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## Advanced Manufacturing in the Bluegrass Region

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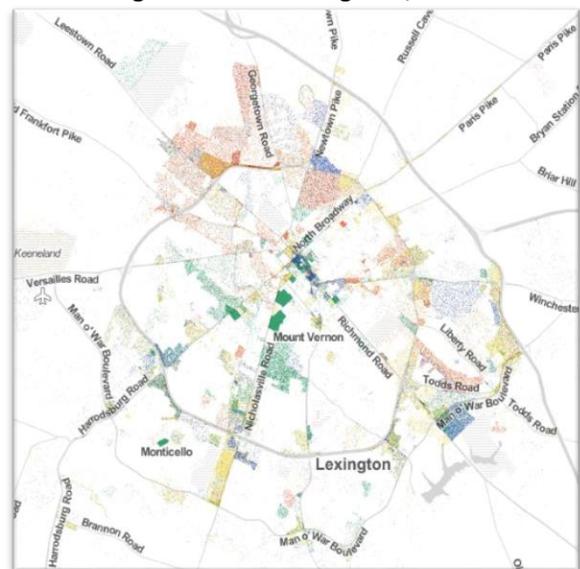
Advanced manufacturing is a key aspect of the Bluegrass Region's economy and is a targeted industry for Lexington's economic development efforts. Advanced manufacturing uses innovation and technology to improve the manufacturing process, typically through the incorporation of computer technology, advanced robotics, clean technology, information technologies, automation, innovation, 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 4,500 manufacturing related facilities in Kentucky employing around 256,000 Kentuckians full-time. Additionally, Kentucky ranks among the leading manufacturing states with 12.8% of its workforce in manufacturing. Kentucky manufacturing companies not only provide jobs and economic prosperity, 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 Camry, RAV4 Hybrid, and Lexus ES 350.

A major focus of Governor Matt Bevin and his administration is to establish Kentucky as the engineering and manufacturing hub of America. Kentucky offers a central geographic location for quickly delivering supplies and manufactured goods to two-thirds of the nation's population. It is home to three major air cargo hubs and engineering schools at major universities. The state also holds the No. 1 status nationally in passenger vehicles produced per capita.

Recently improved and expanded 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

Lexington Manufacturing Jobs, in Red



Source: Robert Manduca, "Employment in America, 2014".

success.

In 2011, the mayors of Louisville and Lexington launched the Bluegrass Economic Advanced Movement (BEAM), an initiative to develop a joint regional business plan to support a leading advanced manufacturing sector with higher average wage jobs. The BEAM Region represents over 2 million people in 22 counties, and approximately 31% of the BEAM population resides in the eight counties<sup>1</sup> of the Bluegrass.

An influential outcome of the BEAM initiative was the [BEAM Trade and Investment Plan](#). Developed in collaboration with the Brookings Global Cities Initiative, the plan examines the importance of foreign direct investment (FDI) and proposes the way forward for metropolitan cultivation of FDI that helps build a resilient and growing BEAM economy. In the BEAM Region, foreign investments have contributed to performance in automotive, chemical, steel, and plastics manufacturing, as well as to the signature bourbon and thoroughbred horse industries. BEAM continues to be important to the region as partners investigate targeted strategic improvements.

Select Advanced Manufacturing Companies in Lexington		
Company	Services	Employees
Toyota Motor Manufacturing	Auto Manufacturing	8,000
Lockheed Martin	Contractor Support	1,100
Link-Belt	Construction Equip.	740
Webasto Roof Systems	Automotive Parts	660
Big Ass Fans	Industrial Ceiling Fans	550
Schneider Electric	Energy Machinery	515
Georgia Pacific	Paper Products	275
Jif – J. M. Smucker Company	Peanut Butter	270
Aventics	Electric Drives, Controls	245
Ceradyne, a 3M company	Ceramic Energy Parts	230
Tiffany & Co.	Jewelry	111

Source: Commerce Lexington, 2018.

