GREATER MANHATTAN, KANSAS:

An Unrivaled Environment for Bioscience Innovation

GREATER MANHATTAN Economic Partnership

Biodefense ◆ Animal Health ◆ Biomanufacturing

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BIOMANUFACTURING AND BIOTECHNOLOGY ECOSYSTEM

Executive Summary

#1 BEST MIDSIZE U.S. CITY

TravelAwaits, 2023

$2B IN CURRENT AND PLANNED INFRASTRUCTURE

1,400 JOBS CREATED TO DATE

POTENTIALLY 3,600 ADDITIONAL JOBS

Why Manhattan, Kansas?

Although it may seem an unlikely location, those familiar with Manhattan and its region know it offers unique connections and resources that make it the perfect place for both private and public institutions researching critical biosecurity and biodefense topics. Here's why.

Innovation thrives.

Kansas State University and its partners are a source of new research and knowledge to advance industry in the long term.

The U.S. Department of Agriculture's National Bio and Agro-Defense Facility, or NBAF, is the only one of its kind in the U.S. and is an international center for critical research in some of the most dangerous zoonotic pathogens — those that can transfer from animals to humans.

Manhattan is the western anchor of the Kansas City Animal Health Corridor, an established innovation sector with the highest concentration of animal health companies in the world. Fifty-six percent of total worldwide animal health, diagnostics and pet food sales come from companies with locations in the KC Animal Health Corridor.

Talent is plentiful.

Area academic programs are developing the next generation of diverse talent in animal health and biosecurity.

Fort Riley is a rich source of experienced, disciplined workforce.

Partnerships are valued.

Greater Manhattan has a unique approach to building and maintaining partnerships among public, private, nonprofit and government stakeholders. We work together to adopt a business-friendly approach that streamlines pathways to engagement and economic development.

Executive Summary

Top Kansas State University researchers and scholars in biosecurity, animal health and agriculture are eager to collaborate.

Local relationships and partners include K-State units and research centers, NBAF, U.S. Department of Agriculture Center for Grain and Animal Health Research, the Kansas Department of Agriculture, the Kansas Wheat Innovation Center, Kansas Farm Bureau, Kansas Wheat Commission, the Kansas City Animal Health Corridor, Fort Riley and more.

Regional partnerships are strong and growing, as evidenced by the U.S. Department of Commerce's Economic Development Administration's recognition of the KC BioHub.

The location is ideal.

Kansas is the heart of U.S. agriculture.

Incentives to locate in the region abound.

Transportation is easy, with daily round-trip flights to and from Chicago and Dallas, interstate access, rail service and more.

Find top-notch quality of life, excellent schools, and a diverse and welcoming community. Greater Manhattan offers the perks of living in a small, college town but the amenities of life in a bigger city.

Sites are available.

Office, laboratory and building sites are on the market.

The Edge District lies north of the K-State campus and close to NBAF and other crucial facilities.

Existing centers and institutes offer research facilities ranging from biosafety level 2 through level 4.

TOP 10 METROS, ECONOMIC DEVELOPMENT PROJECTS PER CAPITA

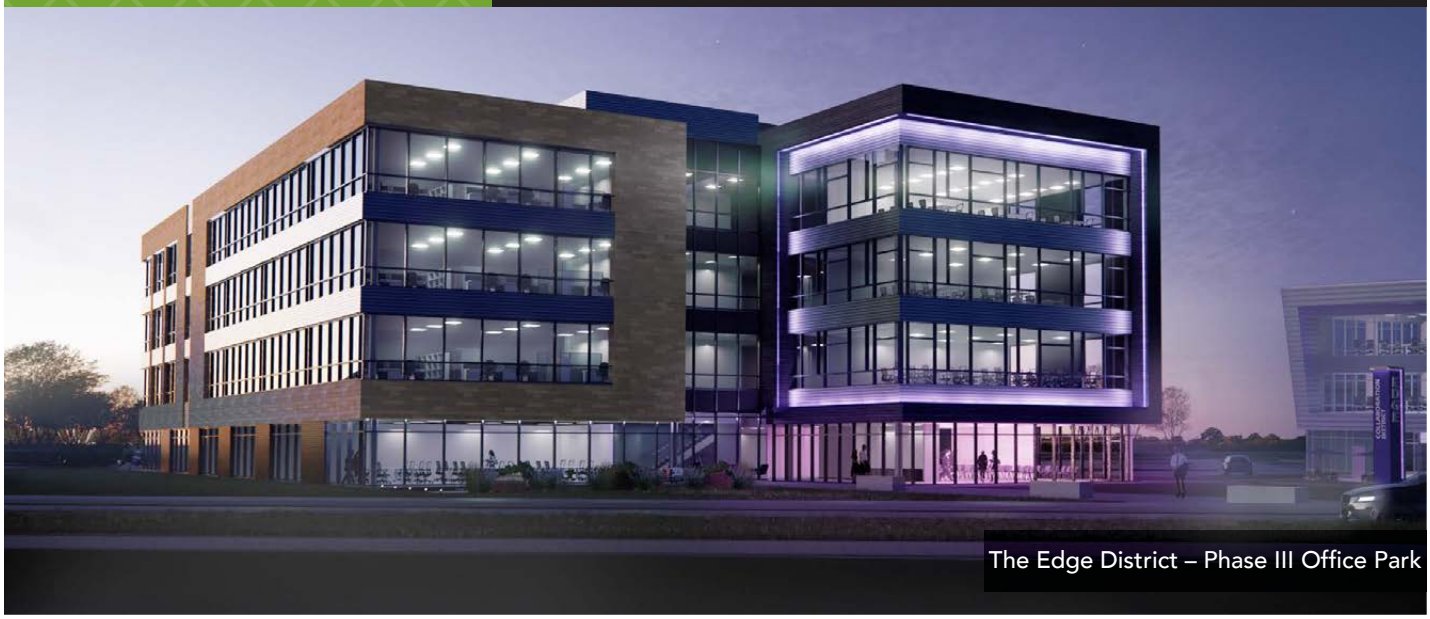
(#3 for cities under 200,000)

Site Selection Magazine, 2022

500-ACRE MASTER PLAN

$77M OF PROPERTY TAX BY 2050

Business Environment



The Edge District – Phase III Office Park

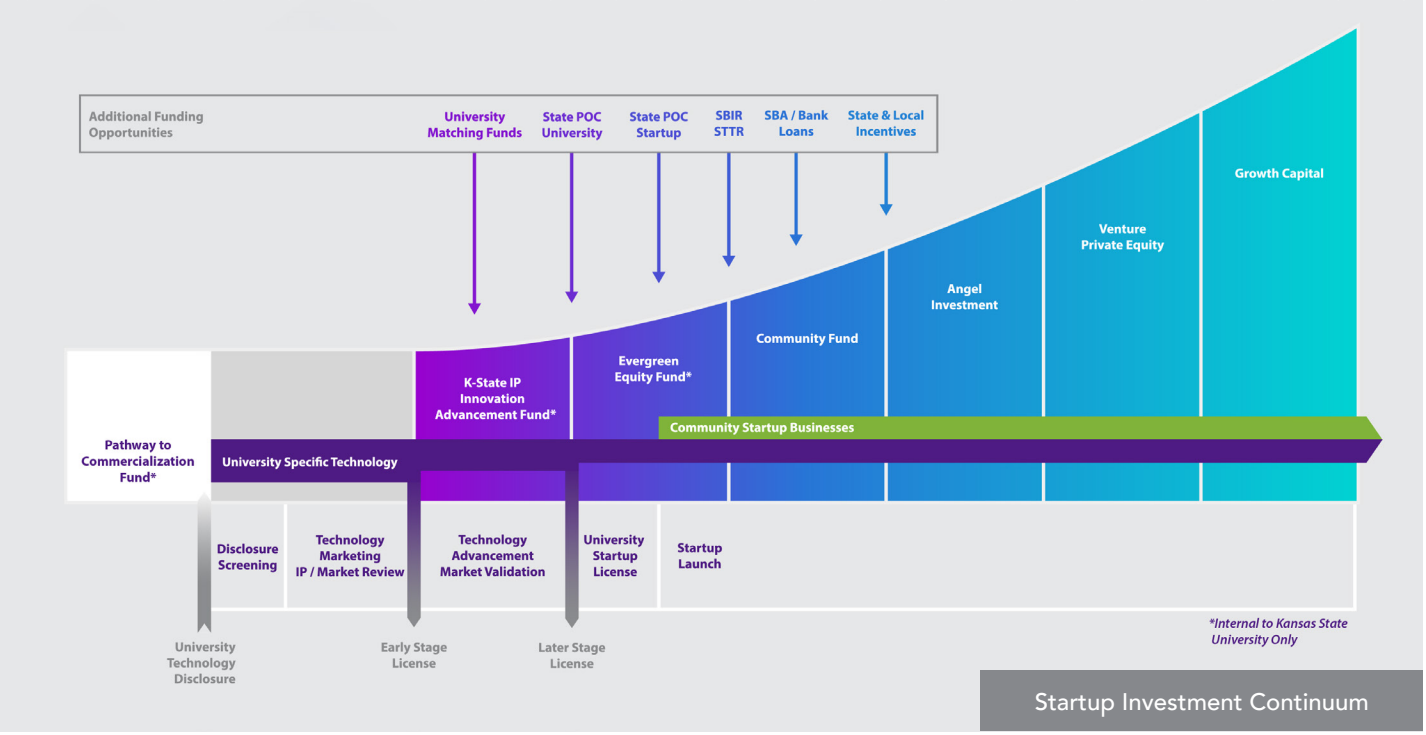
"We're thrilled to break into the top metros category," said Jason Smith, president and CEO of the Manhattan Area Chamber of Commerce. "This is a credit to all of the collaborative efforts between Kansas State University, the Greater Manhattan Economic Partnership, the City of Manhattan and other community partners to attract businesses that will benefit from our strengths, research assets and talent pool."

Economic Development

The Greater Manhattan region and State of Kansas were recognized for economic development activity by *Site Selection* magazine in 2023.

- The Manhattan area garnered national recognition as a top metro with a population less than 200,000, ranking 3rd by projects per capita and 4th by total projects. Additionally, Manhattan ranked 9th overall in the West North Central region, which was up from the 23rd spot in 2021.
- The Governor's Cup Award went to Texas for the most overall activity, but Kansas ranked No. 1 for the most growth per capita. Kansas was recognized for the second year in a row and had 138 projects in 2022, including Panasonic Corp./Panasonic Energy Co. in DeSoto, Scorpius BioManufacturing in Manhattan, and Heartland Coca-Cola Bottling Co. in Olathe.
- Other Kansas highlights:
  - Metros with population over 1 million: Kansas City (Kansas and Missouri combined) ranked 10th by projects per capita.
  - West North Central region: Kansas City ranked 1st, Wichita 6th (up from 9th in 2021) and Manhattan finished 9th, the only other Kansas city on the list.
  - Kansas ranked 6th overall in the number of micropolitans, or cities with population of 10,000 to 50,000, with qualifying projects.

Business Environment



Entrepreneurship and Investment Continuum

The Greater Manhattan region had incredible economic development success over the past two years with a record number of new projects announced, including hundreds of jobs planned and well over $1 billion of investment in the pipeline. Our community achieved this success through the collaboration of our economic development partners, specifically, the City of Manhattan, Pottawatomie County, Kansas State University and the Greater Manhattan Economic Partnership.

Our region's growth will also be driven by the success of small businesses and home-grown accelerators. To that end, our partners are enhancing local entrepreneurship through strategic investment. The community has a long history developing entrepreneurial ventures that have become staples of the community. These include, but aren't limited to, Steel and Pipe Supply (now expanded to SPS Companies), CivicPlus and Manko Window Systems. Even companies like Caterpillar and HanesBrands have established strongholds in the region after buying locally based companies.

Our economic development partners recently released an investment continuum strategy that enhances the deployment of K-State innovations and facilitates technology-based startups as well as enhances opportunities for entrepreneurs across the region.

$3B IN ADDITIONAL ECONOMIC INVESTMENT AND INFRASTRUCTURE BY 2035

Entrepreneurship is an important element of our entire economic development strategy.

The four funding mechanisms include two K-State-specific funds as well as two funds from the Manhattan regional community that will be accessible to community entrepreneurs, including K-State startups.

- The **Pathway to Commercialization Grant Program** (P2C) is a new collaborative program implemented by the K-State Office of the Vice President for Research in partnership with K-State Innovation Partners to encourage the advancement of commercially viable, early stage, pre-disclosure research by faculty at K-State. P2C is a competitive grant program that will help faculty inventors start the commercialization process with concepts or research that have not yet yielded a technology disclosure, and which are currently purely conceptual in nature or have not yet advanced to the point of garnering other grant funding.
- The K-State Innovation Partners **Innovation Advancement Fund** provides capital to advance previously disclosed K-State-developed technologies. Funds will be awarded on a competitive basis. Proposals will be reviewed by an investment review committee, which will recommend those for further development and enhancement opportunities.
- The **Entrepreneurial Evergreen Equity Investment Fund** will provide investments in technology-based, high-growth, potential startups and early-stage companies that either develop from within the region or are being attracted to the region. Charitable contributors will raise $3 million in total capital. It is anticipated that $3 million in total capital will be raised through charitable contributions.
- The **Elevate Community Fund** will assist Manhattan area for-profit businesses with funding for growth and expansion projects that will drive economic activity in the region. This funding will strengthen and grow small businesses; dedicate funds to advancing diversity, equity and inclusion; assist businesses in becoming bankable; and provide gap financing. A total of $3 million will be raised for this fund. Once capital is raised, the funds will be available to businesses in the community through a revolving loan program as well as a grant program planned to be developed in the future.

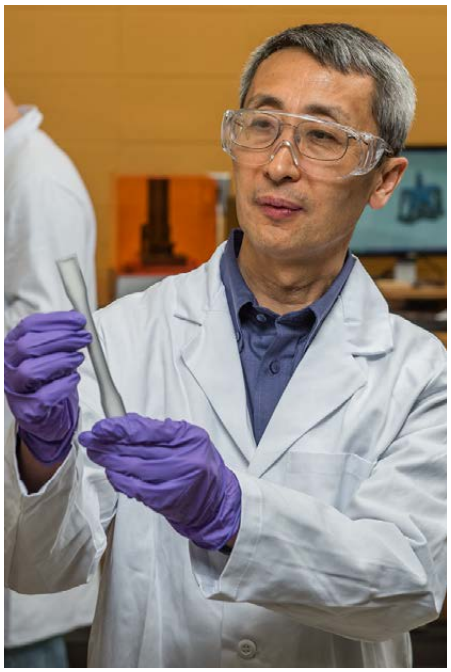
Entrepreneurship is an important element of our entire economic development strategy. In addition to being key employers, locally owned businesses help make the Greater Manhattan region a special place for both residents and visitors.

LEARN MORE:

greatermanhattan.org/announcement/manhattan-advances-entrepreneurial-funding

Kansas State University Biomanufacturing Teaching and Education Initiative

Kansas State University aims to foster collaborative relationships with industry and to provide a robust pipeline of talent to the expanding biomanufacturing industry in Kansas and beyond by ensuring students receive practical training and skills.

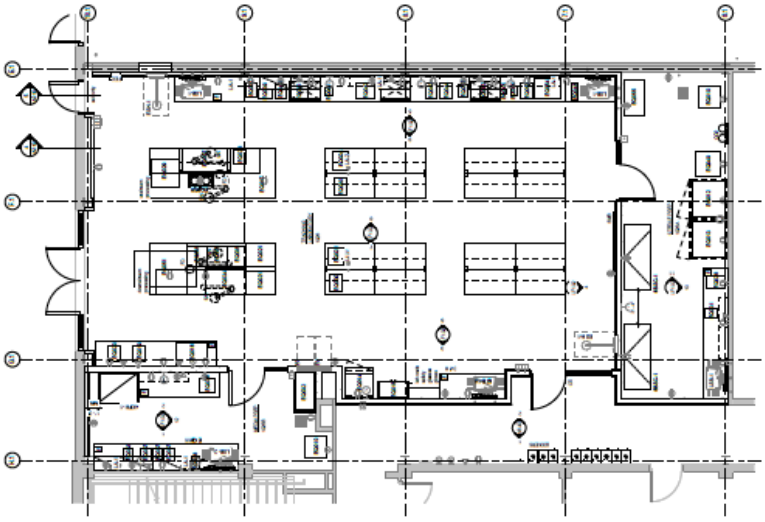


K-State's **Biomanufacturing Teaching and Education Initiative** will use $5M allocated by the State of Kansas to support biomanufacturing training and education in the state. Funds will outfit and renovate space for teaching, purchase needed equipment and support a constellation hire of faculty who will focus on biomanufacturing.

The initiative will include a **Biomanufacturing Training and Education Center** to be housed in the Carl and Melinda Helwig Department of Biological and Agricultural Engineering in Seaton Hall. The 2,300-square-foot facility will feature modern biomanufacturing lab equipment to support hands-on training and complementary analytical techniques. (See diagram below.)

Core competencies include principles and management of biomanufacturing, biologic product development methods and technologies, process design and development, downstream biomanufacturing (product recovery and purification), upstream biomanufacturing (cell growth and optimization) and regulatory affairs and industry standards.

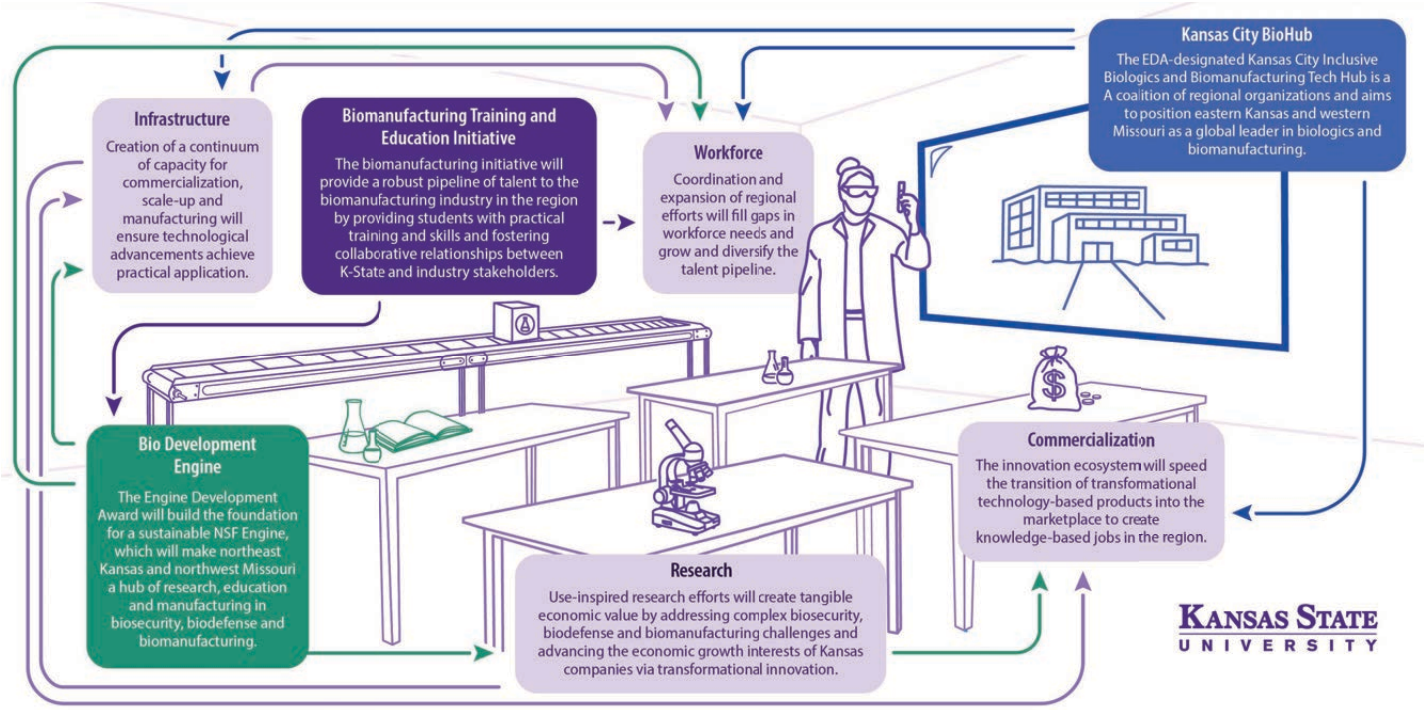
A multidisciplinary strategic hiring initiative in biomanufacturing will move the dial immediately in growing research, increasing instructional capacity, building industry engagement opportunities and contributing to economic development in Kansas.



