



Aerospace & Defense in Missouri

MISSOURI
Advanced Manufacturing Excellence



Aerospace & Defense in Missouri

Missouri is a global leader in the aerospace and defense industry, and could be the best place for your next company expansion.

Aerospace

Nearly one in ten Missouri workers is employed in manufacturing, with automotive and aerospace being the sector's largest components.

Boeing's Defense, Space & Security, in St. Louis, the U.S.'s second largest defense contractor, has more than 16,000 employees in Missouri, making the F/A-18, F-15, EA-18G, MQ-25 and the new USAF T-7A Trainer, along with composite parts for the 777X and a large line of defense munitions. Recently, the U.S. Air Force awarded Boeing a \$1.2 billion contract to build eight new F-15EX fighter aircraft.

GKN Aerospace employs approximately 600 highly-skilled workers at their aerospace manufacturing facility in St. Louis.

Seyer Industries in St. Peters specializes in high-complexity machined parts for the aerospace industry, PAS Technologies near Kansas City manufactures, maintains and overhauls components in the aerospace industry, and NEMO Manufacturing, a manufacturer of electrical components for fighter jets in La Grange expanded in 2017. In 2019 Alpine Aviation Group announced plans to locate in Ozark and create 39 jobs.

From Charles Lindbergh, to the Mars Missions, to the International Space Station, Missouri has led the way in every aspect of aviation for nearly 100 years and that leadership continues today. Statewide, Missouri is home to 100 aerospace manufacturing companies and we could be the best location for your next expansion.

Defense

From the 3,000 (and increasing) employees at the National Geospatial-Intelligence Agency (NGA) West in St. Louis providing intelligence support to U.S. forces globally, to EaglePicher's high-tech lithium batteries

built in Joplin that power NASA and the U.S. military, to the Kansas City National Security Campus supporting the warfighter and securing America's nuclear deterrent, Missouri is a defense industry leader in the heart of America. The defense industry invests \$18.2 billion in investment annually in Missouri, directly impacting more than 25,000 businesses. The Missouri Congressional Delegation is supportive of Missouri's large aerospace and defense industry, and its members have consistently advocated for federal funding of defense systems produced in Missouri.

Recently, NGA chose Missouri as the site of their new \$1.7 billion western headquarters. "The St. Louis city site provides NGA with the most technological, academic and professional environment," agency director Robert Cardillo said. And the urban base is preferable to "attract, recruit and retain" its more than 3,000 high-tech workers.

DRS Technologies has two defense locations in Missouri, with both their DRS Land Systems HQ in St. Louis and a 100-acre heavy equipment manufacturing facility in West Plains. The company recently announced a combined \$32 million investment in both facilities. Missouri's World Wide Technology is a global leader in computer system design for the defense industry. And Northrop Grumman's Lake City Army Ammunition Plant is based in Independence, Missouri, where the company has produced more than eight billion rounds of small-caliber ammunition in the last five years.

BioSTL recently launched the Center for Defense Medicine through a \$1.5 million grant awarded by the U.S. Economic Development Administration (EDA). The new center will use the commercialization programs of BioSTL's investment arm, BioGenerator, to support St. Louis startups as they develop and advance products and technology for use by the U.S. military.

And when it comes to military bases, Missouri is home to Whiteman Air Force Base and America's B-2 Spirit stealth bomber fleet, where both high-skilled military and civilian personnel work to defend the USA, such as technicians from L3 Technologies who maintain the B-2 Bomber simulators on base. Additionally, Missouri is home to Rosecrans Air National Guard Base



and their “Top Gun” C-130 training program, and Fort Leonard Wood Army Base with the U.S. Army Maneuver Support Center of Excellence, along with the U.S. Army’s Chemical, Biological, Radiological and Nuclear School, Engineer School, Military Police School, and 5th Engineer Battalion.

