

Advanced Manufacturing in the Bluegrass Region

November 2022

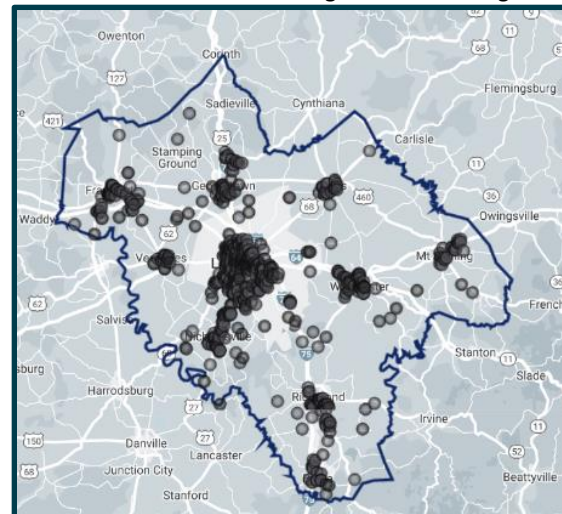
Advanced manufacturing is a key aspect of the Bluegrass Region’s economy and is a targeted industry for Lexington’s economic development efforts. Advanced manufacturing uses innovation and technology to improve the manufacturing process, typically through the incorporation of computer technology, advanced robotics, information technologies, automation, precision control of the manufacturing process, customization, sustainability, waste reduction, and eco-friendly technologies and practices.

Kentucky’s manufacturing industry is a vital part of our state economy and offers Kentuckians promising careers. According to the Kentucky Cabinet for Economic Development, there are 5,000 manufacturing related facilities in Kentucky employing 250,000 Kentuckians¹. Additionally, Kentucky ranks among the leading manufacturing states with 13% of its nonfarm employment in manufacturing¹. Kentucky manufacturing companies not only provide jobs and economic prosperity, but they also produce national brands such as Pop-Tarts, Dixie Cups, Jif peanut butter, Post-It Notes, Hot Pockets, Kentucky Ale, Tiffany & Co. jewelry, numerous brands of bourbon, and automobiles such as Toyota’s Avalon and Lexus ES 350.

Kentucky offers a central geographic location for quickly delivering supplies and manufactured goods and parts to two-thirds of the nation’s population, personal income, and manufacturing facilities². It is also home to three major air cargo hubs and engineering schools at major universities including the University of Kentucky and University of Louisville. The state also holds the No. 1 status nationally in passenger vehicles produced per capita³.

Kentucky’s recently improved and expanded business assets include apprenticeship programs that give students classroom education and work experience with manufacturers, extensive resources and programs for entrepreneurs, and a pro-business environment focused on cutting red tape and giving companies the tools they need for success.

Manufacturing Jobs in the Bluegrass



Manufacturing jobs are represented in black. Source: Data Axle-GIS Planning integration. October 2022

¹ https://ced.ky.gov/Newsroom/NewsPage/20221003_Manufacturing_Month

² <http://thinkkentucky.com/kyedc/pdfs/LogisticsQuickFacts.pdf?07112017&49>

³ http://www.thinkkentucky.com/existing_industries/Automotive.aspx

Select Advanced Manufacturing Companies in Lexington		
Company	Services	Employees
Toyota Motor Manufacturing	Auto Manufacturing	9,712
Lockheed Martin	Contractor Support	1,500
Webasto Roof Systems	Automotive Parts	619
Schneider Electric	Energy Machinery	598
Big Ass Fans	Industrial Ceiling Fans	547
Link-Belt Cranes	Construction Equip.	525
Georgia Pacific	Paper Products	360
The J. M. Smucker Company	Peanut Butter	280
Pepsi-Cola Bottling Co.	Production	219
Emerson	Electric Drives, Controls	160
Tiffany & Co.	Jewelry	160

Source: Commerce Lexington, 2022.⁵

The region’s most prominent advanced manufacturer is Toyota Motor Manufacturing Kentucky, Inc. (TMMK) in Georgetown, an automotive assembly facility established in 1986 by Toyota Motor Corporation. The facility, Toyota’s largest manufacturing plant in the world, produces four cylinder and V-6 engines, Camry, Lexus ES 350, and the RAV4 Hybrid, an addition that increased its production by 100,000 vehicles per year⁴.