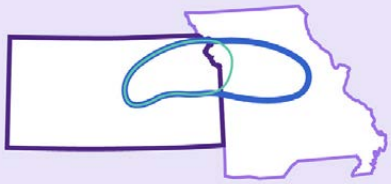
Courses offered for advanced undergraduates include:

- *Introduction to Biomanufacturing*
- *Upstream Biomanufacturing Principles and Processes*
- *Downstream Biomanufacturing Principles and Processes*
- *Biomanufacturing Laboratory Training*
- *Regulatory Affairs for Biomanufacturing and Biologics*

Regional Bio Innovation Ecosystem



Regional Innovation Ecosystem Map



- Region of service for the Bio Development Engine
- Region of service for Biomanufacturing Training and Education Initiative
- Region of service for the Kansas City Tech Hub

NSF Engines Development Award

A regional, collaborative project called Advancing Biosecurity, Biodefense and Biomanufacturing Technologies has been awarded $1 million from the U.S. National Science Foundation's Regional Innovation Engines program. The NSF Engines Development Awards aim to create economic, societal and technological opportunities for the winning regions.

This development award will help attract, create and grow economic activity in the Greater Manhattan region with a focus on biotechnology-based products within the biosecurity, biodefense and biomanufacturing sectors, with applications ranging from biopharmaceutical manufacturing to renewable energy and advanced materials.

The project team includes core leaders from the Manhattan Area Chamber of Commerce (a Greater Manhattan Economic Partnership founding partner), Kansas State University, K-State Innovation Partners, Manhattan Area Technical College and BioKansas. Pottawatomie Economic Development Corporation (another Greater Manhattan Economic Partnership founder) is also a partner. The group is among more than 40 unique teams to receive one of the first-ever NSF Engines Development Awards.

Kansas State University

Manhattan Area Technical College provides workforce education to support bioscience and biotechnology, which will aid the project's effort to support the needs of industry through workforce development.

Another focus of the project is to streamline the process of discovery to commercialization for industry partners and ensure technological advancements achieve practical application and promote economic development.

About NSF Engines

The NSF Engines program is a transformational investment for the nation, ensuring the U.S. remains in the vanguard of competitiveness for decades to come.

The awardees span a broad range of states and regions, reaching geographic areas that have not fully benefited from the technology boom of the past decades. These NSF Engines Development Awards will help organizations create connections and develop their local innovation ecosystems within two years to prepare strong proposals for becoming future NSF Engines, which will each have the opportunity to receive up to $160 million in additional funding.

View a map of the NSF Engines Development Awards. More information can be found on the NSF Engines program website.

Read the full story: greatermanhattan.org/announcement/greater-manhattan-region-wins-1-million-nsf-engines-development-award

In Good Company

More than 25 partners supported the proposal and will be involved in the project. Partners include:

- *BioNexus KC*
- *Ginko Bioworks*
- *Gener8tor*
- *The University of Kansas*
- *Latham BioPharm Group*
- *Pfizer*
- *Ronawk*
- *Scorpius Biomanufacturing*
- *Ventria Bioscience*

A full list of partners can be found on the award website. Interested in joining?

***Email** bio-dev-engine@k-state.edu.*

Kansas State University

KC BioHub

The U.S. Department of Commerce's Economic Development Administration selected a coalition of Kansas City regional organizations as one of 31 Tech Hubs. The Kansas City Inclusive Biologics and Biomanufacturing Tech Hub, or KC BioHub, will aim to build biomanufacturing capacity and add jobs and businesses in the area.

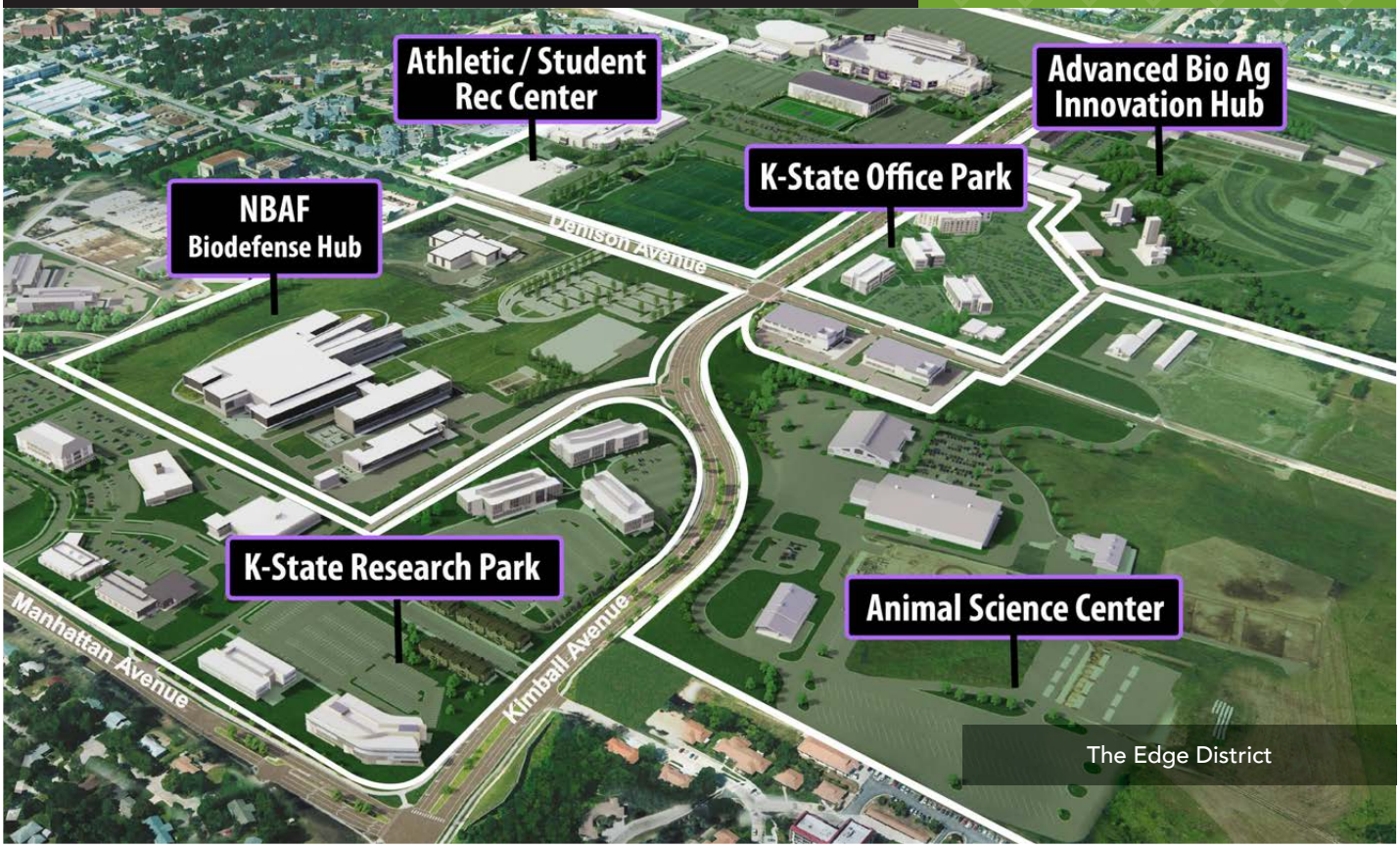
The KC BioHub coalition is led by BioNexus KC and includes more than 70 partner organizations representing academia, entrepreneurship, corporations, government, workforce development and venture capital hub involvement from all four regional research universities — K-State, the University of Kansas, the University of Missouri and the University of Missouri-Kansas City — as well as from two-year and community colleges, including Donnelly College, Metropolitan Community College and Kansas City Kansas Community College.

The Biologics and Biomanufacturing EDA Tech Hub comes on the heels of a recent announcement from the state to fund a biomanufacturing training and education center at K-State, an announcement from the National Science Foundation to support a Type-1 Regional Innovation Engine in Biosciences being led by K-State, an internal major equipment grant program in biosciences and biomanufacturing, and plans to hire 12 new faculty positions in biomanufacturing, supporting biosciences and enabling technologies.

LEARN MORE:

www.k-state.edu/media/newsreleases/2023-10/KC-Biohub-102323.html

Kansas State University



The Edge Collaboration District

The Edge Collaboration District brings industry, research and talent together on the north end of the K-State campus to produce meaningful innovations. A range of companies from ag technology and communications to construction and venture capital are locating at the Edge District to find state-of-the-art facilities and a sense of community. The Edge District provides space, tools and resources to connect industry and academia, plus produces a channel to future talent and a pathway to growth.

KANSAS' MOST COMPREHENSIVE ECONOMIC DEVELOPMENT DISTRICT

Kansas State University

The Edge – Proposed Entertainment District

Advanced Bio Ag Innovation Hub

LEARN MORE:

ksiteonline.com/commercial-real-estate

The district is adjacent to NABF and K-State research facilities, minutes from the Aggieville entertainment district, and steps from K-State athletics facilities. The footprint is large — and growing.

Upcoming projects in the Edge District include a livestock performance arena, the Agronomy Research and Innovation Center, the Global Center for Grain and Food Innovation, a hotel, a condo complex, three restaurants and much more.

INNOVATION
Executive Summary

KANSAS STATE UNIVERSITY

1,400+
faculty members

90+
centers and institutes

9
colleges

$212.9
million in FY 2022 research expenditures

350+
patents granted

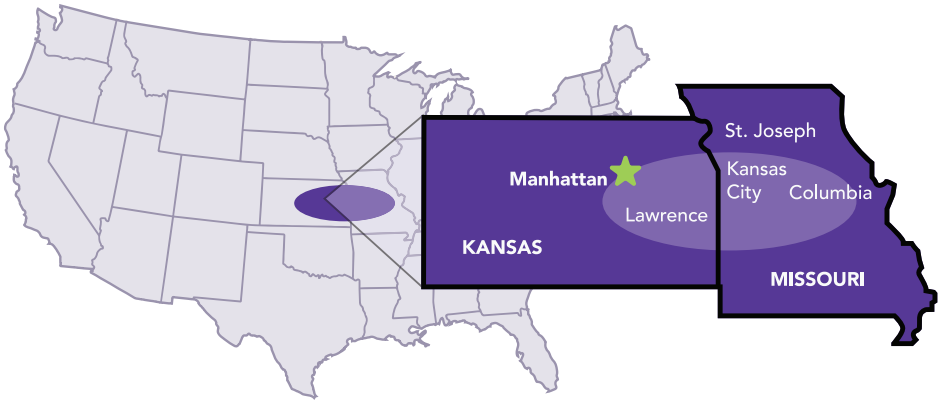
USAID
Feed the Future Labs

Kansas State University and the National Bio and Agro-Defense Facility have created an unrivaled environment for innovation in Manhattan, Kansas.

K-State is the only university in the world with access to biosafety level 1-4 facilities on or adjacent to campus. From emerging zoonotic diseases to vaccine development and biomanufacturing, our experts and facilities are fully equipped to advance knowledge, and our strategic partnerships ensure that your company's workforce, commercialization and regulatory needs are met.

Economic Prosperity Plan

K-State has committed to bringing 3,000 new jobs and $3 billion in direct investment by companies choosing to locate operations in the state by 2029.



Kansas City Animal Health Corridor

The Corridor, anchored by Manhattan, Kansas, and Columbia, Missouri, is home to more than 300 animal health companies, representing the largest concentration in the world. Learn more

Executive Summary

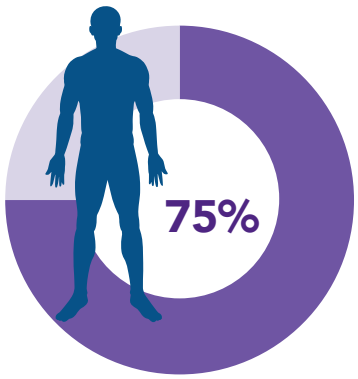
USDA's National Bio and Agro-Defense Facility has biosafety level-2 and -3 laboratories and is the first facility in the United States with biosafety level-4, or BSL-4, containment capable of housing large livestock.


NBAF Ribbon Cutting

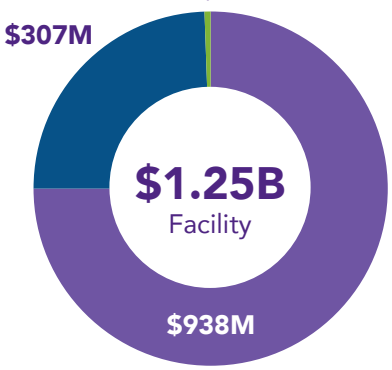
NBAF's BSL-4 containment laboratories require the highest level of safety protocols and equipment so scientists can safely study and diagnose a variety of high-consequence animal pathogens.

NBAF's design incorporates best practices used in other animal and zoonotic pathogen laboratory facilities in the United States and abroad. NBAF is the nation's only large animal BSL-4 facility built to safely handle pathogens that do not currently have treatments or countermeasures.

NBAF also features a Biologics Development Module (BDM) for the pilot-scale development of vaccines and other countermeasures, augmenting laboratory research and accelerating technology transfer to industry partners.



According to the World Health Organization, up to 75% of new and emerging infectious diseases in humans are zoonotic, which means they can be transmitted to humans.



The 574,000 square-foot facility's acquisition cost was $1.25 billion. The cost was fully funded through a combination of $938 million in federal appropriations, $307 million in funding provided by the State of Kansas and $5 million from the City of Manhattan, Kansas.

Kansas State University


Kansas State University

OUR VISION

Kansas State University will lead the nation as a next-generation land-grant university – setting the standard for inspiring learning, creativity, discovery and engagement that positively impacts society and transforms lives in Kansas and around the world.

As the country's first operational land-grant institution, Kansas State University is fiercely proud of our leadership in service to humanity for more than 150 years. In a time of ever-growing population, climate change and large-scale migration, we understand that human and animal health rely on understanding disease and recognize these global challenges will require significant partnerships. Through a coordinated, team-based approach, K-State is the foremost U.S. resource to facilitate private-public collaboration for research on pathogens of worldwide significance. According to the World Health Organization, approximately 75 percent of new and emerging infectious diseases are zoonotic diseases that may be transmitted from animals to humans. Our approach provides opportunities to bring faculty together in multidisciplinary teams to deliver innovative, sustainable solutions that would be challenging to accomplish through a traditional siloed approach.

K-State is the only university in the world with access to a full continuum of BSL 1-4 facilities located on or adjacent to campus. The extensive talent and infrastructure in Manhattan support new technology development for economically important animal and zoonotic infectious diseases.

Our collective expertise in vaccine development, regulatory affairs and flexible manufacturing capacity are unique in the world, as are our opportunities to attract corporate pharmaceutical partners, licensing agreements, and workforce talent. A global reputation for success and existing biotechnology resources in Manhattan contribute to innovation and commercialization.

Kansas State University

State, federal, and private entities near the university are committed to disease surveillance, animal models of disease, diagnostic testing for animal disease and regulatory approval of pharmaceutical products.

A long history of infectious disease research has attracted colocation of multiple federal and private sector partners, including the USDA's National Bio and Agro-Defense Facility, the Center for Grain and Animal Health Research, including its Arthropod-Borne Animal Diseases Research Unit, as well as private sector partners including a contract research organization, the Veterinary and Biomedical Research Center, Orion Integrated Biosciences, and Ventria Bioscience.

K-State Office Park

Proximity to our campus will provide a unique value through direct access to K-State's innovation, talent and training capabilities.

Proximity to our campus will provide a unique value through direct access to K-State's innovation, talent and training capabilities. Frequent face-to-face interactions will provide an opportunity for close scientific collaboration to solve pressing biosecurity challenges as well as engagement with our students, who are the next generation of animal and human health leaders. Enhanced exposure and visibility to K-State's world-class student talent will provide a robust talent pipeline to fulfill the company's global hiring needs.

To deliver on our partnership promise, we will streamline and facilitate collaboration with K-State, including coordinated access to researchers, new technologies and student talent through K-State Innovation Partners, the KSU Foundation, the K-State Career Center and leaders from academic units across our three campuses. K-State's "culture of collaboration" allows researchers across the hall, across campus, across the state and even across the globe to fuel innovation, support a growing global population and improve lives.

Animal health and vaccine innovation is a bedrock of K-State, and our researchers are gifted and highly productive.

Strategic Partnership Opportunities

K-State is committed to collaborating with university, industry, and community partners to deliver corporate engagement, technology commercialization and economic development. K-State leverages its innovation, talent and professional development capabilities to establish and expand strategic partnerships with companies. Developing a comprehensive strategic partnership with K-State will enable your company to efficiently build robust collaborations across multiple key engagement areas, creating tangible economic value by addressing complex global challenges. Finally, in partnership with university and community entities, K-State supports the attraction, retention and expansion of knowledge-based companies into and in Kansas.

Animal health and vaccine innovation is a bedrock of K-State, and our researchers are gifted and highly productive. With a national asset in our community that addresses the most virulent infectious diseases of our time and whose staff holds joint faculty status opportunities on campus, we are able to have a critical mass of innovators seeking industry partnerships. Through a strategic partnership, K-State will become ingrained in the company's early-stage innovation strategy and will provide pre- and post-regulatory approval product testing when feasible. We specialize in:

- Educating K-State researchers on current company external innovation needs;
- Exploring future product opportunities;
- Meeting new and emerging research talent;
- Aligning research with the evolving marketplace; and
- Establishing a research/testing program that aligns with company needs.

Capabilities and Expertise

K-State's capabilities and expertise include the following.

- Domestic, foreign, emerging and zoonotic livestock infectious disease research, including vaccine candidate and diagnostic test development
- Preclinical model development in animal models in BSL-1 through BSL-3 facilities
- Clinical trials
- Large and small animal vector-borne disease research
- Cell line development and purification
- Sequencing within containment
- Gene therapy
- Board-certified pathologists
- Vaccine development (subunit, modified live, DNA, etc.), novel antiviral compounds, disease pathobiology
- Epidemiology including four DVM/PhD epidemiologists
- Pharmacology including five ACVCP-boarded faculty, service laboratories
- Applied toxicology service laboratory, two toxicologists
- Microbiome and its impact on infectious disease transmission
- Parasiticide research and testing
- Animal welfare including ACAW-boarded faculty, objective measures of pain assessment in production animals
- Experienced training programs and dedicated facilities for high-consequence containment research
- Multiple interdisciplinary animal health centers, institutes and labs
- Continuing education and training including Wildcat Parasitology and regulatory affairs available through the College of Veterinary Medicine and K-State Olathe to provide licensure renewal and specific certification
- Center on Emerging and Zoonotic Infectious Diseases supports faculty pursuing research innovation in emerging and zoonotic infectious diseases
- National Agricultural Biosecurity Center located in Pat Roberts Hall unites biosecurity researchers with federal, state and local agencies to provide response resources for emerging biosecurity threats

Kansas State University

Biosecurity Research Institute (BRI)

Facilities

K-State facilities include the following.