Geospatial Analysis and Cybersecurity

Geospatial analysis and cybersecurity are emerging sectors in Missouri, with solid foundations due to the presence of NGA and their thousands of employees. Twenty colleges across Missouri have cybersecurity programs, and many are also engaged in research related to cybersecurity. SixThirty CYBER, a cybersecurity focused seed fund and business development program provides startups with up to \$250K in funding, focused mentorship, and rapid connectivity to the top U.S. financial, healthcare, and federal agency Chief Information Security Officers and executives.

Additionally, the new Geospatial Resource and Innovation Center has launched at T-REX in downtown St. Louis, just two miles from NGA, and NGA has engaged with St. Louis’ LaunchCode to establish coding apprenticeships for talented individuals who lack the traditional IT credentials.

Workforce

Missouri understands that an educated and trained workforce is essential to success. As a result, Missouri offers traditional and non-traditional training options for workers and companies that allow employers to recruit a workforce customized to fit their needs. A key Missouri example in the aerospace and defense industry is the customized pre-employment training developed by Boeing and St. Louis Community College in 2007.

And across the state, aerospace and defense training programs are developing the talent pipeline needed for today’s aerospace and defense industry at Missouri’s Knowledge Centers for Aerospace which include:

- Aviation Institute of Maintenance (Kansas City)
- Boeing Research and Technology’s Collaborative Autonomous System Laboratory (St. Charles)

- Flight Safety International (Berkeley)
- Missouri State University (Springfield)
- Missouri S&T (Rolla)
- Saint Louis University
- Southeast Missouri State (Cape Girardeau)
- St. Louis Community College
- State Technical College of Missouri (Linn)
- University of Central Missouri (Warrensburg)
- Washington University in St. Louis

These Centers connect talent and industry together in a real-world environment that moves the industry forward. The Center for Aerospace Manufacturing Technologies (CAMT) at Missouri S&T, for example, is a national center of excellence for the development and transition of innovative advanced technologies for the aerospace manufacturing supply chain. Its industrial consortium includes The Boeing Company, GKN Aerospace, 3D-printing manufacturer Stratasy and other industry leaders.

In total, 43 Missouri institutions offer aerospace and defense related degrees and certificates, 21 offer degrees or certificates in cybersecurity and 15 offer degrees in precision production. And when it comes to colleges offering degrees in engineering and engineering technology, there are 23 offering associates programs, 13 bachelors, 6 masters and 4 PhD.

Additionally, CyberUp works extensively across Missouri to encourage both adults and youth to pursue careers in cybersecurity and to ensure our region becomes a model other communities follow. We can show you how Missouri can meet your unique talent needs.



Missouri Aerospace & Defense Companies

Recent Projects

Alpine Aviation Group announced plans in 2019 to locate a new manufacturing facility to assemble wiring harnesses for aircraft in Ozark, Missouri, and create 39 jobs.

Boeing announced a \$70 million expansion of its missile and munitions plant in St. Charles, Missouri. The expansion is expected to be completed in 2021. The company also announced their two newest products, the T-7A trainer jet and the MQ-25 unmanned refueler, will both be built at their facilities in St. Louis, Missouri.

Leonardo DRS Land Systems relocated their St. Louis-based line of business to a new Bridgeton facility in 2019, investing \$32 million. DRS Land Systems also expanded their West Plains, Missouri, facility in 2019, adding a new administration facility.

Esri recently expanded their operations in St. Louis, adding 40 jobs at their offices in St. Charles and in the Cortex innovation district.

Essig Research opened a new facility in Moberly, Missouri, in 2018. The company specializes in contract design and drafting for aerospace manufacturers.

