LR 178 (Wishart)

American Rescue Plan Act of 2021
State and Local Fiscal Recovery Funds & Capital Projects Funds

University of Nebraska System Proposals
Last Updated: October 1, 2021

UNK-UNMC Rural Health Complex
Estimated Proposal Cost: $85 million *($25 million from private funds)*

The first phase of this multi-campus initiative is one-time funding to assist in building an $85 million facility adjacent to the existing Health Science Education Complex on the UNK campus. This building will provide the necessary infrastructure for the expansion of several UNMC colleges, and the teaching and learning environment that has been so successful in the HSEC building. The proven success of the Health Science Education Complex—already exceeding capacity--makes UNK the ideal place to expand education and professional development to healthcare providers all over rural Nebraska.

The UNK-UNMC Rural Health Complex will allow UNMC to train in Kearney students who are dedicated to rural practice in several key areas. It would add 66 students to the College of Allied Health Professions which already has a successful cohort of students in the Health Science Education Complex. These students would be in the fields of Occupational Therapy, Medical Nutrition, Genetic Counseling, and Respiratory Care. All of these are high need areas in rural Nebraska. The College of Medicine would for the first time educate physicians in rural Nebraska with an enrollment of 40 students dedicated to rural practice. The College of Nursing plans to expand their Accelerated Bachelor of Science Nursing degree program by 16 students. This would bring their total to over 100 nurses being educated at the Kearney site. Also, the College of Nursing would expand their Family Nurse Practitioner program by another 6 students. The College of Public Health plans to bring a Master of Healthcare Administration to rural Nebraska. This program would engage students dedicated to running and managing a wide variety of healthcare facilities in rural Nebraska and complements UNK's undergraduate program. Lastly, discussion is underway for the UNMC College of Pharmacy to offer a joint degree program with UNK to help provide pharmacists to rural Nebraska.

Central to improving rural healthcare is the need to recruit students into these professions. The pipelines of qualified students will be expanded to increase the supply of rural healthcare workers. Both UNMC and UNK have successful active pipeline projects which need to be expanded to prepare for the UNMC programs which are scheduled to start in 2025. UNK will expand its successful undergraduate curriculum to ensure future UNMC students have the highest quality of preparation for rural health service.

Clinical opportunities for these UNMC students will be crucial if they want to be successful in rural Nebraska. Strategies are currently being developed to attract adequate preceptors and to assist in placing students in rural Nebraska communities. Extensive community dialogues and regional planning will be important to this new rural health care workforce initiative, especially in the recruitment and retention of these health care graduates.

UNL Artificial Intelligence (AI), Cybersecurity, & Holland Computing Center
Estimated Proposal Cost: $50 million

An economic development opportunity for Nebraska's IT, computing, and agricultural communities is presented through a $50 million investment at the Nebraska Innovation Campus (NIC) to dramatically increase Holland Computer Center (HCC) capacity, in a new data center, for enhanced high-speed computing, new cutting-edge research and company growth.

This expansion will include infrastructure targeted at artificial intelligence (AI) computing and cyber security. It will also allow for consolidation of University data centers into a secure and modern facility. This effort will provide differentiating capacity for research and development, engineering design, operations, and logistics. Key participating partners will include agricultural and food industries, logistics, finance, defense, space, cyber security, medical and life science, as well as education and human services institutions.

This new capacity will serve Nebraska companies on a cost-recovery basis. It will impact student recruitment, workforce development, and retention of a high technology labor force. In addition, it will enhance the University's capacity to coordinate and leverage national R&D programs in AI, machine learning, data science, cyber security, agriculture, manufacturing, and medicine.

This effort will build on emerging partnerships that UNL has established with two different national AI institutes funded by the National Science Foundation. It will offer opportunities to leverage national efforts underway for a network of cyber security research and service facilities. With this network we envision a regional cybersecurity extension organization that will support small to medium size businesses much like the current Manufacturing Extension Program (MEP) and the Nebraska Business Development Center (NBDC). Additional cyber security opportunities might include regional facilities for a cyber security range and a cyber observatory, both supported via grant or partner funding.

