

Wyoming Innovation Partnership (WIP)
PHASE 2 PROPOSAL
Submitted to Governor Mark Gordon's Office
November 12, 2021

EXECUTIVE SUMMARY

The Wyoming Innovation Partnership (WIP), on behalf of the nine institutions of higher education, has developed a Phase 2 proposal for its collective efforts towards driving Wyoming's economic prosperity. Phase 2 represents the major structure of the WIP Blueprint with four primary components: (1) infrastructure to create an environment for WIP institutions to collaborate with efficacy; (2) building an entrepreneurial ecosystem using WIP institutions as the backbone of the network; (3) a proactive research and development agenda that helps drive economic activity in Wyoming; and (4) workforce development efforts aligned with the state's priority economic sectors.

Specific institution investments included the Phase 2 proposal are recommendations subject to further consideration, and in some cases, represent balances after Phase 1 WIP funding. WIP leadership intends to convene upon approval of Phase 2 investments to further delineate investments by purpose, institution, phase, and agreed upon metrics. A final summary of this data will be prepared and submitted to Governor Gordon ahead of Wyoming's 2022 legislative session.

Total Phase 2 Request: \$100,000,000

OVERVIEW & BACKGROUND

The WIP is a multi-year initiative of Governor Mark Gordon that leverages the collective efforts of the state's community colleges and university to drive Wyoming's economic and workforce development goals. The purpose of WIP is to improve Wyoming's economic prosperity through the coordinated efforts of the state's nine institutions of higher education (IHE) that link community goals and strengths to the state's strategy for economic development and diversification. WIP aims to grow the economy through *entrepreneurship*, *research*, *computing education*, and *workforce development* by collaborating with industry and governmental partners to spark innovation, economic growth, and prosperity.

The WIP initiative is structured into three phases.

1. Phase 1 (Now-June 30, 2023)

Phase 1 of the WIP initiative is focused primarily on initiative organization, and early, immediate focus on activities intended to launch the WIP's collaborative nature and immediate economic impact.

2. Phase 2 (July 1, 2022 – June 30, 2024)

Phase 2 will be a far larger effort of WIP that will focus on three primary areas to help drive the state's recovery out of the economic and health impacts it has faced since late 2019. These areas include significant workforce development programming efforts, efforts that make it easier for the WIP institutions to collaborate and work together, and large-scale collaborative efforts that improve institutional productivity and outcomes.

3. Phase 3 (July 1, 2024 – Beyond)

Phase 3 of the WIP initiative will be defined in the time ahead based on the impact and progress of Phase 2 to align the work of the WIP institutions with longer-term, transformational strategies to help Wyoming and our communities thrive well into the future.

On September 3, 2021, a Phase 1 proposal was submitted to the Governor's office and has been approved for funding in the amount of \$24,670,000. Phase 1 focus on the establishment of a **Consortial Infrastructure** that allows the nine IHE's to share expertise and increase the educational capabilities needed to advance the statewide economic workforce needs. It proposes to create a **Digital**

Infrastructure to bring digital expertise and computing power to all corners of the state. It also takes the initial step in developing a foundation for an **Entrepreneurial Ecosystem** where the skills and ambition are cultivated and developed to empower citizens to create engines that drive economic advancement. Finally, the Phase 1 proposal aims to capitalize on Wyoming's unique location and resources to ensure that the benefits of our natural resources (energy, agricultural and touristic) stay in the state.

INFRASTRUCTURE

Overview:

Wyoming's IHE's have a long, rich, and successful history of partnership and collaboration. Yet the localized nature of the community college's focus and governance, combined with the deep structural history of UW as Wyoming's Land Grant institution, does not naturally allow for achieving the needed depth of collaboration. Thus, a focus in Phase 2 must be a continued buildout of an infrastructure that creates an environment where collaboration can be accomplished with the greatest of efficacy.

