



## Aerospace & Defense in Missouri

# MISSOURI

Advanced Manufacturing Excellence



## Aerospace & Defense in Missouri



The U.S. is the world's largest aerospace producer, and Missouri has a rich history in aviation, especially military aviation. From Charles Lindbergh, to the Mercury space program, to the latest in aerospace innovation by Boeing, Missouri has led the way in every aspect of aviation for nearly 100 years.

Today, more than 14,000 of Missouri's highly trained workforce builds the F/A-18, EA-18, and F-15 fighter jets at Boeing's Defense, Space and Security facilities, along with a huge array of military ordinance. Statewide, Missouri is home to more than 100 aerospace manufacturing companies.

With an average of \$10.5 billion in prime and sub-contracts awarded each year to companies located or performing work in Missouri, the Department of Defense (DoD) has a large impact on the state's economy. Defense contracting directly affects more than 600 industries and more than 25,000 businesses in Missouri, with Boeing leading the way.

Aerospace manufacturing represents 33.5% of all Missouri DOD contracting, while commercial and industrial building construction is the second largest industry at 9.2%. Sixty-five percent of all Missouri DoD contracts are for durable goods manufacturing.

Boeing, with its Defense, Space and Security manufacturing facilities in St. Louis, Missouri, is the country's second largest defense contractor. Its primary activity is aerospace manufacturing, but it also participates in aircraft parts manufacturing, missile development and manufacturing, and engineering and sustainment services among others.

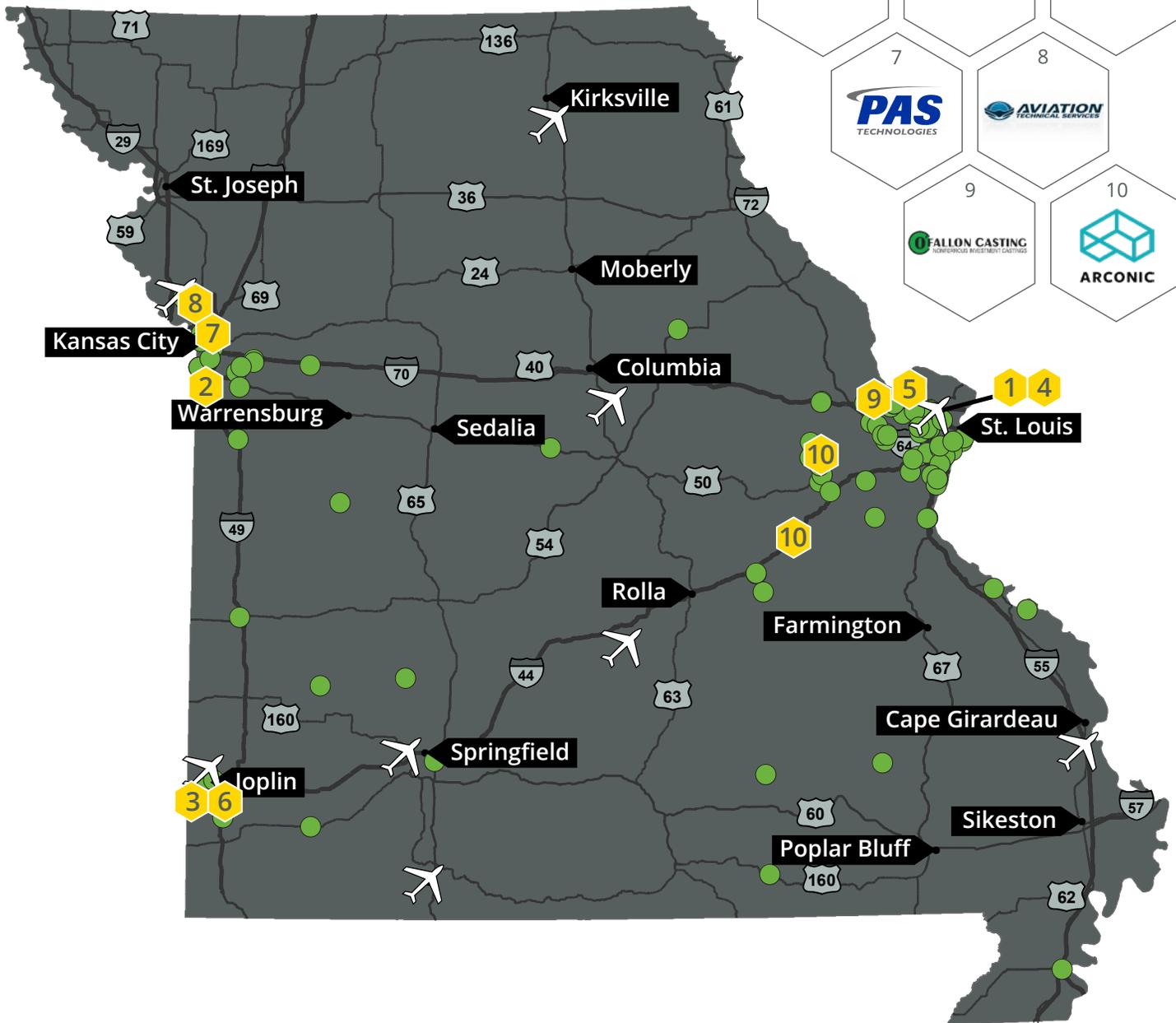
Additionally, the newly formed Midwest Cyber Center of Excellence works extensively across Missouri leading workforce development, youth education and information sharing initiatives and Missouri is home to the western campus of the National Geospatial Intelligence Agency (NGA).

