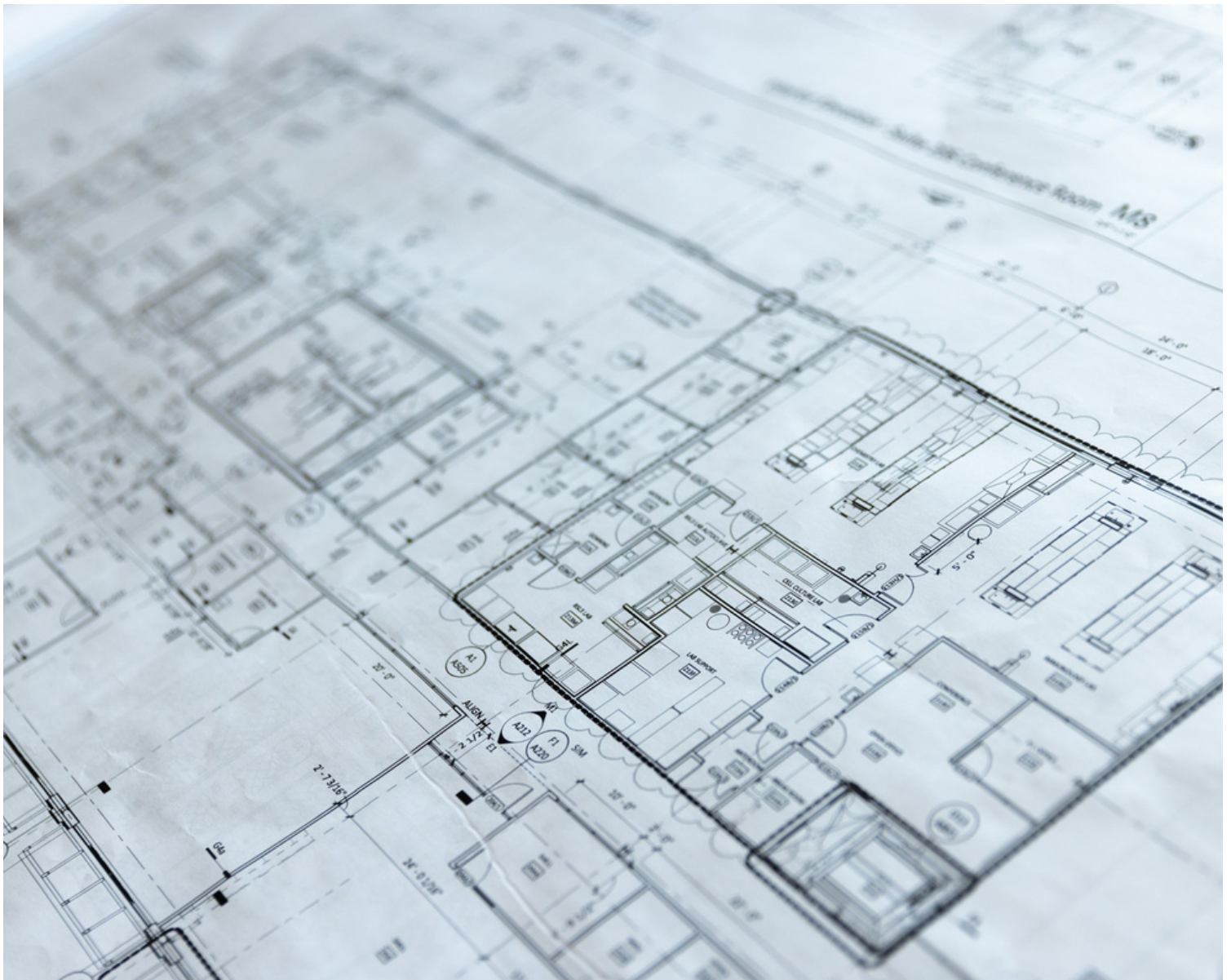


PHASE IV & V DEMAND ANALYSIS



EXECUTIVE SUMMARY



Based on KU Innovation Park's historical growth and the current prospect pipeline, there is enough projected demand to fill an additional 116,242 square feet of space by 2028.