General Areas of Focus:

- WIP Staffing and Organization: \$1.18M
- Centralized Corporate Relations Office - A corporate partners program will develop close connections to Wyoming industries and work with the WIP to build a talent pipeline from K-12 to the workforce: \$2M
- Marketing Campaign (awareness campaign, initiative-specific marketing, etc.): \$250K
- Expanding Opportunities for Internships, Externships, Practica, Apprenticeships, etc.: \$2M

Total Funding Request: \$5.43M

ENTREPRENEURSHIP

Wyoming Center for Entrepreneurship and Innovation (CEI)

Overview:

Wyoming's higher education entrepreneurship and innovation assets are not coordinated, well-developed, efficient, nor fully aligned with the state's priority economic sectors and workforce development/retention needs. In Phase 2, WIP proposes to build upon the success of UW's CEI, IMPACT 307, and the various efforts in place at the state's community colleges, to establish the Wyoming Center for Entrepreneurship and Innovation. The center will be a state-wide interdisciplinary integrator of essential components necessary to build a robust entrepreneurial ecosystem. Under the auspice of the center, the WIP will strive to accomplish five goals for supporting new business starts and small business growth. These are:

- 1. Connect:** *Grow Statewide Entrepreneurship and Innovation Network*

Wyoming has a wealth of individual resources and support for individuals wishing to launch their own business and for small businesses to grow. They need to be brought into a more cohesive, digitally connected network.

Focus Areas: Leadership and governance board, staffing and support infrastructure, digital concierge and resource portal, web-based mentor connection platform, partner/resource relations (alumni, associations, special interest groups, businesses, etc.). Investment: \$2M

- 2. Launch:** *Expand Concept Development, Programming, and Start-Up Initiatives*

Entrepreneurs begin with an idea. Those ideas must be developed, nurtured, and launched. This component of the WY CEI focuses on the spectrum of concept development support ranging from business plan development to start-up initiatives.

Focus Areas: Innovation workshops, short courses, seminars, bootcamps and other applied learning opportunities; Associate degrees, Bachelor's degrees, minors, concentrations, certificates, etc.; Faculty/staff support. Investment: \$5M

3. Mentor: *Create a Resource Base of Mentors for Entrepreneurs*

In an entrepreneurial ecosystem, individuals must be able to connect formally and informally with those who have similar mindsets and experiences to share. Mentoring of emerging entrepreneurs is essential in helping them move from concept to launch, and launch to sustainability.

Focus Areas: Mentor training programs, match-making program, mentor network development and networking, connection events and convenings, etc. Investment: \$1M

4. Incubate: *Establish Spaces and Places to Help Businesses Start and Grow*

Similar to the development and incubation of ideas, new business start-ups and small businesses rely on unique facilities and spaces to help them develop prototypes, materials, and launch their business operations. This goal is focused on “incubating” these entities by establishing a network of unique spaces at Wyoming’s IHE’s to that accomplish this.

Focus Areas: IMPACT 307 incubators, innovation labs, maker spaces, collaborative work spaces, prototyping, UW and CC facilities retrofit and upgrades, etc. Investment: \$6M

Key Metrics:

New business starts, existing business growth/retention, business recruitment, increased access to capital, new job creation

Total Funding Request: \$14M to UW to further build, support and deploy state-wide CEI activities in collaboration with the state’s community colleges.

Notes:

It is understood that American Rescue Plan (ARP) funds are time-limited and not a source of on-going funding for programs; however, in this instance, the ARP funds would be used as initial seed funding to jump start the program and accordingly when the ARP funding expired, the program would be transferred to other funding (i.e., self-generated revenue, philanthropic/private donor support, etc.).

APPLIED RESEARCH and OUTREACH

Overview:

Wyoming’s future is reliant on a robust research agenda that provides opportunity for diversified funding strategies across the state’s economic sectors. States and regions around the world have benefitted from the economic activity that is derived from new knowledge creation associated with universities and other IHE’s. Phase 2 of the WIP initiative will establish a stronger infrastructure to support research and development and drive major research activity focused on stimulating new economic growth. Research investments will focus on the applied arenas of discovery with intentions to bring products or technology to market. This approach provides greatest connectivity between industry and immediate return on investment.

Areas of Focus:

Expanding the purpose and scope of Wyoming's Extension offices across the state to accommodate additional research capacity for UW, the Community Colleges and Industry. Direct outcomes of this expanded scope will include corporate partnership involvement and applications in support of economic sectors. Incorporate elevated lab space, technology and collision spaces for the above three entities. Opportunities for these spaces to fold in local sector activities (Food incubator - farm to table - Drone technology etc.), hospitality (Agro and Eco Tourism connections) has opportunity to connect directly to this research section. Investment: \$7M

Salary and support for visiting faculty scholars to bring immediate expertise in critical areas of need to Wyoming and to bring five research scientists/faculty to seed the Corporate Partners Program and establish large-scale research projects. Each of these research scientists/faculty will be expected to eventually bring in substantial external funding to cover their salary and/or research students (e.g., each scientist will be responsible for securing approximately \$2M per year in external funds). Investment: \$5M