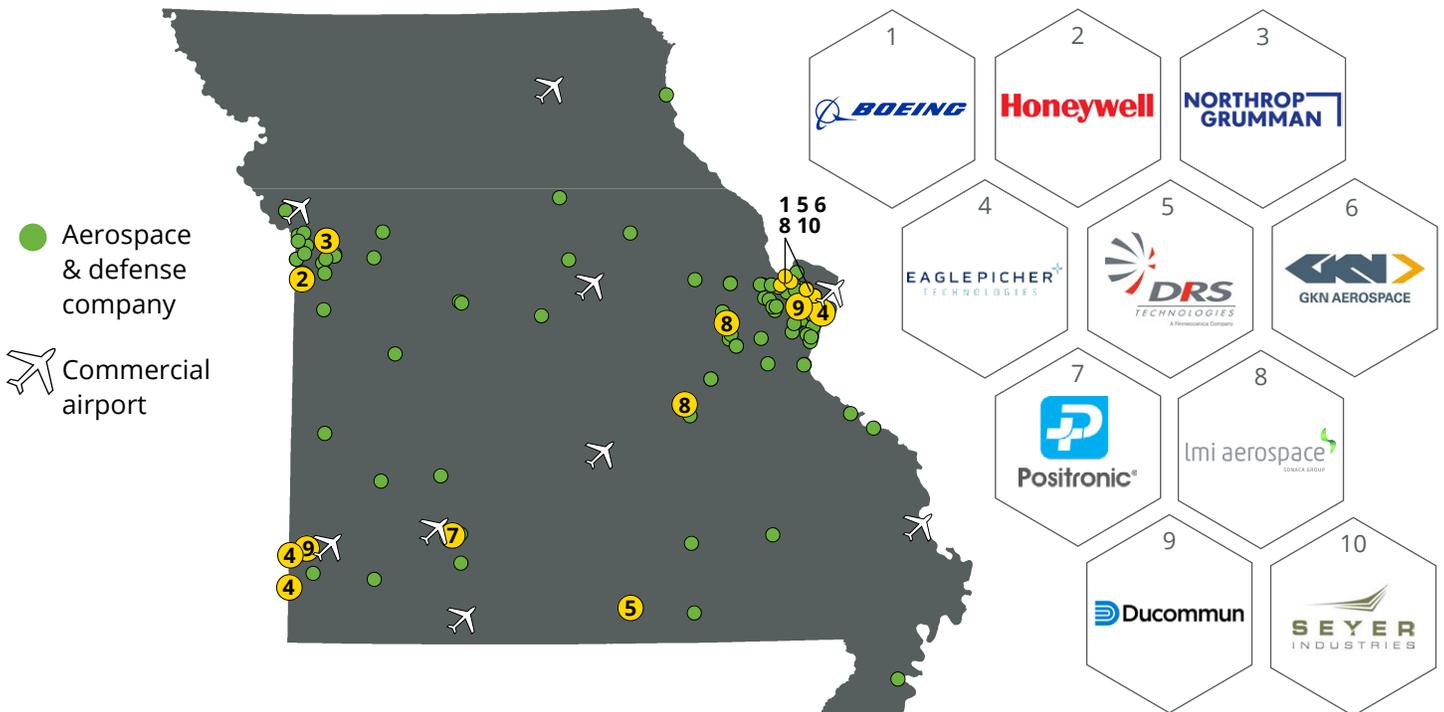
Flying Colours Corp., a privately owned and operated aviation services company, expanded in Chesterfield, Missouri, in 2018. The expansion created 70 new jobs in the region.

Positronic Industries Inc. invested \$2.5 million dollars in its Springfield, Missouri, headquarters in 2018 and added 90 new jobs. The company is an advanced manufacturer of electronic connectors that are utilized in a variety of industries worldwide including military, aerospace, telecommunications, medical, industrial, and test equipment.

R&S Machining Inc. announced a \$13.5 million expansion of their St. Louis facility, adding 60 jobs.

West Star Aviation expanded its Perryville, Missouri, MRO in 2018 to over 120,000 sq. ft. of hanger and shop space.

Top aerospace & defense employers in Missouri



Missouri's Largest Aerospace & Defense Companies



Advanced Industries, Inc.





Missouri's Largest Cybersecurity Companies



Talent & Education In Missouri

Missouri understands that an educated and trained workforce is essential to success in aerospace manufacturing. As a result, Missouri offers traditional and non-traditional training options for workers and companies in the aerospace field with academic institutions statewide granting degrees in engineering related fields and aerospace knowledge centers around the state supporting collaboration with industry leaders such as Boeing. From pre-employment training to advanced degrees Missouri takes flight with our workforce solutions.