- Large animal BSL-2 and BSL-3 facilities
  - Large Animal Research Center (LARC): 19,000 sq. ft, BSL-2 research facility for animals ranging from piglets to calves.
  - KS Veterinary Diagnostic Laboratory (KS-VDL) provides BSL-2 diagnostic testing for the animal health community in Kansas and serves as a member of the National Animal Health Laboratory Network for early detection of significant animal disease.
- Biosecurity Research Institute (BRI): K-State faculty have the expertise and experience to commercialize research discovery with select agent pathogens due to access to the BRI, unlike typical select agent research that is limited to federally regulated, high-containment facilities. Few non-federal facilities qualify for permission to work with the range of pathogens approved for the BRI. ASFV and SARS-CoV-2 are just two examples of economically relevant diseases currently studied in the BRI. License agreements for intellectual property developed by K-State faculty in the BRI for both pathogens were signed in fiscal year 2020. Two important plant pathogens currently under study are *Rathayibacter toxicus* (annual ryegrass toxicity) and *Magnaporthe oryzae* (rice blast).
  - BRI Biologics Development Module (BRI BDM): The Biologics Development Module, or BRI-BDM, is a BSL-2 pilot manufacturing lab located within the BRI. Prototype products are easily transitioned from the BDM lab for testing in vitro or in animal models in the BRI's BSL-3 and ABSL-3Ag labs.

Kansas State University

Examples of prototype countermeasures well suited for the BRI-BDM include modified live virus, live-vectored and recombinant protein-based subunit vaccine candidates for management of zoonotic and foreign animal diseases. Industry partners can manufacture their internally developed prototype products within the BRI-BDM or collaborate with K-State researchers on the development of their innovative discoveries.

- Large and small animal vector-borne disease facilities
- Flea, tick and mosquito vivarium
- NAHLN tier 1, AAVLD-accredited Veterinary Diagnostic Laboratory
- Sensitive Compartmented Information Facility (SCIF) Access
- Core facilities that all house state-of-the-art research and teaching equipment including next-generation sequencing, flow cytometry, molecular diagnostics, confocal imaging, proteomics, lipidomics, electron microscopy
- K-State's Department of Animal Sciences and Industry is one of the largest in the country and maintains research facilities for beef cattle, dairy cattle, swine, poultry, horses and sheep.

K-State's Department of Animal Sciences and Industry is one of the largest in the country.

Kansas State University

Research is anticipated to provide scientific information for designing downstream processing trains for recovery of bio-based products from biomass.

The **Bioseparations and Bioprocessing Laboratory** addresses fundamental separation challenges that impede recovery of biomolecules from biological sources using experimental design, process simulation and high-throughput screening methods. Research is anticipated to provide scientific information for designing downstream processing trains for recovery of bio-based products from biomass. This laboratory is also developing technologies and novel strategies for recovery and purification of pharmaceuticals, food and feed proteins and industrial proteins and is currently developing an enzyme-assisted extraction process for microalgae as a commercially viable, scalable, and environmentally friendly algae lipid-protein separation technique. The purpose of the work is to address a major bottleneck issue with algae biofuel/bioproduct processing and the lack of cost-effective cell lysis and cell content separation processes for intracellular lipid and protein recovery. Thus far, research has been focused on the freshwater species, *Chlamydomonas reinhardtii*, due to its great potential to produce oil, starch, and/or high value, pharmaceutical proteins. Cell wall lysis is a critical first step for the extraction of these products, and studies indicate that the biological-based treatment method can effectively lyse cell walls and release protein and oil from within the chloroplast.

The **Bioprocessing & Industrial Value Added Products** (BIVAP) **Innovation Center** is a state-of-the-art research facility that houses the Bio-Materials and Technology Laboratory, the Extrusion Pilot Facility and Laboratory, and the Bioprocessing and Renewable Energy Laboratory within the Department of Grain Science and Industry at Kansas State University. BIVAP's mission is to contribute to climate change mitigation, energy security, worldwide hunger relief and sustainability by developing innovative technologies to produce value-added biobased products from grains and other agricultural inputs.

Kansas State University

The **Bio-Material & Technology Lab** is one of three key laboratories of BIVAP. Its research includes the following.

- Soy Polymer Research Program: Researchers around the world continue to search for environmentally friendly alternatives to petroleum-based industrial and consumer products. In many cases, they have turned to soybean oil and soybean protein for those alternatives. Soybean oil and protein can be used to produce a wide variety of non-food products, including printing inks, paints, plastic films, solvents, lubricants, hydraulic fluids, biodiesel fuel, building composites, insulating foams, plywood adhesives and other wood bonding agents. Most of these products are available commercially, but some are still under development. This is the case for some of the wood bonding agents and foams. Adhesives containing soy protein are not new to the wood products industry, but because the earlier products were water-soluble, their use was limited. Now, researchers have found ways to produce water-resistant soybean-based wood adhesives that meet all industry standards. Single formulations can be used to bond dry, wet or even green material. Soy protein adhesives can be used to produce formaldehyde-freewood composites, and unlike their petroleum-based cousins, they don't emit volatile organic compounds. Researchers have also used soybean oil to produce rigid urethane foams that have the same mechanical and insulating properties as those made from petroleum. Recent research has also shown that soy protein can be used to improve the properties of polyurethane foams, increasing their strength, their flame resistance and their biodegradability.
- Starch/poly(lactic acid) Research Program: This program aims to develop affordable, durable and degradable bioplastics from starch/PLA for disposable applications and to provide technologies to do so.
- Bio-based Adhesive Program: The research plan is to develop formaldehyde-free, affordable biobased adhesives for producing plywood and agricultural fiber particle boards, to evaluate the adhesives for commercial construction and to promote extension and education in new uses of agriculture commodities.
- The Targeted Excellence Program aims to foster nationally and internationally recognized excellence in biomaterial research, teaching and outreach programs at K-State and lead to mass production of biobased materials and products.

New uses for soybeans will help provide strength and stability to world soybean markets in the future.

Kansas State University

Highly experienced staff and state-of-the-art facilities allow the fermentation team to develop processes for converting a variety of agricultural co-products and waste streams.

The **Bioprocessing and Renewable Energy Laboratory** is an integral part of Department of Grain Science and Industry and is located in the BIVAP building. The laboratory focuses on efficient utilization of the agricultural resources available in the state of Kansas and the conversion of those resources into value-added products. The laboratory is equipped with state of the art fermenters to carry out both aerobic and anaerobic fermentation.

The **Fermentation Center** at BIVAP provides research, technical service and education on fermentation technology. With a highly experienced staff and state-of-the-art facilities, the fermentation team has the resources and capabilities to develop processes for converting a variety of agricultural co-products and waste streams. This includes starches, cellulose and lignocellulose to form 2-carbon (C2) products (such as ethanol) as well as C3 and C4 platform products and organic chemicals that are used as building blocks for energy or processed to produce a variety of consumer products. In addition, the center develops better technologies for pre-processing agricultural raw materials to reduce complex carbohydrates into C5 and C6 sugars that can be fermented through familiar microbiological routes.

Kansas State University

The **Protein and Biopolymer Analysis Core Lab** provides integrated synthetic and analytical capabilities for biological materials, including proteins, peptides, and glycans. The Core encompasses a wide range of sophisticated technical expertise and state-of-the-art instrumentation.

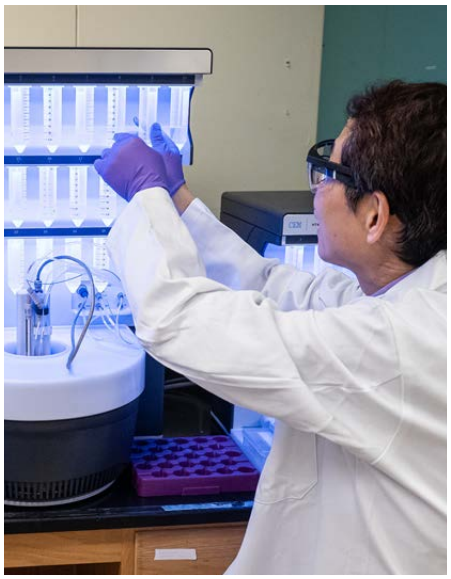
PBACL is available to external customers worldwide and is committed to educating both students and researchers. PBACL will work with you from initial experimental design through publication.

Services include:

- Mass spectrometry-based approaches for identification, characterization, or quantitation of proteins and glycans from tissues, cells, or other biological samples
- Peptide synthesis and purification
- Complete characterization of bio- and synthetic-based polymers
- High-resolution fluorescent imaging of biomolecules in gels, plates and live cells

Equipment includes:

- BMG CLARIOstar plus microplate reader with FP capability
- CEM Liberty Blue 2.0 HT4 automated microwave peptide synthesizer with Razor cleavage
- GE AKTA Pure 25 FPLC system
- GE Amersham Imager 680
- GE Amersham Typhoon 5
- Leica Thunder imager 3D live cell
- Thermo Scientific Nanodrop One dilution-free UV-Vis Spectrometer
- Waters ACQUITY advanced polymer chromatography (APC) coupled with Malvern OMNISEC REVEAL detectors (RI, UV/Vis PDA, light scattering, and viscometer)
- Waters ACQUITY H-class UPLC with UV/Vis PDA and fluorescence detectors
- Waters Xevo G2/XS ToF mass spectrometer coupled with nano-ESI and Waters ACQUITY M-Class nanoUPLC
- Three Lenovo workstations loaded with complete software for proteomic and glycan analyses



The Protein and Biopolymer Analysis Core Lab is available to external customers worldwide and is committed to educating both students and researchers.

Research strengths focused on virus-mosquito-vertebrate host interactions of zoonotic viruses important to animal and human health are conducted at BSL-2, BSL-3 and BSL-3Ag facilities.

Research Strengths

Vaccine Development and Field Efficacy

Researchers in the College of Veterinary Medicine are focused on the development of classical and novel approaches for livestock vaccines with applications to humans and small animals; development of vaccine challenge models; and clinical field studies for validation of efficacy. Investigators are engaged in the development and use of infectious clones, subunit and vectored vaccines, and field validation and application of commercial products. Activities are supported by BSL-2 and BSL-3 facilities, the Beef Cattle Institute, and partnerships with industry.

Antiviral Development

Researchers seek identification of virus or cellular targets for antiviral drug development for coronavirus and calicivirus infections in humans and companion animals; development of in vitro high-throughput screening assays for antiviral compounds; characterization and mechanism of action of antiviral drugs; and in vivo safety and efficacy studies. Several investigators collaborate to conduct studies of host-virus interactions that may lead to the identification of potential antiviral targets, screening and characterization of antiviral compounds and in vivo target validation and efficacy using animal models for coronavirus and calicivirus infections. Special emphasis is on feline infectious peritonitis and systemic, virulent feline calicivirus infection in cats and norovirus infection in humans. A unique strength is collaboration of researchers across multiple disciplines and industry partnerships to conduct studies that encompass in vitro studies, antiviral drug design, chemical synthesis and selection of antiviral compounds, and animal models.

Vector-Borne Diseases and Vector Biology

The scope of this research strength encompasses the interactions between pathogens, tick- and mosquito-borne vectors and the vertebrate host. Tick-borne diseases studied are focused on rickettsial disease agents, *Ehrlichia chaffeensis* and *Ehrlichia canis*. Mosquito-borne viruses studied include Japanese encephalitis, West Nile, chikungunya, Western equine encephalitis, Schmallenberg, o'nyong nyong, and yellow fever viruses. This research strength is well-supported by BSL-2, BSL-3 and BSL- 3Ag facilities; funding and partnerships with the NIH, USDA, the State of Kansas, human and animal health companies; and collaborations with the USDA Arthropod-Borne Animal Disease Unit focused on bluetongue virus transmitted by Culicoides midges.

Tick-borne pathogen studies encompass longstanding research focused on understanding the diseases caused by tick-borne pathogens of the genera Ehrlichia and Anaplasma causing Ehrlichiosis and Anaplasmosis. In particular, research involves understanding pathogen molecular structure, the development of an animal model to study host immunity against *Ehrlichia chaffeensis*, and in defining the contributions of tick and macrophage environments on the pathogen molecular structure and host responses.

Research strengths focused on virus-mosquito-vertebrate host interactions of zoonotic viruses important to animal and human health are conducted at BSL-2, BSL-3 and BSL-3Ag facilities. The goal of this research is to provide a better understanding of vector susceptibility, the capacity of the virus to be transmitted, understanding the molecular-genetic basis of virus transmission to facilitate vaccine and diagnostics design and development, and other countermeasures.

Infectious Disease – Select Agent Research

The scope of this research strength involves investigations of high-consequence existing or emerging transboundary pathogens, such as African swine fever virus, classical swine fever virus, and Rift Valley fever virus. Investigators are working in well-funded collaborative research, supported by BSL-2, BSL-3, ABSL-3 and BSL-3Ag large-animal facilities, and the existence of a college-administered, DHS-funded Center of Excellence in Emerging and Zoonotic Animal Disease with the USDA Plum Island Animal Disease Center, CSIRO Australian Animal Health Laboratory, and The Pirbright Institute, UK.

Viral Pathogenesis of Endemic and Emerging Diseases

The scope of this research strength is major viral diseases of livestock and humans. Studies are performed at the molecular, cellular and organismic levels, including the development of novel animal models. Investigators are engaged in the development and use of infectious clones. Activities are supported by BSL-2 and BSL-3 facilities as well as state-of-the-art flow cytometry and confocal and electron microscope facilities.

Bacterial Pathogenesis of Endemic and Emerging Diseases

The scope of this research strength is investigations of major virulence factors, including structure and function studies, role in pathogenesis, mechanisms of action, and host responses to virulence factors. Investigators are engaged in multidisciplinary regional, national and international research collaborations to study bacterial pathogens and pathogenesis in both humans and domestic food animals. Many of these pathogens are with other programs. This research area is well-supported by funds and partnerships with the NIH, USDA and human and animal health industries.

Research of viral diseases of livestock and humans are supported by BSL-2 and BSL-3 facilities.

Kansas State University

Relationships with veterinary practitioners and the food animal industries allow research to be conducted under field conditions, resulting in externally valid results.

Therapeutic Interventions for Disease

Therapeutic intervention research involves in silica, in vitro, and in vivo pharmacodymanic/pharmacokinetic modeling. This work utilizes both challenge models and small and large population natural-occurring disease models. There is also a focus on the case definitions used to identify animals for disease intervention and how these definitions affect therapeutic outcomes. Several investigators and collaborative teams are engaged in studies of therapeutic intervention of small and large animal diseases. The College of Veterinary Medicine has a unique capability to conduct investigations across the continuum from in vitro work to large population interventions.

Relationships with veterinary practitioners and the food animal industries allow research to be conducted under field conditions, resulting in externally valid results. For food animal interventions, the blend of expertise in production practices with expertise in clinical pharmacology allows response to critical research needs. For companion animals, clinicians have access to clients and patients that allows evaluation of existing and novel therapeutic interventions, again combined with strength in clinical pharmacology.

Immune Mechanisms in Health and Disease

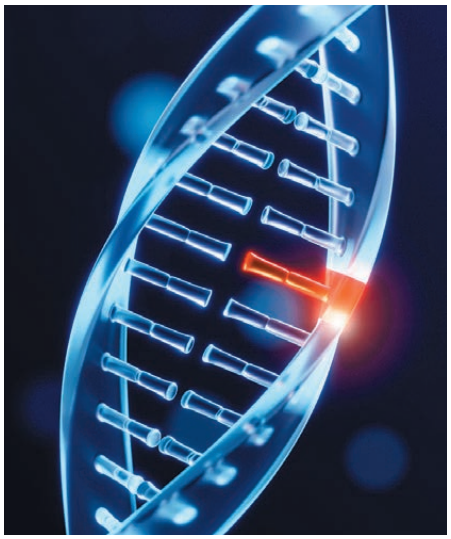
Immunity is important for recovery from disease and for protection following vaccination. In addition, aberrant immune responses, such as inflammation, contribute to clinical disease. Diagnosing the immune status provides important information on the outcome following infection, and animal models of immune protection and immunopathogenesis are often used.

Because several infectious diseases lack vaccines, understanding mechanisms of protection is needed to develop additional therapeutic approaches. Research teams are involved in the analysis of innate and adaptive immune responses in livestock, companion animals and humans. These activities are supported by a state-of-the-art flow cytometry facility that supports research and diagnostics. Researchers are engaged in vaccine development, diagnostics and disease modeling. One unique asset is the availability of a severe combined immunodeficiency (SCID) pig that lacks an adaptive immune response.

Nanomedicine

This field is broadly based on exploring the biological interactions of nanomaterials with biological systems using cutting-edge characterization techniques coupled with innovative in vitro, ex vivo and in vivo animal models. Specific areas of interest include dermal transport of nanomaterials, nanotoxicology and defining and quantitating the role of the protein corona on cellular uptake and biodistribution.

Nanomedicine is a research strength that was greatly enhanced by the establishment of the new Nanotechnology Innovation Center of Kansas State (NICKS) University. This interdisciplinary team bridges research in nanomaterial characterization, cell biology and computational medicine. Newly built facilities include state-of-the-art instrumentation and cell-culture laboratories specifically developed to contribute to the emerging field of nanomedicine, including transmission and scanning electron microscopy. A unique strength of this program is its ability to conduct in vitro studies, as well as in vivo studies in larger animal species more physiologically reflective of human biodistribution, including robust models for human and animal transdermal nanomedicine delivery. Researchers in this group are internationally recognized for expertise in nanotoxicology.



Newly built facilities include state-of-the-art instrumentation and cell-culture laboratories specifically developed to contribute to the emerging field of nanomedicine.

KANSAS STATE UNIVERSITY

For more on K-State's talents faculty and the academic programs that prepare our students for biomanufacturing careers, see the Talent section.

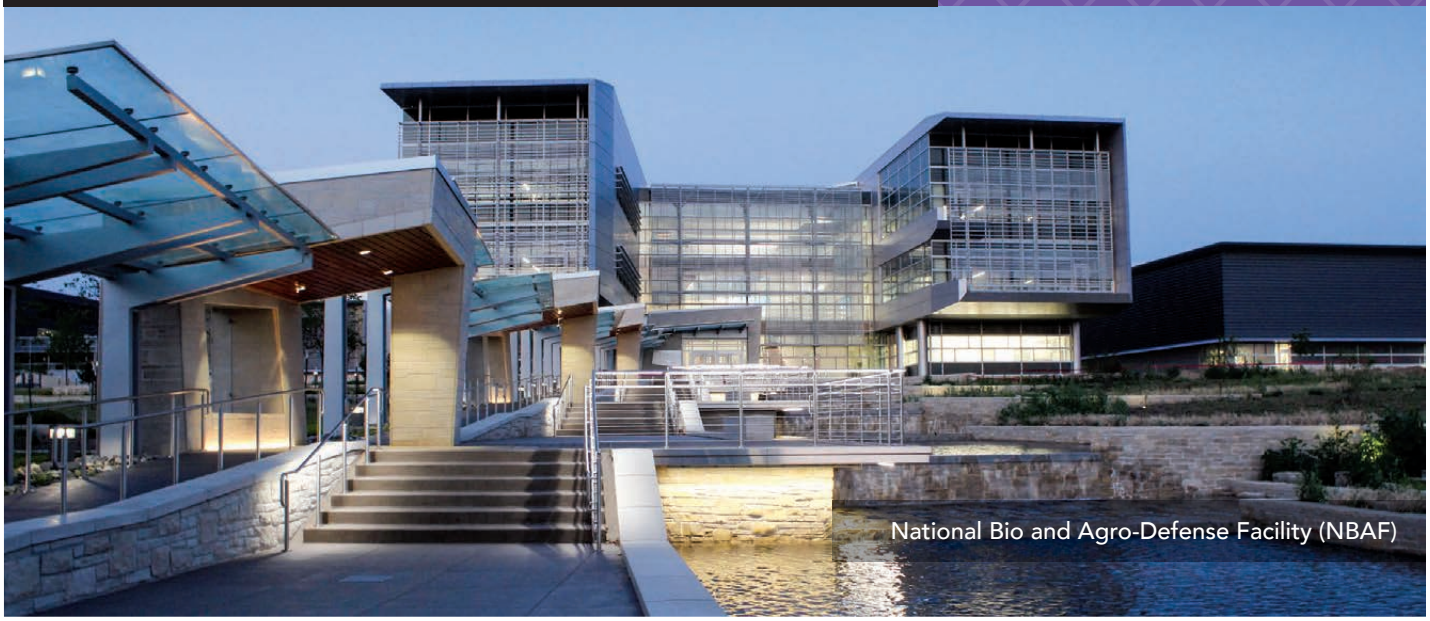
Additional Tools

Technology Development Institute: The Technology Development Institute at Kansas State University (formally the Advanced Manufacturing Institute) provides a broad range of services and project management resources to both private industry and university researchers to advance the commercial readiness of new products and technologies. Over the past 30 years, TDI has created an extensive network of organizations including university experts, patent attorneys, engineering service providers, prototyping specialists and manufacturers who we collaborate with to assist in moving products into the marketplace. TDI employs several industry-experienced engineers and business professionals who work directly with our clients to identify tasks that need to be completed to move development projects forward. These tasks include:

- Product engineering and prototyping
- Assisting with intellectual property and commercialization of new products
- Design and fabrication of custom equipment
- Simulation and component analysis

Collaboration with Regional Universities: K-State is highly collaborative with regional university partners, including the University of Kansas's COBRE Protein Production Group (PPG), the Kansas Vaccine Institute, and the Vaccine Analytics and Formulation Center.

