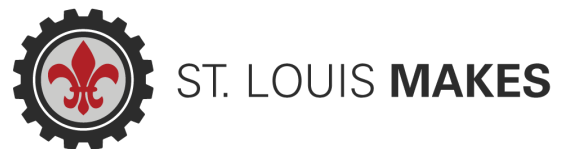


# MAKING MISSOURI A MANUFACTURING POWERHOUSE



MISSOURI CHAMBER  
FOUNDATION

Thank you to our partners!

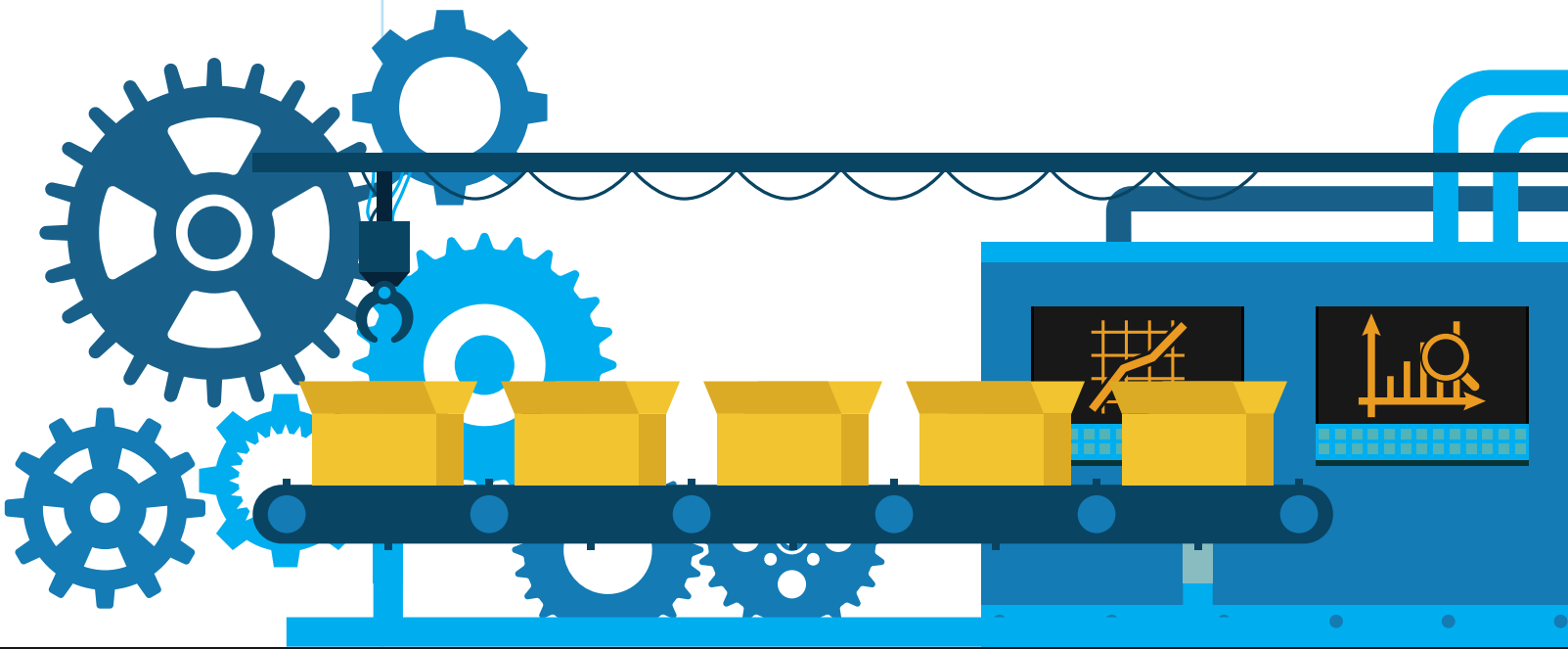


# Introduction

Making Missouri a Manufacturing Powerhouse is part of the Missouri Chamber Foundation's overarching Missouri 2030 strategic plan, a data-driven initiative to reposition our state as a global economic leader. The report was produced by Economic Leadership LLC.

For this report, we conducted one-on-one interviews with a wide variety of manufacturing leaders and stakeholders from around Missouri. We held Manufacturing Roundtables in Jefferson City, Kansas City, Springfield, and St. Louis. In all, nearly 300 manufacturing leaders and stakeholders had the opportunity to weigh in on the report.

In addition to speaking with leaders of Missouri companies and organizations, we also looked at all 50 states to identify best practices that could be incorporated into the final report.

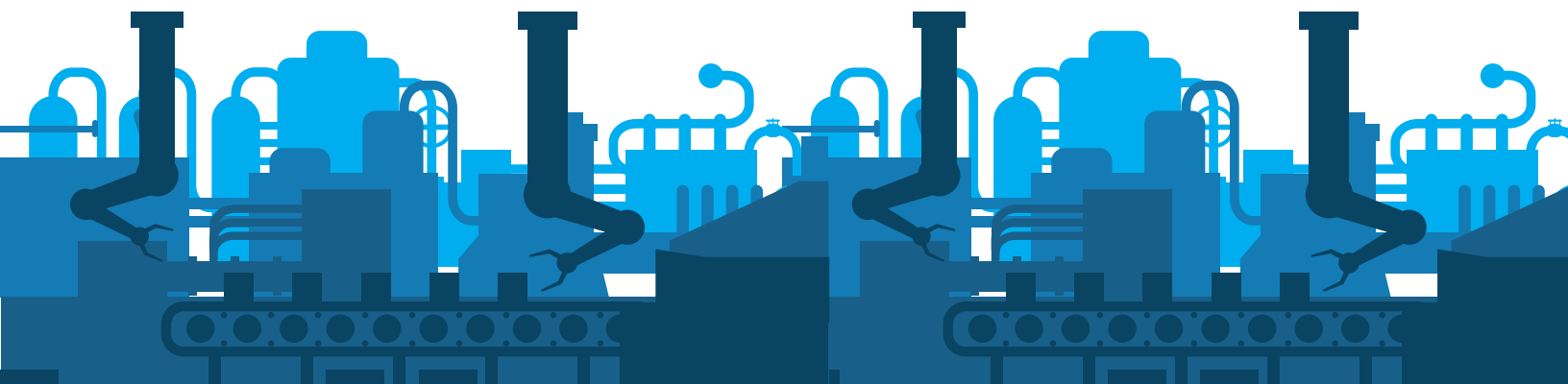


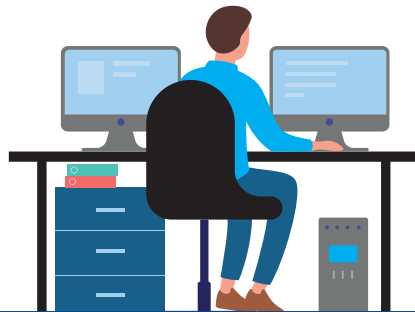
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*Released December 2024*

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# Executive Summary

The manufacturing sector is a critical piece of the Missouri economy, contributing \$50 billion annually to the state's gross domestic product (GDP) and employing 287,000 people. The performance of manufacturing industries in Missouri has been particularly strong since the Great Recession, with major gains in manufacturing GDP, manufacturing employment, and the number of manufacturing establishments in Missouri.

