

# K-State's Plan for Economic Prosperity in Kansas



**KANSAS STATE**  
UNIVERSITY

For more than 150 years, Kansas State University has delivered on its mission to educate the citizenry and advance the well-being of our communities and our state. In today's global economy, this means helping to advance the economic prosperity of Kansas families, Kansas businesses and Kansas communities.

Through public and private investment in K-State's researchers, facilities and students the university will deliver increased prosperity to the people, businesses and hard-working citizens of our state.

This investment will pay off in huge ways, addressing crises our leaders and citizens have grappled with for decades: lower wages than comparable states, out-migration of young people due to lack of employment opportunities and failure to attract outside investment in new and existing businesses.

In the period of 1960-2010, Kansas generally kept pace with the nation's household income growth. Since 2010, however, the state has seriously lagged the rest of the country in this important measure of prosperity. Good jobs are the only way family income can be raised sufficiently to provide stability, security and a high standard of living. Through public-private partnerships and industry-focused research, K-State supports the creation of good jobs to help keep young people in our state, as well as create successful new businesses.

Similarly, businesses prosper in a stable climate of innovation and opportunity. Smart people and smart ideas that drive efficiency and market penetration have consistently been the foundation for business longevity and profitability. Companies large and small understand that K-State can assist them to grow and prosper in a complex business environment.

All Kansans want to increase their income. All Kansans want their state to prosper. The challenge is that individual and collective prosperity is derived from consistent productivity gains — and meaningful gains are difficult to achieve. In this century, increased productivity will be achieved through innovation and a workforce educated in alignment with the world's 21st-century needs. K-State, with its land-grant mission to serve citizens, is the very best vehicle for innovation and education in Kansas today.

Our state is asking, "What asset can we rely upon to drive individual and state prosperity?"

The answer to that question is Kansas State University.

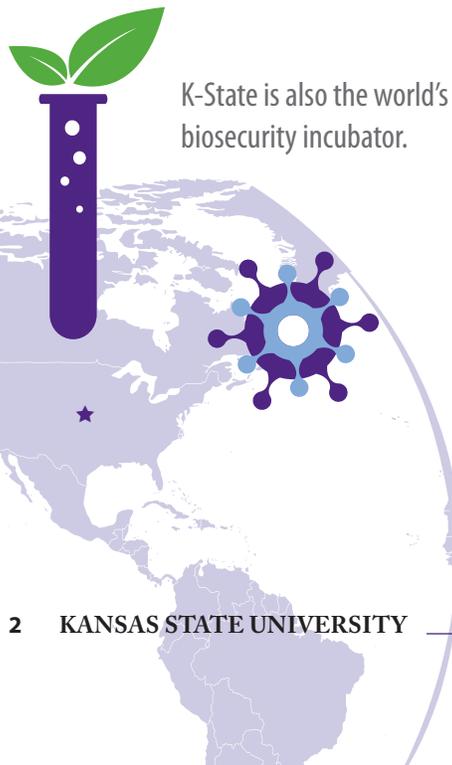
Read on for K-State's plan to secure our state's future.

# Economic Prosperity in Kansas



Kansas State University is the world's foremost global food and biosecurity science university.

K-State is the world's food laboratory.



K-State is also the world's biosecurity incubator.

No other place has the talent and specialized assets to contribute to our state's economic prosperity by leveraging the world's critical need for advances in food production and biodefense.

K-State is the world's food laboratory, successfully solving problems across the entire agriculture chain — production, processing, packaging, distribution and food safety — creating a unique innovation ecosystem.

K-State is also the world's biosecurity incubator, the only university in the world with biosafety level-3 and biosafety level-3 agriculture laboratories located on campus, as well as a biosafety level-4 animal laboratory at the National Bio and Agro-Defense Facility, or NBAF, directly adjacent to campus. These high-containment research facilities give scientists a secure location to study high-consequence pathogens that affect plants, animals and human health.

These and other unique facilities at K-State create the opportunity to foster innovation to improve global health, trade and security through partnerships across campus and with hundreds of state and global industry collaborators.