Graduate research students who will provide core research workforce, develop technology transfer from faculty research, and contribute to education and training. Investment: \$2M

Total Funding Request: \$14M

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COMPUTING RESEARCH/EDUCATION

In the past decade, computing has become an increasingly crucial tool for research, for our graduates, and for almost all sectors of the economy. The University of Wyoming has responded by hiring faculty who use computing in their discipline, establishing programs like the Data Science Center and the Advanced Research Computing Center (ARCC), and by developing a partnership with the University Cooperation for Atmospheric Research and its NSF-funded National Center for Atmospheric Research (NCAR) around the NCAR-Wyoming Supercomputer Center (NWSC).

Today, computing's impact is found in virtually every discipline, and simulation and modeling are more important than ever, but are joined by new data science technologies like artificial intelligence, machine learning and blockchain that are starting to transform every academic discipline, every industry, and every aspect of modern society. Access to world-class research, infrastructure and workforce training in computing and data is therefore critical for Wyoming businesses, its citizens, and all its students.

A focus around "Computing for All" will develop close relationships and new programs with Wyoming community colleges, K-12 schools, state agencies and other community stake holders and will position the University as a regional leader in computing and data with national impact and global reach.

Faculty, staff and students will have access to supported computing and data infrastructure in all disciplines to facilitate new research and education opportunities. Faculty will be more competitive for external research funding. More research involving data science and AI will be catalyzed. New activities to increase involvement with WIP and private sector partners will be possible.

Investments in Computing Education will translate to increased state-wide higher education enrollments in computer/data science courses. Increased state-wide higher education graduates with a computer/data science credential. Increased percentage of state's K-12 educators who have received professional development/training in teaching coding/computer science. Increased corporate partnerships with Wyoming businesses focused on data science solutions and economic development and growth. Increased

external funding involving computing and data. Increased educational offering for students involving use of modern cyberinfrastructure. Increased use of national computing and data cyberinfrastructure.

- One-time critical infrastructure needs for UW's Advanced Research Computing Center (ARCC). Urgent investment is needed to update ARCCs compute/access nodes, network switches, backup storage and power/cooling equipment. New investment is needed to increase the GPU footprint to enable AI/data science research and applications and provide clusters to support WIP initiatives such as the provision of statewide software engineering education and research projects with the private sector: \$10M
- WIP training program that will develop state-wide computer/data science boot camps, specialized coursework, teacher/lecturer professional development and student engagement activities: \$5M
- Start-up funds for six new faculty (\$500,000 per faculty start-up fund) to establish research programs (e.g., equipment, graduate students, post-doctoral fellows, etc.) with \$300,000 of each start-up fund invested in shared computing infrastructure to support their research (e.g., GPUs, unmanned aircraft, sensors, etc.): \$3M
- Salary and support for visiting faculty scholars to bring immediate expertise in critical areas of need to Wyoming: \$2M
- Five research scientists/faculty to seed the Corporate Partners Program and establish large-scale research projects. Each of these research scientists/faculty will be expected to eventually bring in substantial external funding to cover their salary and/or research students (e.g., each scientist will be responsible for securing approximately \$2,000,000 per year in external funds): \$3M

Key Metrics:

Research activity aligned to the state's economic development strategy with a focus on increasing dollars spent, patents generated, intellectual property documented, spin-off's, etc.

Total Funding Request: \$23M to UW to further build, support and deploy state-wide computing research/education in collaboration with the state's community colleges.

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WORKFORCE DEVELOPMENT

Overview:

One of the most significant components of the WIP Blueprint is a strategic focus on developing talent pipelines for those industries associated with the state's economic strategy. These include a focus on adding value to core industries as well as activating new economic sectors. The colleges and the University have drawn on their faculty expertise, industry partners, and workforce data to identify growth areas under each of the main sectors below and are prepared to bring collaborative opportunities across all regions of the state to support credential attainment in response to workforce needs.

The colleges and University will work collaboratively and strategically to identify which specific programs will have the largest impact on the state's economy. Much of the work during Phase 2 will be focused on addressing foundational gaps in workforce training capacity. While the resulting programs may be offered at only one or two distinct sites, the overall effect will be felt statewide, and because of the consortial infrastructure funded in Phase 1 with follow-up support in Phase 2, these site-based new programs will have the capacity to scale up as demand grows across the state. The funding request includes a combination of previously identified programmatic start-up projects, and a **“Collaborative**

Start-Up Fund” to allow the colleges and the University to respond quickly and effectively as opportunities or challenges arise across the state.