One of the Bluegrass Region’s most prominent advanced manufacturers is Toyota Motor Manufacturing Kentucky, Inc. (TMMK) in Georgetown, an automotive assembly facility established in 1986 by Toyota Motor Corporation. The facility produces four cylinder and V-6 engines, Camry, Camry Hybrid, Avalon, Avalon Hybrid, Lexus ES, Lexus ES Hybrid, and the RAV4 Hybrid, an addition that increased its production by 100,000 vehicles per year. Currently, around 8,000 Kentuckians are employed at TMMK. 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 in order to increase their 2.5-liter engine production and implement Toyota New Global Architecture. 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 plant.

<sup>1</sup> Bourbon, Clark, Fayette, Franklin, Jessamine, Madison, Scott, and Woodford Counties.

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.

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 290 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.

Each of these companies’ recommitment 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.

*“We truly are in better position than anyone else to be the engineering and manufacturing hub of America. And we’ve made phenomenal progress. Nearly \$13.5 billion in capital investment and almost 26,000 jobs in engineering and manufacturing have been announced in Kentucky over the last three years. We are positioning Kentucky to be a global leader in automotive and appliance engineering and manufacturing, just as we already lead in stainless steel and sheet aluminum production.”*

*-Matt Bevin, Governor of Kentucky*

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 as well. Additionally, 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 aluminum industry players into the region.

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 systems. 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 modeling.

### 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 the majority 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' market.



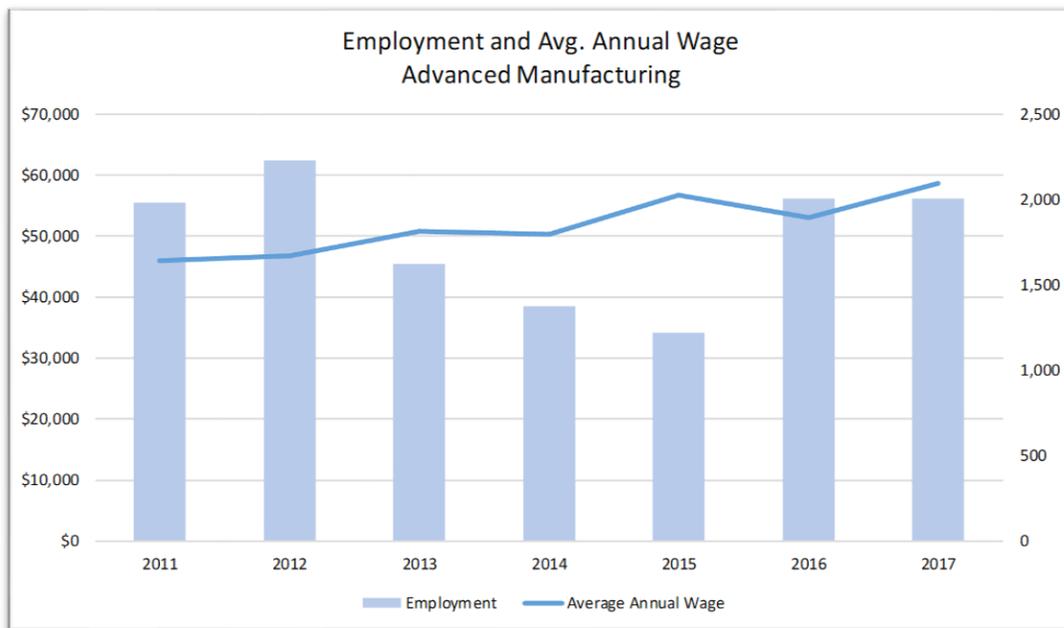
Central Kentucky also boasts two major interstate highways: Interstate-75 and Interstate-64. I-75, a major north-south corridor, and I-64, a major east-west route, intersect north and east of downtown Lexington. Lexington is also home to the Blue Grass Airport and is within an hour's drive of the Cincinnati/Northern Kentucky International Airport and the Louisville International Airport. The Blue Grass Airport offers 17 non-stop destinations and 44 daily flights, the Cincinnati Airport offers 60 non-stop destinations and 180 daily flights, and the Louisville airport offers 31 non-stop destinations and 150 daily flights.