The philosophy of the Toyota Production System is “the complete elimination of all waste.” Toyota’s Just-in-Time system quickly and efficiently produces and delivers only vehicles ordered by customers, without excess. Toyota’s machines monitor production quality and automatically shut off when the process completes or when a quality or equipment problem arises. This ensures high quality of production, increases processing capacity, and allows operators to monitor several machines at once.



In 2017, Toyota invested \$1.33 billion and \$120 million in TMMK to increase their 2.5-liter engine production and implement Toyota New Global Architecture⁵. Toyota’s most recent investment of \$238 million, in 2019, came in response to the increasing demand for hybrid vehicles. The

finances added the production of the Lexus ES Hybrid and RAV4 Hybrid to the Georgetown plant⁶.

Webasto Roof Systems, one of the world’s largest automotive suppliers, has a sunroofs and components production facility in Lexington, their largest in North America. Webasto researchers and developers work with automotive manufacturers to design highly specific custom prototypes and produce sunroofs for individual make and model specifications, a process which takes around two years from design to production. In 2018, Webasto invested \$15.2 million in their expansion and created 183 new jobs.



⁴ <https://locateinlexington.com/wp-content/uploads/Toyota-to-Add-Hybrid-Version-Production-of-RAV4-and-Lexus-ES-in-Georgetown-1.pdf>

⁵ <https://locateinlexington.com/about-us/media-center/>

⁶ <https://locateinlexington.com/wp-content/uploads/Toyota-to-Add-Hybrid-Version-Production-of-RAV4-and-Lexus-ES-in-Georgetown-1.pdf>

The iconic household brand Jif Peanut Butter is made here in Lexington by J.M. Smucker, a leading food products manufacturer. The Jif plant in Lexington is the largest peanut butter production facility in the world, requiring 188 billion peanuts annually and employing around 280 people. Since 2013, Smucker has invested over \$143 million in the Lexington facility to increase efficiency and productivity, improve machinery and equipment, and increase product line capacity.



The Jif plant is the largest peanut butter producer in the world.

CLARK



Photo: Clark Material Handling Company

With over 550 locations worldwide and in more than 80 countries, CLARK Material Handling Company's North American headquarters and manufacturing operation calls Lexington home. CLARK is a top-10 manufacturer of lift trucks globally and was named one of the Best Places to Work in Kentucky in 2022⁷. Today, there are over 250,000 CLARK lift trucks being used in North America and 350,000 internationally⁸. The company has been one of the Bluegrass's fastest growing companies and has undergone two expansions since 2015 with a total of \$9.8 million investment and creation of 70 full-time jobs⁹.

Each of these companies' commitment to the region is proof that Lexington is a great place for advanced manufacturing. The region's strong transportation network helps serve manufacturing operations, allowing for the easy import of component supplies and the export and distribution of finished products, and Lexington's workforce provides the innovative and skilled talent these companies need.

R&D in Advanced Manufacturing

One of Lexington's most unique assets for the advanced manufacturing industry is Secat, Inc. Secat is a metallurgical research laboratory specializing in aluminum product and process technologies. Their location in UK's Coldstream Research Campus grants them access to resources at the University of Kentucky and proximity to clients in their target markets. The company's R&D services support numerous aluminum product industries including automotive, marine, aerospace, construction, and electrical. Secat's suite of services supports local industry through materials testing, failure analysis, alloy development, and process enhancements in forging and casting, with much more. These on-site services are supplemented by available expertise provided through industry consultants and other national laboratories. The Bluegrass Region's concentration of advanced manufacturers gives Secat access to clients and, in turn, their R&D activities have continued to draw even more companies in the aluminum industry into the region.



Photo: Secat, Inc.