Previously Identified Start-up Programs:

Previously identified start-up programs (listed below) are the result of both WIP collaborations and discussions with regional industries. Some projects in this category will incorporate cross-institutional aspects from the start, while others will initially fill regional workforce training gaps, but can be scaled up across the state utilizing the Phase 1 Consortial Infrastructure tools, as demand dictates.

Total Funding Request: \$16M

Brief Program Description	Location
Automated Manufacturing	Western
Expansion – Electrical and Instrumentation Program	Western
Machine Tool & Manufacturing Program Integration	Casper
Agricultural Economics and Ranch/Range Management	Western
Industrial Maintenance and Light Manufacturing	Central
Mobile Slaughter Facility	Central
Agricultural Program Development and Expansion	LCCC
Precision Agriculture Program	Eastern
Hydroponics	Northwest
Agricultural Technology	Northwest
Hybrid Diesel Technology	Casper, LCCC, NWCCD
Renewable Energy Technology	Casper, Northwest, Central
Certified Clinical Medical Assistant	LCCC, Casper
Respiratory Therapy, LPN and conversion to for-credit programs in Health areas	LCCC
Healthcare Expansion – Respiratory Therapy, Radiology and EMT across Fremont and Teton counties	Central
Computer Science, Cybersecurity	Northwest
IT Industry Credentials	Western
Applied programming	LCCC
Crop Certification	Eastern
Medical Technician, Assistant, and ADN	Eastern
CNC Machining Certificate and Degree	Eastern
Performing Arts Expansion	Northwest
Residential Electrical Program	NWCCD
Tourism Events Planning Certificate and Degree	Central
Construction Trades	Central
Criminal Justice	CWC
Geographical Information Systems	Central
Farm Production/Marketing	Central
Mobile Workforce Training Lab – Partnership with DWS	Wyoming IHE's

WIP - “Collaborative Start-Up Fund”:

A “Collaborative Start-Up Fund” (CSF) is proposed to support the following priority economic sectors while activating new sectors. This funding will provide start-up capital for future academic and workforce training programs. This acknowledges that WIP cannot anticipate all future economic opportunities that may arise, and ensures WIP partners have funding to capitalize on needed activities and provide the training and expertise necessary for nascent industries to take root is vital. The WIP administration will create rules and processes for the application, evaluation, awarding, and review of the funds, and will prioritize requests that are collaborative and impactful to the state’s economy.

Agriculture - it is clearly recognized that underdeveloped strengths exist across the state between institutions that point to strong and immediate opportunities to respond to agricultural industry needs while providing opportunities to increase economic activity by adding value to the products and processes produced by Wyoming agriculture producers. Beyond supporting value-added enterprises to existing ag industries, there are also opportunities for new ag enterprise start-ups in areas the state currently imports products.

Areas of Collaborative Focus: Agribusiness and ag business incubation, Animal and Plant Sciences, Range/Ranch Management (with energy and tourism crossover opportunities), meat sciences, biomedical research (with health sciences crossover), advanced agricultural technology including geospatial systems and precision agriculture, “ranch of the future,” crop certification, and blockchain applications (with computing cross over opportunities) represent immediately available areas for response. Colleges with the infrastructure as well as regional and industry-specific needs for programs in this area include: UW, Eastern, Western, Central, LCCC and Northwest.

Hospitality/Tourism - the state is well positioned to meet current and future workforce development needs related to the hospitality, tourism, and outdoor recreation sectors; specifically, further development of degree offerings, certificate programs, and just-in-time credentials to address critical needs in workforce recruitment and retention. Additional infrastructure to digitize credentials will increase the state’s agility and responsiveness in a rapidly changing industry sector.

Areas of Collaborative Focus: Expanding the number of short-term certificates and credentialing to ensure industry has access to the broad range of touristic enterprises, improving coordination of tourism/hospitality training, expertise and information across the state, and increasing culinary and hospitality offerings, particularly in areas with strong tourism sectors and tourism corridors but limited workforce. Colleges with the infrastructure as well as regional and industry-specific needs for programs in this area include: UW, Western, Central, Casper, LCCC, NWCCD and Northwest.

Energy / Natural Resources - Multiple opportunities are available for scaling up existing programs, improving synergies across the eight institutions, and developing new programs that leverage existing expertise and capital resources. More than 50 energy related credentials are currently available across the eight institutions, with opportunity for accelerated pathway development between institutions.