### Workforce

Lexington's workforce is one of the strongest regional benefits available to the advanced manufacturing industry. The 2017 Census data ranks Lexington the 14<sup>th</sup> most educated city in the nation among cities with at least 300,000 people, with 41.8% of the population 25 years or older with at least a bachelor's

degree. Even more impressive, 18% of the population over age 25 has an advanced degree, ranking Lexington 11<sup>th</sup>. This is due in part to being within 40 miles of 10 colleges and universities. Nearly 70,000 students are enrolled in these institutions, graduating over 17,000 annually. Lexington ranked the World's 24<sup>th</sup> Smartest City by *National Geographic* in 2014, 19<sup>th</sup> Best College Town by *Best College Reviews* in 2016, and the 2<sup>nd</sup> Best Mid-sized City for New Grads by *Online Degrees* in 2018.

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 11 universities with significant engineering programs, including the University of



Source: May 2017 Metropolitan and Nonmetropolitan Area Occupational Employment and Wage Estimates, Lexington-Fayette MSA

Kentucky, the University of Cincinnati, the University of Louisville, and the University of Tennessee. These universities provide an excellent workforce from which to draw talented workers in the areas of engineering, including biosystems and agricultural engineering, biomedical engineering, computer science, civil engineering, mechanical engineering, mining engineering, electrical and computer engineering, and chemical and materials engineering, to name only a few.

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.

In January 2017, the new 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, machining, and welding. The AMC also offers traditional general education courses for Scott County and surrounding communities.



The Bluegrass Region has a population of 639,034 and a labor force of 340,932. We have a strong presence of occupations required for advanced manufacturing, such as engineers and technicians, as well as support staff occupations.

Lexington-Fayette MSA Select Occupations			
Occupation	Location Quotient	Average Hourly Wage	Average Annual Wage
Chemical Engineers	1.26	\$47.92	\$99,670
Industrial Engineers	1.33	\$39.95	\$83,100
Industrial Engineering Technicians	0.41	\$24.56	\$51,070
Mechanical Engineers	1.49	\$43.46	\$90,390
Mechanical Engineering Technicians	1.28	\$26.84	\$55,830
Cutting, Punching, and Press Machine Setters, Operators, Tenders	0.84	\$16.02	\$33,320
Molding, Coremaking, and Casting Machine Setters, Operators, and Tenders	-	\$14.13	\$29,400
Multiple Machine Tool Setters, Operators, and Tenders	0.88	\$18.23	\$37,920

Source: May 2017 Metropolitan and Nonmetropolitan Area Occupational Employment and Wage Estimates, Lexington-Fayette MSA

### Cost of Doing Business

Lexington and Kentucky have one of the lowest overall costs of doing business in the eastern United States. In 2014, KPMG ranked Lexington #7 in Lowest International Business Location Costs in the U.S. Northwest/Canada Region and, in 2017, *Business Facilities* ranked Kentucky #5 Best Cost of Doing Business and #8 Lowest Industrial Electricity Rates.



*Ground breaking for Lexington manufacturer Big Ass Fans.*

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 almost 20% lower than the national average. 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. In 2015, Lexington was ranked #16 Best Place for Business and Careers by *Forbes*, and *Area Development* ranked Kentucky #10 Best State for Doing Business. Additionally, in 2017, *Hero Pay* ranked Lexington the #8 Best City to Start a Business.

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 \$2.25 per square foot for bulk warehouse space to \$14.00 per square foot and beyond for high-tech R&D space. The vacancy rate for industrial buildings during the first half of 2017 was 3.26%.

### **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 #16 Best Large City to Live In by *Wallet Hub* in 2016, #8 Best City to Live in America by *Money* in 2018, and #3 Best City to Raise a Family by *Zumper* in 2018. 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 make 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.

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