Knowledge Centers for Aerospace

Aviation Institute of Maintenance (Kansas City)

- Aviation Maintenance Technician (AMT) Program

Boeing Research and Technology's Collaborative Autonomous System Laboratory (St. Charles)

- Serve as Boeing's leading location for collaborative autonomous technology development with academic institutions and research partners, including government agencies and other companies
- Recently unveiled its prototype air cargo drone, produced by HorizonX

FlightSafety International Inc. (St. Louis)

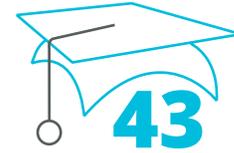
- Provides aviation training services to pilots, technicians, and other aviation professionals
- Offers business and corporate aviation, commercial aviation, military and defense aviation, customer, maintenance, and aircraft dispatcher and corporate scheduler training services

Metropolitan Community College (Kansas City)

- AAS in Engineering Technology

Missouri State University (Springfield)

- Center for Applied Science and Engineering develops and supports advanced materials research



MISSOURI INSTITUTIONS OFFERING AEROSPACE AND DEFENSE RELATED DEGREES AND CERTIFICATES



OFFERING DEGREES IN CYBERSECURITY



OFFERING DEGREES IN PRECISION PRODUCTION

OFFERING DEGREES IN ENGINEERING AND ENGINEERING TECHNOLOGY:

23 ASSOCIATE'S

13 BACHELOR'S

6 MASTER'S

4 PHD



Missouri University of Science & Technology (Missouri S&T) (Rolla)

- Collaborates with Boeing on research projects
- Worked with Boeing to create the Center for Aerospace Manufacturing Technologies, supporting the aerospace supply chain
- Center for Intelligent Maintenance Systems partners with companies to develop new technologies
- Intelligent Systems Center performs research to address companies' technology needs and technical issues

Ranken Technical College (St. Louis)

- Ranken's Industrial Engineering Technician apprentice program was recently recognized by winning 1st place in the National Career Pathways Network's (NCPN) Career Pathways Excellence Award.

- Ranken recently broke ground on a new campus in Troy, Missouri. Ranken will provide secondary and post-secondary education and training for the region, and initially focus on the emerging technologies of aquaponics, advanced manufacturing, renewable energy, as well as building and construction trades.

Saint Louis University

- Home of Parks College of Engineering, Aviation and Technology, the first federally certified school of aviation in the U.S.
- Space Systems Research Laboratory performing research in the design, fabrication and operation of space systems
- The AirCRAFT Lab leverages the advantages of Unmanned Aerial Systems (UAS)—versatility, low cost, flexibility, minimal risk overhead and the tacit acceptance of a potential loss; this makes them the ideal platforms for experimental evaluation of cutting edge, high risk/high reward flight control algorithms, especially those addressing adverse flight conditions such as failures of sensors and actuators
- California-based geospatial information Esri recently formed an official partnership with Saint Louis University to advance geotech innovation
- In 2019, SLU launched a geospatial institute, called GeoSLU, and signed a collaborative research and development agreement with the NGA for geospatial research, training and innovation initiatives

Southeast Missouri State University (Cape Girardeau)

- BS in Unmanned Aircraft Systems (UAS)

St. Louis Community College

- St. Louis Community College's Workforce Solutions Group and the Emerson Center for Engineering & Manufacturing formed a joint venture with Boeing to develop a customized preemployment training program
- Provides 208 hours of instruction in aircraft assembly techniques, work instructions, teamwork, interview skills and resume writing
- More than 600 assembly mechanics recruited and trained through this program to date

- Aerospace Institute works with adults and high school students to grow a ready workforce for entry-level technician jobs in partnership with regional aerospace companies

State Technical College of Missouri (Linn)

- Offers hands-on training in airframes and powerplants

University of Central Missouri (Warrensburg)

- Offers degrees in Aviation Management, Aviation Maintenance Management and Professional Pilot
- Training conducted by current and former B-2 and A-10 pilots based at Whiteman AFB