National Bio and Agro-Defense Facility



National Bio and Agro-Defense Facility (NBAF)

The U.S. Department of Agriculture (USDA) has been working with the U.S. Department of Homeland Security (DHS) to stand up the National Bio and Agro-Defense Facility (NBAF) in Manhattan, Kansas. USDA will own and operate NBAF. This state-of-the-art facility is a national asset that will help protect the nation's agriculture, farmers and citizens against the threat and potential impact of serious animal diseases.

NBAF will replace the aging Plum Island Animal Disease Center (PIADC), a biosafety level-3 facility that is more than 68 years old. Currently, USDA's Agricultural Research Service (ARS) and Animal and Plant Health Inspection Service (APHIS) conduct foreign animal disease research, training and diagnostics in this center. ARS and APHIS will transfer their research and diagnostic missions from PIADC to NBAF and will operate the facility jointly.

DHS reported that contractor construction and commissioning were completed in December 2022. The USDA team at NBAF now has unfettered access to the facility and started a phase called the operational endurance period. During this phase, USDA's work processes must be tested and validated in accordance with the building systems.

NBAF will eventually have about 400 USDA personnel. As of March 2023, more than 280 team members had been hired to support NBAF operations and science.

OUR VISION

A safer and more resilient America through a world-class science facility for large animal agricultural research, training and diagnostics.

OUR MISSION

To protect the United States against transboundary, emerging and zoonotic animal diseases that threaten our food supply, agricultural economy and public health.

Protecting the food supply

Protecting livestock and agricultural interests also protects the economy. Agriculture, food and food processing contribute more than $1.1 trillion to the U.S. economy's gross domestic product per year. In addition, 11 percent of jobs — about 22 million — have some ties to agriculture.

At NBAF, USDA will continue to conduct comprehensive research, develop vaccines and antivirals, and provide enhanced diagnostic and training capabilities to protect the nation from foreign or transboundary animal diseases — those that can enter the U.S. from another country. They will also focus on diseases that are:

- Emerging — are new or not well known.
- Zoonotic — normally exist in animals but can also infect humans.

According to the World Health Organization, up to 75% of new and emerging infectious diseases in humans are zoonotic. USDA will expand its scientific work at NBAF and be the first in the U.S. to provide maximum biocontainment (BSL-4) laboratories capable of housing large livestock to develop vaccines and diagnostics for zoonotic diseases. Through these initiatives, USDA will expand its support of global health and food security. NBAF will be a critical component of USDA's priority to develop vaccines and countermeasures for — as well as the early detection of — diseases that threaten livestock, other animals and food from the nation's farms and fields.

Science at NBAF

NBAF is in a unique position to do diagnostics and training, as well as research and development of veterinary countermeasures — such as vaccines and antivirals — for foreign, emerging and zoonotic diseases in large livestock within the safety and security of this next-generation facility. The Foreign Animal Disease Diagnostic Laboratory (FADDL) and the Foreign Animal Disease Research Unit (FADRU) at Plum Island will transfer their science to NBAF. FADDL employees are involved in prevention, surveillance, diagnosis and response to these diseases, including the expertise to manage two vaccine banks. FADDL also trains state and federal veterinarians to recognize the clinical signs of foreign animal diseases. FADRU and two new

NBAF

USDA units — the Foreign Arthropod-Borne Animal Disease Research Unit (FABADRU) and the Zoonotic and Emerging Disease Research Unit (ZEDRU) — will focus on research and countermeasures for high-consequence animal diseases.

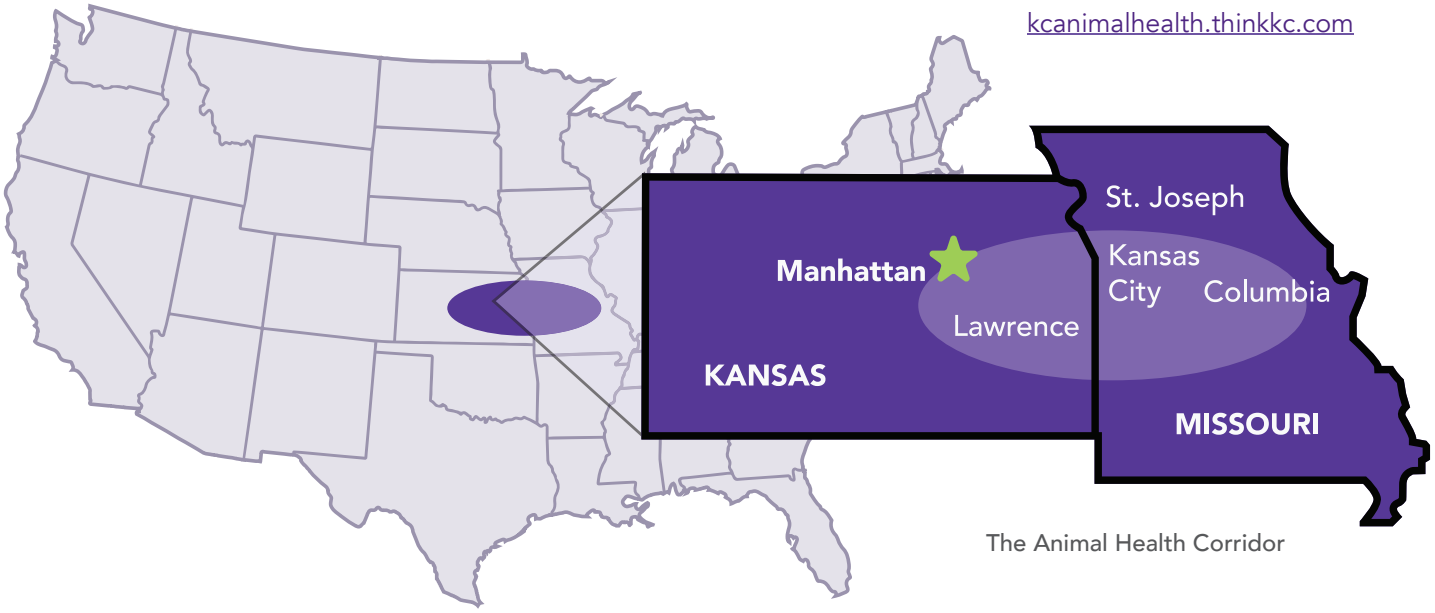
In addition, NBAF will have a Biologics Development Module that will enhance and expedite the transition of new innovations from research to commercially viable countermeasures like vaccines and antivirals.

NBAF's location in Manhattan, Kansas, places it within the Kansas City Animal Health Corridor, the largest concentration of animal health companies in the world. NBAF is constructed and operated on a secure federally owned site, adjacent to Kansas State University's Biosecurity Research Institute and the Kansas Department of Agriculture.

The Animal Health Corridor is home to more than 300 companies, including:

Boehringer Ingelheim
Cargill Animal Nutrition
Ceva Animal Health LLC – Biomune
Del Monte Pet Products
Elanco Animal Health
Hill's Pet Nutrition
Merck Animal Health
Nestle Purina Product Technology Ctr
Zoetis

For a full list, visit
kcanimalhealth.thinkkc.com



The Animal Health Corridor

NBAF

What is the Biologics Development Module?

The Biologics Development Module, or BDM, is a unique proof-of-concept production facility inside NBAF's secure campus. It is designed to enhance and expedite the transition of innovations from research to commercially viable countermeasures like vaccines and diagnostics. The BDM lab space exists outside of NBAF's main BSL-3 and -4 lab spaces, operating as a BSL-2 lab space. Within NBAF's secure campus and with access to facility safety support systems, some portions of the BDM have the capacity to scale up to function as a BSL-3 production space if needed.

Why is the BDM important?

The BDM is designed to enhance and expedite the transition of innovations from research to commercially viable countermeasures like vaccines and diagnostics.

The transition of research from discovery through proof-of-concept, process optimization, and product licensure carries a significant risk of failure to get a return on investment for industry partners. This is especially true in limited market areas such as transboundary and emerging veterinary pathogens. Through a project development plan, the BDM will help industry partners see the potential in new discoveries developed through NBAF's research and de-risk those potential projects so industry stakeholders can understand their return on investment.

What is the focus of the BDM?

The BDM will focus its efforts on:

- Transitioning NBAF research projects into development projects
- Performing proof-of concept studies for safety and efficacy
- Scaling up processes
- Developing analytical tools to support projects

By reducing the risk undertaken by industry partners, the BDM team hopes to enhance the number of veterinary medical countermeasures available on the market to meet emerging threats to American agriculture.

How will the BDM support industry?

The BDM will create opportunities for partnerships and collaborations between NBAF scientists and private pharmaceutical and animal health companies to develop new vaccines, biotherapeutics, diagnostics and pathogen detection products. The BDM will perform the scientific work needed to confirm product efficacy and establish datasets needed for product licensure. The BDM and its team at NBAF are equipped to perform science at all stages of product development from biological research to manufacturing capabilities. This allows them to undertake whatever work is needed for product development.

As a component of NBAF, the BDM has the capability to plan and facilitate animal studies in cattle, swine, goats and sheep to generate both proof-of concept data as well as the data required for regulatory submissions. The science done within the BDM will reduce the risk for industry partners in getting a veterinary product to licensure and allow for better realization of research discoveries applications.

Creating opportunities for partnerships and collaborations between NBAF scientists and private pharmaceutical and animal health companies to develop new vaccines, biotherapeutics, diagnostics and pathogen detection products.

How many USDA employees will work in the BDM?

The BDM will have roughly 10 full-time employees with diverse skillsets and experiences. In addition to full-time USDA employees, the BDM can bring in support employees from partner organizations to assist in product development and transition when needed.

How do NBAF and the BDM engage with external partners?

External partners that have projects fitting within NBAF's mission of protecting the food supply will have access to the BDM's expertise. The BDM will use a diverse toolbox of agreements to facilitate the transition of research to a final product. These agreements will allow the BDM to lower input costs through cost-sharing agreements, meet regulatory requirements for pre-license work, and establish clear pathways to products for research projects.

NBAF

Officials Cut Ribbon on National Bio and Agro-Defense Facility — May 24, 2023

U.S. Department of Agriculture and the Department of Homeland Security Science and Technology Directorate officials celebrated the dedication and ribbon-cutting of the National Bio and Agro-Defense Facility. This facility, which offers the highest level of biocontainment laboratories and safety protocols, is the first of its kind in the United States and will allow scientists to study and diagnose critical animal diseases.

"America's farmers, ranchers and consumers count on our researchers to understand, monitor for and develop solutions to combat a variety of high-consequence animal pathogens, and a facility of this magnitude positions us to respond," said Agriculture Secretary Tom Vilsack. "This new, innovative facility will give USDA scientists access to cutting-edge, safe and secure technology so they can continue to lead the world in animal health research, training and diagnostics to protect our food supply, agricultural economy and public health."

The valuable scientific information delivered by researchers at NBAF will also allow America to remain a leading contributor of countermeasures that will protect agriculture, economies and citizens across the globe.

NBAF

NBAF will replace DHS' Plum Island Animal Disease Center, which is a biosafety level-3 facility in New York that is more than 68 years old. Both departments have collaborated on the requirements for this next-generation science facility since 2006, and Manhattan, Kan. was selected as NBAF's site in 2009. DHS led NBAF's design and construction, and USDA will own and operate the facility.

"NBAF is a historic investment for agriculture and our Nation in ensuring the health, safety and security of the U.S. food supply," said Under Secretary and USDA Chief Scientist Chavonda Jacobs-Young. "As the first facility of its kind in the United States, the innovative and cutting-edge solutions our scientists and partners can produce here will lead efforts to protect public health and address new and emerging diseases for many years to come."

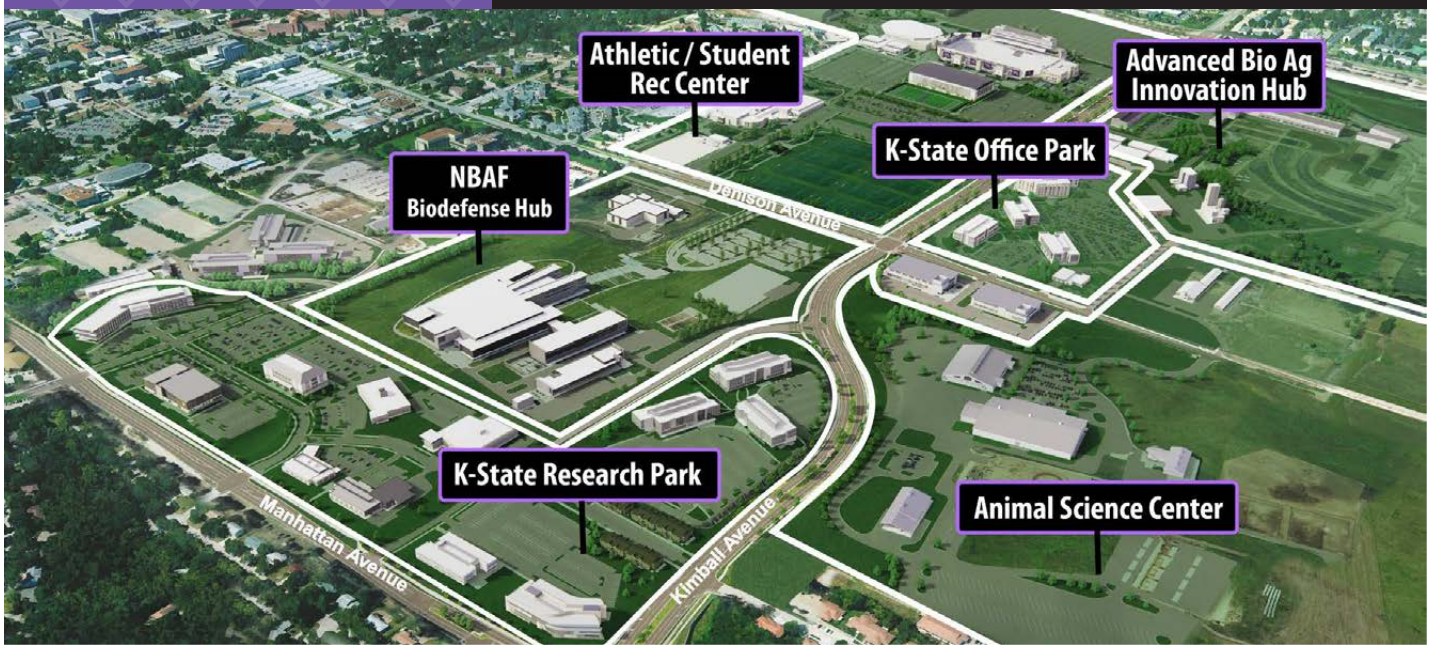
"This new facility highlights USDA's commitment to taking every step possible to protect the United States from transboundary, emerging, and zoonotic animal diseases," said Under Secretary for USDA's Marketing and Regulatory Programs Jenny Moffitt. "Through investments like these, we can ensure our country has the tools to keep the American people and our agricultural animals safe, and to prevent diseases costly to farmers."

With more than 400 employees, USDA's Agricultural Research Service and Animal and Plant Health Inspection Service will share NBAF's operational responsibilities. ARS will primarily focus on research to understand high-consequence and emerging animal diseases and develop countermeasures, such as vaccines and antivirals. APHIS will focus on prevention, surveillance, diagnosis and response to these diseases, including the expertise to manage two vaccine banks and train state and federal veterinarians to recognize livestock diseases.

A ribbon-cutting ceremony held at the facility May 24, 2023, highlighted the state and local community's support. City of Manhattan Mayor Mark Hatesohl, Kansas State University President Dr. Richard Linton, Kansas Governor Laura Kelly, U.S. Senator Jerry Moran, and former U.S. Senator Pat Roberts also addressed the crowd during the ceremony.

Kansas Governor Laura Kelly addressed the crowd during the ceremony.

NBAF



NBAF is adjacent to the Edge Collaboration District, which includes the K-State Research Park, K-State Office Park, K-State Athletics Facilities, the Advanced Bio Ag Innovation Hub, and the Animal Science Center.

Agriculture Secretary Tom Vilsack provided closing remarks. Dr. Simon Liu, USDA ARS Administrator, also led a moderated conversation with Jenny Lester Moffitt, USDA Marketing and Regulatory Programs Under Secretary; Dr. Chavonda Jacobs-Young, USDA Chief Scientist and Under Secretary for Research, Education and Economics; and Julie Brewer, DHS S&T Executive Director of Innovation & Collaboration. Katie Zenk, Deputy Under Secretary for Marketing and Regulatory Programs, also participated in the program.

"NBAF's Midwest location offers researchers and diagnosticians closer proximity to develop key partnerships with the animal health industry and several academic institutions," said NBAF Director Dr. Alfonso Clavijo. "NBAF will create opportunities between scientists and animal health companies to enhance and expedite the transition of new veterinary countermeasures from research to market to protect the nation's agriculture if needed."

Adjacent to Kansas State University and on the western edge of the largest concentration of animal health companies in the nation, the 48-acre NBAF campus includes more than 700,000 square feet of total building space. The main building, at 500,000 square feet, includes containment laboratories, animal holding facilities, office spaces, facility support areas and required safety systems — such as redundant HEPA air filtration and waste decontamination systems.

NBAF
NATIONAL BIO AND AGRO-DEFENSE FACILITY

LEARN MORE:

greatermanhattan.org/national-bio-and-agro-defense-facility-nbaf

TALENT

Executive Summary

With Kansas State University, Manhattan Area Technical College, and Fort Riley, the Greater Manhattan region boasts a wealth of talent. All three of these institutions provide education and support that prepare and connect the workforce of tomorrow with prospective employers.

The region is home to more than 130,000 residents, 47,000 employees and 30,000 students. A steady stream of highly diverse, educated and skilled individuals continually enter the regional workforce as 6,000 higher education degrees are awarded in the region each year and 1,800 soldiers transition out of the U.S. Army from Fort Riley annually.

MANHATTAN:

MOST EDUCATED CITY IN KANSAS

Insurify, 2020

MANHATTAN:

#10 BEST CITIES AFTER MILITARY SERVICE

Navy Federal Credit Union, Best Places, 2022

1,800 Fort Riley soldiers transition from Fort Riley annually.