The expansion will offer opportunities for the National Strategic Research Institute (NSRI) to scale R&D partnerships with the Joint Artificial Intelligence Command of the Department of Defense and other military enterprises focused on cyber security. The expansion will offer new infrastructure to support the National Center for Resilient and Regenerative Precision Agriculture (NCR2PA), a proposed facility of the U.S. Department of Agriculture's Agricultural Research Service, at the Nebraska Innovation Campus. In addition, companion efforts to accelerate internships, entrepreneurship and startup companies would leverage this HCC expansion and new R&D initiatives like NCR2PA.

This investment will build on the operational expertise of HCC and greatly extend its capacity. The HCC at UNL currently provides advanced computing facilities for research and development across the NU system, makes these facilities accessible to company partners, and develops the next generation of knowledge workers to support advanced computing. A new investment in next generation computing hardware at HCC will offer new capabilities for research and product development across the state of Nebraska. Current business interactions are

small and on an ad hoc basis. With this build out we envision an automated streamlined service that would engage dozens of small and large companies in R&D activities.

The data center is planned and budgeted as a modular building especially suited to data center requirements. The data center and computing hardware would be sited at the Nebraska Innovation Campus, be managed in partnership with NU-ITS, and take advantage of advanced networking and sophisticated energy investments already in place. The NIC's Centralized Renewable Energy System (CRES) utilizes a city wastewater stream as a heat sink to heat and cool buildings on NIC. The proposed data center would be connected to the CRES and would seek to create a energy model to make heating buildings at NIC more efficient. With a micro grid employed to supply power for the data center, it is possible to utilize the methane produced by the city wastewater treatment facility to power the electric generation. The result is a "green" data center that increases the profitability of the CRES and likely lower energy costs at Nebraska Innovation Campus.

An initial build out over 2.5 years can be achieved for approximately $50 million with the following high-level estimates:

- *Computing equipment: $25 million*
- *Software: $3 million*
- *2-Megawatt modular datacenter infrastructure and electricity: $22 million*

UNL USDA National Center for Resilient & Regenerative Agriculture P3 Facility
Estimated Proposal Cost: $50 million *($25 million from private funds)*

A game-changing opportunity for Nebraska's agricultural and start-up communities is presented through a $25 million investment of APRA funding to match $25 million in private funding for the construction of a public-private partnership (P3) research facility as a companion to the new USDA National Center for Regenerative and Resilient Precision Agriculture (NCR2PA) at UNL's Nebraska Innovation Campus. This new national laboratory would house up to 60 federal research scientists in partnership with UNL's Institute of Agriculture and Natural Resources. This is a transformational opportunity for the University of Nebraska-Lincoln, our state, Nebraska producers, and American agriculture.

AgTech and related technology startup growth partially depends on the existence of research partnerships that are integrated through both shared visions and space to innovate. This new facility space centered around agriculture R&D and the USDA, will allow federal, state, and private sector partners to expand tech transfer and commercialization efforts and solve pressing challenges facing Nebraska's agricultural economy.

Nebraska is at the core of the U.S. Midwest Agricultural Production Complex. Nebraska has the third largest agricultural economy in the United States. In 2017, the total output of Nebraska's agricultural production complex was $81.8 billion, accounting for 33.9% of the state's total output. The state's agricultural sector contributed $25.7 billion to Nebraska's gross state product, representing 21.6% of the total with nearly $6.8 billion in agricultural exports. Nebraska is known for the scale and diversity of its crop and livestock commodities and the abundance of it natural resources. Research expertise in food, agriculture, climate, water, drought, landscape resilience, and rural prosperity, coupled with an established education pipeline, and robust partnerships with federal and state agencies, farmers, ranchers, processors, and other industries, reinforce Nebraska's standing as a national leader in food and agricultural innovation.