The university has embarked on a bold new initiative to leverage more than 150 years of practical excellence to create thousands of new jobs and capture billions of dollars in new outside investment for Kansas.

As the country's first operational land-grant institution, K-State has always focused on advancing economic growth for our state. Extending that history into the future, the university has embarked on a bold new initiative to leverage more than 150 years of practical excellence to create thousands of new jobs and capture billions of dollars in new outside investment for Kansas.

The university's economic prosperity initiative is built upon our four foundational focus areas of global leadership:

- 1) **FOOD AND AGRICULTURE SYSTEMS INNOVATION**
- 2) **DIGITAL AGRICULTURE AND ADVANCED ANALYTICS**
- 3) **BIOSECURITY AND BIODEFENSE**
- 4) **K-STATE 105: EVERY TOWN TO GOWN**

**For the economic prosperity of Kansas, K-State will:**

- Create new, high-paying jobs across the state.
- Bring investments into the state from across the country and around the world.
- Attract mature companies.
- Develop emerging companies.
- Create and incubate new businesses.
- Grow the university research enterprise.
- Develop strategic corporate partnerships.
- Engage with global industries and government agencies.

**Benchmarks for Success**

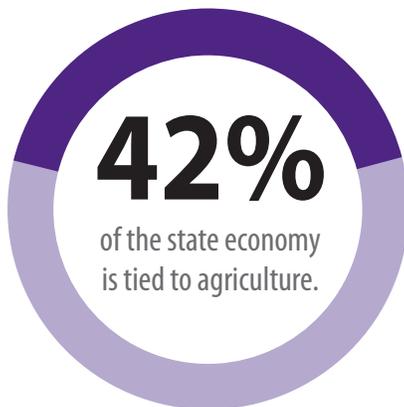
With appropriate external investments that allow full implementation, the goal of K-State's plan for economic prosperity is to support the creation of 3,000 direct jobs and \$3 billion in direct investment in the state within the next 10 years. Short-term progress updates and benchmark dashboard will be shared at [k-state.edu/economic-prosperity](http://k-state.edu/economic-prosperity).

	<b>BASELINE (2019)</b>	<b>2 YEARS (2020-2021)</b>	<b>3 YEARS (2020-2022)</b>	<b>5 YEARS (2020- 2024)</b>	<b>10 YEARS (2020-2029)</b>
<b>Direct Jobs</b>	587	1000	1100	1500	3000
<b>Direct Investment to Kansas</b>	\$154M	\$400M	\$550M	\$1B	\$3B

# 1) FOOD AND AGRICULTURE SYSTEMS INNOVATION



K-State researchers work with producers to transform, sustain and adapt food and agriculture systems worldwide to create jobs here in Kansas and bring billions in national and international investment to the state.



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K-State will work across the food system to ensure Kansas' food and agriculture systems will align with the values and needs of consumers and other food and agriculture stakeholders. K-State's food and agriculture strategy will be comprehensive and feature teams of researchers and educators with expertise in agriculture, biology, social sciences, engineering and extension. The resulting competitive advantages for Kansas within five to 10 years include:

- **Economic growth and job creation.**
- **Profitable, regenerative and sustainable food and agriculture systems.**
- **Disruptive technology and innovation.**
- **Better health for Kansas citizens through nutritional security.**



#### **Potential new technological innovations:**

- Management techniques.
- Digital technologies.
- Precision livestock management.
- Supply chain sustainability.
- Environmental and supporting infrastructures.

### **Economic growth and job creation**

K-State will attract investment leading to new job opportunities for Kansas graduates through profitable and practical business solutions for the food and agriculture system. Forty-two percent of the state economy is tied to agriculture. Keeping more of the food system chain in the state is critical for the Kansas economy. For instance, the beef cattle ranching and farming sector is the top employer in Kansas with the highest financial output. However, lack of workforce development is a statewide barrier to future rural prosperity. High-quality formal and continuing education will address critical workforce gaps, increasing both the number of trained professionals and students seeking an education in agricultural science and systems.

