

DRIVING TRANSFORMATIONAL DISCOVERY, INNOVATION, AND SCHOLARSHIP

TASK FORCE RECOMMENDATIONS

JUNE 2023

BACKGROUND

K-State has expertise in key research areas and has historically demonstrated great prowess in driving world-class discovery, innovation, and scholarship within these areas. Further, the institution continues to define and model what it means to be a next-generation land-grant university that not only leads at the forefront of discovery, but leverages its collective intellectual power to transform disciplines, practices, and communities.

The work of this task force has culminated in recommendations that outline many of the most necessary actions at the institutional level to support expansive innovation across the university. This starts with organizing research activities around priority areas that are both inclusive and magnify the collective impact this enterprise produces – recognizing there are many ways for faculty with various interests and diverse programs to contribute to grand societal challenges in an interdisciplinary, mutually beneficial way. K-State must clearly and boldly commit to this “research agenda,” recognizing that scholarship is central to the mission of any institution of higher learning, but particularly to the mission of a land-grant university like K-State.

As K-State increasingly considers how to best build and equip teams to address interdisciplinary challenges, the needs for structures and supports that enable these teams to maximize their research output will become increasingly pressing. The university has a unique opportunity to reimagine how to best support research as it charts this new direction for the K-State research enterprise. This also includes adopting an operating mindset and establishing the supporting infrastructure that enables K-State to move nimbly in the face of a rapidly changing research landscape, as well as the evolving priorities and expectations of funding entities that universities rely upon to develop impactful solutions and discoveries.

K-State must clearly and boldly commit to this research agenda and dedicate the resources and attention it will require, recognizing that these investments will have a multiplier effect in accelerating the university to even greater heights in solving some of the greatest challenges Kansas, the nation, and the world will face in the decades to come.

PROCESS

A task force comprising some of the university’s leading voices and diverse perspectives was assembled to better understand the current state of discovery, innovation, and scholarship across the institution and identify recommendations that will guide the university’s scholarly work through 2030 and beyond.

TASK FORCE MEMBERS

- Brad Behnke, Professor, Kinesiology, and Associate Dean for Research, College of Health & Human Sciences, Task Force Co-Chair
- Stacy Hutchinson, Professor, Biological & Agricultural Engineering, and Associate Dean for Research and Graduate Programs, Carl R. Ice College of Engineering, Task Force Co-Chair
- Christer Aakeröy, Distinguished Professor and Head, Chemistry, College of Arts & Sciences
- Traci Brimhall, Professor, English, College of Arts & Sciences
- Chris Culbertson, Professor, Chemistry, and Interim Dean, College of Arts & Sciences
- Taylor Davison, Senior, Biology and Public Health, College of Arts & Sciences
- Melanie Derby, Associate Professor, Mechanical & Nuclear Engineering, Carl R. Ice College of Engineering
- Curt Frasier, Attorney and Partner, Frasier, Johnson & Martin, Beloit, KS, K-State Alumni
- Hyung Jin Kim, Associate Professor, Landscape Architecture and Regional & Community Planning, College of Architecture, Planning & Design
- Laurel Littrell, Professor, K-State Libraries
- Brian Olson, Professor and Head, Western Kansas Research Extension Centers, K-State Research & Extension
- Paola Paez, Research Associate Professor, Hospitality Management and Center for Food Safety in Child Nutrition Program, College of Health & Human Sciences
- Eleni Pliakoni, Associate Professor, Horticulture & Natural Resources, College of Agriculture and K-State Olathe
- Vara Prasad, Distinguished Professor, Agronomy, and Director, Sustainable Intensification Lab, College of Agriculture
- Julia Rivera, Masters Student and McNair Scholar, Grain Science, College of Agriculture
- Chwen Sheu, Professor, Management, and Associate Dean for Academic Programs, College of Business Administration
- Brad Woods, Associate Vice President for Research Compliance, Office of the Vice President for Research
- Hans Coetzee, Distinguished Professor and Head, Anatomy & Physiology, College of Veterinary Medicine, ex-officio

This task force met four times from February to April 2023, participating in extensive and in-depth discussions, reviewing data, analyzing best practices, defining the ideal future state for K-State, and developing ideas for bridging the gap between the university's current and future state.

The following findings and recommendations represent a summary of this task force's work, submitted for the university's consideration as key inputs to K-State's future through its next strategic plan.