The national picture for manufacturing features uneven performance since the COVID-19 pandemic, continuing struggles with inflation and a shortage of qualified workers. However, the important trends of reshoring supply chain capacity to North America, growth in exports, and new federal policies have spurred impressive levels of investment in U.S. manufacturing facilities. Capital investment is also key to company efforts to automate and boost productivity. Together, these trends create a time of great opportunity for American manufacturers and states that provide an environment in which they can thrive.

Despite the size and importance of the state's manufacturing sector, data indicates plenty of room for improvement and growth. Missouri ranks 28th in Economic Leadership's latest index of manufacturing

... these trends create a time of great opportunity for American manufacturers and states that provide an environment in which they can thrive.

competitiveness. The state is rated highly for business climate factors, such as the tax burden and costs of doing business, as well as being a place of innovation. It ranks poorly, however, in crucial areas for manufacturing, such as workforce and infrastructure. Missouri ranks 27th in the U.S. for exporting goods, another opportunity for improvement.

Stakeholders across the state echo the finding that workforce is the number one challenge facing Missouri manufacturers. Training programs, career awareness initiatives, and solving the child care puzzle are top priorities for improving the workforce. Manufacturers also need help with capital requirements and implementing the modernization and automation projects that are critical for improving competitiveness.

Infrastructure, especially the expansion of reliable and affordable energy, is critical to future manufacturing growth.

Missouri must take bold steps to lean into the movement to reshore critical manufacturing back to the United States. Missouri must consider strategic investments in creating large, development-ready sites. Right-to-work status must also be reconsidered.

To make Missouri a manufacturing powerhouse, this plan features seven recommendations and includes best practices from other states in each category:

1. Expand the workforce pipeline for manufacturing careers
2. Provide incentives and technical assistance to increase capital investment
3. Invest in infrastructure to support manufacturing – transportation, broadband and energy
4. Support the recruitment of new manufacturers and expansion of existing operations
5. Increase exports
6. Strengthen Missouri's legal climate
7. Address public safety

Studying and adopting from these efforts can allow Missouri to make quicker progress in strengthening economic competitiveness. In a time of great opportunity but also great competition, Missouri must establish a goal of moving from good to great, rising to be one of the nation's true manufacturing powerhouses.

# Global and National Manufacturing Trends

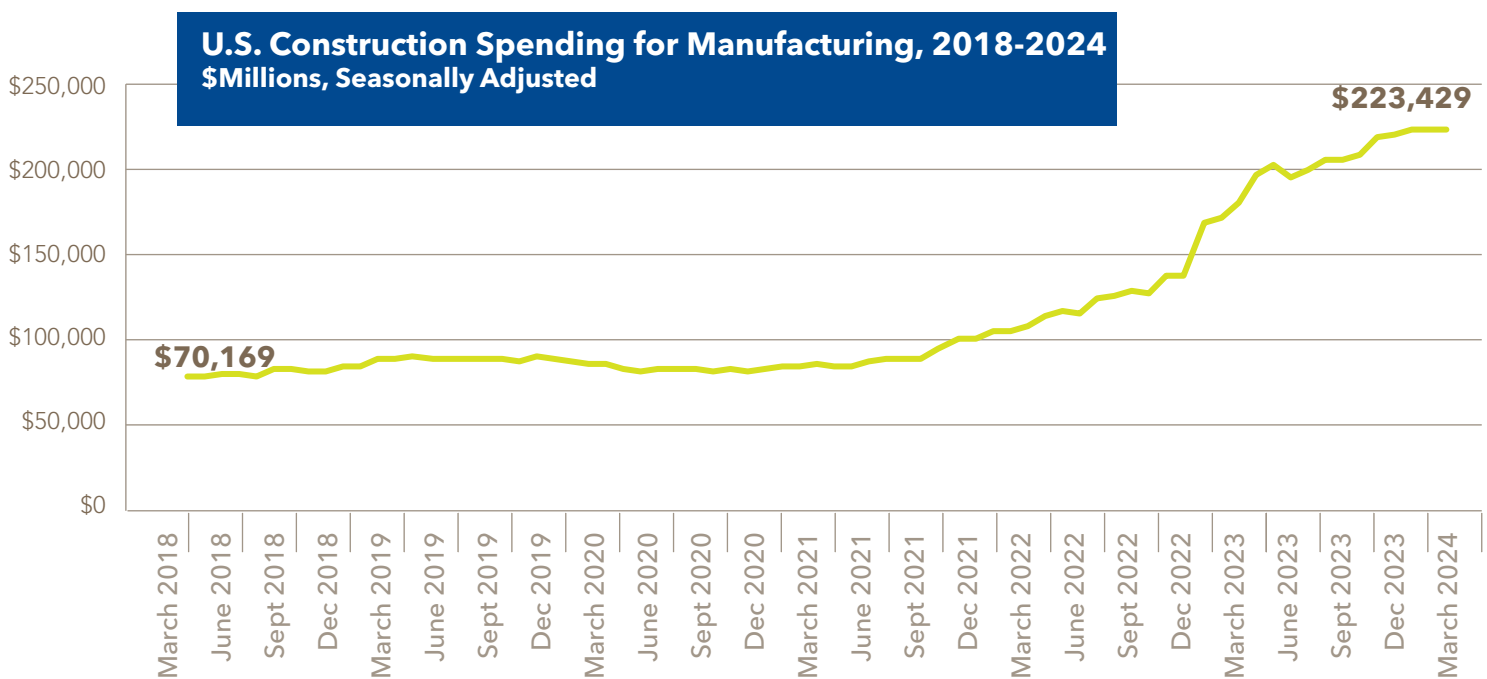
## Trends in Global Trade

According to recent data and forecasts from the World Trade Organization (WTO), global trade in goods slowed significantly in 2023 but was expected to rebound in 2024. World trade slumped late in 2022 and throughout most of 2023 due to a) global inflation pressures, b) tighter monetary policy in developed nations, c) the war in Ukraine, d) property market struggles in China, and e) conflicts in the Middle East. The WTO's global outlook in April 2024 showed that the volume of traded goods surprisingly dropped by 1.2 percent in 2023. However, it forecast that trade growth for goods will increase by 2.6 percent in 2024 and by 3.3 percent in 2025.<sup>i</sup>