Estimates of potential tenants based on internal Park knowledge and conversations with these prospects indicate around 136,000 square feet of space is needed.

Phase IV will establish the Park as a leader in national security with classified space for KU and private industry, while Phase V's bioinnovation and sustainability focus can benefit from partnerships with companies and collaborations with KU's research programs.

There is enough projected demand to fill an additional 116,242 square feet of space by 2028.

MARKET LANDSCAPE

This section will briefly address various industries and markets related to the focus of Phase IV and V development, KU's related assets, and the opportunity for the Park. The focus of Phase IV is national security, while Phase V will feature bioinnovation and sustainability. This encompasses companies working in cybersecurity, remote sensing, biotechnology, animal health technologies and more. Each will be defined below from research on the size of the market, growth, and current status.

PHASE IV: NATIONAL SECURITY



Cybersecurity

The cybersecurity industry has an annual revenue of \$166 billion, which is estimated to grow to \$273 billion by 2028.¹ The cost of cyberattacks in 2023 reached \$8 trillion. The security services market has a projected volume of \$85.5 billion for 2023. For global comparison, most of the revenue generated stems from the United States.

The cost of cyberattacks far outweighs the cost it takes to prevent them. At the FBI & KU Cybersecurity Conference earlier this year, Jason Rodgers, CEO of Invary, a cybersecurity & malware detection company, spoke on how identifying and eliminating cyberattacks takes 304 days on average.² "The average cost of a data breach was \$4.3 million," he said. "But the average cost of a mega-breach of more than 50 million records topped \$400 million."



Remote Sensing

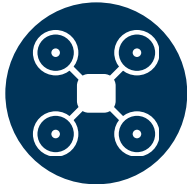
A major part of this industry is radar and lidar (light detection and ranging) sensing technologies. In 2022, the global market size was \$18.1 billion and is expected to grow to \$55.4 billion in the next 10 years.³ Military- and intelligence-related sensing captured more than 34% of the revenue share in 2022. This highlights the significant role that national security plays in remote sensing technology.

KU Innovation Park has seen recent interest in remote sensing by construction and transportation-focused companies in the private sector. The experience of resident companies indicates that lidar sensing enhances the ability to conduct research and scope out cost-effective projects. The remote sensing industry is growing significantly and is expected to expand into other industries soon.

¹ <https://www.statista.com/outlook/tmo/cybersecurity/worldwide>

² <https://research.ku.edu/fbi-ku-cybersecurity-conference>

³ <https://www.precedenceresearch.com/remote-sensing-technology-market>



UAVs

The Unmanned Aerial Vehicle (UAV) manufacturing industry produced \$4.5 billion in revenue since 2018.⁴ In the United States, 57 businesses employing 8,231 workers manage to generate an impressive \$821.5 million in wages. Civil UAVs make up 34.5% of all manufactured drones on the market. Regulations around civil use have become more flexible, creating a possibility for growth.

PHASE V: BIOINNOVATION & SUSTAINABILITY



Biotechnology

The biotechnology industry has an annual revenue of \$193 billion and is expected to grow to \$256 billion by 2028.⁵ The industry has grown 7.0% in the last five years, with similar growth forecasted for the next five years at 5.0%. There are 3,429 businesses that operate in this market, with a total employment of 408,000, accounting for \$48.5 billion in annual wages. The total amount spent on research and development in this field in 2023 was \$414 billion.

Compared to other markets, biotechnology flourished during the COVID-19 pandemic as investors were pouring money into innovative companies and technology. Over 61% of this industry is dominated by human health and continues to climb in that direction with new advancements.