# Missouri Aerospace & Defense Companies

 Largest aerospace manufacturing employers in Missouri

 Aerospace manufacturing company

 Commercial airport



# Missouri's Largest Aerospace & Defense Companies



Advanced Industries, Inc.



ARCONIC



ARNOLD DEFENSE  
PROTECTING THE MODERN WARFIGHTER



## Recent Projects

3M (Springfield) expanded its footprint in Springfield through a \$40 million investment at its facility, where it produces industrial adhesives and tapes for the aerospace industry and other heavy industrial customers around the world. 3M expected its expansion to result in the creation of approximately 90 full-time positions.

ACCI Specialty Materials (Harrisonville), a startup that manufactures chemical products for the aerospace and automotive industries, expanded in Harrisonville, Missouri, in 2016. The expansion added 14 new jobs to the region.

Boeing (St. Louis), a global advanced manufacturing company, expanded in St. Louis, Missouri, in 2016. The expansion represented \$300 million in capital investment, and added 500 new jobs to the region. The company also recently opened its first commercial aircraft facility in St. Louis, which will be used to manufacture composite parts for the new 777X commercial jetliner, and will generate new 700 jobs.

EaglePicher (Joplin) celebrated the opening of its new Lithium Ion Center of Excellence in 2016, which will focus on battery systems for the aircraft market, the U.S. military, and the field of medicine.

Flying Colours Corp. (Chesterfield), privately owned and operated aviation services company, expanded in Chesterfield, Missouri, in 2017. The expansion created 70 new jobs in the region.

High Tech Solutions LLC (Lee's Summit), which makes aerospace machined components and assemblies, relocated its HQ to, and expanded in Lee's Summit, Missouri, in 2016. The project represented \$14.4 million in investment and 46 new jobs to the state.

LMI Aerospace (Washington), a leader in providing aerostructures, systems and components to the commercial, business and regional and military aerospace markets, expanded in Washington, Missouri, in 2016. The expansion represented \$17.5 million in capital investment, and created 60 new jobs in the region. LMI Aerospace, as of February 2017, was acquired by Sonaca Group, an aero structures company headquartered in Belgium.



O'Fallon Casting (O'Fallon), a manufacturer of castings for commercial, government and aerospace markets, expanded in O'Fallon, Missouri, in 2016. The expansion represented \$7.2 million in capital investment.