### **Profitable, regenerative and sustainable food and agriculture systems**

Expert interdisciplinary teams will go beyond simply sustaining Kansas food and agriculture systems to help meet the entire world's challenges and opportunities. K-State researchers will increase food and agriculture producers' profits and improve plant and animal health through:

- Reduction of diseases and pests.
- Food and feed safety and nutrition.
- Soil health.
- Water and air quality.
- Water availability.
- Biodiversity under climate change.
- Other emerging food system challenges.

### **Disruptive technology and innovation**

Generating knowledge to shape new technologies will continue to be a key mission for K-State. K-State will build the skilled and digitally competent workforce our state needs through industry partnerships, cross-disciplinary research, new degree tracks and targeted industry training programs.

### **Better health for Kansas citizens through nutritional security**

A healthy workforce is essential to a growing economy. K-State will continue to lead the way to nutritional security for Kansans while creating a roadmap for the nation. The U.S. Department of Agriculture defines nutritional security as, "when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life." K-State's food and agriculture expertise will enable Kansas food systems to deliver nutritious food options, strengthen protein production, advance precision nutrition and contribute practical solutions to reducing food waste and loss.

## 2) DIGITAL AGRICULTURE AND ADVANCED ANALYTICS



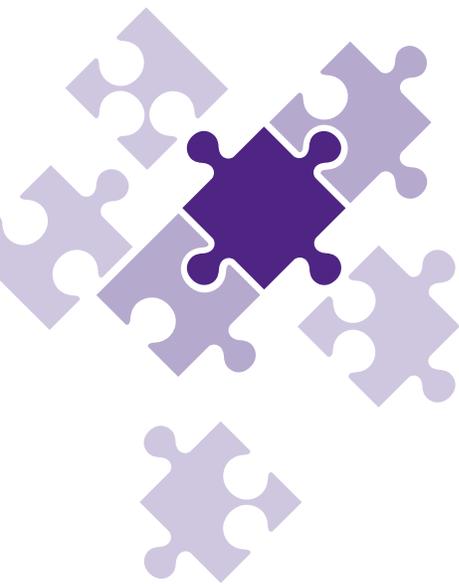
K-State will lead the global food system in creating and embracing leading-edge methods that are driven by data, analytics and decision making in near real time.

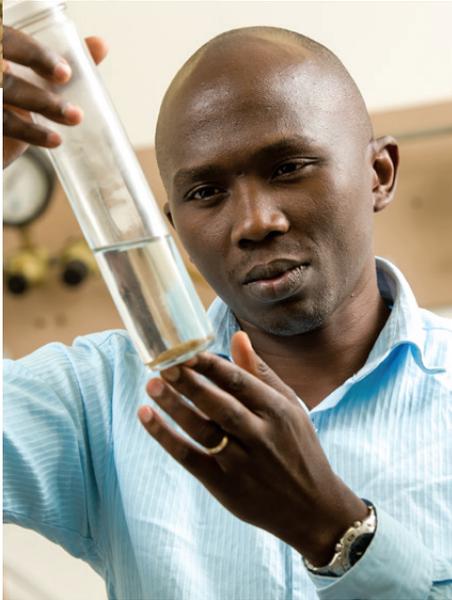
Our initiative in DAAA will grow existing Kansas businesses, attract new, outside investment and create family-sustaining jobs.

In today's world, data generation, its appropriate analysis, and application of digital solutions is the foundation of growth for every economic sector. Kansas is uniquely positioned to become the worldwide nexus for the development and deployment of digital agriculture and advanced analytics, or DAAA, systems. Our initiative in DAAA will grow existing Kansas businesses, attract new, outside investment and create family-sustaining jobs to advance Kansas beyond its current national rank as a Top-15 technology state.

Natural phenomena, consumer preferences, political decisions and countless other production and market variables often overwhelm producers' ability to react. The result: unpredictable and severe shocks that diminish commercial profitability, consumer confidence and ultimately public health and safety. Core DAAA advancements made at K-State will transform food production from reactive to predictive, giving farmers, ranchers and other producers what they need to make better-informed, more responsive and more profitable decisions. We will accomplish this through:

- **Enhancing current capabilities.**
- **Leveraging geographic advantage.**
- **Increasing institutional coordination.**
- **Integrating across disciplines.**
- **Developing hardware and software.**
- **Educating the workforce.**





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### **Enhancing current capabilities**

K-State will leverage existing computing capacity and artificial intelligence research — as well as incorporate expertise in advanced breeding techniques and integrated cropping systems research — to better attract investment and grow our capability to become the global leader in DAAA.