6,000 HIGHER-ED DEGREES AWARDED ANNUALLY

MANHATTAN AREA TECHNICAL COLLEGE:

#2 BEST COMMUNITY COLLEGE IN THE U.S.

WalletHub, 2023

Executive Summary

Because of the presence of K-State and Ft. Riley, Manhattan's population has a higher level of diversity compared to other communities of our size. Our Manhattan-Ogden USD 383 school district serves this diverse and ever-changing population. With over 70 countries represented and 40 languages spoken, we value the rich cultural and linguistic variance our students and families bring to the classroom and community. Our places of worship, community groups and businesses match this diversity, including various international markets, ethnic restaurants and cultural events.

K-STATE:

BEST COLLEGE IN KANSAS

Niche, 2022
Money Magazine, 2020

We value the rich cultural and linguistic variance our students and families bring to the classroom and community.

Kansas State University


Kansas State University

KANSAS STATE UNIVERSITY

K-State's range of academic programs — including a Biomanufacturing Training and Education Center — mean that expertise is available now and for the future. The table below lists the number of graduates from programs relevant to biomanufacturing companies. Information on faculty and individual programs follows.

Additional resources include the following.

- K-State can help facilitate company/university connections with departments, programs, and faculty.
- The Knowledge Based Economic Development (KBED) partnership between multiple university entities, the City of Manhattan, and regional economic development partners ensures collaboration and connectivity for companies locating and growing in the Manhattan region.
- The K-State Career Center provides a centralized hub for employers that want to hire K-State graduates and/or interns. We maintain a strong relationship with the K-State Career Center as well as their counterparts at more than 20 universities and colleges in a 5-state area.

Kansas State University Academic Programs

	STUDENTS IN 2023			2022 GRADUATES		
	Bachelor's	Master's	Doctorate	Bachelor's	Master's	Doctorate
College of Veterinary Medicine	—	122	522	—	65	113
Veterinary Medicine (D.V.M.)	—	—	480	—	—	104
Pathobiology or Physiology	—	—	42		—	9
Veterinary Biomedical Science	—	79	—	—	45	—
Public Health (M.P.H.)	—	43	—	—	20	—
College of Agriculture	872	156	33	238	39	6
Animal Sciences & Industry	872	156	33	238	39	6
College of Arts and Sciences	961	16	122	228	15	28
Biochemistry	124	3	16	15	3	5
Biology	575	12	45	116	10	9
Chemistry	47	1	51	5	2	13
Life Sciences	165	—	—	68	—	—
Microbiology	50	—	10	24	—	1
College of Business Administration	990	203	—	631	125	—
Accounting	137	76	—	115	52	—
Finance	236	—	—	150	—	—
General Business Administration	115	127	—	32	73	—
Management	191	—	—	151	—	—
Management Information Systems	65	—	—	42	—	—
Marketing	246	—	—	141	—	—
College of Engineering	1082	93	74	297	29	17
Biological Systems Engineering	80	21	16	24	4	2
Chemical Engineering	175	16	19	41	2	3
Industrial Engineering	146	15	17	50	7	2
Mechanical Engineering	681	17	15	182	4	8
Nuclear Engineering	—	7	7	—	4	2
Operations Research	—	17	—	—	8	—
College of Health and Human Sciences	346	62	53	162	14	17
Nutrition and Health	346	62	45	162	14	13
Human Nutrition	-	—	8	-	—	4

Kansas State University Faculty

Dr. Juergen Richt and Dr. Taeyong Kwon investigate zoonotic, emerging and transboundary diseases of livestock focusing mainly on viral diseases.

Faculty

Dr. Waikatha Mwangi: Research program seeks to develop novel strategies for safely inducing immune protection against microbial pathogens in livestock. Major ongoing efforts are focused on the development of an African Swine Fever virus subunit vaccine and a broadly protective Bovine Viral Diarrhea Virus vaccine, adjuvants and diagnostic tools.

Dr. Jishu Shi: The Laboratory of Vaccine Immunology develops vaccine adjuvants and novel diagnostic assays and vaccines for swine and bovine infectious diseases. We focus our research on classical swine fever (CSF), African Swine Fever (ASF), porcine reproductive and respiratory syndrome (PRRS), porcine pseudorabies (PPV), Bluetongue (BT) disease, Epizootic Hemorrhagic Disease (EHD), and other emerging viral diseases of swine and cattle.

Dr. Juergen Richt: Investigates zoonotic, emerging and transboundary diseases of livestock focusing mainly on viral diseases. During his 25+ year scientific career, he has studied pathogen-host interactions in various infectious disease models including Avian and Swine Influenza viruses (AIV, SIV), African Swine Fever virus (ASFV), Rift Valley Fever virus (RVFV), Vesicular Stomatitis virus (VSV), Schmallenberg virus (SBV), animal prion diseases and Borna Disease Virus (BDV). He is an editor for Virus Genes and serve on editorial boards for other scientific journals. Currently, he is the Director of the Center of Excellence for Emerging and Zoonotic Animal Diseases (CEEZAD) and the NIH COBRE Center on Emerging and Zoonotic Infectious Diseases (CEZID).

Kansas State University Faculty

Dr. Stephen Higgs: Associate Vice President for Research and the Director of the Biosecurity Research Institute (BRI). Recent collaborations have enabled the evaluation of different vaccines targeted at protecting people from Zika virus infections, as described in publications in *Nature*, *Nature Medicine* and *Scientific Reports*.

Dr. Kristin Michel: Lead studies involving *Anopheles gambiae* s.s. mosquitoes, the main contributing species to malaria transmission in Africa. Michel's research team's project involved characterizing genes specific to hemocytes, mosquito blood cells. The researchers were able to identify genes in the blood cells whose expression changed with malaria infection.

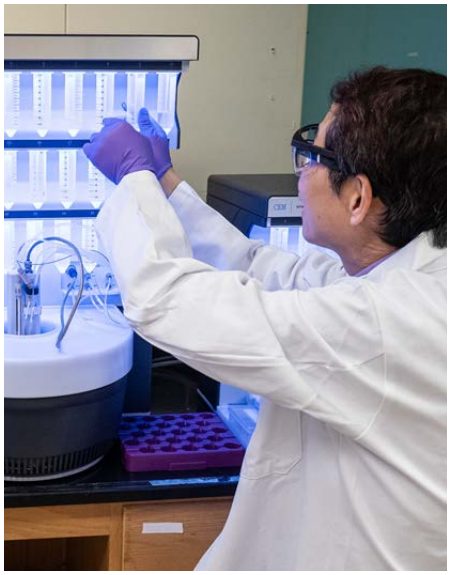
Dr. Roman Reddy Ganta: Research for over two and half decades has focused on important human and animal vector-borne infectious diseases. Currently work on tick-borne diseases caused by *Ehrlichia* and *Anaplasma* species pathogens.

Dr. Kathryn Reif: Research interests revolve around vectors and vector-borne diseases, especially ticks and tick-borne diseases. Studied several pathogens of veterinary and medical importance, including the tick-borne bacterial pathogens *Francisella* sp., *Rickettsia* sp. *Anaplasma* sp., and *Borrelia* sp.; the tick-borne protozoal pathogens *Babesia* sp. and *Theileria* sp.; the flea-borne pathogen *Rickettsia felis*; and, mosquito-borne West Nile virus.

Dr. Shing I Chang: Research: Chang's research area involves various data analytics methods related to quality engineering for manufacturing and health care applications. His recent research topics include statistical process monitoring for big data in manufacturing, quality 3D printing through cyber manufacturing, and entropy-based monitoring to prevent elderly falls using Microsoft Kinect videos and Fitbit health data.

Dr. Ashesh Kumar Sinha: Sinha's research focuses on developing optimization models and data analytics to address key supply chain challenges at strategic, operational and tactical levels. On strategic levels, he conducts research to analyze challenges in production and subcontracting decisions due to stochasticity in demand (randomness and cyclical trends) and product complexity. On tactical and operational levels, he develops dynamic supply chain logistics models and analyzes the impact of real-world restrictions on the optimal dispatch decisions.

Dr. Roman Reddy Ganta has researched for over two and a half decades on important human and animal vector-borne infectious diseases.



Dr. Li utilizes enzymology, synthetic organic chemistry and molecular biology to study biologically important enzymes/proteins.

Dr. Ping Li: Dr. Li utilizes enzymology, synthetic organic chemistry and molecular biology as major tools to study and manipulate biologically important enzymes/proteins. His research focus is around three projects:

- **Polyhydroxyalkanoate (PHA) biosynthesis, regulation and utilization**: PHAs are carbon storage polymers produced by a variety of bacteria under conditions that limit nutrients except for carbon. Environmentally friendly PHA bioplastics are considered an ideal alternative to petroleum-derived plastics that are non-biodegradable. The goal is to understand PHA homeostasis at the molecular level such that metabolic- and protein-engineering in bacteria can be performed to produce PHA polymers economically. Moreover, study of PHA production can serve as a paradigm to understand widespread template-independent polymerizations where the mechanism remains enigmatic.
- **Bacterial enzymes involved in lignin degradation**: Lignin is a recalcitrant polymer consisting of various phenylpropane-based monomers linked together by C-C and C-O-C bonds, which is the most abundant renewable carbon source on earth next to cellulose. The cost of lignin degradation has been a major indicator for the competitiveness of biofuels vs. petroleum-based gasoline. It is well known that fungus contains a series of redox metalloenzymes that can efficiently degrade lignin. However, until now they have not been used at industrial scales due to difficulties in modulation of fungal genetics and production of fungal proteins. Therefore, there is a paradigm shift to seek for bacterial enzymes for lignin degradation. The goal is to identify and develop them into a system that can be used to process lignin degradation economically at large scales.
- **Protein methyltransferases in epigenetics**: Methylation is one of commonly observed protein posttranslational modifications that play important roles in signaling network and epigenetic regulation. Defects in methylation have been linked to various diseases including cancers, neurological disorders and abnormalities in development. Aside from protein lysine and arginine methyltransferases, a new type of protein methyltransferases, α-N-terminal RCC1 methyltransferases (NRMTs), was recently discovered in eukaryotes and human. Limited study of NRMTs suggests that they may be linked to cancers. The goal is to identify the processes and/or targets involving NRMT for potential cancer therapy.

Dr. Mark Wilkins: Wilkins' research focuses on fermentation of sugars and lignin monomers to produce both foods and chemicals. Utilization of waste products as feedstock is an emphasis. Recent projects have included production of bioplastics from fermentation of sugars and lignin monomers, succinic acid fermentation, packed bed fermenter design and utilization of corn fiber as a feedstock for bioprocessing.

Dr. Donghai Wang: Wang's research has focused on bioconversion of renewable materials into biofuels, chemicals and biomaterials including protein adhesives, resins and biodegradable composites, and near-infrared technology for analysis of physical and chemical properties of biomaterials.

Production of biofuels from renewable resources is his major research area. Wang has received approximately $6 million as principal investigator and $22 million as co-principal investigator supported by USDA, DOT, NSF and DOE, among others. Wang and his students conducted fundamental and applied research to overcome some technical barriers for cost-effective production of biofuels from both starch-based feedstocks such as corn, sorghum and millets and cellulosic biomass such as grass, crop residues and woody biomass. Wang has collaborated with materials scientists to develop biodegradable protein-based adhesives and oil-based resins. The major focus on this area is to develop cost-effective technology to separate the proteins and carbohydrates from plant-based materials at high yield and high purity as well as low cost. He is co-director of the Bio Material and Technology Laboratory at K-State. He also conducts research on development of near-infrared spectroscopy models as rapid methods for analysis and characterization of physical and chemical properties of biomaterials. He has established research collaborations with engineers and scientists across the K-State campus and nationwide and has been involved in several large nationwide research projects.

Dr. Lisa Wilken addresses fundamental separation challenges and develops technologies and strategies to recover and purify pharmaceuticals, food and feed proteins and more.

Dr. Lisa Wilken: Wilken's Bioseparations and Bioprocessing Laboratory addresses fundamental separation challenges that impede recovery of biomolecules from biological sources using experimental design, process simulation and high-throughput screening methods. Research is anticipated to provide scientific information for designing downstream processing trains for recovery of bio-based products from biomass. Her laboratory is also developing technologies and novel strategies for recovery and purification of pharmaceuticals, food and feed proteins and industrial proteins and is currently developing an enzyme-assisted extraction process for microalgae as a commercially viable, scalable and environmentally friendly algae lipid-protein separation technique. The purpose of the work is to address a major bottleneck issue with algae biofuel/bioproduct processing, the lack of cost-effective cell lysis and cell content separation processes for intracellular lipid and protein recovery. Thus far, research has been focused on the freshwater

species, *Chlamydomonas reinhardtii*, due to its great potential to produce oil, starch and/or high value, pharmaceutical proteins. Cell wall lysis is a critical first step for the extraction of these products, and studies in Dr. Wilken's lab indicate that our biological-based treatment method can effectively lyse cell walls and release protein and oil from within the chloroplast.

Dr. Mark Weiss' lab is focused on producing promising cellular therapeutics for regenerative medicine.

Dr. Mark Weiss: Weiss' research focus is on stem cell biotechnology. His lab successfully produced various stem cell lines such as rat embryonic stem cells and cells derived from umbilical cord or other tissues with the intent of using this technology to advance cellular therapy and regenerative medicine. His lab is focused upon producing promising cellular therapeutics for regenerative medicine. For example, mesenchymal stromal cells have been tested in a variety of rodent preclinical disease models, including neurodegenerative diseases such as Parkinson's disease, heart disease such as myocardial infarction, and cancer. Based upon the immune properties of Wharton' s jelly derived mesenchymal stromal cells, the lab is working toward clinical trials with colleagues at Kansas State University, the University of Kansas and University of Minnesota. In addition, the Weiss lab focuses upon the mechanisms of pluripotency in rat embryonic stem cells. In this area the focus is to efficiently produce new rat models of human disease using gene targeting in rat embryonic stem cells. To date, the lab has produced chimeric rats using the techniques described by our collaborator, Dr. Qilong Ying (USC), and a variety of tools for quality control and validation.

Dr. Pankaj Baral: Baral's lab research primarily focuses on neuroimmunology, innate immunity and host–pathogen interactions in the lung. The respiratory tract is heavily innervated by sensory and autonomic (sympathetic and parasympathetic) neurons that constantly interact with external and endogenous insults, including pathogens. Respiratory infectious diseases such as viral pneumonia, pneumococcal pneumonia and drug-resistant Gram-negative pneumonia are major global health problems. Current treatment modalities and vaccines for these respiratory diseases are not effective for the absolute protection of disease. His lab will study how neuro-immune interaction at respiratory tract regulates the host defense and inflammation during respiratory infection and acute lung injury. The nervous system cross-talks with the immune system through the neuronal mediators, such as neuropeptides (e.g. calcitonin gene-related peptide; substance P, vasoactive intestinal peptide, etc.) and neurotransmitters (e.g. epinephrine, nor-epinephrine, acetylcholine). The long-lasting goals of my research are to determine how respiratory tract-innervating neurons alter the host defense and immunopathology of lung diseases, including bacterial pneumonia, respiratory viral infection and chronic lung diseases, and to understand the key cellular interaction pathways to nervous system that could be targeted for therapeutic purposes.

Kansas State University Programs

Academic Programs

College of Veterinary Medicine

Anatomy and Physiology: A multi-disciplinary department with responsibilities in instruction, research and continuing education in the disciplines of gross and microscopic anatomy, cell and systemic physiology, pharmacology and neuroscience.

Clinical Sciences: Provides quality veterinary medical education and post-graduate training, offers cutting-edge diagnostic and therapeutic services and advances the science of veterinary medicine through basic and applied research.

Diagnostic Medicine/Pathobiology: A full-service department that helps train tomorrow's veterinarians and scientists, provides diagnostic service to the state and the nation and conducts research on disease in animals and humans.

College of Arts and Sciences

Biochemistry and Molecular Biophysics: The department of biochemistry and molecular biophysics offers Bachelor of Arts, Bachelor of Science, Master of Science and doctoral degrees in biochemistry. A combined B.S./M.S. degree provides undergraduates an opportunity to obtain both a Bachelor of Science and Master of Science in biochemistry in five years. The specialized track in medical biochemistry is aimed at creating successful programs of study for students in pre-medical, pre-veterinary, pre-dental or pre-nursing majors. The molecular biophysics track develops a unique skillset for students desiring careers in basic research with additional quantitative and biophysical experience.

Medical biochemistry is aimed at creating successful programs of study for students in pre-medical, pre-veterinary, pre-dental or pre-nursing majors.

Biology: The Division of Biology unites internationally recognized scientists and educators who are leading discovery in the biological sciences through cutting-edge research and instruction. We strive to provide the next generation of researchers and scientists with the skills to succeed in diverse careers and tackle the challenges faced by our society.

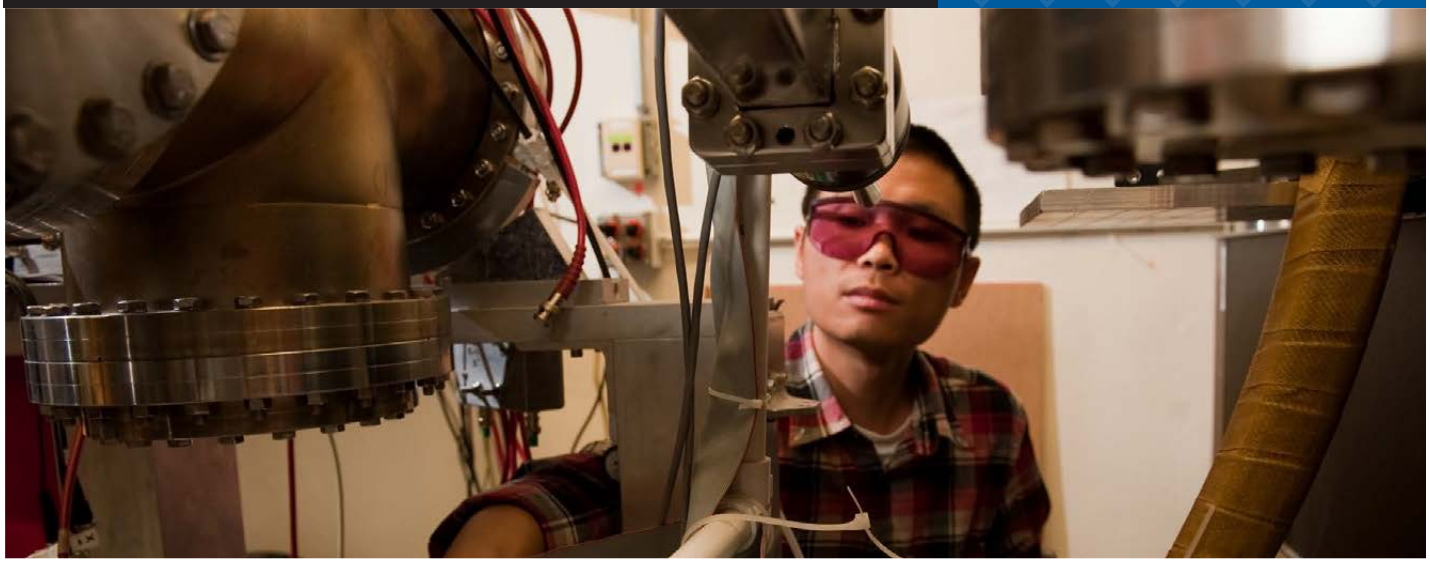
Life Sciences: Life Science is an interdisciplinary major that explores living organisms and life processes. It is a flexible major combining biology, psychology, chemistry and biological anthropology. It provides students a well-rounded approach to the science of people and associated career paths with its interdisciplinary approach. Life Sciences promotes critical thinking and problem-solving skills that can be applied to real-world issues. The flexibility and content within this major provide training and readiness for those interested in health, research, nonprofit, and other people- and science-centered careers. This major combines a series of fundamental courses key in the life science disciplines along with open major electives so that students have the flexibility to build an academically diverse educational experience across multiple disciplines in a way that highlights their interests and career goals.