UNO Biomechanics Research - World-Leading Work in Health and Human Sciences
Estimated Proposal Cost: $16 million

The world recognized University of Nebraska at Omaha (UNO) Division of Biomechanics and Research Development houses all research conducted by the Department of Biomechanics, the Center for Research in Human Movement Variability, and associated programs. Areas of research focus include gait rehabilitation and falls prevention, experimental and computational vascular mechanobiology, printing low-cost 3D prosthetics, improving physical function and quality of life in the elderly and in individuals with movement-related pathologies. In 2019-2020 researchers from the Department of Biomechanics received over 18 million dollars in external grant funding. This funding request will expand cardiovascular device manufacturing and testing capabilities and soft tissue imaging and analysis to do the following:

- *Significantly strengthen the $30 million cardiovascular device focused COBRE*
- *Offer unique opportunities for collaboration among academic and industry across the U.S. and worldwide*
- *Facilitate the expansion of current collaborative projects with the Department of Defense and Food and Drug Administration*
- *Build a new Core that would attract additional funding from biomedical device industry and expand industry-funded projects*
- *Purchase equipment that is not available on any University of Nebraska campus necessary for deep tissue scanning that is required for accurate characterization of thick human arteries*

Funding will also support the Health & Kinesiology Research, Engagement, and Community Hub (REACH) initiative which will expand faculty and student research capabilities, workforce development efforts, and community collaborations related to exercise physiology including vascular physiology and environmental physiology, physical activity, and health promotion, as well as orthopedics and sports medicine. This funding request will:

- *Relocate and consolidate teaching and research labs into a single wing of the building to facilitate student and faculty collaboration in teaching and research*
- *Provide a new, dedicated front entrance at the southeast corner of Dodge campus for the School of H & K and UNO*
- *Alleviate privacy concerns for research subjects*
- *Create a separate entrance from current shared entry to increase community access to the engagement and outreach efforts*

UNMC Pancreatic Cancer Research Institute
Research Early Diagnosis and Treatment Startup Packages
Estimated Proposal Cost: $30 million *($15 million from private funds)*

This strategic research proposal would dedicate $30 million, $15 million from ARPA funding and $15 million in private matching funds, to the University of Nebraska Medical Center Pancreatic Cancer Research Institute to expand early diagnosis and treatment research.

The public-private partnership approach would help UNMC to achieve the following:

1. *Recruit seven new pancreatic cancer researchers with expertise in various areas including, but not limited to, immunotherapy, drug discovery and delivery, and early detection research.*

2. *Create an innovative Pancreas Cancer Cellular Immunotherapy Resource with the aim of developing new treatments and therapies for pancreatic cancer patients.*

3. *Expand its novel Pancreas Cancer Early Detection Clinic with the objective of diagnosing pancreatic cancer at an earlier stage.*

Current and future Buffett Cancer Center pancreatic cancer researchers would utilize the Pancreas Cancer Cellular Immunotherapy Resource as well as data collected from the Early Detection Clinic. Through a team science effort, the Pancreatic Cancer Research Center of Excellence will conduct cutting edge research in the lab and ultimately bring new therapies, treatments, and early pancreatic screening techniques to the patient.

UNMC Global Center for Health Security
Research & Faculty Startup Innovation Packages
Estimated Proposal Cost: $10 million

The COVID-19 pandemic continues to demonstrate major gaps in health systems' abilities to mitigate emerging health threats. The inability of public health and health systems to rapidly recognize, correctly characterize, and effectively respond to the novel coronavirus disease resulted in a significant social and economic toll in the U.S. and across the globe. Unless these problems are fixed, communities, businesses, and families will remain highly vulnerable to future pandemics. UNMC's Global Center for Health Security (GCHS) is a world leader in health system preparedness for emerging diseases and pandemic threats – but maintaining that leadership role, providing critical solutions needed to face the next pandemic, and propelling Nebraska to the forefront of healthcare innovation necessitate a major investment and growth plan for GCHS.