### **Leveraging geographic advantage**

Our state's extreme variability of climatic and production conditions positions Kansas as a model for U.S. and global dryland and irrigated agricultural regions. K-State owns or leases nearly 30,000 acres of land throughout the state. This distribution of regional research and extension centers make it an ideal laboratory for developing DAAA in the most variable and challenging environments.

### **Increasing institutional coordination**

Collaboration with other Kansas institutions — such as geographic information systems and remote sensing with the University of Kansas and robotics with Wichita State University — will maximize economic impact of DAAA research, teaching and training activities.

### **Integration across disciplines**

By unifying core disciplines, K-State will magnify our assets for global prominence. Strengths in agriculture-related biophysical and social sciences provide the ideal foundation for predictive data-driven advancements.

### **Hardware and software development**

K-State will lead the development of new sensors and other point-of-decision crop and livestock tools: portable computing, enhanced battery and power delivery systems, software development and integration of existing equipment.

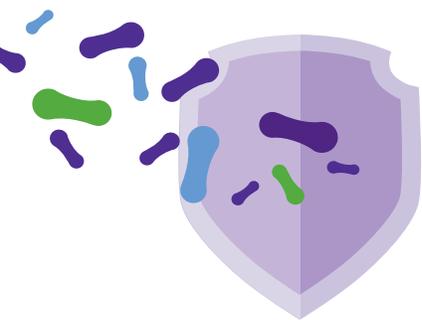
### **Workforce development**

K-State will play a vital role in communicating private-sector demands for a digital agriculture workforce to better inform the state's educational system. This includes working closely with other state-supported organizations that are enhancing K-12 STEM education to produce a computationally literate workforce.

# 3) BIOSECURITY AND BIODEFENSE



K-State's plan for economic prosperity will make us the foremost U.S. resource for private-public research collaboration on pathogens of global significance.



K-State leads all competitors in discovery and development of biosecurity and biodefense strategies.

K-State leads all competitors in discovery and development of biosecurity and biodefense strategies. We are the only university in the world with access to biosafety level-1 through biosafety level-4 facilities on or adjacent to campus. While already extensive, K-State will increase capacity for industry to develop technological advancements for greater profits, streamlining the discovery-to-commercialization process for industry partners. With deep talent and well-established infrastructure in Manhattan, K-State will attract new companies, entrepreneurs and venture capitalists to the region.

For instance, K-State's global reputation for discovery and commercialization will enhance our state's opportunities to attract pharmaceutical partners, licensing agreements and workforce talent. In just one example, K-State was uniquely positioned to pivot research and contribute solutions during the COVID-19 pandemic through the Biosecurity Research Institute, or BRI. The BRI was instrumental in securing \$12 million in funded grants as well as several licensing agreements related to COVID-19.

K-State will leverage our expertise in biosecurity and biodefense by maximizing:

- **Facilities.**
- **Partnerships.**
- **Homegrown talent.**
- **High-value opportunities and resources.**

### **Facilities**

K-State will develop specialized facilities that are accessible to private industry to advance research and development. A biotechnology development module within the BRI, or BRI-BDM, will allow corporate partners to develop diagnostic, therapeutic and preventive countermeasures for a broad range of emerging zoonotic diseases while addressing scalable production. This secure space will also enable emergency rapid manufacturing to protect the nation's animal and food supply during a crisis.

Benchtop lab and animal facilities will provide strong capacity to support commercialization and product development and to attract corporate-sponsored research. An expansion of the BSL-2 Ag Large Animal Research Center will alleviate current critically low housing capacity for animals for pharmaceutical studies. The BSL-1 and BSL-2 core facilities in the College of Veterinary Medicine will provide benchtop services for imaging and molecular analyses for private-sector collaborators.