Washington University in St. Louis

- Institute of Materials Science & Engineering leverages an interdisciplinary platform in engineering, physics, chemistry, and earth and planetary sciences
- Washington University has partnered with Phantom Works, Boeing's defense research arm, to develop new technologies for the defense industry
- The McDonnell Center for the Space Sciences at Washington University in St. Louis is a multidisciplinary consortium with more than one hundred members to share sophisticated scientific instruments. Research projects include the SuperTIGER balloon, the XL-Calibur telescope, weathering on the moon, New Horizons images, and Apollo mission lunar samples. Work includes the Viking and Phoenix landers and the Spirit, Opportunity, Curiosity, and Perseverance rovers and the mission specifications, choice of landing site, and rover's wheels for Mars 2020.

Other Resources

Missouri Enterprise provides manufacturing, engineering and business optimization services for Missouri companies. Missouri Enterprise has substantial experience in production, quality, and safety support and training for firms in the A&D sector. They are the NIST Manufacturing Extension Partnership (MEP) organization for the State of Missouri, helping DOD suppliers achieve cybersecurity compliance.

Aerospace & Defense Workforce

Access to skilled labor means higher productivity, higher quality of product, and higher profits for Missouri companies. With a workforce of more than three million, Missouri has a tremendous resource for growing businesses. Manufacturing employs 273,000 Missourians in over 6,500 establishments, making up 9.8 percent of the state's total employment (*BLS, 2018*).

Additionally, military bases in and around the state of Missouri—including Ft. Leonard Wood, Whiteman AFB, Scott AFB and Fort Leavenworth—are home to more than 19,000 active duty military personnel.

Military bases in Missouri:

Fort Leonard Wood (Fort Leonard Wood)

Whiteman AFB (Johnson)

Marine Corps Mobilization Command (Kansas City)

Additional military bases nearby:

Scott AFB (St. Clair County, Illinois)

Fort Leavenworth (Leavenworth County, Kansas)

Code	Occupation title	Missouri employment	Missouri median hourly wage	U.S. median hourly wage
00-0000	All Occupations	2,820,610	\$17.88	\$19.14
17-2141	Mechanical Engineers	3,010	\$39.09	\$42.51
17-2011	Aerospace Engineers	1,190	\$52.75	\$56.01
17-2199	Engineers, All Other	1,170	\$42.17	\$47.62
17-3021	Aerospace Engineering Operations Technologists and Technicians	80	\$37.61	\$31.74
17-3023	Electrical and Electronics Engineering Technicians	1,130	\$32.71	\$31.38
17-3027	Mechanical Engineering Technicians	200	\$26.91	\$27.40
49-2091	Avionics Technicians	280	\$36.04	\$31.59
49-3011	Aircraft Mechanics and Service Technicians	1,910	\$30.63	\$30.81
51-0000	Production Occupations	207,630	\$17.48	\$17.31
51-1011	First-Line Supervisors of Production and Operating Workers	13,410	\$27.85	\$29.48
51-2031	Engine and Other Machine Assemblers	510	\$20.12	\$21.95
51-2041	Structural Metal Fabricators and Fitters	550	\$18.80	\$19.42
51-2090	Miscellaneous Assemblers and Fabricators	27,470	\$18.35	\$15.55
51-4041	Machinists	5,540	\$22.15	\$21.36
51-4121	Welders, Cutters, Solderers, and Brazers	10,490	\$19.10	\$20.43
51-4122	Welding, Soldering, and Brazing Machine Setters, Operators, and Tenders	590	\$15.99	\$18.42