## Manufacturing Trends in the U.S. - Tailwinds

The U.S. manufacturing sector is experiencing very high levels of investment for at least two reasons:

- a) The trend of “reshoring” supply chain activities to the U.S. (as well as “near-shoring” others to nearby countries such as Mexico), which has generated major growth in construction spending for new and expanded facilities;
- b) The recent passage of three pieces of federal legislation that have “spurred record private sector investment” in manufacturing.<sup>ii</sup>

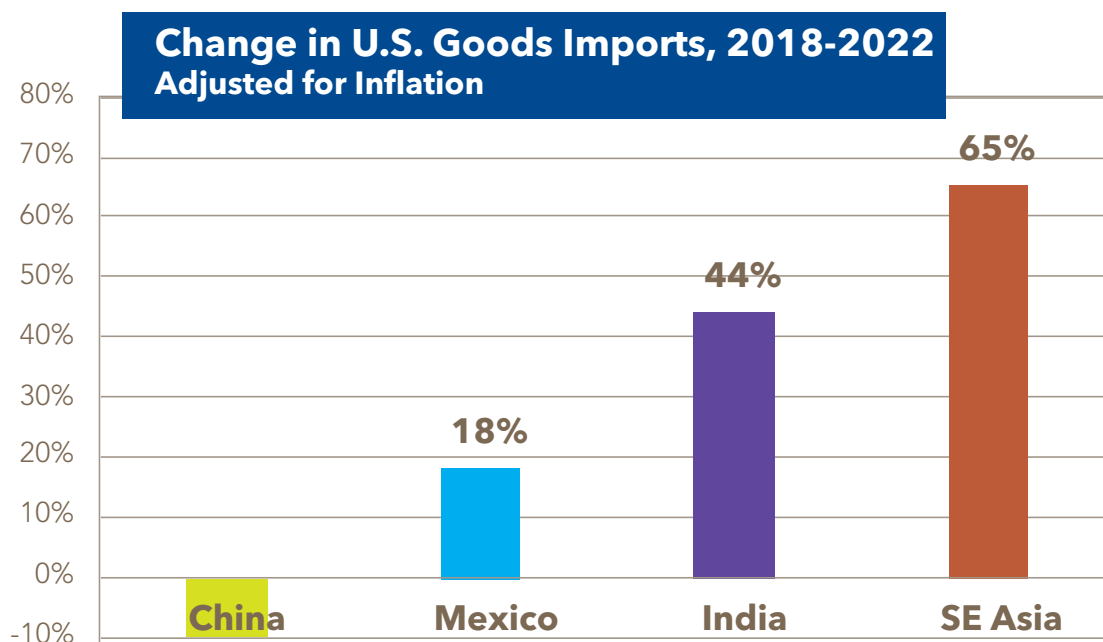


Source: EL from Federal Reserve bank of St. Louis data

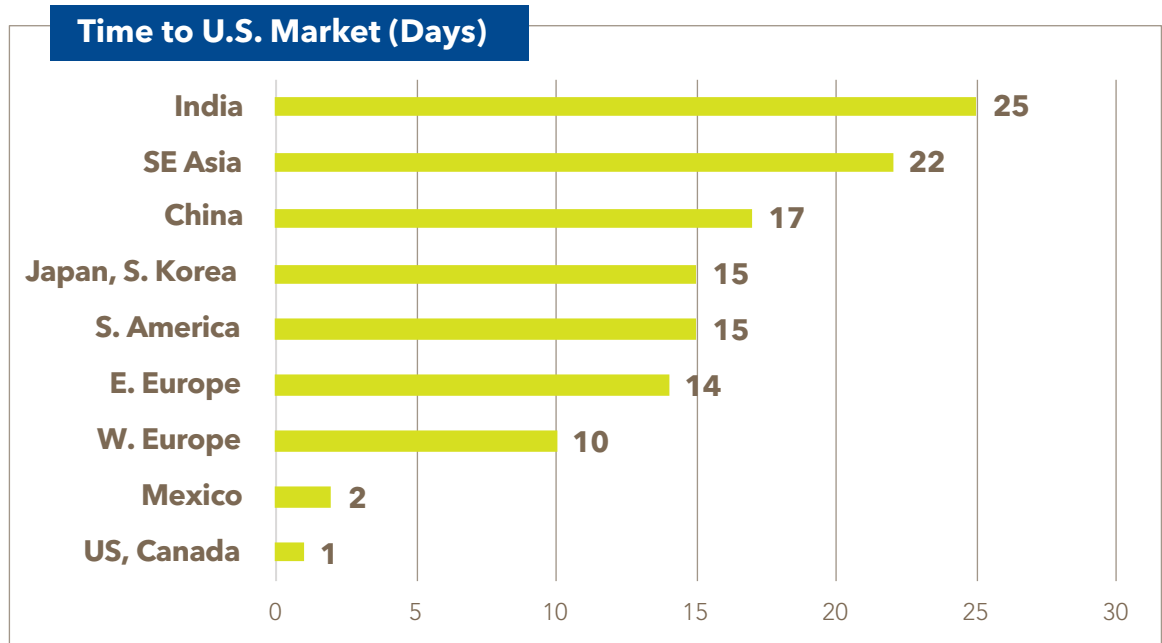


Reshoring and near-shoring of production is part of a global shift in manufacturing and supply chain activities. Companies continue to reevaluate their facility locations based on a set of factors including risk, time to market, cost, and labor availability. According to a Boston Consulting Group (BCG) survey, 90 percent of respondents had relocated some production or supply base to a different country in the last five years, and 90 percent plan to do so over the next five years. <sup>iii</sup>