### **Partnerships**

K-State will partner with emerging pharmaceutical and biologic companies so they can grow, prosper and create jobs in Kansas. By leveraging existing state, regional and federal resources to support commercialization, investment and job growth, K-State will advance Kansas biosecurity and biodefense strengths.

K-State Innovation Partners streamlines corporate engagement, technology commercialization and economic development, providing a consistent experience for corporate collaborators as well as university innovators.

The Kansas City Animal Health Corridor supports 300 animal health companies — 56% of the worldwide industry. Animal Health Corridor's Animal Health Investment Forum provides an opportunity for emerging companies with early stage animal health products to present their vision and business plan to venture capital investment firms and animal health companies. Regional and national venture capital firms with interests in animal health and agriculture located in and around the Animal Health Corridor.

Small Business Innovation Research and Small Business Technology Transfer are federal programs that encourage small businesses to engage in research and development with the potential for commercialization.



### **The greatest needs our biosecurity and biodefense industry partners have are:**

- Collaborative intellectual support.
- Temporary lease access to biosafety level-2 and biosafety level-3 animal facilities.
- Benchtop lab space.
- Scale-up manufacturing equipment.



### **Homegrown talent**

Attracting, educating and retaining homegrown talent — which is fundamental across the state’s economic landscape — remains one of K-State’s highest priorities. K-State faculty are committed to training the next generation of scientists to study high-consequence pathogens — and equally committed to keeping them in our state.

The high-containment training laboratory at the BRI provides experiences for students at many different levels in a setting without dangerous pathogens. In addition, the BSL-3 and BSL-3 Ag labs allow students an opportunity to build their resumes while gaining hands-on experiences and preparing for academic and corporate careers.

### **High-value opportunities and resources**

K-State will identify and prioritize the highest-value federal and private sector opportunities as well as facility and talent needs to take prime advantage of those opportunities. We will identify multiple resources to appropriately address these facility and talent needs — corporate investment and philanthropy, federal/state investment, national corporate, private and family foundations and donors.

### **State, federal and private entities at or near the university collaborate on disease surveillance, diagnostic testing for animal and plant disease and regulatory approval of pharmaceutical products.**

- The Large Animal Research Center.
- K-State Veterinary Diagnostic Laboratory.
- Center on Emerging and Zoonotic Infectious Diseases.
- National Agricultural Biosecurity Center.
- USDA Center for Grain and Animal Health Research.
- Veterinary and Biomedical Research Center.

# 4) K-STATE 105: EVERY TOWN TO GOWN



K-State will streamline methods for businesses and communities statewide to access our innovation, talent and training through local liaisons and coordinated resources.

The biggest business impact K-State can make is to assist new and existing companies that sell goods and services outside the local area.



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One of the most vexing issues facing Kansas is the uneven economic growth in our state. Many communities in Kansas struggle to find effective solutions to advance local prosperity, including support for local entrepreneurs. However, we know that most net new job creation in the country comes from companies five years of age or less. This indicates that we must pay more attention to creating new companies and advancing existing companies. The biggest business impact K-State can make is to assist new and existing companies that sell goods and services outside the local area. This brings new money into our communities and regions.



K-State will create an Every Town to Gown initiative to enhance our presence in all 105 counties in Kansas. K-State will deploy cutting-edge research and development, workforce development initiatives and more to solve problems, support community and economic development and encourage connections between urban and rural areas. This initiative will build on K-State's status as a leader in community vitality by focusing on creating sustainable growth across the state. K-State will leverage and expand our:

- **Statewide Economic Development Liaison Network.**
- **Regional, community and business support liaisons.**
- **Technical solutions for Kansas companies.**
- **Support for entrepreneurship and new business creation.**
- **Workforce development.**

#### **Economic Development Liaison Network**

The Economic Development Liaison Network will review existing programs and expertise to identify opportunities for collaboration. This network will create a sustainable structure that will align the areas of research, education, service and economic development and will focus on translating innovation into economic development throughout the state.