NEMO Manufacturing (La Grange), a manufacturer of electronic components for everything from computers to fighter jets, announced its plans to expand in La Grange, Missouri, in 2017. The 22,000 sq. ft. expansion is expected to add up to 20 new advanced manufacturing jobs in the region.

Seyer Industries (St. Peters), a manufacturer of higher-level assemblies for the aerospace and maritime industries, announced its expansion in Missouri in 2017. The 70,000 sq. ft. expansion represents more than \$25 million in investment and is expected to add 125 new jobs to the region.

# Talent & Education In Missouri

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.

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
- Metropolitan Community College (Kansas City)
- AAS in Engineering Technology

### 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. (Berkeley)

- 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.



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:



**20** ASSOCIATE'S  
**7** MASTER'S

**15** BACHELOR'S  
**4** PHD

### Missouri State University (Springfield)

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

### 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.

### **Saint Louis University**

- Home of Parks College of Engineering, Aviation and Technology, the first federally certified school of aviation in the US.
- 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.

### **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 427 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.



## Degrees and Certificates Offered in Missouri

### Missouri colleges offering precision production associate degrees or certificate programs:

Crowder College (Neosho)  
East Central College (Union)  
Jefferson College (Hillsboro)  
Metropolitan Community College (Kansas City)  
Mineral Area College (Park Hills)  
Missouri Southern State University (Joplin)  
Moberly Area Community College  
North Central Missouri College (Trenton)  
Ozarks Technical Community College (Springfield)  
Ranken Technical College (Perryville, St. Louis)  
Saint Charles Community College  
Saint Louis Community College  
State Fair Community College (Sedalia)  
State Technical College of Missouri (Linn)  
Vatterott College (St. Louis)

### Missouri colleges offering engineering or engineering technology degree programs (aerospace, general, industrial, mechanical and electrical):

Brown Mackie College (St. Louis)  
DeVry University (Kansas City)  
Jefferson College (Hillsboro)  
Maryville University (St. Louis) (joint program with Washington University in St. Louis)  
Metropolitan Community College (Kansas City)  
Mineral Area College (Park Hills)  
Missouri Southern State University (Joplin)  
Missouri State University (Springfield)  
Missouri University of Science and Technology (Rolla)  
Missouri Western State University (St. Joseph)  
Moberly Area Community College  
Ozarks Technical Community College (Springfield)  
Pinnacle Career Institute (Kansas City)  
Ranken Technical College (Perryville, St. Louis)  
Rockhurst University (Kansas City)  
Southeast Missouri State University (Cape Girardeau)  
Saint Louis Community College

Saint Louis University  
State Technical College of Missouri (Linn)  
University of Central Missouri (Warrensburg)  
University of Missouri (Columbia)  
University of Missouri-Kansas City  
University of Missouri-St. Louis (joint program with Washington University in St. Louis)  
Washington University in St. Louis

### Missouri colleges offering cybersecurity degree programs and certificates:

American Business and Technology University (St. Joseph)  
Bryan University (Columbia and Springfield)  
Drury University (Springfield)  
Fontbonne University (St. Louis)  
Jefferson College (Hillsboro)  
Lindenwood University (St. Charles)  
Maryville University (St. Louis)  
Metropolitan Community College (Kansas City)  
Missouri State University (Springfield)  
Missouri University of Science and Technology (Rolla)  
Missouri Western State University (St. Joseph)  
National American University-Lee's Summit  
Park University (Parkville)  
Saint Charles Community College  
Saint Louis Community College  
Southeast Missouri State University (Cape Girardeau)  
University of Central Missouri (Warrensburg)  
University of Missouri-St. Louis  
University of Phoenix-Missouri  
Vatterott College (St. Louis)  
Washington University (St. Louis)  
Webster University (St. Louis)

## Other Resources

Missouri Enterprise also 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.



# Aerospace & Defense Employment

Manufacturing employs 263,314 Missourians in over 6,400 establishments, making up 9.6 percent of the state's total employment (*BLS, 2016*).