Animal Health Technology

The animal health sector accounts for 7.5% of the biotechnology industry, with an annual revenue of \$13.2 billion.⁷ The revenue is expected to reach \$14.5 billion by 2028. This sector has grown 4.1% in the last five years and is projected to grow 3.1% in the next five. This sector includes 185 businesses with 28,817 employees, accounting for \$2.8 billion in annual wages. The total amount spent on research and development in this field in 2023 was \$28 billion.

Similar to the overarching biotechnology industry, the animal health sector performed well during the pandemic.⁸ Livestock and domesticated pets are the main focus in the industry when creating technology and vaccines.

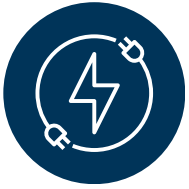
4 <https://www.ibisworld.com/united-states/market-research-reports/unmanned-aerial-vehicle-uav-manufacturing-industry>

5 <https://www.ibisworld.com/industry-statistics/market-size/biotechnology-united-states>

6 <https://www.ibisworld.com/industry-statistics/market-size/biotechnology-united-states>

7 <https://www.ibisworld.com/united-states/market-research-reports/animal-health-biotechnology-industry/>

8 <https://www.ibisworld.com/united-states/market-research-reports/animal-health-biotechnology-industry/>



Sustainability

The global sustainability and green technology industry has an annual revenue of \$16.5 billion, expected to reach \$41.9 billion by 2028⁹. The annual growth rate until 2030 is expected to be 20.8%. Electric vehicles (EVs) are a large part of the future of sustainability and the Park is already focused on transportation.

From conversations with Park tenants and the KU Transportation Center, EVs will lead the next decade of technological advancements. Additionally, local, state, and national governments are passing legislation requiring standards of sustainability that must be met for their projects. For example, the city of Lawrence is increasing its project sustainability standards, requiring anyone who is awarded a contract with the city to meet heightened standards of sustainability.

REGIONAL DEVELOPMENTS

The Kansas City metropolitan places a strong emphasis on national security. One notable regional presence is Honeywell's Kansas City National Security Campus (KCNSC). KCNSC is one of eight of the Department of Energy's (DOE's) nuclear security sites and is responsible for making 80% of non-nuclear parts for armaments.¹⁰ The company has expanded its regional presence significantly in the past few years, now sitting at almost 6,500 employees, with plans to hit 7,000 by September 2023. This demonstrates the demand for security innovation and educated talent to fill these positions.

EnterpriseKC is a local economic development agency that is investing in cybersecurity. One of their current initiatives is called Cyber Range. The website states, "The Cyber Range is a virtual, interactive environment designed to simulate real-world networks, systems, and applications for cybersecurity education, training, research, and development." Students, researchers, industry professionals, and government workers can strengthen theoretical learning alongside practical training. It helps participants learn about the latest threats and tactics so they can prepare to defend a network against an actual attack.

Regarding bioinnovation, Lawrence falls in the middle of America's Animal Health Corridor. Spanning from Manhattan, Kansas, to Columbia, Missouri, this concentration of animal health companies accounts for 56% of total worldwide animal health, diagnostics, and pet food sales.¹¹ The growth and success of these companies can be partially attributed to top educational institutions, transportation connections, and generous incentives for companies in the animal health industry.¹² This regional focus justifies the demand for lab space for animal health companies.

9 <https://www.statista.com/statistics/1319996/green-technology-and-sustainability-market-size-worldwide/>

10 <https://www.kcur.org/news/2023-02-01/kansas-citys-role-in-making-doomsday-weapons-is-a-boon-for-the-local-economy>

11 <https://bit.ly/3rAdCJ3>

12 <https://www.areadevelopment.com/stateresources/kansas/americas-animal-health-corridor-kansascity008.shtml>

RELATED STRENGTHS OF THE UNIVERSITY OF KANSAS

One of KU's core strengths is national security, specifically remote sensing and integrated systems, and information sciences. Recognition of these strengths can be seen by actions of the University. The FBI partners with KU to hold an annual Cybersecurity Conference. Park resident companies including Invary and Garmin have attended this conference to apply their findings to ensure better security in the United States. Recently, the Office of the Director of National Intelligence granted KU \$2.4 million to add degrees in biotechnology, information technology and cybersecurity to its existing intelligence and national security program.