College of Engineering

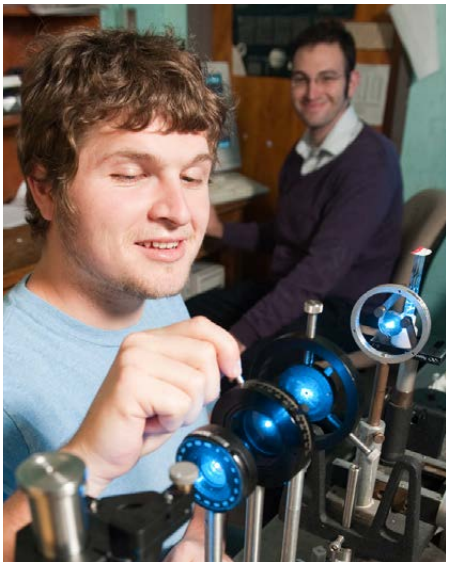
Biological and Agricultural Engineering: BAE researchers are leading research and development into issues central to environmental sustainability, biofuel and bio-based products, and precision agriculture and power machinery. Research activities at BAE are divided into three focus areas: Environmental Quality Group, Bioprocessing Group, and Mechatronics/ Precision Agriculture Group.

Chemical Engineering: Research in the Tim Taylor Department of Chemical Engineering is both fundamental or generating new knowledge, and applied, or developing new processes and technologies. Research areas include crystal growth and epitaxy of boron compound semiconductors, carbon nanomaterials for energy and environmental applications, environmental applications of chemical engineering, atomistic modeling for catalyst development and novel material discovery, synthetic materials and biofunctional interfaces for biosensing and cell screening applications, protein nanomaterials for advanced biotechnology applications, and intelligent and sustainable process systems engineering.

Kansas State University Programs



Electrical and Computer Engineering: Research in the biomedical area includes the development of devices for both human and animal health care. This includes biomedical sensors, therapeutic medical devices, embedded systems, biofabrication, communication circuits, wireless communications, energy harvesting, signal processing, brain-computer interfaces, biosecurity and image processing and infectious disease prediction and mitigation.



Industrial and Manufacturing Systems Engineering: IMSE works at the cutting edge, leading innovations in the areas of advanced manufacturing, operations research and systems engineering. Advanced manufacturing is an exciting and rapidly advancing field today. IMSE researchers are at the forefront of innovation in renewable energy manufacturing, 3D printing of advanced materials, laser micromachining, nanotube and nanowire manufacturing, and more. Operations research teams at K-State develop both theoretical foundations and modern applications of advanced analytical methods to help minimize risk and make better decisions. Using discrete optimization, mathematical programming, dynamic systems modeling and optimization, IMSE researchers are working to make an impact in a variety of fields, including humanitarian logistics, health systems modeling, pattern recognition, scheduling and more. IMSE researchers are working to optimize a variety of complex systems, which are generally defined as regularly interlacing, interrelated or interdependent groups of items or elements that form a complex whole. Our faculty have concentrated systems engineering efforts in humanitarian logistics, health care operations, transportation engineering, quality production systems and product and technology development.

Biomanufacturing Training and Education Center

The Biomanufacturing Training and Education Center, or BTEC, at Kansas State University will conduct its first courses in 2024. The purpose of BTEC is to provide a robust pipeline of talent to the expanding biomanufacturing industry in Kansas and beyond by providing students with hands-on training and skills in practice and theory of biomanufacturing, as well as to foster collaborative relationships between K-State and industry stakeholders.

The Center will include a biomanufacturing laboratory facility to be housed in the Carl and Melinda Helwig Department of Biological and Agricultural Engineering. The 2,300-square-foot facility will feature modern biomanufacturing lab equipment to support hands-on training in upstream and downstream processing and complementary analytical techniques. BTEC is funded by the state of Kansas and supports the NSF Engine Development Award project that K-State leads, Advancing Biosecurity, Biodefense and Biomanufacturing Technologies.

Several new courses aimed at advanced undergraduate students will be offered through BTEC.

Introduction to Biomanufacturing will include a history of biomanufacturing as well as current and future trends, cell biology and gene technology, an overview of industry processes and an introduction to regulatory affairs in the United States and global marketplaces.

Upstream Biomanufacturing Principles and Processes will teach about unit operations in upstream processes and media optimization, design and scale-up of bioreactors for cell culture.

Downstream Biomanufacturing Principles and Processes will feature unit operations for downstream process development and optimization including cell harvesting, product capture and purification, polishing and formulation.

Biomanufacturing Laboratory Training will give hands-on-experience in the newly designed BTEC facility, including training good manufacturing practices, sterile techniques, cell culture, recombinant protein production and protein extraction and purification

Regulatory Affairs for Biomanufacturing and Biologics will dive into regulatory requirements to develop, test, manufacture and sell biopharmaceutical products in the U.S., as well as quality assurance in a biomanufacturing facility.

Core Competencies of the Center include:

- Principles and management of biomanufacturing
- Biologic product development methods and technologies
- Process design and development
- Downstream biomanufacturing (product recover and purification)
- Upstream biomanufacturing (cell growth and optimization)
- Regulatory affairs and industry standards

Manhattan Area Technical College

MATC Advanced Technology Center

Manhattan Area Technical College's new Advanced Technology Center facility will open for the fall 2024 semester. This facility will allow MATC to double capacity for students in several programs supporting facility operations for the bioscience/biotechnology industries. Examples include the following.

Industrial Engineering Technology: A mechatronics lab providing entry-level skills education in electricity applications with circuits, fluid drive systems (hydraulics and pneumatics), programmable logic control systems, robotics and more. Capacity expands to 16 students.

Critical Environment Technology: In the new facility, this lab will feature the ability to use various situation simulations for students to apply their skills with control systems and the interplay of climate controls, water, security and more with an emphasis on environments with varying levels of containment conditions. Students in other tech programs such as HVAC, Industrial Engineering, Construction Trades, Biomanufacturing and Information Networking have opportunities to gain this targeted workforce education reinforcing safety and security operations in critical environments. Capacity expands to 14 students.

The new MATC facility will allow double capacity for students in several programs supporting facility operations for the bioscience/biotechnology industries.

Manhattan Area Technical College

HVAC: Students earn industry-identified entry-level skills for climate control systems, including commercial and related facilities. Commercial refrigeration skills are also provided to the students. Students can earn EPA 608 and OSHA 10 credentials. Again, students receive training on several control systems and may also complete courses within Critical Environment Technology. Capacity expands to 32 students.

Construction Trades: the program offers students opportunities to earn up to a Carpentry II level credential from NCCER as well as experience with residential and commercial construction. Students interact with regional construction companies on a regular basis. Capacity expands to 40 students.

Plumbing Technology: Anticipated program start date is August 2025.

Biomanufacturing Technology: Anticipated start date is January 2025.

Information Networking Technology will add a path for Cybersecurity by fall 2024.

Business Administration will add a pathway for Data Analytics by fall 2024.

Customized education options are also available through MATC (*both for college credit and/or continuing education and professional development*).

Manhattan Area Technical College

MATC named #2 community college in the country by WalletHub in 2023

Cost is often a major consideration when choosing a college. And with tuition rates continuing to rise every year — not to mention all the other expenses related to attendance — many would-be students are unable to afford a university education. That's even more of a concern this year as lots of people deal with financial struggles caused by high inflation.

Community colleges offer students the ability to get higher education without having as much financial strain. … Other than serving as an affordable, and in some cases free, option for education, community colleges have a number of attractive qualities. They often provide more flexible schedules, smaller class sizes and rigorous coursework. Some even go beyond two-year programs to offer four-year bachelor's degrees. These qualities appeal especially to students who need to balance their studies with other commitments, such as family and work.

Individual community colleges, however, vary in quality and affordability. To determine where students can receive the best education at the lowest price, WalletHub compared more than 650 community colleges across 19 key indicators of cost and quality. Our data set ranges from the cost of in-state tuition and fees to student-faculty ratio to graduation rate.

Source: WalletHub

MANHATTAN AREA TECHNICAL COLLEGE:

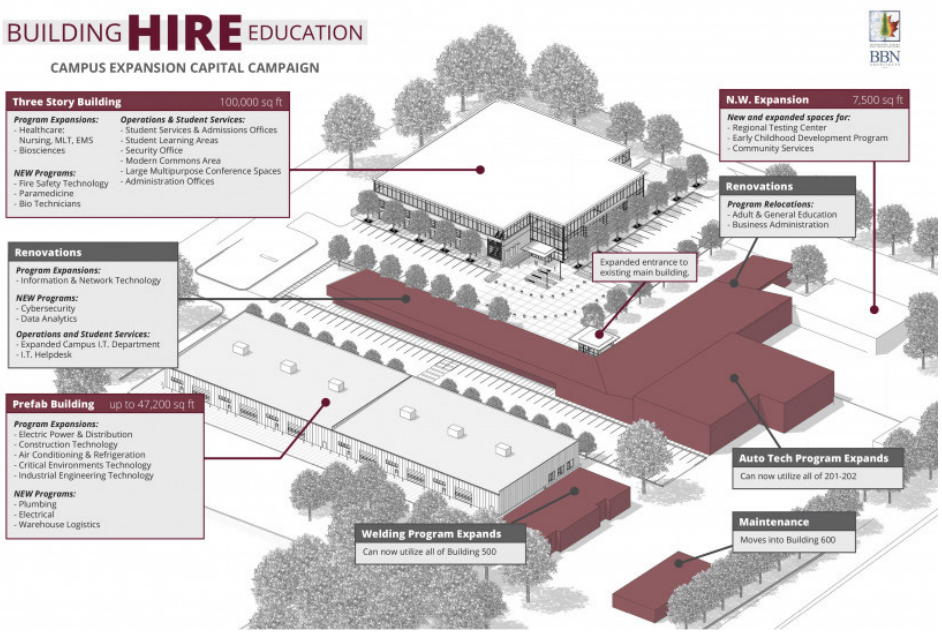
#2 BEST COMMUNITY COLLEGE IN THE U.S.

WalletHub, 2023

Manhattan Area Technical College

Advanced Technology Center

- New facility will replace six existing modular buildings on the east side of campus.
- Home to six technical programs and BSL-3 simulation training lab.
- Conference room and computer lab for business and industry leadership advisory committee meetings and workforce training.
- Supports program growth to meet regional workforce demand.



Program Growth

- Air conditioning and refrigeration
- Construction technology
- Critical environment technology
- Electric power and distribution
- Industrial engineering technology

New Programs

- Biomanufacturing
- Plumbing technology

Fort Riley

2,400 soldiers a year transition out of Fort Riley

Fort Riley

Historic Fort Riley, home of the U.S. Army's 1st Infantry Division (The Big Red One), serves 15,000 soldiers, 18,000 family members and 31,000 retirees and veterans.

Each year, approximately 2,400 soldiers transition from active duty out of Fort Riley, giving our region the opportunity to retain a highly trained, highly disciplined and highly loyal workforce.

*Contact the **Transition Services Manager**, Fort Riley Soldier for Life Program, **785-239-2193**, to learn more about training and recruitment opportunities that could provide you with your next great team member.*

Major Army Post Makes Manhattan Unique University City

There's one significant difference between Manhattan, Kansas, and other Midwestern college towns with major research universities: Fort Riley. This historic U.S. Army installation had an economic impact in FY 2022 (with multipliers) of more than $4 billion.

"When we work with outside consultants, they have a hard time finding comparable communities of our size with the twin economic drivers of both a Power Five university and a major military installation," said Jason Smith, president and CEO of the Manhattan Area Chamber of Commerce. "Having both assets in this region makes us attractive for companies wanting to tap into our highly skilled talent pools."

The installation, located directly west of Manhattan, has more than 14,700 military personnel, 5,500 civilian employees and 15,300 family members, and supports more than 27,000 regional veterans. About half of the military personnel and their families live on post, and the other half live, work and play in Greater Manhattan's regional communities.

Each year, about 2,400 military members transition from Fort Riley into the civilian workforce. When they make that leap, many employers find that military occupational specialties — ranging from air traffic control to health care to water treatment — translate well into the civilian world.

In addition, military spouses bring global experience and training into the existing regional workforce, providing a highly skilled talent pool from which local employers can recruit.

The economic impact total of Fort Riley to the regional economy includes military personnel payroll, contracts for supplies and services, construction contracts, Veterans Administration expenditures, education and health care. Direct impact (without multipliers) was $1.8 billion for FY 2022.

Fort Riley

Opportunities Abound for Transitioning Military Workforce and Local Employers

Military members and their families are no strangers to transitions. Whether undergoing multiple moves or overseas deployments, this highly resilient population is used to adapting. But one transition — from military to civilian life — can be particularly daunting as service members navigate finding jobs, relocating and adjusting to a new way of life.

Support from military-based programs and military-friendly communities can help ensure the process goes as smoothly as possible, while building a region's access to this highly skilled workforce — a win-win for soldiers and local businesses.

BHS Construction is a general contractor that's served the Greater Manhattan region for over 50 years. The company has worked with various programs to recruit service members. According to BHS Construction's human resources director Nathan Redeker, service members bring valuable life experiences and soft skills to the workplace.

"Transitioning service members are very ambitious. They want to showcase their skills and we want to bring them on board and have them be successful," he said.

Service members bring valuable life experiences and soft skills to the workplace.

Fort Riley

With approximately 2,400 soldiers transitioning from Fort Riley each year, the region has access to a workforce rich in experience and skills to tap into. Several programs help connect businesses with this unique talent pool.

Local Partnerships

The Army's Transition Assistance Program (TAP) is a primary conduit. By facilitating everything from briefs about finances to connections with local employers, TAP's mission is to prepare soldiers for a successful transition to the civilian world. Local partnerships can be an impactful component of fulfilling that mission.

"The Junction City and Manhattan Area chambers of commerce work hard to keep soldiers in the area. I work with them to promote business programs, internships, job opportunities and local resources, if soldiers want to stay in Kansas," said Master Sgt. Bradley Spaid, TAP liaison, 1st Infantry Division. "We see a lot of interest in the retired population to stay in Kansas. One of the main reasons is that the employment opportunities are vast. Soldiers often find employment here even before they separate from the military."

Military-friendly communities like those in the Greater Manhattan region see the value in these highly skilled professionals and make an effort to attract them. The Manhattan Area Chamber of Commerce's Military Relations Committee connects active duty and retired service members with local leaders and professionals. The Workforce Advisory Board provides employment and professional development resources.

"There are plenty of opportunities. If a soldier wants to stay in Manhattan, the chamber provides opportunities for soldiers to attend their Business After Hours, get to know the community and find a mentor to welcome them," Spaid said.

Recruitment Programs

Proximity to Fort Riley means local companies can also develop relationships with soldiers stationed there who are planning to transition out of the military.

An Army initiative called the Career Skills Program (CSP) provides an opportunity for soldiers to participate in internships while on active duty. Service members can leverage their experience while providing a talent pipeline for companies. For example, a sergeant major whose skills may align with those of a project manager can leverage her leadership experience while gaining specialized knowledge in a given industry. If there's a good fit, an internship can result in a direct hire.

Fort Riley

"Annually, we had 703 soldiers participate in the CSP. Of those, 665 completed the program and 553 got immediate employment. It's been super successful," Spaid said.

Participation is mission-dependent and at each unit commander's discretion. This program has connected soldiers with work-based opportunities through:

- **Heroes MAKE America**: An industry-based program facilitating meet-and-greets with local employers like Caterpillar in Wamego and tours of solar and wind energy facilities
- **ABF Freight Teamsters Military Assistance Program**: A logistics company enabling soldiers to earn a commercial driver's license and providing an immediate hire opportunity upon successful completion of their certification
- **Airstreams Renewables Inc.**: A program providing soldiers with a solid foundation in wind energy, communication towers and related industrial careers. Students learn technical and safety skills to prepare them for entry-level positions in those industries.
- **Home Builders Institute (HBI)**: An educational program introducing soldiers to electric and carpentry trades that has partnered with Habitat for Humanity for participants to help build houses in Ogden

BHS Construction recently hired a soldier participating in the HBI program.

"HBI is a great program," Redeker said. "It offers 12 weeks of training with six weeks on construction and six weeks on electricity. It gives transitioning service members a taste of what it's like to work in construction."

Programs through other branches provide opportunities to tap into military talent at other locations. Skills Bridge is an Air Force internship program that BHS Construction has also participated in.

An airman contacted the company while he was on active duty in California. His family was already in Manhattan, having chosen to locate here after his service. He wanted to work in construction and the six-month program essentially served as a prolonged job interview, with the company providing on-the-job training.

"Before he was done, we knew we were prepared to offer him a job. It was a great experience for us," Redeker said. "We take hiring very seriously. It's a big investment and programs like this are a great way to determine if there's a good fit."

Fort Riley

For more information about becoming involved in recruitment opportunities for transitioning service members, contact ***Allison Muth*** *at* ***785-776-8829*** *or* allison@manhattan.org

Educational Opportunities

Local educational institutions like Kansas State University and Barton Community College also offer specialized resources for military personnel and their families. From programs focused on different career fields to scholarships to training, these schools can help soldiers transition to careers in teaching, logistics and more.

K-State's College of Education Military Initiatives are specifically focused on helping military-connected families take advantage of opportunities in academia as students and educators.

Additional Resources

Fort Riley also offers multiple in-house resources to connect soldiers to local career opportunities and employers, including:

- **Job fairs**: Hosted on base, the focus can range from companies actively recruiting military personnel to local educational institutions showcasing learning and employment opportunities
- **USO Pathfinder Transition Program**: A mentorship program that helps soldiers create resumes, navigate housing options and more
- **Army Community Services Employment Readiness Program**: A resource that provides military personnel and their family members with access to career coaching, classes, job listings and more

"It's not fire and forget. Fort Riley cares about what the soldier does next," Spaid said. "It's more than just the transitioning soldier. We want to make sure the whole family transitions successfully."

Manhattan Area Chamber of Commerce and Made for Manhattan

Manhattan Area Chamber and Made for Manhattan

The Manhattan Area Chamber of Commerce provides talent recruitment and retention initiatives as a value-add for area employers. These programs engage thousands of university students at career and internship fairs throughout the four-state area.

The Chamber also offers Manhattan-specific resources for human resource professionals and recruiters as part of the Made for Manhattan program. Made for Manhattan introduces new and prospective residents to the people, places, activities and events that make The Little Apple a perfect place to live and work. Manhattan industries, Manhattanite stories, neighborhood maps, connections for the military community, and "Man-Have To's:" It's all there.

Made for Manhattan

Made for Manhattan Helps Companies Recruit Top Talent to Top Spot

What's it like to live in Manhattan, Kansas? There's a lot to love about this small town with big-city amenities. Not to be confused with its larger namesake in New York, Manhattan, Kansas, has been recognized as a top college town, top place to retire young, top small town for business and careers and top-100 place to live in America. Business community leaders are getting the word out.

To help new and prospective employees discover the attributes that make the region so appealing, the Manhattan Area Chamber of Commerce launched an initiative called Made for Manhattan. While anyone can access Manhattan's selling points through the initiative's components, it's especially useful for companies to leverage as they recruit talent to meet their workforce needs in the region.

"Made for Manhattan is an online resource and toolkit for new residents, job seekers and human resources professionals," said Allison Muth, talent strategies manager for the Manhattan Area Chamber of Commerce. "The overarching goal is to showcase the amenities we have here."

Made for Manhattan introduces newcomers and potential residents to the diverse faces and places that make the region so vibrant.

"There's a lot of opportunity to succeed in Manhattan and there aren't a lot of places like it," Muth said. "It's not just that there are great jobs. It's a great place to live, work and raise a family. Truly, I think there are few places like it."