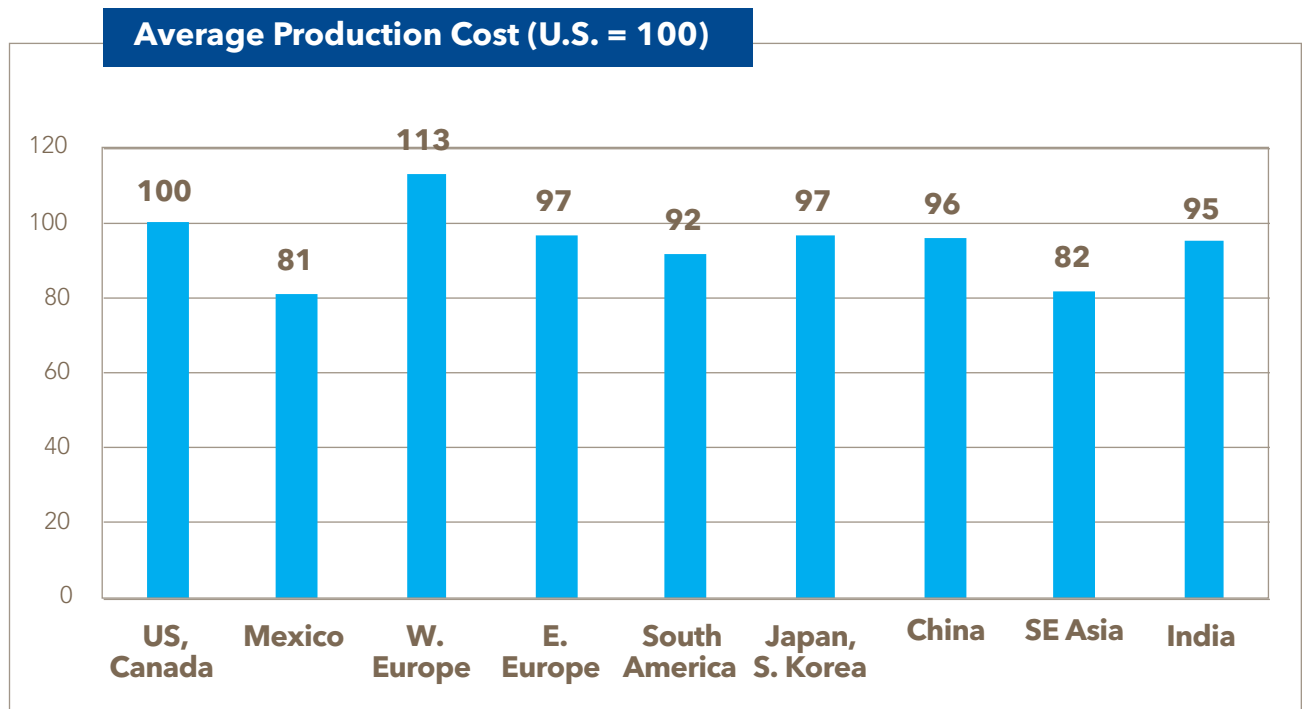
This in-process shift is shown by the change in goods imported into the U.S. from various parts of the world, illustrated below. From 2018 to 2022, the dollar value of goods imported from China fell by 10 percent or \$55 billion. Meanwhile, goods imported from Southeast Asian (ASEAN) nations rose by 65 percent (or \$118 billion) and by 44 percent (or \$23 billion) from India. The value of imports from the United States' largest trading partner – Mexico – increased by 18 percent or \$58 billion.



As noted above, these location shifts are “in process” and will continue to evolve. According to a recent survey, 55 percent of North American manufacturers said that their production relocations achieved all of their objectives, whether it be cost savings, faster time to market, better access to labor, or greater supply chain reliability.<sup>iv</sup> For many others, it is too soon to tell.



Source: Data from Boston Consulting Group, 2023



Source: Data from Boston Consulting Group, 2023

The key tradeoff of costs versus time to market is detailed in the two charts on the facing page for various locations around the globe and for goods bound for U.S. markets.

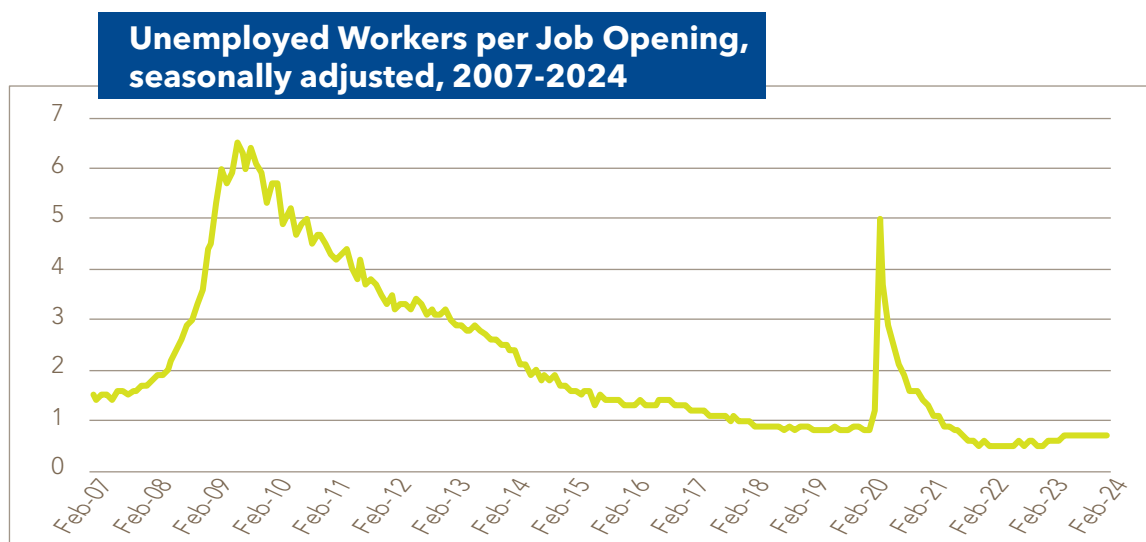
Wage increases have occurred globally and in most places have risen faster than productivity gains. From 2018 to 2022, labor costs adjusted for productivity rose by 18 percent in India, 21 percent in the U.S., 22 percent in Mexico, and 24 percent in China. Despite those wage increases in lower-cost India and Mexico, BCG writes that “Mexico is the most competitive near-shore option” for U.S. markets.<sup>v</sup>

The relevant legislation includes the Infrastructure Investment and Jobs Act (IIJA), the Creating Helpful Incentives to Produce Semiconductors Act (CHIPS), and the Inflation Reduction Act (IRA). Together, they support infrastructure investments, creation of a more robust semiconductor industry in America, and development of the clean energy subsector. After the passage of these federal incentives, the value of announced investments was about twice the total in 2021 and almost 20 times the dollar level in 2019.<sup>vi</sup> Since the IRA was adopted in the summer of 2022, about \$88 billion in new clean energy manufacturing facility investments have been announced across the country.<sup>vii</sup> Overall, construction spending for manufacturing in 2023 was more than double pre-COVID levels. A commercial real estate market researcher notes that the U.S. could increase its manufacturing space total by 10 percent over the next decade – adding perhaps 500 million square feet – making this a “watershed moment” for the sector.<sup>viii</sup>

## Manufacturing Trends in the U.S. - Headwinds

Though the current momentum for manufacturing in America is positive, there are several areas of concern for the industry. Concerns include persistent labor shortages, lingering supply chain issues, health care and insurance costs, and the large financial investments needed to modernize and innovate. Macro-level concerns include economic uncertainty, geopolitical risk, and domestic political dysfunction.

Talent-related challenges in manufacturing are neither new nor do they appear to be abating anytime soon. In the fourth quarter of 2023, 71 percent of respondents in a National Association of Manufacturers (NAM) survey indicated that the inability to attract and retain employees was their top challenge.<sup>ix</sup> Demographic realities mean that workforce shortages are persisting in all business sectors, as shown in the chart below plotting the number of unemployed workers per job opening in the United States.