KU's Information and Telecommunication Technology Center (ITTC) researches applications for areas including information systems, business, biomedical, educational, agriculture, and finance. This building houses the Institute for Information Sciences (I2S), which develops and commercializes new technologies in computer, communication, and radar systems. I2S has received 85 grants over the last five years for their work.¹³

Bioinnovation is another core strength of the University. KU ranks in the top 100 of universities in the country in biological sciences and in the top 75 for biostatistics and chemistry,¹⁴ proving that KU is a top science research institution. KU's Biopharmaceutical Innovation and Optimization (BIO) Center demonstrates this strength. They provide drug delivery, solubilization, and stabilization services to researchers with the aim of translating innovative research into new medical treatments and technologies.

SUMMARY OF MARKET LANDSCAPE

The upward market trends of both national security and bioinnovation are promising. The Park has already begun investing in and amassing assets in these high-growth industries. By identifying these high-growth industries, the Park has minimized the risk of lack of demand. Companies located at the Park have the space and technology needed to compete on the national level and continue expanding.

The Park is tying much of its future planning to the University of Kansas' assets. With KU investing into creating educational paths focused on biotechnology and national security, the Park can provide the opportunity to give those students experience as interns during their undergraduate studies that could lead to jobs after graduation. Companies located at the Park would have a direct intern pipeline to majors directly correlating to their work at the Park. This opportunity would benefit the university, the tenant companies, the students and the region, as well as establish the Park as a leader in industries with national prominence.

¹³ <https://i2s-research.ku.edu/>

¹⁴ <https://www.usnews.com/best-graduate-schools/top-science-schools/university-of-kansas-155317>

THE PARK'S GROWTH

Analyzing the Park's historical growth is important to assessing future demand because it is a metric to check assumptions around needed square footage. Some of the demand for space is generated by the Park itself. Offering fully customized office and lab space with proximity to the university has been a driver for demand. Resident companies have grown from a single lab in the main facility to occupying 7,500-10,000 square feet in Phase III. Using this historical data, we can estimate what the future demand for space at the Park will be.



KU INNOVATION PARK'S ANNUAL GROWTH RATE

The Compound Annual Growth Rate (CAGR) accounts for the general growth of the Park and overall market demand. The CAGR can then be applied to current known demand data to predict growth. To calculate the general Park growth, data on the space rented out by the Park and the number of employees working at the Park starting in 2017 through June 2023 was collected. This data was converted into a CAGR for both the space rented and the number of employees. These two CAGRs were then averaged together to create the Park's overall growth rate. The averaged CAGR considers factors such as:

- The overall growth of resident companies
- The conversion rate of prospects into Park resident companies
- The addition of unforeseen companies
- Companies graduating or stopping operations
- The growth-distorting effects of adding additional facilities

Calculating KU Innovation Park's Annual Growth Rate

A compound annual growth rate of 17.153% was calculated. Figure 1 breaks down the data and calculations used. Using the space rented and the number of employees is a reliable method for determining Park growth for the following reasons:

- Using the total number of employees rather than the number of companies eliminates the variance in size among tenant companies.
- Employee numbers account for companies and their employees exiting the system, which is a more accurate net figure than a rate based on existing company growth.
- Using company growth rates fails to account for companies that are no longer part of the KU Innovation Park system.

Figure 1

| | Rented Space (Sq. Ft.) | Number of Employees |
|---------------------------------------|------------------------|---------------------|
| 2017 | 27,609 | 181 |
| June 2023 | 66,672 | 428 |
| Number of Periods | 5.5 | 5.5 |
| CAGR | 17.368% | 16.938% |
| KUIP's Averaged CAGR = 17.153% | | |

Applying KU Innovation Park's Annual Growth Rate

Using KU Innovation Park's CAGR, it is possible to predict what the demand for rented space will be over the next five years. Figure 2 shows what the predicted demand for rentable space will be solely based on the past growth of the Park. The gross rented space increase is 80,461 square feet, which is the 2028 demand prediction subtracted by the June 2023 current rented space. The gross rented space is then multiplied by the shareable space multiplier to give us the total amount of predicted building square footage needed in 2028, or the gross increase.