Areas of Collaborative Focus: Emerging opportunities to respond to industry and economic needs of the state include: power lineman, hybrid diesel technology, wind and solar energy and storage, carbon storage, nuclear, hydrogen, green construction, and other emerging energy industries. Expansion of electrical, instrumentation and industrial technologies will be needed to support these energy and mining industries. Colleges with the infrastructure as well as regional and industry-specific needs for programs in this area include: UW, Western, Central, Casper, LCCC and NWCCD.

In recognition of the very different program development and implementation processes between the University and community colleges, the CSF will allocate:

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Activate New Economic Sectors

Advanced Manufacturing – Manufacturing as an industry is growing strong again in the United States, and this trend is predicted to continue well beyond the current COVID-19 pandemic. Manufacturers are growing, investing, and hiring according to the National Association of Manufacturers. However, the association reported that 77% of manufacturers said they had positions going unfilled for the lack of qualified applicants. These unfilled positions are the result of the burgeoning skills gap that is being heightened by the rapid adoption of new technology, the retirement of baby boomers, and the difficulty of recruiting skilled youth into the industry. This pressure will only increase as companies work to expand, bring off-shore operations back to America, and working-age populations remain un-addressed.

Wyoming is positioned well to embrace the next wave of American manufacturing progress. The number one issue that will determine the success of growing a manufacturing industry in Wyoming is the availability of a trained, qualified workforce. WIP institutions present the opportunity to develop a cohesive pipeline for the preparation of an Advanced Manufacturing workforce for Wyoming.

Areas of Collaborative Focus: Machining (including metrology), Computer Numeric Control (CNC milling and turning), machine tool technology, automated manufacturing, additive manufacturing (including materials and metallurgy), glass manufacturing, ISO/quality assurance, Lean, Project Management Associate certification preparation, various OSHA and safety training, Coordinate Measurement Machine (CMM), Geometric Dimensioning and Tolerancing (GD&T), routine maintenance, CAD/CAM, 3D modeling. Colleges with the infrastructure as well as regional and industry-specific needs for programs in this area include: UW, Eastern, Western, Central, Casper, LCCC and NWCCD.

Digital / Technology - A collaborative effort is underway to develop a 2-year software development degree with clear pathways to a 4-year degree at UW in response to statewide and national demand for software developers across all industry sectors. All of the state's higher education institutions, along with international and industry partners (Wyoming based businesses) have contributed to this initiative; an initiative that will catalyze additional program development in areas such as artificial intelligence, machine learning, and cyber security. Development and offering of short-term IT certificates to high school students through the community colleges can fill immediate workforce shortages and provide a seamless pathway onto the University.

Areas of Collaborative Focus: UW School of Computing, Software Development, Applied Programming Cybersecurity, Data Analytics, IT industry certifications (Microsoft, AWS, Other), GIS, Financial Technology including Blockchain, low-voltage fiber optics, and leveraging digital processing power and storage to enhance research opportunities across the state. Colleges with the infrastructure as well as regional and industry-specific needs for programs in this area include: UW, Western, Central, LCCC, NWCCD and Northwest.

Healthcare– Health program expansions are necessary to ensure respiratory, emergency, and rehabilitative expertise and training is available across the state. This industry represents significant opportunity for economic growth and diversification. From direct provider/clinician job opportunities, to manufacturing, advancements in medicine, and telehealth, many opportunities exist. All community colleges in the state provide essential workers for the healthcare industry in their area and all will participate in programmatic enhancements in this industry sector.

Areas of Collaborative Focus: Expansion of nursing programs, increased capacity for respiratory therapy, radiology, emergency medical professionals, and improving and enlarging the ability to offer

short-term medical training across the state via mobile units and telehealth methodologies. Colleges with the infrastructure as well as regional and industry-specific needs for programs in this area include all the colleges and the University.

Key Metrics:

Increased output of graduate (credential holders), post-secondary education attainment rates, overall increase in qualified workforce, etc.

Total Funding Request: \$27.57M

Notes:

It is understood that American Rescue Plan (ARP) funds are time-limited and not a source of on-going funding for programs; however, in this instance, in addition to the significant one-time computational infrastructure expenditures, the ARP funds would be used as initial seed funding to jump start the program and accordingly when the ARP funding expired, the program would be transferred to other funding (i.e., self-generated revenue, philanthropic/private donor support, etc.).