⁷ <https://www.clarkmhc.com/News/ShowStory/59ba9320-e258-4814-bdbc-c71f285bac2b>

⁸ <https://www.clarkmhc.com/Company/>

⁹ <https://locateinlexington.com/data-facts-and-figures/locations-and-expansions/>



In February 2019, the E D Bullard Company expanded their operations from nearby Cynthiana to Lexington by opening a R&D facility called the Bullard Center. Bullard is a global leader in manufacturing personal protective equipment such

as thermal imagers, hard hats, firefighter and rescue helmets, supplied air respirators, powered air-purifying respirators, and air quality equipment. The fifth-generation family-owned business, originally founded in San Francisco, created the “Hard Boiled” hat in 1919, also known today as the hard hat. In 1991, Bullard’s headquarters relocated to Cynthiana Kentucky¹⁰. Bullard’s decision to build the Bullard Center in Lexington was motivated by a desire to greater utilize the talent the city offers. The facility is used by the company’s marketing and product development teams to develop future Bullard products and services.

The University of Kentucky’s College of Engineering is actively invested in increasing our region’s competitive advantage in advanced manufacturing by developing the future of manufacturing processes and technology. The College of



Engineering does this through the Institute for Sustainable Manufacturing (ISM) and the Institute of Research for Technology Development (IR4TD). ISM is a multidisciplinary collaborative research unit whose primary objectives are to develop and advance sustainable manufacturing principles and practices in Kentucky, the nation, and the world. The institute is an asset for companies in Kentucky seeking to grow their business through technology transfer focused on sustainable products, processes, and manufacturing systems¹¹. IR4TD is a unique engineering research center dedicated to research, education, outreach, and service. The organization uses a win-win approach to industry collaboration where both the individual and society benefit. IR4TD’s areas of research include coating and surface protection systems, combustion and fluid sciences, energy and environment, imaging and visualization, nanotechnology, nondestructive testing and evaluation, and scale modeling¹².

¹⁰ <https://www.bullard.com/about-bullard>

¹¹ <https://www.engr.uky.edu/ism>

¹² <https://www.engr.uky.edu/ir4td/research>

Location

Lexington's central location and excellent transportation system have been major factors in Kentucky's growth and development. Lexington is located at the center of a 31-state distribution area and is within a 600-mile radius of most of the nation's manufacturing employment, retail sales, and population. By virtue of this geographic location and Kentucky's integrated system of state-maintained roads, interstates, and parkways, Lexington is within overnight range of over half of the United States' market¹³.



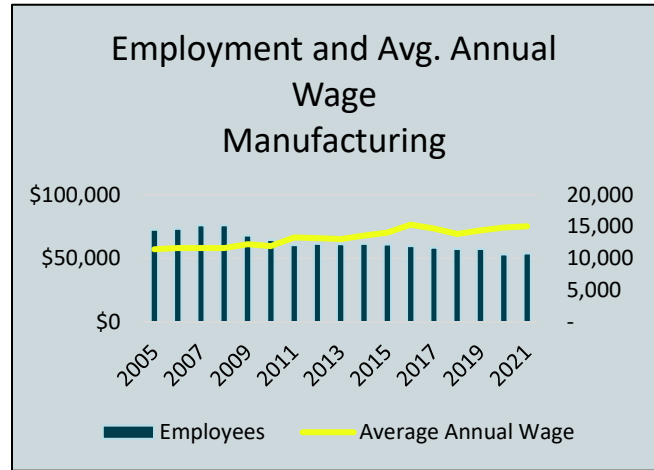
Central Kentucky also boasts two major interstate highways: Interstate-75 and Interstate-64. I-75, a major north-south corridor, and I-64, a major east-west route, intersect north and east of downtown Lexington. Lexington is also home to the Blue Grass Airport and is within an hour's drive of the Cincinnati/Northern Kentucky International Airport and the Louisville International Airport. The Blue Grass Airport offers 16 non-stop destinations and 40 daily flights, the Cincinnati Airport offers 55 non-stop destinations and 179 daily flights, and the Louisville airport offers 37 non-stop destinations and 150 daily flights¹⁴.