PRIORITY RECOMMENDATIONS

BUILD AND ADVANCE K-STATE'S RESEARCH AGENDA

K-State has a long history of excellence and leadership in many areas of scholarly work, but much of this progress has been made in individual units or siloes throughout the broader institution. As global interest in interdisciplinary research grows, prominent funding agencies are intentionally investing in projects driven by interdisciplinary research teams, recognizing the shared impact such teams and approaches can generate. Additionally, higher education institutions are increasingly tasked with addressing the grand societal challenges of today and future generations. The convergence of these trends

demonstrates a clear opportunity and imperative for K-State to develop a complementary research agenda that identifies broad areas of research focus where K-State's expertise aligns areas of strength with opportunities to have the greatest impact and builds an environment where all who are interested can contribute to this scholarly work.

As a land-grant university that also maintains a Carnegie R1 research classification, K-State has a unique opportunity to further differentiate its research agenda and overall impact by integrating Kansas State Research and Extension deep within these areas of focus. KSRE's statewide presence and network offer clear pathways and present community-based petri dishes both for experimentation and addressing real and pressing challenges across the state, honing best practices locally and regionally that can be scaled for global impact.

This research agenda should feature priority interdisciplinary focus areas that include:

- **COMMUNITY WELL-BEING, including sense of place, community building and belonging, health, and education and meeting the needs of diverse and disadvantaged communities.** This encompasses research focused on understanding physical, social, and cultural features of a community environment, researching the social environment of a community, identifying of factors that drive health disparities (including social determinants of health and health care policies), and work that measures and impacts the structures, policies, and practices that impact accessibility to education.
- **SUSTAINABILITY, including water, air, energy, climate change, biodiversity, and overall community resilience.** This includes considerations of water and resource management practices, renewable energy and net-zero emission technologies, the natural and environmental factors that impact resource usage and impacts on our health, environment, and society, the conservation and restoration of biodiversity, the policies and economics practices, and their impacts on human ecology.
- **GLOBAL FOOD SECURITY, including food production, animal infectious diseases, and safety and sustainable agricultural practices.** Contributing research to this area includes practices for increasing food production, the impact of social, political, and environmental policies and factors that impact production, as well as strategies for preventing and controlling infectious diseases, and environmental factors that contribute to their prevalence. Other contributing research could include considerations of the supply chain and the interactions between policy and economics that affect food access and security.
- **ENABLING TECHNOLOGIES, including advanced manufacturing, artificial intelligence, internet of things (IoT), big data and data science, cybersecurity, and smart and connected communities.** This area includes considerations of how to advance and take into account the implications of natural language processing and machine learning, as well as integration of technology across foundational elements of modern human life. It also includes the opportunity to consider the ethical and societal impacts of these integrations.

STRATEGIC INITIATIVES

SHORT-TERM (0-3 YEARS)

- Develop interdisciplinary structures to drive relationship-building and collaboration, including lunch and learns, seminars, and research cafes
- Establish and expand transparent, well-communicated, internal seed funding opportunities in support of collaborative research projects in each research priority area
- Establish process for integrating arts, humanities, and library expertise into major interdisciplinary grant proposals

- Audit and reestablish centers and institutes intentionally built around priority areas
- Develop research intelligence framework for anticipating and pursuing funding opportunities
- Integrate community action follow-up plans in grant proposals, when applicable
- Establish internal teams to support interdisciplinary proposal development and project management
- Invest in strategic cluster hires in priority research areas

LONGER-TERM (4-7+ YEARS)

- Build and support interdisciplinary graduate programs aligned with priority research areas
- Position K-State to demonstrate capabilities and expertise that secures targeted and competitive state and federal funding for priority research areas
- Identify designated spaces to house interdisciplinary teams across each priority area

INVEST IN ROBUST INFRASTRUCTURE TO SUPPORT RESEARCH AND SCHOLARSHIP

One of the challenges to K-State leveraging its resources for scholarship inherently involves the university's highly decentralized structure. While this has allowed for areas of specialization to evolve over time, it has created challenges exacerbated by unequal access to many underlying resources that support research and scholarly work. When it comes to physical infrastructure, these issues are exacerbated by the increasing costs for new construction and needs to address years of deferred maintenance. K-State has distinct opportunities to change this paradigm, starting with a focus on spurring greater intentional collaboration and more intentional pooling and utilization of resources across the institution, utilizing effective structures and efficient processes that more holistically support scholarship across the institution. As the institution moves forward with broader-scale campus master planning, K-State can build on these nearer-term successes by prioritizing physical infrastructure improvements that position the institution to promote innovative, interdisciplinary discovery most effectively at all levels of the institution.