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 22,000 active duty military personnel.

Code	Occupation title	Missouri employment	Missouri median hourly wage	US median hourly wage
00-0000	All Occupations	2,757,850	\$16.46	\$17.81
17-2141	Mechanical Engineers	3,420	\$38.15	\$40.48
17-2199	Engineers, All Other	1,260	\$37.21	\$46.78
17-3023	Electrical and Electronics Engineering Technicians	1,720	\$31.38	\$29.90
17-3027	Mechanical Engineering Technicians	710	\$20.53	\$26.19
49-3011	Aircraft Mechanics and Service Technicians	1,760	\$28.38	\$28.93
51-0000	Production Occupations	197,140	\$15.69	\$15.93
51-1011	First-Line Supervisors of Production and Operating Workers	12,690	\$25.78	\$27.78
51-2031	Engine and Other Machine Assemblers	990	\$17.71	\$19.81
51-2041	Structural Metal Fabricators and Fitters	NA	\$17.72	\$18.14
51-2092	Team Assemblers	23,380	\$16.41	\$14.45
51-2099	Assemblers and Fabricators, All Other	5,000	\$13.30	\$13.73
51-4041	Machinists	6,500	\$19.67	\$20.05
51-4121	Welders, Cutters, Solderers, and Brazers	8,120	\$17.52	\$18.94
51-4122	Welding, Soldering, and Brazing Machine Setters, Operators, and Tenders	1,030	\$15.76	\$17.78