¹³ <http://thinkkentucky.com/kyedc/pdfs/LogisticsQuickFacts.pdf?07112017&49>

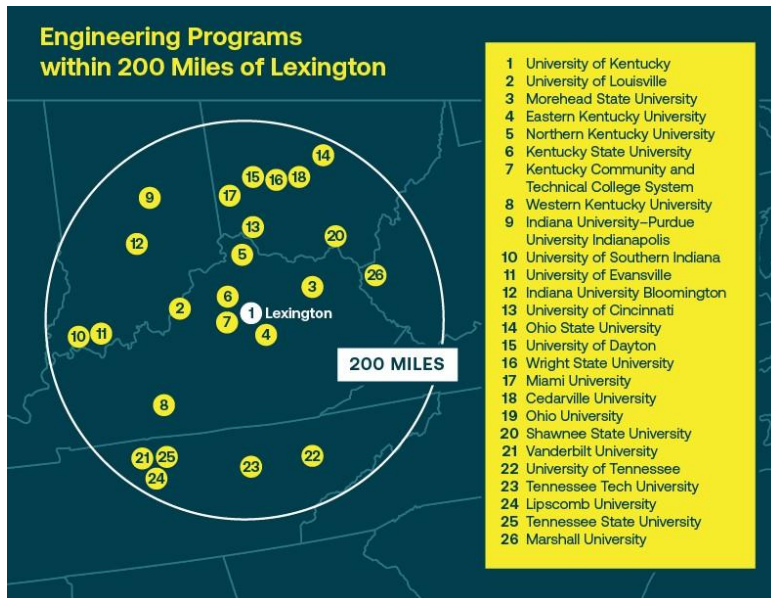
¹⁴ <https://locateinlexington.com/data-facts-and-figures/>

Workforce

Lexington’s workforce is one of the strongest regional benefits available to the advanced manufacturing industry. The 2020 Census data ranks Lexington the 11th most educated city in the nation among cities with at least 300,000 people, with 45.0% of the population 25 years or older with at least a bachelor’s degree. Even more impressive, 20% of the population over age 25 has an advanced degree, ranking Lexington 10th. This is due in part to being within 40 miles of 10 colleges and universities. Nearly 70,000 students are enrolled in these institutions, awarding over 20,000 degrees and credentials annually¹⁵. Lexington has received numerous accolades fueled by its educated population, including being ranked the #4 Top Potential Tech Growth Center by *the Brookings Institute* in 2019¹⁶, #11 Best Untapped City for Startups in 2020 by *Fundera*¹⁷, and the #6 Best City for New College Grads by *SmartAsset* in 2021¹⁸.



Source: Bureau of Labor Statistics, Quarterly Census of Employment and Wages, Annual Averages.



Specific to advanced manufacturing, the University of Kentucky’s College of Engineering offers undergraduate, master’s, and doctoral programs in engineering. Within a 200-mile radius of Central Kentucky, there are 26 institutions of higher learning with engineering programs, including the University of Kentucky, the University of Cincinnati, the University of Louisville, and the University of Tennessee. These schools provide an excellent workforce from which to draw talented workers in the areas of engineering, including biosystems and

agricultural, biomedical, computer science, civil, mechanical, mining, electrical and computer, and chemical and materials, to name only a few.