Made for Manhattan

The main component of the effort is a website with information about housing, neighborhoods, schools, amenities, attractions and resident success stories. A relocation guide, welcome box and postcards featuring key information and stories are also available.

The website offers information about housing, neighborhoods, schools, amenities, attractions and resident success stories.

Katie Stone, general manager at local eatery Bourbon and Baker, used the toolkit for her recruiting efforts.

"After recruiting a new leader for our business from New York, I knew this would be a big move for her, especially for her first time moving away from the East coast," Stone said. "I was looking to put together a resource to make the transition easier for her, including activities, maps, and other essential information when moving to a new city, let alone across the country! The Made for Manhattan resource came to mind. I was able to direct her to the website and it's become a valuable source for information that she still uses as she continues to learn more about her new home."

From key statistics and city rankings to in-depth stories, Made for Manhattan offers overview information as well as ways for people to drill down into areas of interest. Human resources professionals can use a filter feature in the New to Manhattan section to provide targeted information based on new or potential employees' questions and concerns.

"If you're weighing your options, you might access this information and think, 'I didn't realize they had all this, that the quality of life is so good,'" Muth said. "It really highlights the diversity here and can help job seekers envision themselves in Manhattan."

Made for Manhattan

Dual Career Program

This new Made for Manhattan program utilizes simple online forms to enable spouses, partners and family members of new or prospective employees to share professional information with a network of human resource professionals and companies hiring in the region. Employers benefit by expanding their pool of prospects and also assisting recruitment targets with dual career considerations, increasing the likelihood they accept a job offer.

Industry Recruitment Materials

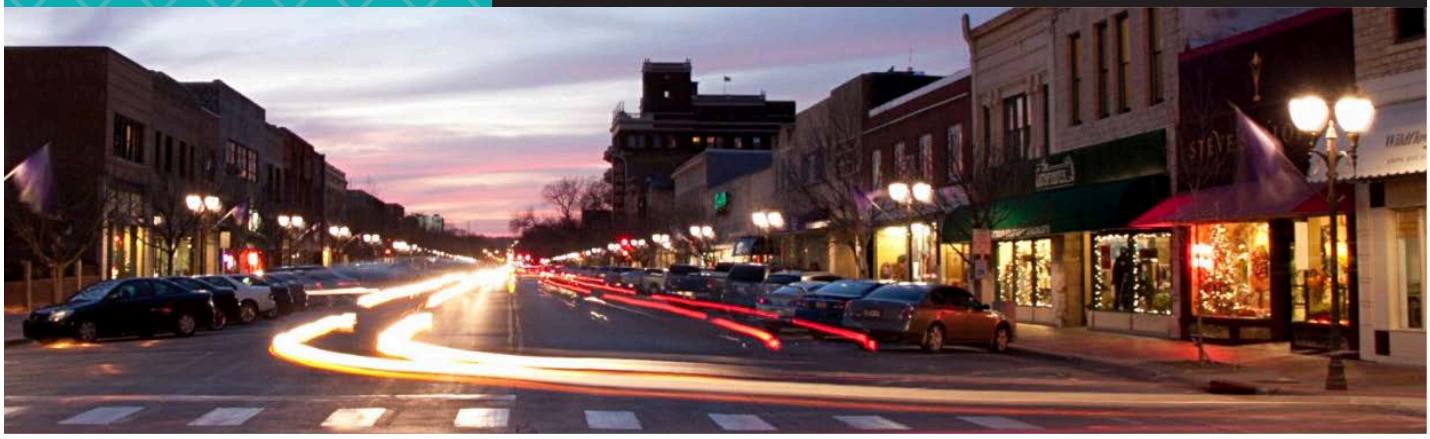
The Made for Manhattan website features industry-specific information and video content that can be used by companies in their recruitment and hiring processes. Key industries highlighted include Manufacturing, Healthcare, Construction and the Agro-Defense and Bio-Industry. This content is also available to employers in printed form to be used at career fairs and hiring events. Additionally, the Made for Manhattan website includes a Jobs page featuring companies hiring in the Manhattan region and a Military Connect page specifically designed for incoming military personnel and their families.

"It's not just that there are great jobs. It's a great place to live, work and raise a family. Truly, I think there are few places like it."

— Allison Muth

COMMUNITY

Executive Summary



Greater Manhattan's healthy economy and excellent quality of life is sustained by thriving and diverse communities. The region is home to more than 133,000 residents, 49,000 civilian employees and 25,000 students. Higher education's graduating students and Fort Riley's transitioning soldiers renew the workforce and help spur growth. The natural beauty of the Flint Hills tallgrass prairie, robust parks and recreation programs and facilities, Tuttle Creek Lake and Milford Lake, and golf courses and trails provide year-round outdoor recreation opportunities. Museums, a nationally accredited zoo, arts venues, shopping and Big XII college athletics provide activities and entertainment for the whole family.

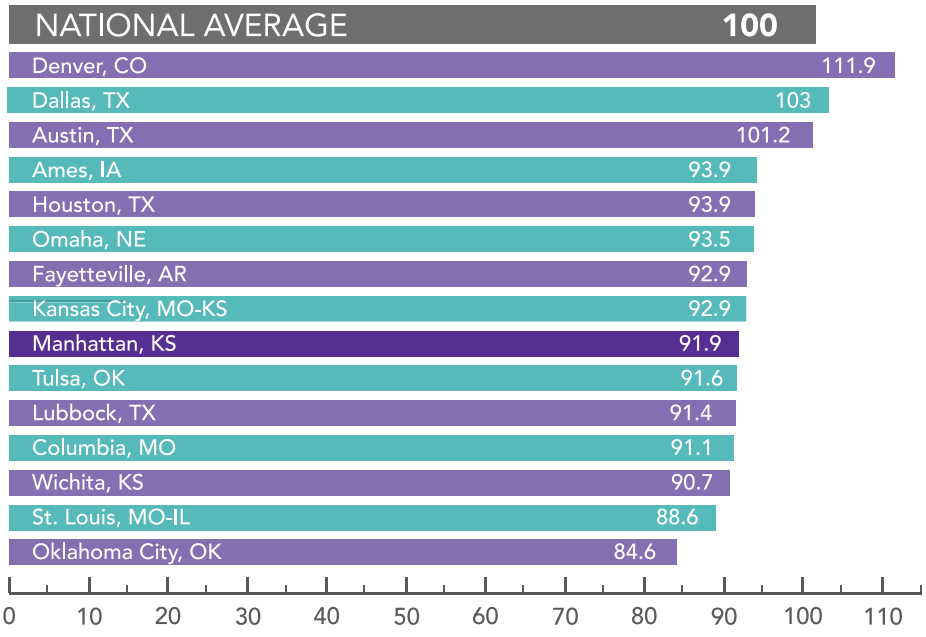
TOP 100 BEST PLACES TO LIVE IN AMERICA

Livability.com, 2021

2024 *PRINCETON REVIEW* RANKINGS FOR K-STATE

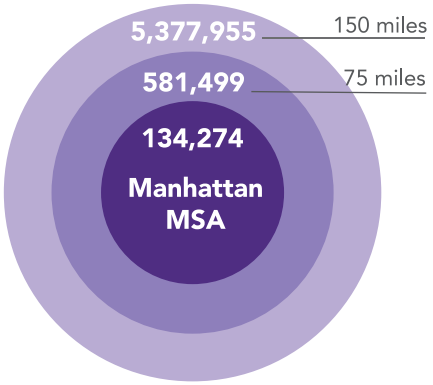
- **#1** Friendliest Students
- **#1** Best Town-Gown Relations
- **#2** Happiest Students
- **#4** Best Quality of Life
- **#5** Best Athletic Facilities
- **#9** Best College City

COST OF LIVING COMPARISON | Composite Index (ACCRA)



Executive Summary

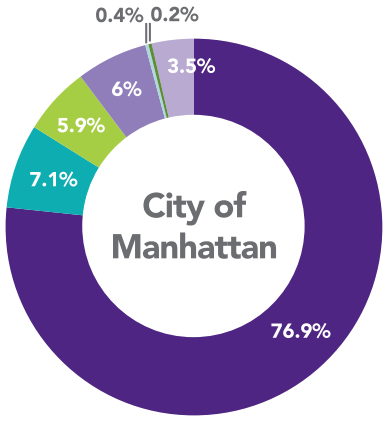
POPULATION

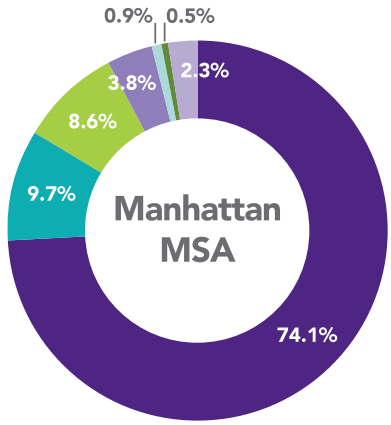


MAJOR EMPLOYERS

Kansas State University	5,674
Fort Riley Civilian Personnel	5,145
Manhattan/Ogden USD 383	1,350
Ascension Via Christi Hospital	490
Stormont Vail	382
Wal-Mart	380
Caterpillar	350
City of Manhattan	325
Meadowlark Retirement Community	315
Florence Manufacturing	310
NBAF	300
Champion Teamwear	280
Manko Window Systems	270
Dillons	265
Pawnee Mental Health	225
CivicPlus	210
Big Lakes Development Center	205

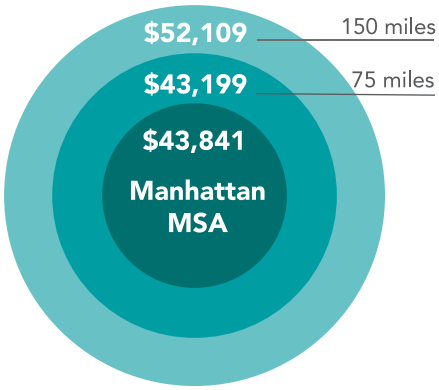
DEMOGRAPHICS



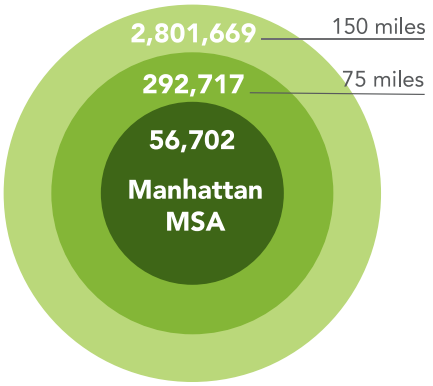


- White
- Hispanic
- Black
- Asian
- Native American
- Pacific Islander
- Other

AVERAGE WAGE



LABOR FORCE



MSA= Metropolitan Statistical Area

Greater Manhattan

Over the past 150 years, the Greater Manhattan region has become an international leader in biosecurity, agricultural research and innovation. This is largely due to the presence of Kansas State University, one of the original land-grant universities and one of 107 public research universities with highest research activity (R1) by the Carnegie Classification of Institutions of Higher Education. Manhattan's unique mix of facilities, researchers, students and businesses have made the region special — a place centrally located, featuring both the cultural amenities of a larger city and the laid-back, friendly atmosphere of a small college town.

The Greater Manhattan region is directly accessible from the KC metro via Interstate 70. In addition, the Manhattan Regional Airport (MHK) offers multiple daily jet flights to Chicago and Dallas on American Airlines and makes all major U.S. cities and many international destinations just one connection away.

With the opening of the gold-standard National Bio and Agro-Defense Facility (NBAF) in 2023, the Manhattan region has cemented its role as the western anchor of the Kansas City Animal Health Corridor. The strong partnerships that enabled the community to land the NBAF project are on display in both the private and public sectors. These partnerships also lead Manhattan and K-State to the perennial top-five ranking in *Princeton Review* for Town and Gown Relations.

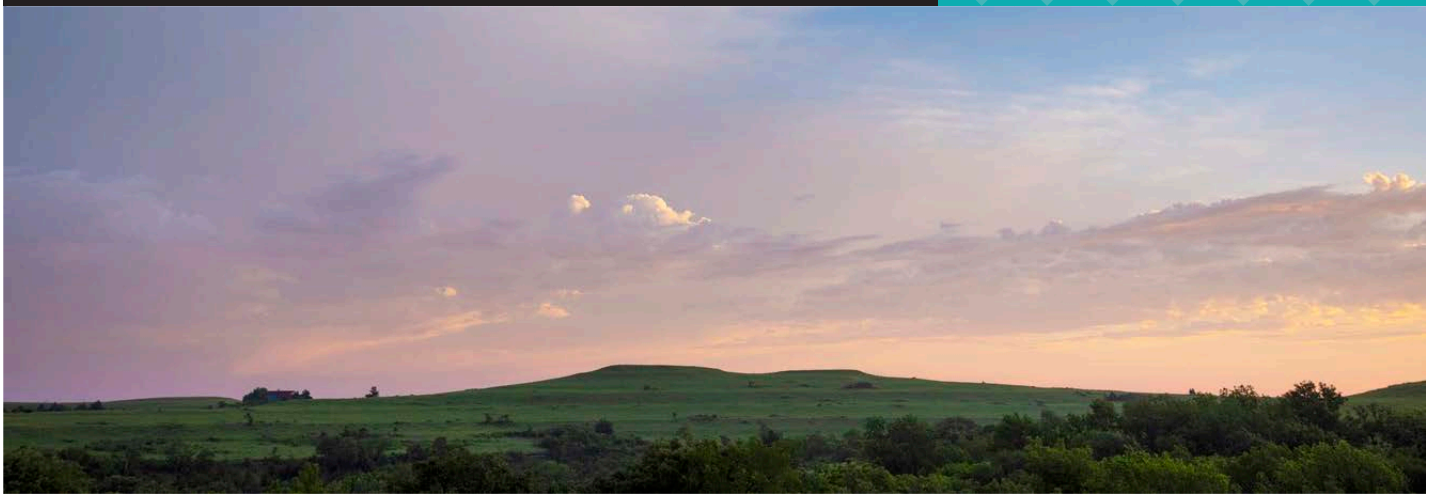
The presence of K-State and Fort Riley (U.S. Army) means that Manhattan's population has a higher level of diversity compared to other communities of our size. Our Manhattan-Ogden USD 383 school district serves this diverse and ever-changing population. With over 70 countries represented and 40 languages spoken among more than 7,000 students, USD 383 values the rich cultural and linguistic variance our students and families bring to the classroom and community. Our places of worship, community groups, and businesses match this diversity, including various international markets, ethnic restaurants, and cultural events.

The Greater Manhattan region has an unparalleled quality of life, making it a great place to build a career and raise a family. TravelAwaits named Manhattan the "#1 Best Midsize U.S. City" (2023), Livability.com ranked Manhattan as one of the "Top 100 Best Places to Live in America" (2021), and Alot.com identified Manhattan as one of the "30 Best Small Cities in the United States" (2021). Other recognitions for public schools, the university, and natural beauty abound. But the region is not one to rest on its laurels. The ongoing investment of millions of dollars into schools, the arts, indoor and outdoor recreation assets, and downtown redevelopment is positioning Manhattan for a bright future.

#1 BEST MIDSIZE U.S. CITY

TravelAwaits, 2023

Greater Manhattan



Princeton Review rankings for K-State, 2024

#1 Friendliest Students

#1 Best Town-Gown Relations

#2 Happiest Students

#4 Best Quality of Life

#5 Best Athletic Facilities

#9 Best College City

Best Value College in Kansas (K-State)
– SmartAsset, 2022

Best Cities After Military Service (#10)
– Navy Federal Credit Union/Best Places, 2022

Top 30 Most Beautiful College Towns of 2022
– Value Colleges, 2022

30 Best Small Cities in the United States
– Alot.com, 2021

Most Educated City in Kansas *– Insurify, 2020*

#2 Best College Town in America
– Livability.com, 2019

Greater Manhattan

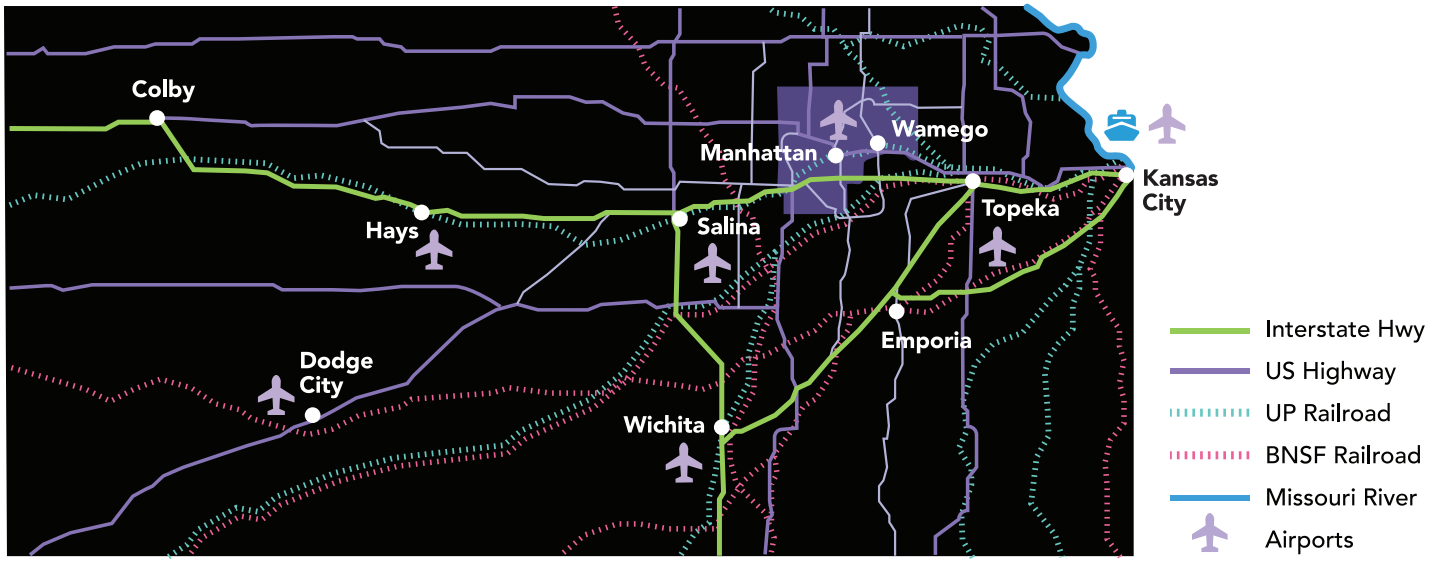

Manhattan Regional Airport

Location and Transportation

We're a "fly anywhere fast" region in a state you do NOT want to fly over because you might miss your next big business opportunity. We say we're "something special in between," and we mean it. We're ideally situated for convenient logistics and transportation, whether for dynamic business growth or recreational travel.

Smack dab in between every place your business needs to be, the Greater Manhattan region:

- Offers multiple daily jet flights from the Manhattan Regional Airport to Chicago and Dallas
- Is two hours from Kansas City, Lincoln, Wichita
- Has easy access to I-70, I-80 and I-35 as well as US 24, 36, 75, 77 and many state highways
- Is two hours from PortKC
- Enjoys public bus service in and between communities



Greater Manhattan

Business Environment

Kansas State University and Fort Riley play foundational roles in the Greater Manhattan region's economy. Kansas State University's enrollment exceeds 21,000 students and the university has more than 6,000 employees. Fort Riley is home to 15,000 active-duty U.S. Army personnel and employs over 3,500 civilians. Fort Riley's full economic impact on the region during FY 2019 topped $3.8 billion.

Retail sales exceed $1 billion annually in the City of Manhattan and the economic impact of major manufacturers and employers in the community is more than $200 million.