The GCHS is uniquely positioned as a leader and national resource for education, training, clinical operations, and research for high-consequence infectious disease preparedness and response. As coordinating center for such activities across the university system, GCHS is well-situated to leverage resources, expertise, and collaborative relationships to transform the current portfolio of programs into a public-private partnership (PPP) that will unleash the creative power of academia and industry to serve the public good and protect humanity from health security threats. If resourced appropriately, GCHS can transform how the world recognizes, diagnoses, and manages emerging infectious diseases. GCHS can serve as an engine for innovation that will produce new technologies and systems to protect global health against all infectious disease threats and disrupt healthcare delivery. Revolutionary solutions for improving health security and healthcare will catalyze a new biotechnology industry base, promoting local economic growth. Expanded training and education programs will produce the health security workforce of the future.

Initial GCHS innovation efforts will focus on three domains that were underscored as critical deficiencies in COVID-19 response: 1) emerging disease detection/situational awareness, 2) medical and public health emergency surge capacity, and 3) supply chain and logistical dependency. To achieve this, the GCHS will pursue a broad portfolio of research and development involving multiple disciplines (chemistry, engineering, virology, biology, informatics, veterinary sciences, health sciences) within the NU System and foster strong external partnerships with major funders within the Federal Government as well as from NGOs and philanthropic foundations. The GCHS's singular resources, expertise, and proven ability to integrate partners into a highly functioning team create the perfect home for this next leap forward in global health security.

The struggles of health systems and communities in making timely and effective decisions to mitigate the impact of COVID-19 made clear the need for professionals specially trained in biopreparedness and response. GCHS already is setting the standard in developing formal health security training programs for scientists and clinicians, but these programs are currently small

and limited by funding constraints. An enhanced program will allow GCHS to solidify its position as a global leader in health security training and education, developing a linked set of training programs in basic science, public health, and clinical fields. In this way, UNMC will ensure a pipeline of future generations of health security leaders that will continue to grow our intramural capability, create collaborative links with partner institutions, and establish international standards for health security professionals.

The pandemic reinforced the truism that infectious agents are not contained by political boundaries, and their spread is greatly facilitated by modern transportation networks for trade and travel. As a result, our health security is greatly enhanced when we can characterize and contain emerging health threats at the point of origin rather than react to wide geographic spread. GCHS will focus on solutions that can be adapted for implementation in resource-limited settings, not only to facilitate utility in less-developed regions of the globe but also to maximize effectiveness in the setting of a highly resourced but overwhelmed healthcare system in Western countries facing large-scale outbreaks. This dual challenge creates opportunities for disruptive advances in healthcare delivery, the research relevance of which would be far-reaching.

To rapidly enhance its role as an intellectual incubator and applied/translational science engine within the university and develop cutting-edge solutions for mitigating pandemic disease threats and targeting resource-limited settings, the $10 million proposal will allow GCHS to immediately expand:

- Core infrastructure (personnel, administrative) to conduct and coordinate research portfolios;
- Recruitment of top-notch multi-disciplinary faculty
- Domestic and international networks of sites serving as platforms for research and testing

NU System/NSCS – Hardware Upgrades for Enterprise Resource Planning (ERP) Systems
Estimated Proposal Cost: $10 million

With ARPA's State and Local Capital Projects Funds emphasis on key infrastructure projects related to education, health care, and broadband, it is important to understand that essential infrastructure often depends heavily on technology systems and services.

The University of Nebraska hosts the business information system (i.e., SAP financials, Human Resources, Payroll, etc.) and student information system (Peoplesoft) for both the University of Nebraska System and the Nebraska State College System.

An investment of $10 million would allow for significant hardware and equipment upgrades to improve disaster recovery and cybersecurity capabilities, while expanding the lifecycle of both systems. Business continuity and cybersecurity remain top risks on the University's annual risk assessment, and these critical technology investments will help mitigate those risks.