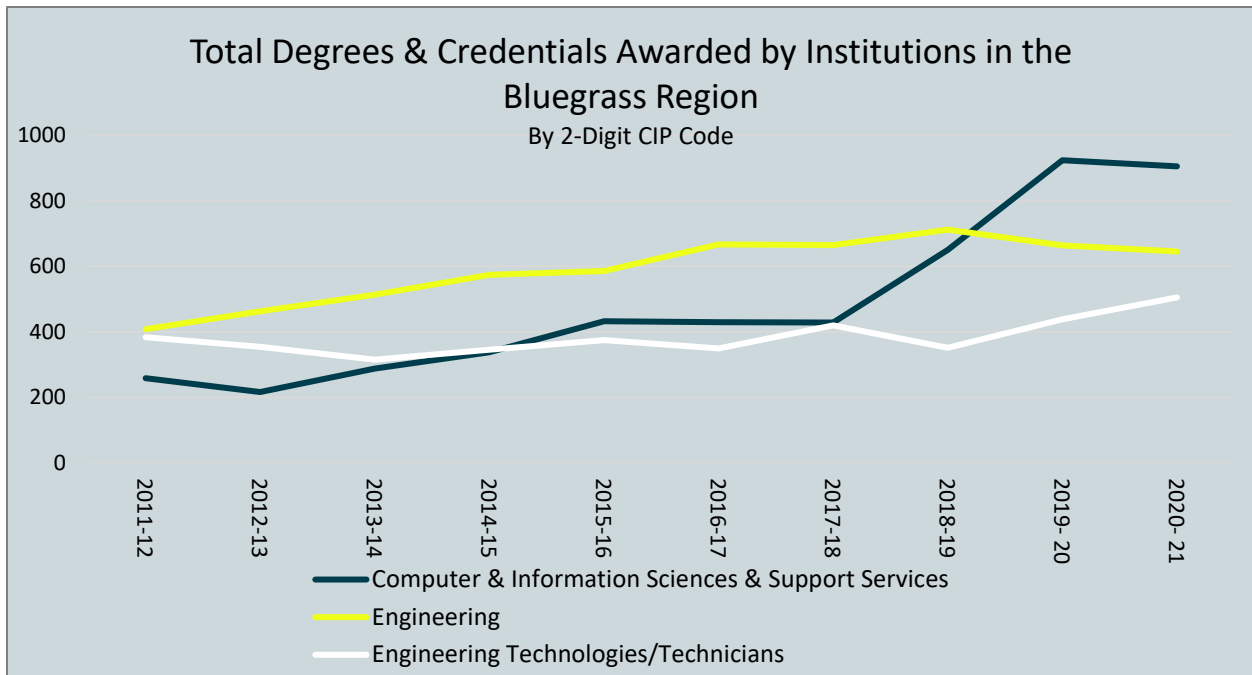
¹⁵ <https://locateinlexington.com/data-facts-and-figures/why-lexington/educated-workforce/> - Commerce Lexington Inc. analysis of Kentucky Council on Postsecondary Education and U.S. Census Bureau ACS data.

¹⁶ <https://www.brookings.edu/research/growth-centers-how-to-spread-tech-innovation-across-america/>

¹⁷ <https://www.fundera.com/blog/best-untapped-cities-for-startups>

¹⁸ <https://smartasset.com/checking-account/the-best-cities-for-new-college-grads-in-2019>

Another educational opportunity geared towards advanced manufacturing in the region is the Advanced Manufacturing Technician program. Operated by KY FAME, a partnership between regional manufacturers, the AMT program builds a sustainable advanced manufacturing workforce through an apprentice-based curriculum that combines learning with hands-on experience in an immersive environment. Students learn the knowledge and skills required to be advanced manufacturing technicians, such as electricity, robotics, fluid power, mechanics, fabrication, and industrial troubleshooting, and apply those concepts while working part-time for actual manufacturers in the region, such as Toyota and Link-Belt. Today, KY FAME is made up of over 125 member companies, 56 employer sponsors, and over 10 partner colleges. Graduates from the program have a 98% job placement rate¹⁹.



Source: KY Council on Postsecondary Education, Data Center, Degrees and Credential Awarded.

In January 2017, the Advanced Manufacturing Center (AMC) in Georgetown welcomed AMT and Bluegrass Community and Technical College (BCTC) students for the first time. The 78,000 square foot building was designed to look, feel, and operate like a manufacturing facility to enhance students' learning and skill development, while also including classrooms, offices, and computer labs. Classes support the BCTC programs in industrial maintenance, electronics, PLCs, industrial electricity, robotics, mechanical drives, fluid power,



Photo: BCTC Georgetown/Scott County Advanced Manufacturing Center.

¹⁹ <https://kyfame.com/>

machining, and welding. The AMC also offers traditional general education courses for Scott County and surrounding communities²⁰.

According to the U.S. Census Bureau and the Bureau of Labor Statistics, the Bluegrass Region has a population nearing 700,000 and a labor force of over 171,000²¹. The area has a high concentration of many of the occupations required for advanced manufacturing, including engineers, technicians, and support staff.