STRATEGIC INITIATIVES

SHORT-TERM (0-3 YEARS)

- Expand audit of physical research spaces and instrumentation to identify functionality and build a centralized plan and process to expand utilization of existing resources
- Develop university-wide strategy and investment plan for resourcing basic through translational research, including equipment, maintenance, quality control, human capital, and training needed
- Leverage existing structures and groups to facilitate two-way communication about research opportunities
- Develop real-time financial grant reporting systems, processes, and capabilities
- Reorganize and invest in expanded centralized grant support teams and structures, including building staff expertise for graphics, project management, writing, forms, and budgeting, with appropriate oversight and accountability
- Build capabilities to support annual report requirements
- Invest in infrastructure for managing research output, including data storage and organization, archiving and preservation
- Adopt and scale research incentive programs

LONGER-TERM (4-7+ YEARS)

- Expand KSRE to include specialists from all colleges within the institution
- Develop and reinforce culture of research and continuous evaluation and improvement of research support processes and structures
- Develop physical, interdisciplinary urban research centers and hubs in major cities
- Modify funding structures to create sustainable university research incentive program
- Build and invest in consolidated core research facilities with shared instrumentation
- Build multidisciplinary research building(s) that cohause interdisciplinary research teams
- Embed rewards and incentives for development of intellectual property and commercialization into P&T
- Expand and appropriately staff compliance capabilities within the sponsored research office

REINFORCE AND STRENGTHEN THE RESEARCH WORKFORCE

K-State has established a national reputation for high-quality instruction and student mentorship. Understanding that students are the lifeblood of any higher education institution, K-State must reinforce and expand this reputation even further as part of its continued focus on strategic enrollment management, strengthening the pipeline of both undergraduate and graduate students to the university.

Providing high-quality mentorship and producing innovative and interdisciplinary research requires underlying institutional programming and financial support – representing a clear opportunity where institutional action can strengthen the intersection of these areas of focus and recognizing that research is often the collective output of teams comprised of not only researchers, but students and staff as well.

STRATEGIC INITIATIVES

SHORT-TERM (0-3 YEARS)

- Develop programming to support students in sharing their research experiences as they prepare to enter the workforce or graduate school
- Reimagine and standardize graduate support mechanisms (GRA, GTA, tuition reimbursement, and fees) across the university
- Establish university-wide, competitive floor or minimum for graduate student support
- Expand national and international student recruitment
- Expand marketing and advertisement of undergraduate and graduate programs
- Develop relationships with regional educational institutions and international universities to build pipelines of potential applicants and faculty
- Identify opportunities for leveraging industry support for graduate research
- Expand recruitment for and scope of visiting scholars programs
- Expand incentives and institutional financial support for recruiting and funding post-docs
- Develop extended support resources for PIs with NSF Research Experience for Undergraduates (REU) grants

LONGER-TERM (4-7+ YEARS)

- Develop waiver system for graduate program application fees
- Develop rotational, interdisciplinary graduate programs (where appropriate)
- Increase available graduate student scholarships
- Assess the feasibility of providing health insurance to graduate students
- Modernize research facilities, equipment, and instrumentation
- Establish sustainable professional development and support programming for postdocs, including grant-funded mentorship for undergraduate researchers

SUCCESS DEFINED

The task force identified a number of prospective metrics to monitor the success of these priority recommendations and the outcomes they are designed to generate for the institution, including the following:

- Graduate student enrollment
- Number of faculty and research-focused staff hired annually
- Percent increase in publications in high-impact journals, particularly those that are open access
- Percent increase in number of interdisciplinary grant proposals
- Increase in available grant funding opportunities
- Number of faculty inducted into national academics
- Number of faculty who have received national academy fellowships
- Increase in annual proposal hit rates
- Amount of money raised by the Foundation annually to support research
- Number of doctoral degrees awarded
- Graduate student placement rates
- Number of pre-doctoral fellowships
- Number of faculty with career development awards
- Annual investment in core research facilities
- Institutional ranking as a research university