The presence of home-grown major employers like CivicPlus (a leader in integrated technology platforms for local governments), GTM Sportwear (now Champion Teamwear owned by Hanesbrands Inc.), and Manko Window Systems demonstrate Manhattan's capacity to support private business growth on a national and global scale. Additionally, the Greater Manhattan region has successfully attracted major federal (NBAF) and state (Kansas Department of Agriculture) relocation projects that have resulted in significant new facility developments. Multiple state-wide agriculture organizations have also made the choice to locate headquarters in Manhattan, including the Kansas Farm Bureau and the Kansas Wheat Commission.

MAJOR EMPLOYERS

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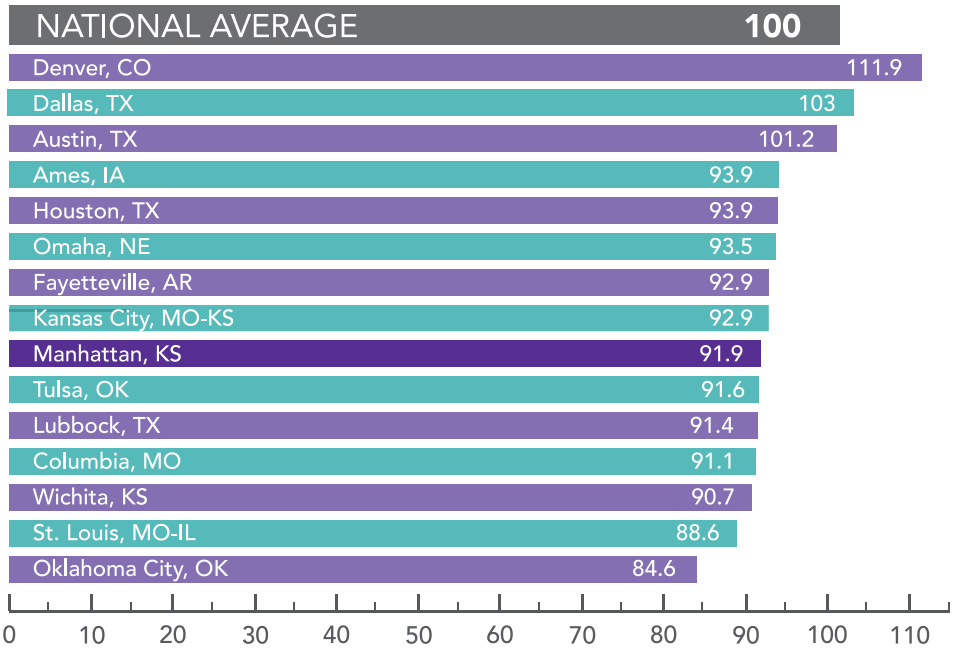
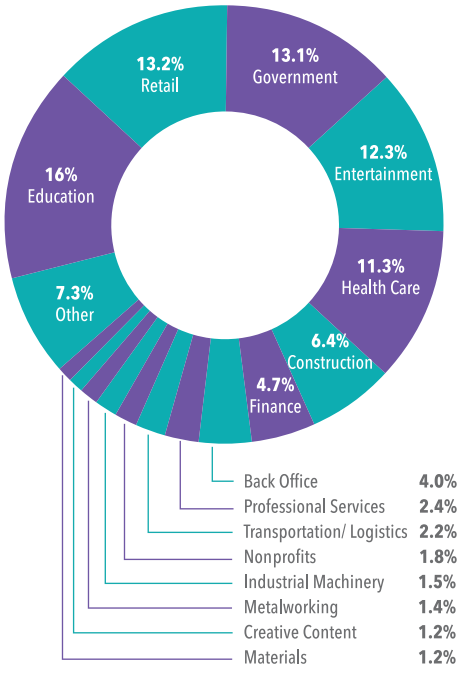
Big Lakes Development Center	205

COST OF LIVING COMPARISON

Composite Index (ACCRA)



EMPLOYMENT BY INDUSTRY CLUSTER



TOP 100 BEST PLACES TO LIVE IN AMERICA

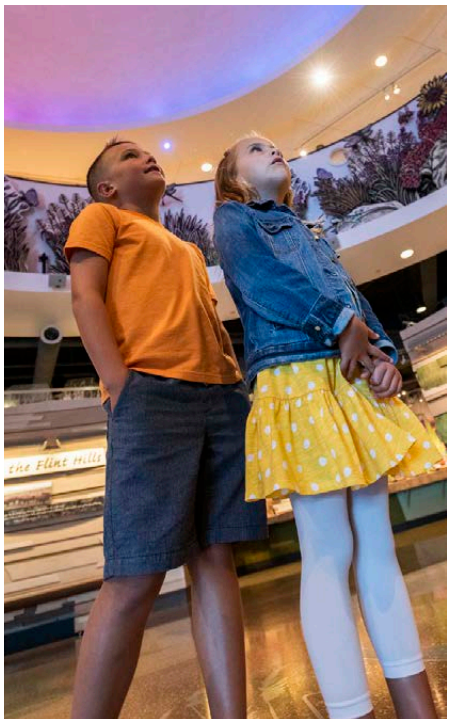
Livability.com, 2021

Quality of Life

The Greater Manhattan region offers something for every member of your family. At times, you will feel as if you are in a big city, and at others, you're back in your own hometown. In the Greater Manhattan region, you can see Yo-Yo Ma or Kristin Chenoweth on a Friday night at McCain Auditorium on the K-State campus, then run into your kid's teacher while grocery shopping on Saturday morning. The fall season brings full-on Power Five Conference football game experiences complete with the incredible tailgating scene outside Bill Snyder Family Stadium. In the summer, "ooh" and "ahh" as the region hosts one of the largest fireworks shows in the Midwest.

Natural Beauty and Outdoor Recreation

The Greater Manhattan region sits in the Flint Hills, one of the only existing tracts of tallgrass prairie left on Earth. Whether hiking on the Konza Prairie, boating on Tuttle Creek and Milford reservoirs, canoeing on the Kansas River, or exploring the Tallgrass Prairie National Preserve, families can slow down and experience nature in unique ecosystems that exist nowhere else. History is only steps away as you learn about the Underground Railroad at Mount Mitchell, part of the Freedom's Frontier National Heritage Area, or visit the U.S. Cavalry and 1st Infantry Division Museums on Fort Riley.



We believe in investing in the walkability and outdoor experiences of our communities with lovely parks, art installations, numerous walking trails and robust parks and recreation programs. Outdoor recreation opportunities abound in the Greater Manhattan region. At any time, you're only minutes from getting out on the water, lacing up for a prairie hike, jumping onto a suburban bike trail, riding on horseback across the beautiful Flint Hills, enjoying one of the area's challenging golf courses, or flying through the tree canopy on a zip-line.

Schools

Our education-oriented region values our award-winning school districts, lifelong learning opportunities and many arts and enrichment organizations. Strong school districts in the region value and showcase the diverse backgrounds of our residents. Area schools are consistently recognized for their academic quality and their students' achievements. In U.S. News 2023-2024 Best U.S. High Schools, Manhattan High School and Rock Creek High School ranked in the state's top 10 and the nation's top 2,000 out of 17,680 schools according to their performance on state-required tests, graduation, and how well they prepare students for college.

Food and Faith

The Aggieville district provides a mix of shopping, dining, nightlife and entertainment that can only be found in a thriving college town.

Downtown Manhattan has become a foodie hotspot for its fine dining establishments, breweries and casual restaurants. The Aggieville district located adjacent to campus provides a unique mix of shopping, dining, nightlife and entertainment that can only be found in a thriving college town. And across Manhattan and the surrounding region, our unique shopping boutiques and trendy entertainment options will keep you and your family well supplied and amused. The Greater Manhattan region also benefits from the many residents who come here from around the world because of Kansas State University and Fort Riley. Access to international grocery stores, ethnic cuisine, and a multitude of social and faith organizations are some of the benefits of our diverse and welcoming community.

Housing

From contemporary lofts to country living on an acreage, the Greater Manhattan region offers housing options to fit all desires and budgets. According to the ACCRA Cost of Living Index, housing costs in Manhattan are 18% lower than the national average. If you want to be in the middle of the action, downtown Manhattan lofts, luxury apartments adjacent to Aggieville or townhomes near Kansas State University may fit your style. The community's core features beautiful treelined streets and historic homes, some constructed from the same native limestone used to construct K-State's campus buildings. Suburban development continues at a fast pace with new construction options including golf course views or within walking distance to newly built elementary schools. The Flint Hills beckon for those wanting to enjoy life in the country or run an agricultural operation. Whether living in the country, or one of the region's smaller communities, with their charm and welcoming nature, Manhattan and Kansas State University are always easily accessible and just minutes away.

Stormont Vail Health

Health Care

First-class health care for all ages is accessible in the Greater Manhattan region. Hospitals in Manhattan, Wamego, Onaga, St. Marys, Junction City and on Fort Riley serve residents throughout the region. In Manhattan, Ascension Via Christi (150 beds), Manhattan Surgical Hospital (13 beds), and Stormont Vail Health Manhattan Campus (primary and specialty medicine and other services in a 79,000 square-foot facility opened in 2023) provide exemplary care, and residents have the choice of around 175 medical doctors, 50 dentists, 30 chiropractors and 20 optometrists. Students at K-State have access to Lafene Health Center, a cost-effective, physician-directed health and wellness center.

Incentive Programs

We will work with you from day one to maximize your profit potential. Contact us today to start putting together a package that will make the Greater Manhattan region your next smart business decision.

City of Manhattan Incentives

The City of Manhattan's business incentive efforts are focused on the creation of high-paying jobs, working closely with the Manhattan Area Chamber of Commerce and regional partners.

- Customized packages that include tax abatements, loans, grants, IRBs, training support, infrastructure improvements
- Dedicated city sales tax for economic development
- Three Federal Opportunity Zone tracts adjacent to Kansas State University

State of Kansas Incentives

- The Promoting Employment Across Kansas (PEAK) program offers qualified companies the ability to retain 95 percent of their payroll withholding tax for five to 10 years. The number of years that the withholding tax can be retained depends on the aggregate median wage of all PEAK jobs/employees as compared to the relevant county median wage. If the aggregate median wage of the new jobs does not qualify the project for PEAK, the annual average wage of the new jobs can be used. Qualifying through the use of the average wage limits the benefits received. A PEAK application must be submitted before locating or creating PEAK-eligible jobs in Kansas. PEAK is available for new or relocated operations in Kansas as well as operations currently in the state that are expanding. Learn more at kansascommerce.gov/peak
- The High Performance Incentive Program (HPIP) offers a 10 percent corporate income tax credit on the qualified capital investment of an eligible company. Investment can include purchase or lease of a facility or equipment, remodeling or build-out costs, fixtures, furniture and business equipment. Equipment transferred into Kansas is also credited at the original acquisition cost.

  The minimum investment threshold to qualify for HPIP is $1 million for the urban counties of Douglas, Johnson, Sedgwick, Shawnee and Wyandotte.

Incentive Programs

For all other counties, the minimum investment threshold is $50,000.

For any investment in which the company anticipates claiming a tax credit through HPIP, a project description form must be submitted before the company commits to that investment. The HPIP credits can reduce or eliminate a company's Kansas corporate income tax liability and must be used within a consecutive 16-year period. Learn more at kansascommerce.gov/hpip

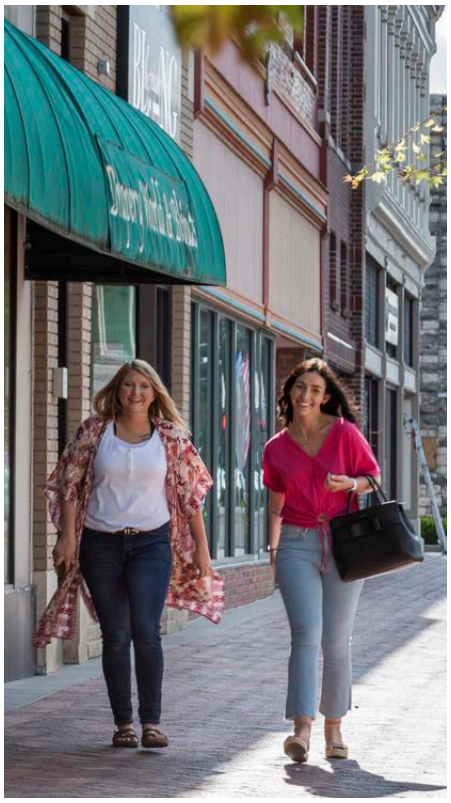
- High Performance Incentive Program Tax Credit Transfers: For projects placed into service on and after January 1, 2021, a taxpayer may sell or transfer up to 50% of the tax credit allowed. The taxpayer may sell or make a transfer to one or more transferees, but the total of all transfers shall not exceed 50% of the taxpayer's tax credit. An HPIP certified company may request up to two transfers a year. The taxpayer shall make the transfer or transfers within a single tax year. The credit may be sold or transferred to any individual or entity and shall be claimed in the year the credit was transferred against the transferee's tax liability for the income tax under the Kansas income tax act or the premium tax, privilege fees, or the privilege tax.

  The amount of the credit that exceeds the transferee's tax liability for such year may be carried forward for credit in the succeeding taxable year or years until the total amount of the tax credit is used, except that no such credit shall be carried forward for deduction after the 16th taxable year succeeding the taxable year in which such credit was initially claimed.

TOP 10 METROS, ECONOMIC DEVELOPMENT PROJECTS PER CAPITA

(#3 for cities under 200,000)

Site Selection Magazine, 2022



In the event the tax credit earned by the taxpayer and transferred to a transferee is later disallowed in whole or in part by the Secretary of Revenue, the taxpayer that originally earned the tax credit shall be liable for repayment to the state in the amount disallowed. Learn more at kansascommerce.gov/hpip

- The Kansas Industrial Training (KIT) program is direct financial assistance for the training of net new jobs to Kansas. The program can be structured as pre-employment, classroom, on-the-job or a combination of the three approaches. The program can pay the negotiated costs for instructors' salaries, video development, textbooks and training manuals, supplies and materials and curriculum planning and development. To access the funding, the company prepares a plan which identifies trainers, trainees, the type of training and the estimated cost. Once approved, the funding is allocated based on actual reimbursement of training expenditures per the plan and contract with the Department of Commerce. Travel expenses or payments for training facilities are not allowed under the program. All contracts will be written for 12 months; however, a company can close early on the contract if desired. Requests for reimbursement are accepted at the end of the project. Reimbursement requests must be made within 90 days after the project ends, or the company risks losing the incentive. Learn more at kansascommerce.gov/kit

- The Kansas Industrial Retraining (KIR) program is a job retention tool that helps employees of restructuring companies who are likely to be displaced because of obsolete or inadequate job skills and knowledge. Learn more at kansascommerce.gov/kir

- Tax Credits and Exemptions
  - Manufacturing Machinery and Equipment sales tax exemptions: State statute exempts all sales and use tax for machinery and equipment used as an integral or essential part of an integrated production operation by a manufacturing or processing plant or facility. Learn more.
  - Research & Development Tax Credit: Kansas offers an income tax credit equal to 6.5 percent of a company's investment in research and development (R&D) above an average of the actual expenditures in R&D made in the taxable year and the two immediate preceding taxable years. Only 25 percent of the allowable annual credit may be claimed in any one year.

Incentive Programs

Any remaining credit may be carried forward in 25 percent increments until exhausted. Expenditures in R&D activities are defined as those expenses that are allowable as deductions under the federal Internal Revenue Code. This credit is only available to C-Corporations subject to the Kansas corporate income tax. This credit is not available to individuals, partnerships, S-Corporations, limited liability companies or other pass-through entities. Learn more.

- **Angel Investor Tax Credits**: This income tax credit is equal up to 50 percent of the investor's cash investment in qualified securities of an eligible Kansas business. If the amount of the credit exceeds the investor's tax liability in any one taxable year, the remaining portion of the credit may be carried forward until the total amount of the credit is used. The credit is limited to $100,000 per single Kansas business invested in with a maximum total of $2,350,000 in tax credits for a single year, per investor.

  The cumulative aggregate amount of angel investor tax credits allowed shall not exceed $6 million for each tax year, with a $500,000 increase each tax year after that through tax year 2026.

  The SEC defines an accredited investor as a person whose individual net worth, or joint net worth with that person's spouse exceeds $1 million, or any person who had an individual income in excess of $200,000 in each of the two most recent years or joint income with that person's spouse in excess of $300,000 in each of those years, and with a reasonable expectation of reaching the same income level in the current year. Learn more.

LEARN MORE:

Kansas Business Incentives or a booklet with available opportunities kansascommerce.gov/businesses/incentives

Federal and Utility Incentives

- **New Market Tax Credits**: The NMTC Program attracts private capital to low-income communities by permitting individual and corporate investors to receive a tax credit against their federal income tax in exchange for making equity investments in specialized financial intermediaries called community development entities (CDEs). The credit totals 39 percent of the original investment amount and is claimed over a period of seven years.

  Manhattan has several areas in designated census tracts for funding, including areas around Kansas State University and the central business district. Additional information on the NMTC program can be found at https://www.cdfifund.gov/programs-training/Programs/new-markets-tax-credit.

  Projects utilizing the NMTC program will realize up to 20% of the total investment in up-front cash. This can be structured to benefit the company in either a company-owned or developer-owned facility.

- **Evergy**: This investor-owned energy company serves more than 1.6 million customers across Kansas and Missouri, a service area stretching 316 miles west to east and 325 miles north to south, with 62,000 miles of transmission and distribution lines and over 800 substations to deliver power to its customers.

  Evergy's economic development team's role is to promote and support industry development for companies and communities throughout their service area. Evergy provides comprehensive support for businesses relocating to or expanding in the Evergy service area. Economic growth in communities is supported through local partner programs that help build strong business environments so communities can grow and prosper.

  Additional information on Evergy economic development resources, business support and incentives, including the Economic Development Rider Incentive, can be found at www.evergyed.com.

Greater Manhattan Area

Learn more about Greater Manhattan

Considering a move? Read why one couple moved back to the area, then take their advice and try it out!

- Take in a show, sports event or festival. There's almost always something fun going on!
- Explore Aggieville or Downtown, enjoy dinner and a local brew, and take a stroll around Blue Earth Plaza.
- Watch the sun rise from Bluemont Hill. Bring coffee and some Varsity Donuts.
- Take a walk on the gorgeous K-State campus, largely constructed of native limestone.
- Experience a sunset hike on the Konza Prairie or cycle our Linear Trail.
- Ask a realtor to talk your ear off about all that's going on in town between checking out a few houses. Be sure to visit at least one newer neighborhood and one historic one.
- Window shop along Poyntz Avenue, or hammock for a few hours in City Park and count the dogs (or e-scooters) that go by. Don't forget to take a selfie with Johnny Kaw

Greater Manhattan Area

Cherlyn White-Conklin of Wamego loves the variety of amenities, the scenery and outdoors, the minimal commutes, and the shopping, plus cultural resources and high-speed internet connections.

Some area residents assume their stay will be a short one but turn into vocal advocates for making Greater Manhattan their permanent home. They find they can hire quality employees, find great education for their children, experience diversity and cultural events, connect with others in a friendly community, and explore area towns that are rich in history, tradition, and charm. Read more.

Cherlyn White-Conklin of Wamego loves the variety of amenities, the scenery and outdoors, the minimal commutes, and the shopping, plus cultural resources and high-speed internet connections. She was raised in Wamego and moved back from Kansas City. "You might wonder how I could possibly leave that excitement behind and fall back in love with rural living. Plenty of reasons. And the switch is much easier than you might think," she says. "It's the best of all worlds. We're close to cities like Kansas City, Salina, Topeka and Manhattan with world-class facilities, and far enough away that we can enjoy rolling hills and amazing celestial phenomena (no light pollution). There's plenty of space to just breathe." Read more.

Explore the area and the possibilities of rural life north and east of Manhattan. St. Marys, Westmoreland, Riley, Wamego, St. George and more – Take a look!