Analysis of KU Innovation Park's Annual Growth Rate

Projections were then converted from rented square footage into gross square footage using a multiplier of 1.4447. This was the ratio of total square footage to private office/lab space in KU Innovation Park's Phase III building, which Phases IV and V will emulate. Gross square footage includes shared workspaces, conference rooms, common areas, and support areas.

Analysis of KU Innovation Park's Growth

Based solely on the CAGR, it is estimated that the Park will have an increased demand of 116,242 square feet in total space in five years (Figure 2). Some of this demand can be alleviated by the 4,900 square feet currently available space in the main facility. However, this number demonstrates a large demand for new space. Opening Phase III was a significant driver in boosting the Park's CAGR, committing all 45,600 square feet within six months of opening, demonstrating that newly built space will be filled. Additionally, the upward trend of the targeted industries correlates to our current tenants' growth.

Because national security is becoming an increasing focus, KU's KARL lab is expected to expand into Phase IV. Invary recently raised over \$1.8 million to fund its startup company. Sen. Jerry Moran has expressed great interest in national security and furthering public and private industry growth in this sector. He has been a key governmental supporter of the Park and is working to secure \$22 million in congressional funding for Phase IV.

Bioinnovation is also becoming a booming industry full of technological and biological advances. IdentiGen's footprint is now over three-and-a-half times larger since moving into the Park. They recently were acquired by another Park and Fortune 100 pharmaceutical company, Merck Animal Health, and now have over 10,000 square feet of space in Phase III. Argenta is a large animal health company whose flagship U.S. operation is set to move into new lab space in Phase III because they have outgrown their space in the main facility. ViroVax is a tenant that has large amounts of funding from National Institutes of Health (NIH) grants allocated to research and development. Companies are elevating their growth and expertise due to the rising interest in both the national security and bioinnovation markets.

Figure 2

| Year | Rented Space (Sq. Ft.) |
|--|------------------------|
| June 2023 | 66,672 |
| 2024 | 78,108 |
| 2025 | 91,506 |
| 2026 | 107,202 |
| 2027 | 125,590 |
| 2028 | 147,133 |
| Subtract Current Rentable Space | (66,672) |
| Gross Rented Space Increase | 80,461 |
| Multiplier for Shareable Space | 1.4447 |
| Gross Increase (2028) | 116,242 |

CONCLUSION



The demand analysis for Phases IV and V of KU Innovation Park indicates promising opportunities for growth and development. The market analysis highlights the potential in the national security and bioinnovation & sustainability sectors. The Park itself has been a catalyst for creating this demand. This is evident by three major companies racing for the final 7,500 square feet in Phase III. The CAGR numbers support this inference as well, sitting at 17.153%, well above the 9-12% that is considered “good” for large companies.

The demand and space for Phase V is less than that of IV, but still is on par with the Park’s growth and potential prospects. Larger biotech and sustainability companies are tougher due to many building their own facilities. The proximity to KU and its students must be emphasized as a point of recruitment to get satellite locations. Additionally, the biggest opportunity to fill space in Phase IV likely will be companies currently located at the Park that seek expansion from their current labs.

The demand and potential for classified space in Phase IV should not be underestimated. The opportunity for both KARL and private industry to have classified space in a national security building would establish the Park as a leader in the region and across the country. A fusion center would be a major draw for all parties interested in national security, especially with new federal regulations coming that require more secure research. This would also legitimize the Park’s efforts and emphasis on security. Therefore, a greater emphasis should be placed on Phase IV, and the initial evaluation of 80,000 square feet should be expanded to roughly 85,000-90,000 square feet.



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