#### **Regional, community and business support liaisons**

The Economic Development Liaison Network will also include regional, community and business support liaisons to coordinate solutions and maximize the capabilities of K-State. The network will leverage local extension agents and provide a streamlined point of entry to university engagement.



This initiative will build on K-State's status as a leader in community vitality by focusing on creating sustainable growth across the state.

K-State will provide the regional community and business support liaisons with technical assistance, workshops, forums and support. As new innovations and knowledge are generated from K-State's research and teaching activities, liaisons and extension professionals will disseminate relevant information to these regional stakeholders. This information will provide solutions to local challenges and create efficiencies that drive innovation and job creation.

### **Technical solutions for Kansas companies**

K-State will identify pathways to seek federal, state, local, private and nonprofit resources to make technical assistance, research and training programs accessible to small and emerging companies. Faculty who are interested in collaborating with small businesses on Small Business Innovation Research and Small Business Technology Transfer grants will be identified and connected with Kansas companies.

Better communication channels to share resources and service offerings, as well as research results and new innovations, will be established. Additional research centers that offer technical assistance to small- to medium-sized businesses will be identified.

### **Support for entrepreneurship and new business creation**

Through coordination of entrepreneurial support and training efforts with other entities, K-State will help develop new businesses around the state.

A National Science Foundation Innovation Corps program will rely on experiential education techniques to help researchers gain valuable insight into entrepreneurship, industry requirements and challenges. A program that works with the Kansas Department of Commerce's proposed Innovation Network will connect new businesses with successful mentors. In addition, a Master Business Leader and Entrepreneur Program will provide training and resources to local communities.

### **Workforce development**

Effective internships improve students' employability, academic outcomes and career goals while building the talent pipeline for Kansas companies. Internships will be enhanced to develop work-based, service-learning experiences. Year-round internship programs will extend student experiences and mentoring opportunities with Kansas companies. These experiences will assist our state with talent attraction and retention of graduates to overcome workforce shortages.

K-State also will collaborate with technical and community colleges to provide industry-relevant training and education that includes stackable credentials and pathways to degrees for in-demand occupations in target sectors.

K-State's Center for Engagement and Community Development will enhance campus and community partnerships to promote vitality, livability and quality of place in our state's economic regions.

The implementation of workforce-related initiatives in the Kansas Agriculture Growth Strategy – interdisciplinary education, high school career immersion experiences, improved veteran career and education transitions — will be an important advancement for K-State 105.



K-State also will collaborate with technical and community colleges to provide industry-relevant training and education that includes stackable credentials and pathways to degrees for in-demand occupations in target sectors.



# Gaps and Needs

**Facilities:** Commercial real estate will be critical to realize the economic outcomes expected through this initiative. Lab space and other innovation–enabling spaces for start-up companies, small businesses and corporate co-locations will be necessary.

**Startup capital:** Resources to support new and emerging companies will include evergreen funds and other venture capital to accelerate the commercialization of innovation and create jobs.

**Capacity:** Additional faculty and staff capacity will be necessary to accelerate and deliver the K-State economic prosperity vision.

**Culture:** The activities and cultures of university units, extension stations, industry, government and economic development partners are disparate and have varied priorities. Efforts to convene and build collaboration will be necessary to build productive partnerships.

**Institutional incentives and rewards:** A transition to rewarding interdisciplinary and systems-focused integrated research, education and extension programs will be necessary. A mindset of collaboration and performance that incentivizes cooperation across departments, colleges and beyond the university will be key.

**New market validation and awareness:** As the global agricultural landscape continues to shift over the coming decades, K-State must stand ready to facilitate adoption of new technologies, techniques and consumer-driven market demands that may challenge what we historically understand as agriculture.

**Broadband and cellular access:** Connectivity plays an essential role in how rural communities and businesses employ technology, deliver services and connect even the smallest community with the rest of the world. Broadband and reliable cellular deployment to rural areas will ensure that Kansas, and the nation, will stay at the forefront of technological innovation and development.

To learn more about K-State’s plan for economic prosperity, please visit

**[k-state.edu/economic-prosperity](http://k-state.edu/economic-prosperity)**

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UNIVERSITY

Office of the Vice President for Research

