entities. Since 2019, this group has actively collaborated to bring change to Northeast Nebraska. A focus on Agtech, makerspace Fab Lab, and advanced manufacturing as outlined under the HRC are key components of the Growing Together initiative.

A focus on agriculture will also require engagement with organizations like the Nebraska Farm Bureau (attached support letter). With more than 55,000 member families involved in Nebraska agriculture, the Nebraska Farm Bureau has local county-based farm bureau chapters in all 93 Nebraska counties that advocate for agriculture, provide scholarships, and build future leaders in rural areas. The Farm Bureau is committed to support the HRC through identifying labor disruptions in the agriculture value chain and networking with farm and ranch family members.

While the HRC has many non-construction component projects, the two construction component projects only involve remodeling of existing buildings. However, both coalition members will ensure that all federal and state labor standards are met through the construction phases of the projects.

Detailed Plan on Engaging Equitably. The 5 "Pillars" of the HRC are bound by Equity to ensure that no person is left behind through these transformational component projects. Equity is viewed by the HRC in three ways.

1) *Pipeline of future workforce.* Nebraska ranks #4 nationally for the number of high school and middle school teams (per student population) participating in two national robotic competitions (CREATE and VEX) and one international competition (FIRST) according to the Nebraska Public Power District. However, students in our underserved communities are not participating due to cost of robotic kits and mentorship. The HRC will engage K-12 underserved communities by sponsoring robotic competitions, subsidized by the HRC and managed by community-based Prairie STEM in Omaha under the Metropolitan Community College component project.

The US News and World Report indicates that robotics degree programs at the undergraduate and graduate level have a disproportionately larger male population than most computer engineering or electrical engineering programs. *At the University of Nebraska-Lincoln College of Engineering (COE), the undergraduate student body unfortunately also reflects this data: 73.3% men, 26.7% women, 8.3% Hispanic, 2.5% Black and 0.1% American Indian/Alaska Native*. COE aims to counter those demographics through new, purposeful programs to have greater appeal to women students, underserved minorities, and rural students outside Nebraska's urban population centers.

The COE is developing a flexible summer bridge program to support students who are highly motivated to pursue an engineering career but are not yet prepared to begin the rigors of mathematics, physics, and computing courses. Many of these students perform at the top of their high school class but *do not have ready access to be calculus-ready or prepared for problem*

solving skills in introductory engineering courses. The Robotics Engineering students will serve as an early cohort participating in an intense 6-week program (July to August) to provide students the computational, problem solving, and mathematics skills that those in economically-advantaged schools take for granted. COE will conduct outreach to student counselors in rural and underserved urban high schools to solicit applications. According to the University of Nebraska-Lincoln Chancellor's Office, 85% of recent university undergraduates from Nebraska remain in the state after graduating while over 50% of out-of-state undergraduates remain in the state after graduating.

The Nebraska Innovation Studio component project will partner with the Nebraska Commission on Indian Affairs and serve as a co-host for the Sovereign Native Youth STEM Leadership Academy, a special summer program for high school students from Santee Sioux, Winnebago, Omaha, Ponca, and other tribes across the state.

2) Engaging existing workforce and manufacturer/startup owners. Northeast Community College (NECC) will also make extensive use of its existing career-related events to share information about the robotics curriculum. In the current academic year, for example, NECC will host more than 30 events, including a large Agriculture Field Day that attracts producers, agribusinesses, and students; Latino youth summits in Norfolk and South Sioux City; a Cybersecurity Career Day; two Agriculture, Math & Sciences Career Days; an Applied Technology Career Day; and an Adult Learners Open House.

NECC also hosts an annual Ag-Ceptional Women's event, which brings several hundred women involved in production agriculture to campus. That will serve as an additional opportunity to highlight the new robotics curriculum as it pertains to production agriculture. Outreach efforts also will include development of automation technology boot camps and workshops specifically geared toward incumbent workers in the meatpacking industry.