Source: BLS, May 2019

North America's Logistics Center

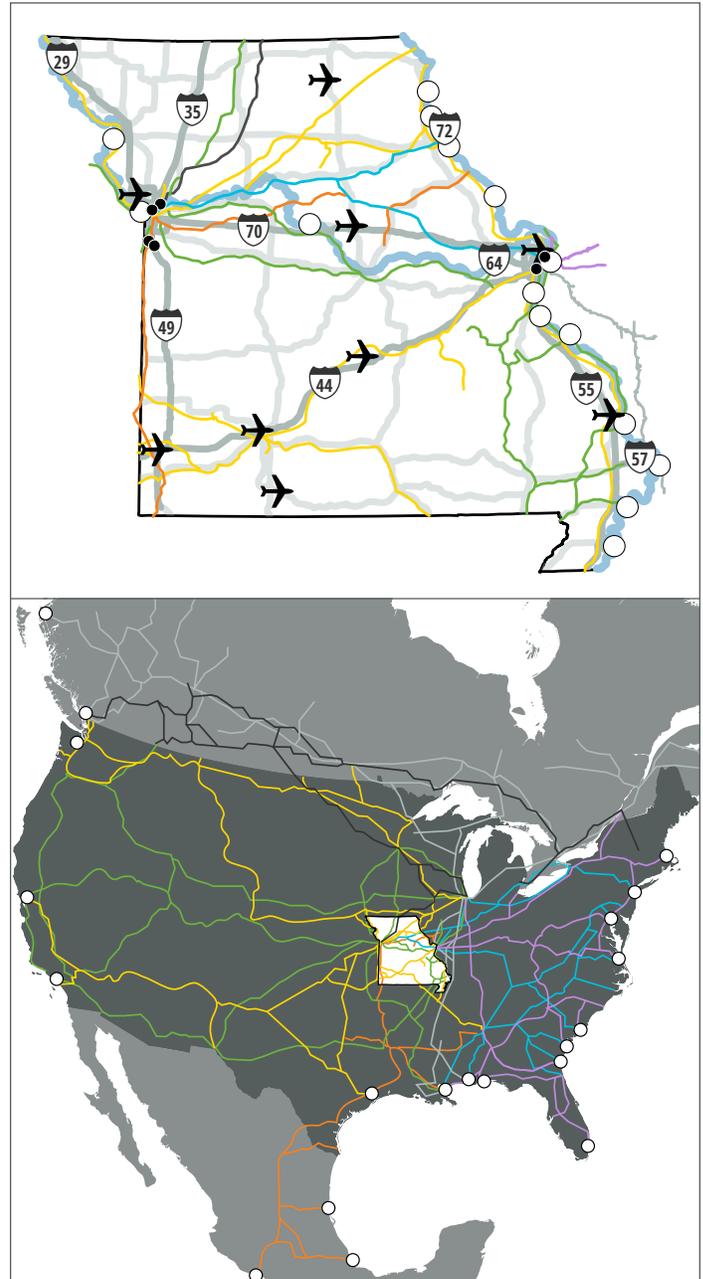
Missouri knows logistics, and can get your product to the global market quickly and efficiently. We are the nations rail, river and road crossroads, and a booming epicenter of commerce. We can get your goods anywhere in the world via our international airports, extensive river barge infrastructure, or any of the U.S. Class 1 railroads. Missouri is home to the confluence of the two largest rivers in North America, the Missouri and Mississippi, and is home to the most northern ice free port on the Mississippi with unrestricted access to the Gulf of Mexico.



Missouri's central location allows companies to reach more than 50% of the continental U.S. within one-day's drive, and most of the rest within two. Ninety-six percent of Missouri's population lives within 15 miles of a 4-lane divided highway.

CNBC ranked Missouri's infrastructure 7th best in the U.S. in 2019.

Missouri is central and connected



Railroad lines:

- BNSF Railway
- Canadian National Railway
- Canadian Pacific Railway
- CSX Transportation
- Kansas City Southern Railway
- Norfolk Southern Railway
- Union Pacific Railroad

- Airports
- Intermodal
- Ports



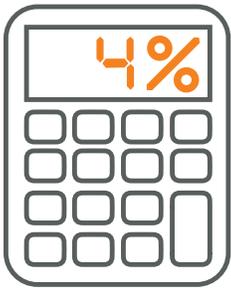
Missouri Reduces Your Risk and Your Costs

Missouri provides you with a solid business foundation, financial and otherwise. In Missouri, taxes and business costs don't eat up all of your company's profits.