UNO Science, Technology, Engineering & Mathematics (STEM) Trail Center
Estimated Proposal Cost: $5 million

The primary goal of the STEM TRAIL Center is to improve human potential through lifelong learning. As a Center, we recognize the importance of collectively engaging learners and their families, and learners of all ages and experience levels, along with statewide partners. And through this engagement, we seek to directly support the expansion of the STEM workforce in Nebraska. As has been identified in the four commissioned studies in the past decade (i.e., Blueprint Nebraska; Battelle Study; CREC; and the SRI International Report), we are well-positioned to provide the programming to alleviate many of the identified challenges. We simply need the space and infrastructure to do so.

Given the one-time opportunity for capital support, we request consideration for the renovation and building of an innovative space to house the STEM TRAIL Center so that we can carry out our expansive programming. At this time, we have demand for programming that exceeds the occupancy of the space provided, and because of this we are unable to meet the demand for our offerings, that include additional programs that support P12 teachers, entrepreneurs, informal educators, and community partners due to lack of space available.

Consequently, a one-time infusion of support would pave the way for several key initiatives:

- *Expanding the technical skill sets common to a variety of STEM professions (data science, data analytics, technical writing, etc.) providing an opportunity for re-skilling and supporting Nebraskans to pursue high-skill, high-demand, and high-wage (H3) jobs.*
- *Supporting P-12 teachers across the state with innovative STEM professional development and partnerships to support a diverse array of schools implementing innovative and effective STEM education. Essential to this work is the Metropolitan Omaha Educational Consortium (MOEC), and the ability to build on our partnerships with existing partnerships with North/South Omaha.*
- *Expanding access and training opportunities for informal educators, such as out-of-school time staff. We will build upon our partnerships with Collective for Youth, supporting dozens of before and after school programs in Omaha.*
- *Developing a mentored, entrepreneurial pipeline to support "student CEOs" or "STEMPreneurs in Residence" to take University-derived technology, generate their own company with faculty mentorship, and grow more small businesses in Nebraska.*

Finally, while funding this proposal will greatly enhance our competitiveness for federal grants, the STEM TRAIL Center has already diligently supported a high return on investment in terms of community support and monetary support that well-exceeds expenses. Specifically, since our inception in May of 2019, the Center has secured more than $3 million in program-related funding and identified more than $500,000 of matching support for capital improvements.

The $5 million proposal will support the renovation and construction of a formal space for our STEM TRAIL Center. A one-time $5 million investment would establish a singular location where the community is welcome to be a part of the STEM TRAIL Center, helping us recruit high school students to UNO, hosting community events, and securing UNO as a national and international model for STEM excellence.

UNO National Counterterrorism, Innovation, Technology and Education Center
Estimated Proposal Cost: $4 million

The National Counterterrorism, Innovation, Technology and Education Center (NCITE) is a U.S. Department of Homeland Security Center of Excellence located at University of Nebraska at Omaha. NCITE was established in 2020 through a historic 10-year, $36 million dollar grant awarded to UNO. As a federally funded academic consortium, NCITE serves as the national academic hub focused on bolstering counterterrorism efforts and terrorism and targeted violence prevention. The goal of NCITE is to translate relevant research into tools for front line Homeland Security professionals and help build a workforce pipeline for STEM and Homeland Security fields.

The opportunity to investment $4 million in American Rescue Plan Act funding will significantly increase UNO research technology capacity in the following areas:

1. ***NCITE Safe Communities Virtual and Augmented Realty Lab***
    - *With this public facing working lab, corporations, government, and education organizations will be able to conduct studies and experience applied research focused on innovations to keep communities safe.*

2. ***Militant and Radical Violent Extremist Leadership Lab (MARVEL)***
    - *Experts from various academic fields with four partnering universities will team together to support studies on how organizational leadership and resources can predict and thwart terrorism through this virtual IT lab.*

3. ***NCITE Experiential Security Innovation and Events Space***
    - *Enable researchers, students, community partners, and curious children to experience NCITE model of collaboration and data visualization strategies.*