Both Invest Nebraska-The Combine and the Nebraska Manufacturing Extension Partnership highlighted specific outcomes to include the robotic startup creation by women and minorities and the purposeful outreach to women and minority-owned manufacturers to engage with on advanced manufacturing automation.

3) Community Outreach. MCC plans to hold numerous events around the Omaha metro area for women and underserved communities to engage them on urban agriculture and indoor robotic farming. MCC will also lead the effort to create a Community Partner Advisory Board detailed in the prior section. The Nebraska Farm Bureau has also committed to support the HRC component projects by engaging their 55,000 member families who mainly live in rural areas. The Farm Bureau will identify labor disruptions in the agriculture value chain for agtech robotic startups and provide networking opportunities in rural areas with farm and ranch family members to build the community.

Detailed Overview on Expected Outcomes

Overarching Specific Metrics from the Heartland Robotics Cluster (2002 - 2027)

College of Engineering	**370** new students enrolled in BS robotics engineering or taking robotics classes (other engineer fields) **100 new students (women/underserved populations) enrolled in BS robotics engineeering or taking robotic classes** **700** students utilizing teaching lab facilities **36** new research projects utilizing College of Engineering facilities **38** new technology transfer activities (invention disclosures, patents, licenses signed)
Metropolitan Community College (urban)	**64** students receiving 2-year degree in Robotics/Prototype Design **15 women/underserved populations receiving 2-year degree in Robotics/Prototype Design** **50 new robotic/automation jobs created in the North and South Omaha communities** **540 K-12 underserved students participating in school robotic competitions** **18** community outreach events organized around urban farming and Agtech **152 women/underserved populations participating in learning and educational outreach events**
Northeast Community College (rural)	**57 memberships sold to use the Fab Lab** **27 training sessions offered** **8 new partnerships formed with public/private entities** **21 training sessions for upskilling incumbent workers** **8 training sessions for upskilling incumbent workers in meat processing facilities** Fabrication prototypes: **16** new prototypes started, **9** prototyped, and **6** prototypes completed
Manufacturing Extension Partnership	**190** Nebraska manufacturers participating robotics supply chain efforts **339** manufacturers integrating automation into their respective production lines **5** new manufacturing companies started **115 women/underserved owned manufacturers served by Manufacturing Automation Program**
Nebraska Innovation Studio	**743** people enrolled in the Nebraska Innovation Studio Robotics Programs **150 women/underserved populations enrolled in Nebraska Innovation Studio Robotics Programs** **11** new industry partners seeking annual robotic training (ag, manufacturing, food & feed production) **400** people receive supplemental training on Nebraska Innovation Studio equipment **30** employees of participants reporting upskill/increase pay/advancement per year **50%** increase in robotics-based skills as reported by participants
Invest Nebraska & The Combine	**14** new robotic startups formed and participate in Entreprenuership Robotic TA Programs **4 new robotic startups formed by women/underserved populations** **$33M** of private capital raised by these new Robotic Startups **335** program meetings between Combine staff and participants **110** new jobs created by the Combine incubator startups **8** applications submitted to other government/private philanthropy funds to further the Cluster's vision **40** monthly meetings of the Heartland Robotics Steering Committee organized **30** quarterly meetings of the Heartland Industry Advisory Board organized

While the above table describes the specific outcomes of each component application, the vision of the HRC requires long-term planning. If we were to project the outcomes after 25 years, it is the hope of all cluster partners that the results resemble the economic impacts of the National Robotics Engineering Center (NREC) at Carnegie Mellon University. A December 2021 report by Fourth Economy, found that the initial $10M investment into the Center in 1995, resulted in:

- 80 companies specializing in robotics, artificial intelligence and related technologies have started with a value of more than $18 billion.
- 457 technologies licensed.
- 3 in 5 employer firms in the robotics/AI/tech sector in Pittsburgh have direct staff ties to NREC alumni (former researchers or staff members).
- 20+ active firms founded by NREC alumni.
- $545 million total direct funding raised by NREC.

The Heartland Robotics Cluster believes that over 25 years, this initiative and the associated component projects could have similar results with this seed funding from the EDA.