Source: BLS, May 2016



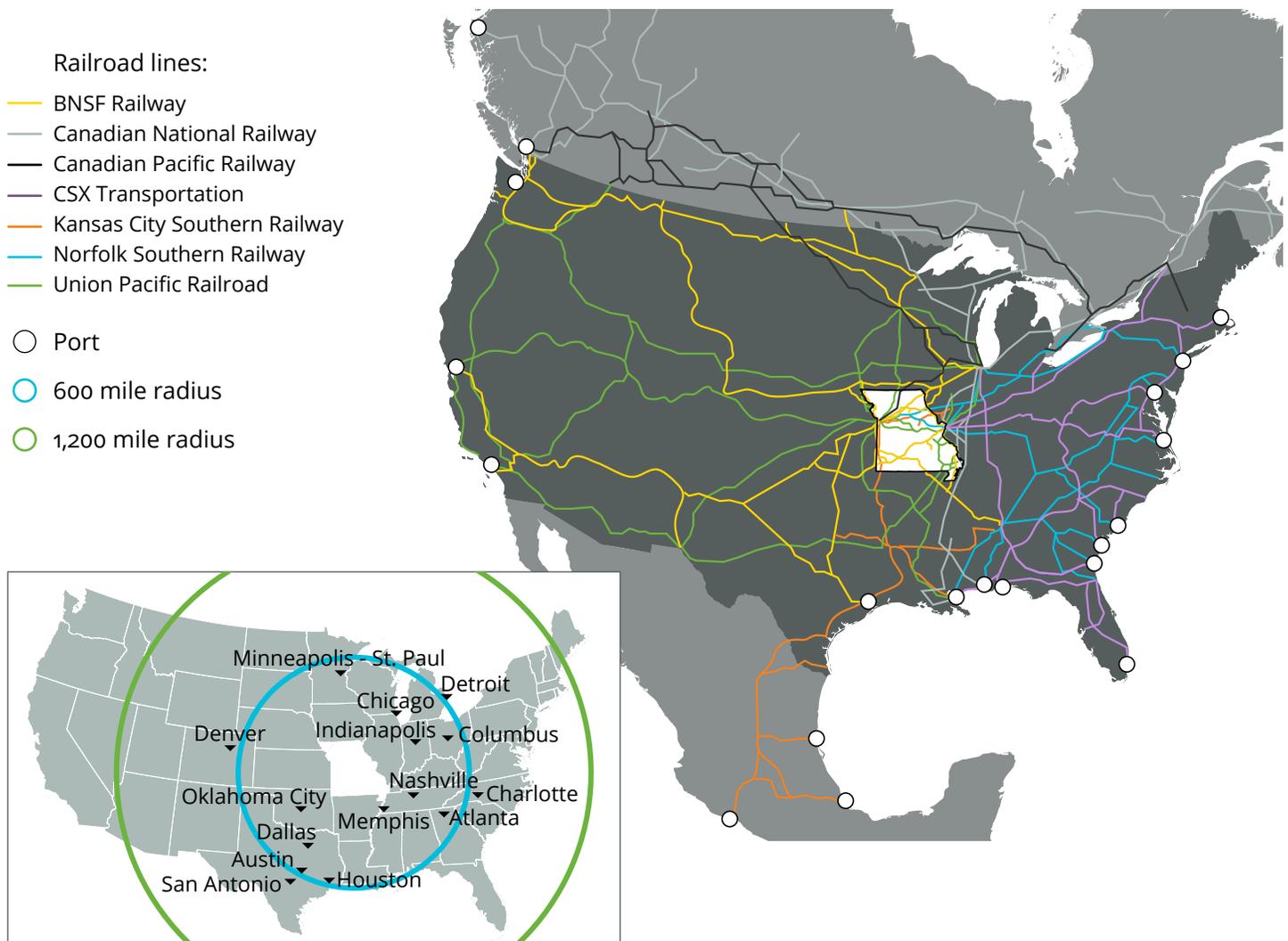
# North America's Logistics Center

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 US 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.

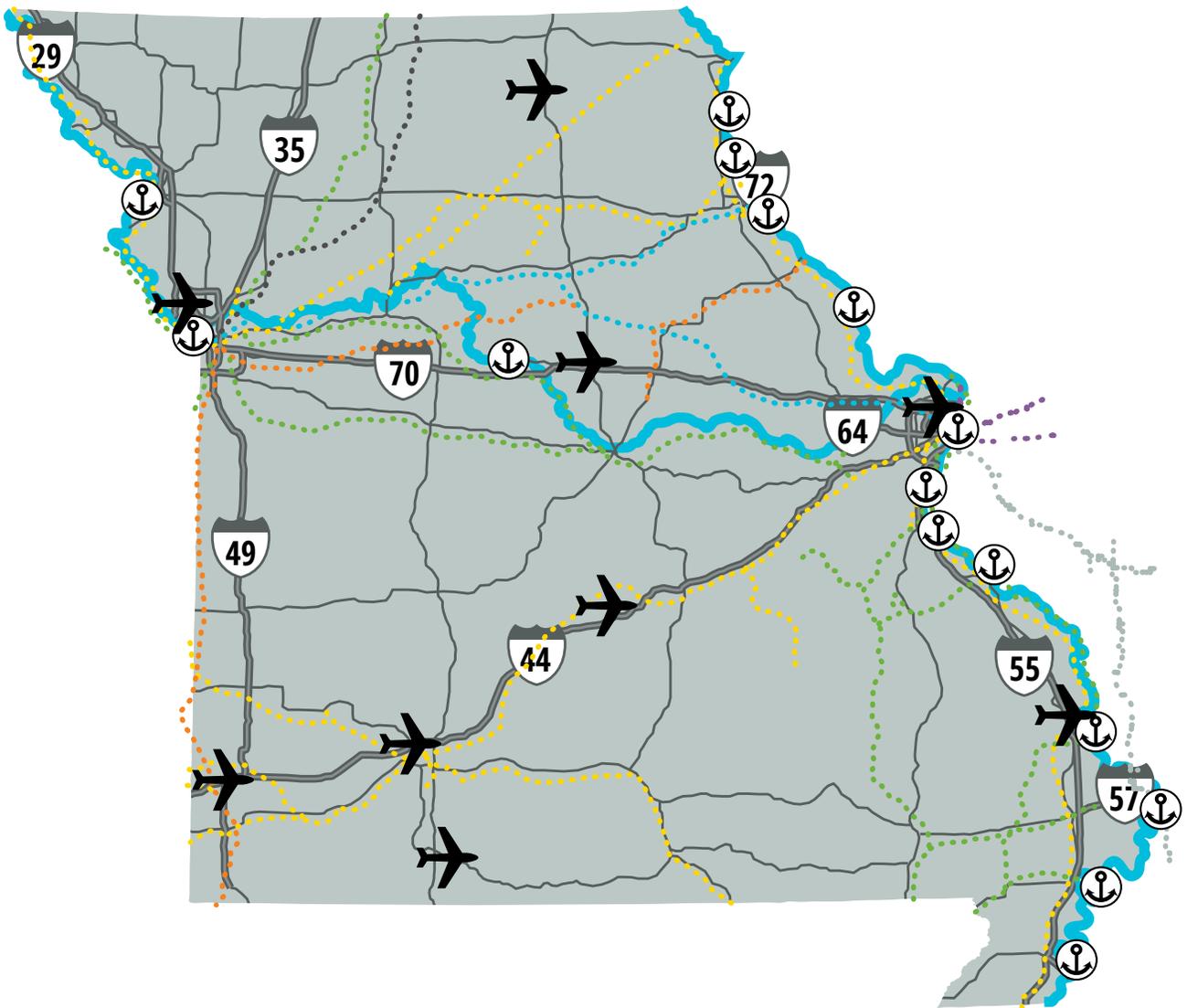
CNBC ranked Missouri's infrastructure 11<sup>th</sup> best in the US in 2017.