Source: EL from U.S. Bureau of Labor Statistics data

Data for the manufacturing sector shows the same trend, with less than one unemployed worker (with any manufacturing experience) per job opening. Labor supply conditions in manufacturing have improved since 2022, but a tight labor market remains.

Employer steps taken to address worker shortages include wage increases and workplace flexibility. Flexibility for production workers includes flexible shift scheduling, compressed workweeks, and the ability to split or swap shifts.<sup>x</sup> Other methods that companies are using to address the tight labor supply include:

- Incorporating talent supply more than ever into site location decisions;
- Using artificial intelligence (AI) and other digital tools to assess regional labor supply and reach candidates;
- Developing alumni corps to engage retired employees and benefit from their expertise;
- Working with schools to address the STEM talent pipeline as early as elementary school;
- Freeing up time during the workweek to upskill current employees.<sup>xi</sup>

In manufacturing supply chains, Deloitte analysis shows that material delivery times hit a peak in the summer of 2022 and have been slowly declining since then, but they remain significantly slower than pre-pandemic schedules.<sup>xii</sup> The increased U.S. production of semiconductor chips and other reshoring efforts should reap benefits but will take years to be fully realized. To improve supply chain performance, companies continue to adopt digital tools, from generative AI to blockchain, to identify and address bottlenecks, as well as improve security and efficiency.

Investing in automation, robotics, AI, and other innovations in manufacturing processes is now considered urgent for U.S. manufacturers to create the “smart factories” needed to compete globally. A recent survey showed 86 percent of manufacturing leaders think smart factory innovations will drive competitiveness over the next few years.<sup>xiii</sup> A majority of manufacturers say they’ve incorporated data analytics and cloud computing, and more are adding IoT sensors and devices into their processes. Companies that have made these investments say they’ve benefitted in four primary ways: 1) cost reduction, 2) gains in product quality, 3) efficiency gains, and 4) improved safety and sustainability.<sup>xiv</sup>

### **Fastest-Growing U.S. Manufacturing Subsectors 2023-2028:**

- SOLAR POWER EQUIPMENT
- 3D PRINTERS
- DRONES
- HYBRID & ELECTRIC VEHICLES

*Source: Top 5 Industrial Manufacturing Trends in 2024, Oracle; from IBISWorld research*

## **U.S. MANUFACTURING TAILWINDS AND HEADWINDS**



### **TAILWINDS**

Reshoring and Near-shoring  
Resilient Customers  
Automation Productivity Gains  
Federal Legislation



### **HEADWINDS**

Labor Shortages  
Geopolitical Unrest  
Energy Concerns  
Inflation  
Lack of Capital to Automate

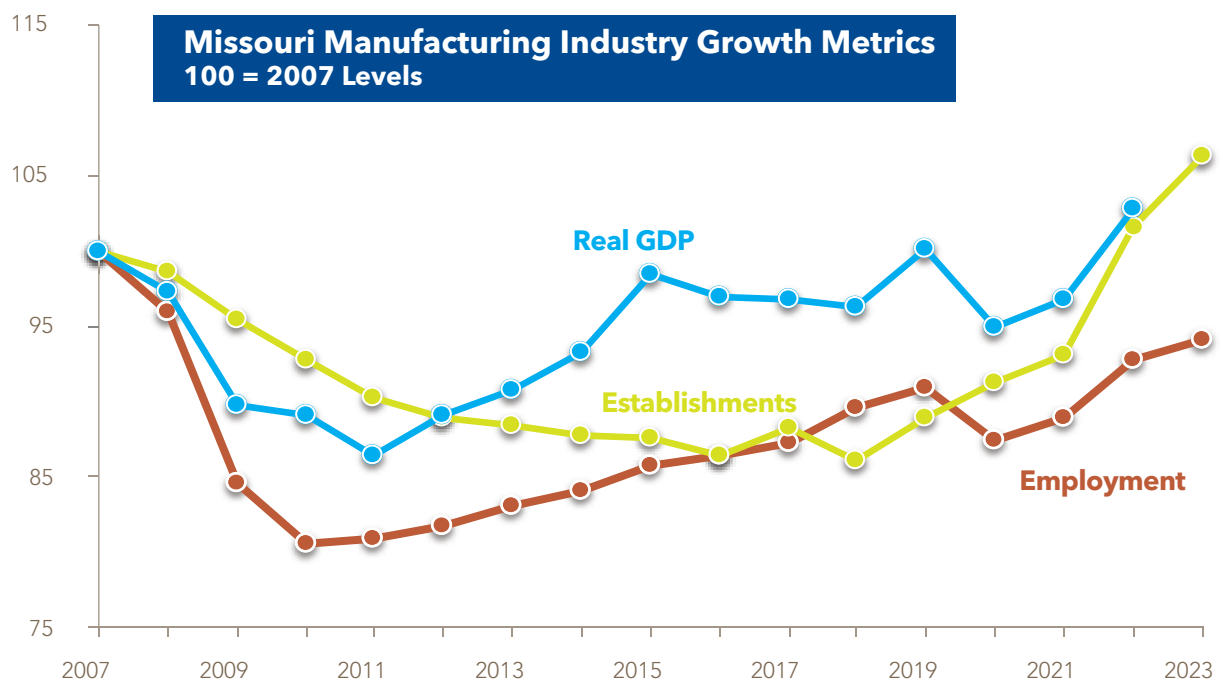
# The State of Manufacturing in Missouri

The 8,000 manufacturing establishments across Missouri produce nearly 10 percent of the state's total earnings. They account for 9.5 percent of total employment and 11.6 percent of private sector jobs, with more than 287,000 workers.

Missouri Manufacturing Industry Summary Statistics, 2023			
Indicator	Manufacturing Industry	State Total	State Total Percentage
Employees	287,090	3,029,300	9.5%
Establishments	8,000	241,060	3.3%
Earnings (billions)	\$24.3	\$249	9.8%

Source: EL estimates based on Lightcast 2024.1

Since bottoming out during the Great Recession years of 2010 and 2011, both manufacturing GDP and employment have risen in strong fashion. After a long downward slide, the total number of manufacturing establishments has surged since 2018.

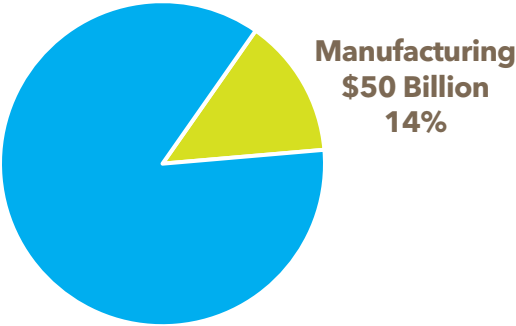


Source: EL calculations based on Lightcast 2024.1

Note: GDP data not available for 2023

The manufacturing sector contributes 14 percent of the Missouri GDP, as shown below.

