



330 East Main Street
 Lexington, KY 40507
 Ph. (859) 254-4447
 LocateInLexington.com

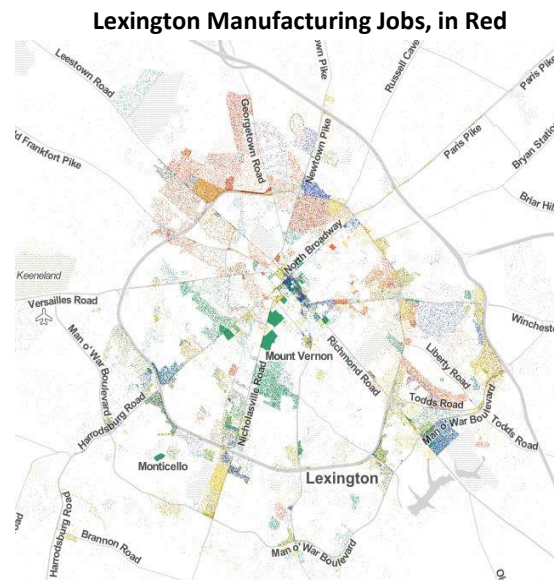
Advanced Manufacturing in the Bluegrass Region

August 2017

Advanced manufacturing is a key aspect of the Bluegrass Region’s economy and is a targeted industry for Lexington’s economic development. 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 over 2,400 manufacturers in Kentucky employing around 252,000 Kentuckians full-time. 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 Camrys and Lexus ES 350.

In 2011, Mayor Jim Gray of Lexington and Mayor Greg Fischer of Louisville 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 counties¹ of the Bluegrass. In 2013, the Mayors in partnership with the Brookings Institution released a report – “Seizing the Manufacturing Movement: An Economic Growth Plan for the Bluegrass Region of Kentucky” – concluding that the Lexington-Louisville region has a promising manufacturing base, but it will need to invest in more research, innovation, and workforce



Source: Robert Manduca, “Employment in America, 2014”

¹ Bourbon, Clark, Fayette, Franklin, Jessamine, Madison, Scott, and Woodford Counties.

improvements to remain competitive. Since then, Kentucky has experienced record-breaking export growth in the past five years, and exports in 2016 totaled over \$29 billion. Kentucky’s top five exports were aerospace parts and products (\$10.8 billion), motor vehicles and parts (\$5.5 billion), pharmaceutical and medicines (\$1.8 billion), resin, rubber, fibers, and filaments (\$1.1 billion), and basic chemicals (\$741 million).

In November 2016, the mayors unveiled the [BEAM Trade and Investment Plan](#). Developed in collaboration with the Brookings Global Cities program, 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. Foreign-owned firms in the U.S. make outsized contributions to the fundamental components of vibrant economic centers, accounting for significant innovation, research, and exports production, in addition to high-wage jobs. 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. The BEAM project is ongoing as key regional partners investigate targeted strategic improvements.

Select Advanced Manufacturing Companies in Lexington		
Company	Services	Employees
Toyota Motor Manufacturing	Auto Manufacturing	8,200
Lockheed Martin	Contractor Support	1,100
Trane Lexington	Air Handling Systems	800
Big Ass Solutions	Industrial Ceiling Fans	799
Webasto Roof Systems	Automotive Parts	760
Link-Belt	Construction Equip.	700
Schneider Electric	Energy Machinery	500
Jif – J. M. Smucker Company	Peanut Butter	280
Aventics	Electric Drives, Controls	245
Georgia Pacific	Paper Products	230
Ceradyne, a 3M company	Ceramic Energy Parts	230
Tiffany & Co.	Jewelry	125

Source: Commerce Lexington, 2016.

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, and the first U.S. assembled Lexus, an addition that increased its production by 50,000 vehicles. Currently, around 8,200 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.

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. Webasto recently invested \$10 million in expansions and modernization, and created 65 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 280 people. In 2013, Smucker announced it would invest over \$43 million in upgrades to increase efficiency and productivity, improve machinery and equipment, and increase product line capacity. In a press release for the announcement, Gov. Beshear said, “This investment of \$43 million in Lexington really shows the commitment to Smucker’s growth and success here, and is a testament to the positive relationship the company has with the Commonwealth.”



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.

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 18 non-stop destinations and 42 daily flights, the Cincinnati Airport offers 54 non-stop destinations and 194 daily flights, and the Louisville airport offers 27 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 2015 Census data ranks Lexington the 11th most educated city in the nation among cities with at least 300,000 people, with 41.6% of the population 25 years or older with at least a bachelor's degree. Even more impressive, 18.9% of the population over age 25 has an advanced degree, ranking Lexington #9. 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 16,000 annually. Lexington ranked the World's 24th Smartest City by *National Geographic* in 2014 and the 19th Best College Town by *Best College Reviews* in 2016.

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 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 Georgetown, Scott County, and surrounding communities.

The Bluegrass Region has a population of 646,858 and a labor force of 330,126. 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	1.27	\$48.60	\$101,080
Industrial Engineers	1.21	\$40.14	\$83,480
Industrial Engineering Technicians	0.54	\$20.50	\$42,640
Mechanical Engineers	1.72	\$42.97	\$89,390
Mechanical Engineering Technicians	1.07	\$26.10	\$54,290
Cutting, Punching, and Press Machine Setters, Operators, Tenders	0.70	\$16.28	\$33,860
Molding, Coremaking, and Casting Machine Setters, Operators, and Tenders	-	\$14.34	\$29,830
Multiple Machine Tool Setters, Operators, and Tenders	0.89	\$18.61	\$38,710

Source: May 2016 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 #8 Top Lowest Industrial Electricity Rates.

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, *Forbes* ranked Lexington #16 Best Place for Business and Careers and *Area Development* ranked Kentucky #10 Best State for Doing Business.

Furthermore, real estate costs are also below the national average in Lexington and Central Kentucky. The average price per square foot for Class A industrial space is \$5.75, within a range of \$4.50 - \$7.00. Class B industrial space runs at an average price of \$4.96 per square foot, within a range of \$4.00-\$6.50.

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 and ranking #7 Most Affordable Big City in America by *Kiplinger* in 2014.

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.



Ground breaking for Big Ass Solutions, manufacturer of industrial and residential fans.

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