Income Tax Allocation

Starting January 1, 2020, Missouri's corporate income tax rate dropped to 4 percent, making us one of the most tax-friendly states in the U.S. Missouri also moved to a single factor, market-based corporate income tax apportionment model based only on sales.

In addition, it is important to note that Missouri has not adopted worldwide or nationwide unitary tax assessment in computing multinational corporate income tax liability.



CORPORATE INCOME TAX RATE OF **4 PERCENT**, THE **2ND** LOWEST IN THE U.S.

Tax Exemptions for Manufacturers

Manufacturers locating in Missouri enjoy numerous tax advantages, including:

- Sales/use tax exemption on machinery and equipment used to establish a new or expand an existing facility
- Property tax exemption for inventories
- State sales tax and local use tax exemption on energy purchases

Certified Sites

Missouri's Certified Sites Program also reduces your risk by ensuring there has already been a comprehensive review of the availability of utilities, site access, environmental concerns, land use conformance, and potential site development costs. Having a site

"certified" reduces the risk associated with development of particular sites by providing up front and consistent information. Additionally, Missouri's 50+ years of a AAA bond rating is representative of our solid financial acumen and stable financial foundations.

Missouri has 44 rail served sites of 50 acres or more and 169 industrial facilities with more than 50,000 square feet (*LocationOne as of 8/6/2020*).

Workforce Development

Missouri One Start provides businesses with \$42 million of comprehensive pre-employment and customized training solutions to help them ramp up faster during an expansion. Missouri One Start's network of colleges and training facilities have the resources to meet each business's unique needs by delivering tailored pre-employment screening, employment marketing, and job specific training to make businesses more competitive. In addition, Missouri offers free community college through the A+ and Fast Track programs.

Our Services

Missouri is also committed to your growth. Our goal is to reduce your risk and provide first-class support from your initial site search to the day you open for business. Our team is ready to work with you and provide a "concierge service" as you consider where your next expansion will be.

Benefits like our low business and labor costs, reliable and inexpensive energy, aggressive and performance-based incentives, and a statewide commitment to attracting companies and investment, make Missouri a place where your company can come to grow and thrive. Whether it's in six weeks, six months, or six years, we are an expert resource to support you when the time is right to look at Missouri.



Subash Alias, CEO

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Working primarily out of the St. Louis office, Subash is the CEO and focuses on bringing jobs and investment to Missouri.



Cathleen Flournoy, VP, Business Recruitment

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Based in the Kansas City office, and focusing on multiple industry sectors, Cathleen generates, cultivates and closes business attraction opportunities to bring jobs and capital investment to Missouri.



Kylee Garretson, Director, Business Recruitment & Capacity Building

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Kylee actively manages business attraction projects for Missouri, provides support to the full business recruitment team, and manages Missouri's capacity building initiatives in communities across the state. She is based in the Kansas City office.



Deborah Price, VP, Business Recruitment & General Counsel

314-932-3974, deborah@missouripartnership.com

Focusing mostly in domestic markets as well as South America and Israel, Deborah is generating, cultivating and closing opportunities with companies across multiple industry sectors. As General Counsel, Deborah serves as the Partnership's senior attorney. She is based in the St. Louis office.



Dennis Pruitt, CEcD, VP, Business Development

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Dennis, who is based in the St. Louis office, works across multiple industry sectors, primarily targeting companies in Europe, Asia, and Canada to bring new jobs and investment into Missouri.



Mark Sutherland, CMO

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Mark joined the Missouri Partnership in 2015, having led marketing and communication outreach across a variety of sectors for 20+ years. Mark leads the Partnership's marketing team and works business attraction projects in Missouri's aerospace industry.



Created September 2020

Missouri Partnership is a public-private economic development organization focused on attracting new jobs and investment to the state and promoting Missouri's business strengths. We work in partnership with the Hawthorn Foundation, the Missouri Department of Economic Development, the State of Missouri, and economic development agencies across the state. • www.missouripartnership.com