**Manufacturing Industry Contribution to Missouri's GDP, 2022**



Source: EL calculations based on Lightcast 2024.1

**Global Exports from Missouri**

The value of goods exported from Missouri soared from \$678.8 million in January 2010 to \$1.14 billion in December 2023, an increase of 68.2 percent. This impressive gain was not, however, as large as the overall U.S. increase in export values, which rose by 90.7 percent in the same period.<sup>xv</sup>

The value of goods exported by Missouri in 2023 totaled nearly \$18 billion, ranking the state 27th in the nation. The table to the right shows how Missouri stacks up with neighboring states.

State	2023 Goods Export Value	2023 Goods Export Rank
Illinois	\$78.7B	5th
Kentucky	\$40.2B	15th
Tennessee	\$38.1B	16th
Iowa	\$18.4B	25th
Missouri	\$17.9B	27th
Kansas	\$14.1B	31st
Nebraska	\$8.0B	34th
Oklahoma	\$6.5B	37th
Arkansas	\$6.5B	38th

Source: U.S. Exports of Trade Goods by State, 2023. Statista 2024.

## Leading Export Markets for Missouri Goods

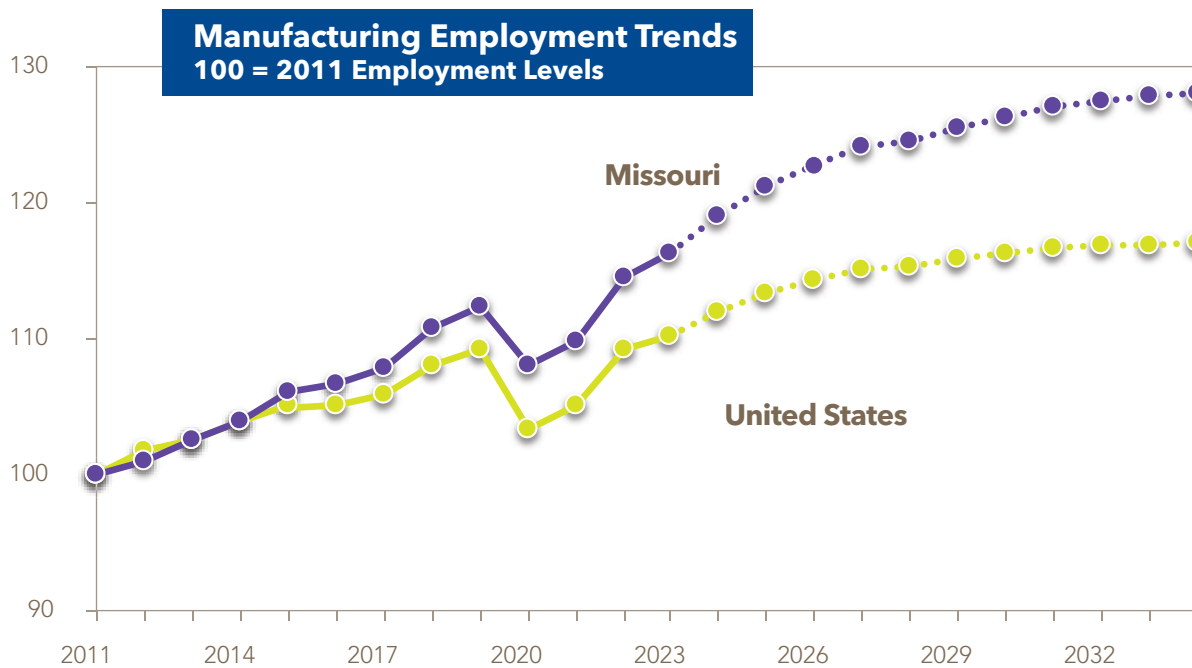
According to the Missouri Department of Economic Development, the top export destinations for Missouri products are – by far – Canada and Mexico. Using 2023 data, the top export markets are shown below. Nationwide, the top U.S. export markets are also Canada and Mexico, but China and the Netherlands make the top five as well. Those two markets could be attractive targets for Missouri manufacturers.



*Source: Missouri Department of Economic Development, 2023 data*



Looking at employment trends since the end of the Great Recession, Missouri has steadily increased manufacturing jobs and outpaced the national rate of growth. These trends are projected to continue over the next 10 years.



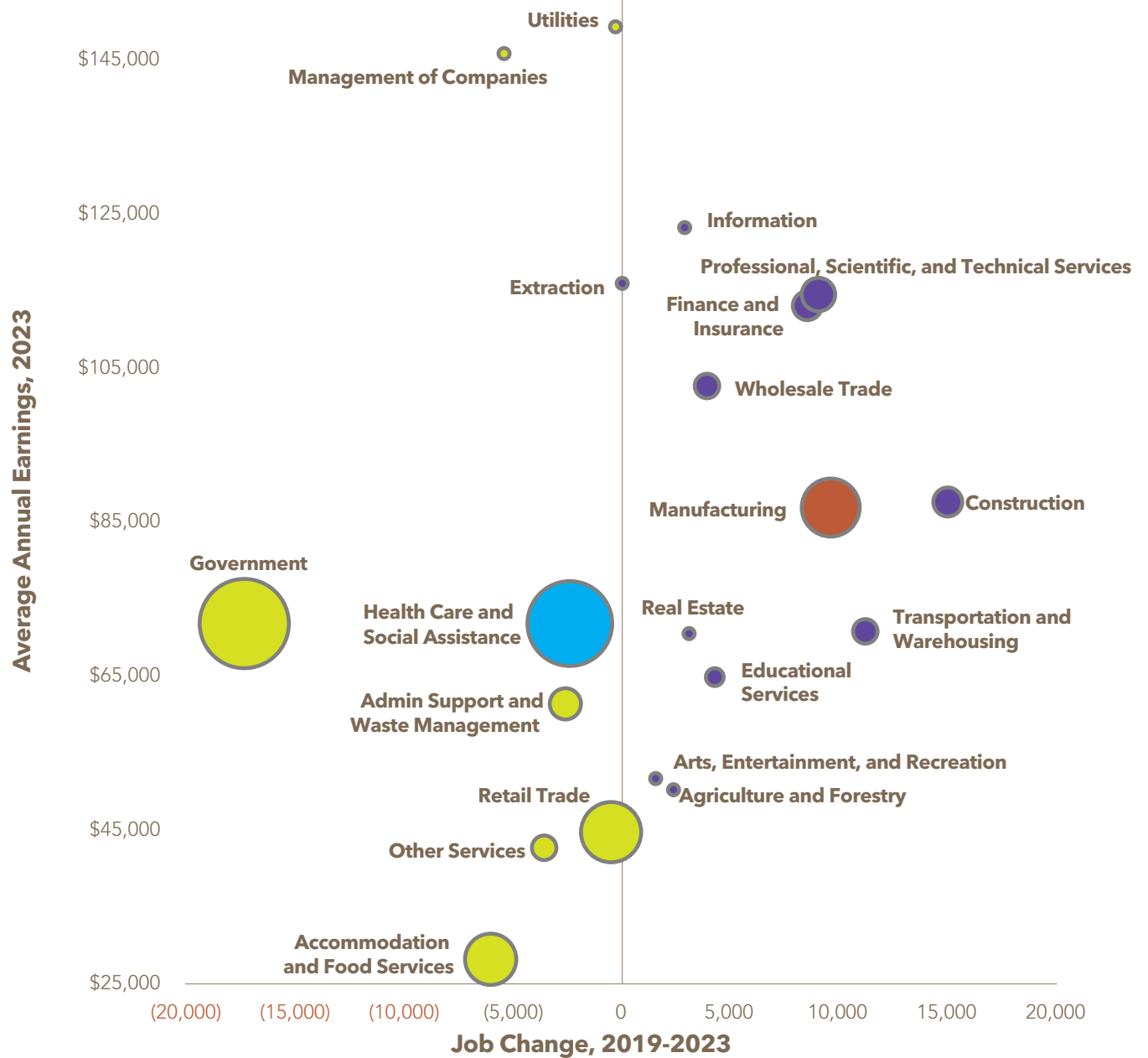
Source: EL calculations based on Lightcast 2024.1