## Missouri's central and connected location



# Missouri's Transportation Network

- Railroad lines:
- BNSF
  - CN
  - CP
  - CSX
  - KCS
  - NS
  - UP



# 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

An important tax advantage for Missouri businesses is the amount of income considered taxable as only income earned in Missouri is taxed. Two allocation options are offered for calculating this income: (1) the three-factor formula, based on sales, property and payroll or (2) the single-factor formula, based only on sales. Missouri is one of only two states to allow companies to annually select the income allocation formula that results in lower corporate income tax liability.

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.

## 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 & local use tax exemption on energy purchases

## Our services

Missouri is also committed to your growth. We are ready to work with you, statewide, to make the journey from the initial site search to the day you open for business see reduced risk, no pain, and efficient progress through first-class support and site selection assistance. 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.

## Certified Sites

Missouri's Certified Sites Program also reduces your risk by ensuring there has already been a comprehensive review of items including 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 has nearly 60 rail served sites of 50+ acres or more and 146 industrial facilities with more than 50,000+ square feet (*Source: LocationOne as of 2/14/2018*).



ONE OF THE BEST TRACK RECORDS IN THE U.S. FOR **FISCAL RESPONSIBILITY**



**Steve Johnson, CEO**

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Steve joined Missouri Partnership in early 2015, having led regional economic development efforts in both St. Louis and Kansas City over the past 30+ years. Steve directs the Partnership's marketing and business recruitment teams, working in close cooperation with the Missouri Department of Economic Development and the Hawthorn Foundation.



**Subash Alias, SVP**

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Subash focuses on business recruitment activities including lead generation and project management across multiple industry sectors, with an emphasis on aerospace and financial services, to bring jobs and investment to Missouri. He works primarily out of our St. Louis office.



**Deborah Price, VP of Business Recruitment & General Counsel**

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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, including agtech and health innovation. As General Counsel, Deborah serves as the Partnership's senior attorney responsible for advising the CEO on legal issues involving organizational operations, contractual and statutory compliance and overall risk management. She is based in our St. Louis office.



**Dennis Pruitt, CEcD, VP of International Business Recruitment**

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Based in our St. Louis office, Dennis works across multiple industry sectors, including energy and food solutions. He primarily targets companies in Europe, Asia, and Canada to bring new jobs and investment into Missouri.