Overview of Work conducted in Phase 1. Once the Heartland Robotics Cluster was announced as a finalist for the BBBRC, INC scheduled weekly meetings of the coalition partners and our EDR from the Denver Regional Office. These meetings were intended to discuss individual coalition projects, collaborate when opportunities arise, identify gaps in the proposals, and re-evaluate the coalition projects to ensure they contribute to the cluster's overall economic impact.

INC also scheduled separate weekly meetings with the EDR and representatives of the EDA Denver Regional Office to answer questions, provide immediate feedback on EDA processes/forms, and offer general guidance. As previously discussed, weekly meetings of the Heartland Industry Advisory Board were also held to provide private sector input and direction of the main cluster components – Infrastructure/R&D, Workforce/Education, Equity, and Governance. Community input was gained through conversations with the Urban League in Omaha, No More Empty Pots (Omaha non-profit), etc. (see Community Support Letters).

Detailed list of changes to the vision/proposal to Phase 1 Concept Proposal. There were no major changes made to cluster vision. But as coalition partners reviewed their respective component projects, the following proposals evolved between Phase 1 Concept Proposal submission and Phase 2 Full Application Submission (changes italicized).

University of Nebraska College of Engineering

- Conduct generalized research in the field of robotics – *A construction project for a research lab was added to the Phase 2 component project.*
- Develop a teaching lab for undergraduate students – No changes.
- Formalize undergraduate and graduate degree programs in robotics – *The Phase 2 component project does include creating a robotic engineer undergraduate program. Further research by the University found that only eight (8) robotic engineer undergraduate programs exist across the country. Efforts to create graduate degree programs in robotics was put on hold until more investigation is completed.*

Metropolitan Community College

- Create workforce training curriculum in robotics and automation – No changes.
- Expand existing Prototype Design Lab – No changes.
- Coordinate metro community partners to conduct outreach – No changes.

- Establish robotic learning competitions in underserved K-12 schools – *No changes, but plan to contract with Prairie STEM, a nonprofit headquartered in Omaha, Nebraska with a mission to provide world-class STEM Learning and Social Emotional Learning integration.*

Northeast Community College

- Create workforce training curriculum in robotics and automation – No changes.
- Coordinate community partners to conduct outreach – No changes.
- Create and staff a new Robotics Lab Space – *After surveying regional manufacturers, a need arose to create a Fab Lab focused on manufacturing prototype development for existing manufacturers and startups.*

Nebraska Manufacturing Extension Partnership

- Identify rural/urban manufacturers to assist new robotic startups with supply chain issues – No changes.
- Assist rural/urban manufacturers to integrate robotic automation into their production systems – No changes.
- Develop a long-term strategic plan related to supply chain resiliency – No changes.
- Create a Manufacturing Automation Demonstration Area/Program – *After reviewing construction options, it was decided by MEP to not construct a new building or rehab an existing building on Nebraska Innovation Campus but rather find an existing building near the downtown Lincoln area to use and focus on the equipment needs. Lease expenses would be less, and no construction project needed.*

Nebraska Innovation Studio

- Expand a robotic makerspace in the existing Nebraska Innovation Studio makerspace – No changes.
- Develop and administer a Robotic Technical Assistance Program for entrepreneurs and early-stage companies – No changes.

Invest Nebraska – The Combine

- Hire new entrepreneurship technical assistance staff focused on robotics and irrigation automation – No changes.
- Expand the existing Combine 8-step module agtech program to include robotics – No changes.
- Governance for the Heartland Robotics Cluster – *Originally, it was planned to only staff the meetings of the Heartland Robotics Cluster Steering Committee. However, between Phase 1 and Phase 2 submission, it became very evident that additional Invest Nebraska leadership would be needed to sustain the cluster's development with the goal of creating a separate non-profit entity that could focus on the cluster's sustainability and growth into the future.*

Lessons learned – While the Phase 1 component projects for the most part remained the same for the Phase 2 submission, it became evident that construction projects were modified due to time constraints and the ability to find matching funds in a short period of time.