Manufacturing also has an employment multiplier that is the fifth highest among industry sectors in Missouri. The manufacturing multiplier of 2.48 means that for every manufacturing job created in Missouri, an estimated 1.48 additional jobs are created throughout the state's economy.

When analyzing changes in job levels since the pandemic (2019-2023), manufacturing stands out among those well-paying industries that have added a substantial number of jobs in Missouri (see page 16). Manufacturing is grouped near construction, wholesale trade, and transportation and warehousing as sectors with strong performance and numerous jobs that do not require a four-year degree.

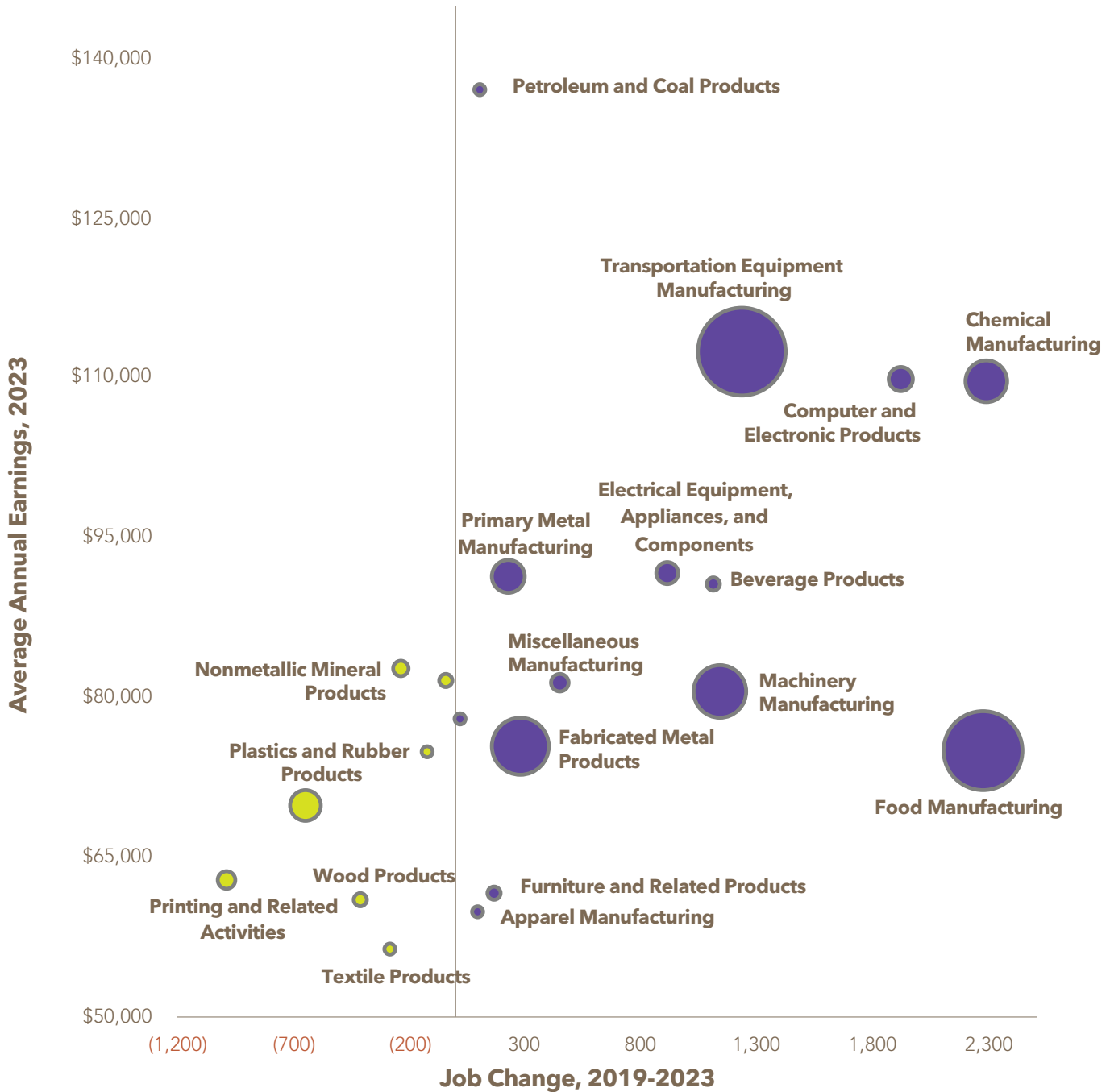
Among leading manufacturing subsectors around the state, transportation equipment, computer and electronics, and chemical manufacturing stand out for robust job growth from 2019-2023 accompanied by high average earnings. Areas that added many jobs with slightly lower average earnings include machinery and food manufacturing (see page 17).