Lexington-Fayette MSA Select Occupations			
Occupation	Location Quotient	Median Hourly Wage	Average Annual Wage
Chemical Engineers	0.97	\$50.78	\$113,350
Electrical Engineers	1.00	\$45.82	\$95,430
Materials Engineers	2.10	\$45.82	\$93,870
Mechanical Engineers	1.24	\$38.16	\$87,590
Industrial Engineers	1.90	\$37.30	\$83,360
Mechanical Engineering Technologists and Technicians	0.72	\$28.91	\$55,980
Multiple Machine Tool Setters, Operators, and Tenders, Metal and Plastic	0.29	\$21.34	\$42,140
Machinists	1.97	\$23.05	\$49,900
Cutting, Punching, and Press Machine Setters, Operators, Tenders	2.24	\$19.32	\$41,860
Chemical Equipment Operators and Tenders	0.63	\$19.26	\$48,070
Plating Machine Setters, Operators, and Tenders, Metal and Plastic	1.14	\$15.10	\$34,630

Source: May 2021 Metropolitan and Nonmetropolitan Area Occupational Employment and Wage Estimates, Lexington-Fayette MSA

Cost of Doing Business

Lexington and Kentucky are known for their low overall costs of doing business in the eastern United States. In 2019, *SmartAsset* ranked Lexington the #6 City with the Lowest Startup Costs. *Business Facilities* also ranked Lexington the #8 Mid-sized Metro with the Best Business Climate in 2022²².



Kentucky enjoys a tremendous competitive advantage in the provision of energy, natural gas, and water supply. Kentucky’s industrial sector energy costs are among the lowest in the nation, averaging over 18% lower than the national average²³. Utility costs are kept low because of Kentucky’s large coal reserves, coal burning utility plants, ample water supply, and location on the natural gas transportation corridor. Kentucky’s competitive tax climate also helps keep costs of business low.

²⁰ <https://bluegrass.kctcs.edu/about/campuses/georgetown/>
²¹ U.S. Census Bureau, ACS, 2020- 5-Year Estimates
²² <https://locateinlexington.com/data-facts-and-figures/bluegrass-rankings/>
²³ <https://locateinlexington.com/data-facts-and-figures/why-lexington/low-business-costs/>

The available building inventory in Lexington varies periodically, but an inventory of manufacturing and warehousing/distribution facilities priced below the national average is available. Industrial lease rates range from \$1.95 per square foot for bulk warehouse space to \$14.00 per square foot and beyond for high-tech R&D space²⁴. The vacancy rate for industrial buildings at mid-year 2021 was 2.85%²⁵.

Local Attributes

Lexington is one of the best places to live and raise a family. The region enjoys a wealth of natural beauty and offers various outdoor activities that take advantage of those resources. The high quality of life and good school systems help Lexington receive consistent recognition such as ranking 6th Best City for New College Grads by *SmartAsset* in 2021, 9th Most Diversified Metro Economies in the US by *WalletHub* in 2020, and 5th Most Affordable City for an Early Retirement by *SmartAdvisor Match* in 2020²⁶. Lexington boasts many outstanding lifestyle and cultural amenities including premiere horse-racing, numerous museums, and prestigious athletic teams. From the excitement of cheering your favorite horse down the stretch to the unsurpassed collegiate athletics to working with companies from around the globe, Lexington offers all the amenities of a major metropolitan area with the immediate escape of pastoral countryside.



The Arboretum, State Botanical Garden of Kentucky

Lexington's central location, strong manufacturing background, and educated workforce are among the many reasons Lexington is a great location for advanced manufacturing. Our affordable cost of living and desirable quality of life makes the Bluegrass Region the ultimate location for employees and their families, while Lexington's productive workforce, central location, and pro-business environment also provide a profitable location in which to conduct business. For an insider look into life in Lexington, click [here](#).

²⁴ Commerce Lexington Inc. analysis of online listings, <https://locateinlexington.com/find-properties/>.

²⁵ <http://www.naiisaac.com/expertise/research>

²⁶ <https://locateinlexington.com/data-facts-and-figures/bluegrass-rankings/>

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