## Missouri Post-Pandemic Job Change by Industry and Earnings



Source: EL calculations based on Lightcast 2024.1

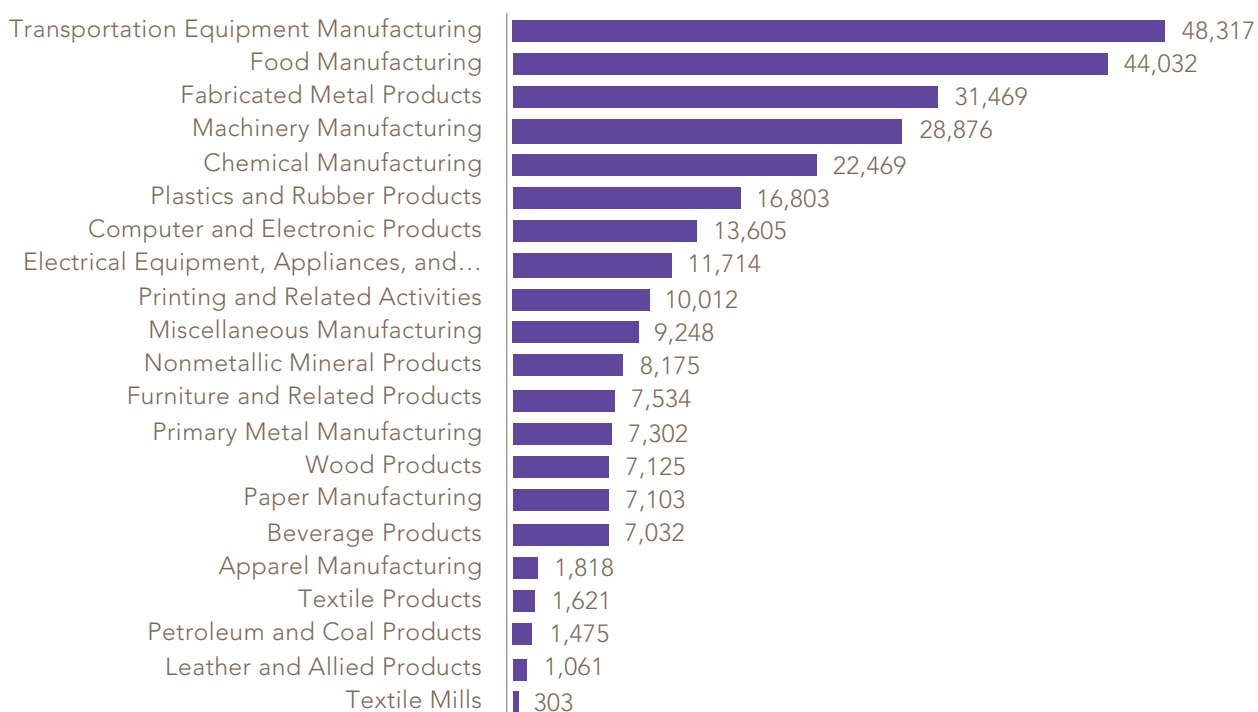
## Missouri Manufacturing Job Change by Industry and Earnings



Source: EL calculations based on Lightcast 2024.1

Below are the 2023 employment levels of manufacturing subsectors in Missouri, led by transportation equipment and food manufacturing. Nine different manufacturing subsectors each employ more than 10,000 people.

### Missouri Manufacturing Industries by Employment, 2023



Source: EL calculations based on Lightcast 2024.1

# Rating Missouri's Manufacturing Competitiveness

For the last several years, Economic Leadership has produced a Manufacturing Competitiveness Index using nearly 60 metrics across five categories to rank all 50 states for overall manufacturing competitiveness. The index takes data from a wide range of public sources in the areas of business climate, workforce, infrastructure, innovation, and economic strength.

For 2023, Missouri achieved an overall competitiveness ranking of 28th. The state fared the best for business climate (10th) and innovation (14th) while doing the poorest in workforce (40th) and infrastructure (39th). The top state for manufacturing competitiveness in 2023 was Utah, followed by North Carolina. Tennessee and Idaho tied for third. The table to the right shows how Missouri compared with its immediate neighbors.

Here is a breakdown of how Missouri rated 28th overall, looking at strengths and weaknesses in each of the five categories.

## Business Climate

Based on nine business climate metrics, Missouri was rated highly at 10th in the nation. It received top marks for tax climate and manufacturing operating costs. However, it was ranked among the bottom 10 in America for its legal climate.

## Workforce

Missouri fared the worst in the 18 metrics that make up the workforce index score. The state ranked low in health scores due to the prevalence of adult obesity (47th), as well as the change in student STEM and tech program completions (43rd). Missouri ranked 37th in worker productivity (manufacturing output per employee) and 34th in eighth grade reading scores, contributing to the overall category rank of 40th.

However, Missouri did well in certain measures, such as high school graduation rate (18th). Missouri also has the 11th lowest share of disengaged youth (those not in school or working, with no degree above a high school diploma).

## Infrastructure

Missouri struggled in the infrastructure category, ranking 39th overall. Among the nine metrics in this category, it did well in the growth of freight shipments (4th) and interstate highway miles per population (18th). It ranked among the bottom 10, however, for overall transportation spending per capita (43rd), bridges in good condition (42nd), and broadband access (41st).

### Manufacturing Competitiveness Index Rankings, 2023

State	Rank
Tennessee	3 (tie)
Kentucky	8
Nebraska	11
Kansas	20
Iowa	22
Missouri	28
Illinois	37
Oklahoma	41
Arkansas	43

*Source: Economic Leadership calculations*

However, those statistics will likely improve as a result of significant policy changes in recent years. After decades of transportation infrastructure disinvestment, Missouri's phased-in fuel tax increase is starting to provide needed funds to begin necessary projects. A \$2.8 billion state investment to improve I-70 and a \$728 million investment in I-44 will also help Missouri catch up with other states that have more sustainable investments in transportation. Deploying these large projects will take time, and it may be several years before the investments will put Missouri on the same level as states that have done a more consistent job of sustainably funding infrastructure needs.

## **Innovation**

Missouri placed 14th nationally for innovation and did not rank lower than 27th in any of the seven metrics used.

It received its best scores for the rate of adults becoming entrepreneurs (13th) and business research and development as a share of private industry output (15th).

## **Economic Strength**

Missouri placed in the middle of the pack for measures of economic strength in manufacturing, tied for 24th nationally. Fourteen different metrics were used in the economic strength category. Missouri had top 20 scores in several measures, including manufacturing GDP contribution and growth of manufacturing GDP. It also ranked 15th in total manufacturing employment. The lowest rank (44th) came in total manufacturing capital expenditures per employee. It also had lower scores in measures of goods exported.

In one-on-one interviews, manufacturing leaders echoed the need for improvement in certain competitiveness metrics. Four issues stand out:

1. The need for capital investments – along with strategic planning expertise and technical support – for manufacturing companies to modernize and boost productivity.
2. The need to increase the number of skilled workers completing technical and STEM programs in community colleges, trade schools, high school career and technical education (CTE) programs, and apprenticeship programs.
3. The need to maintain Missouri's extensive transportation infrastructure through state, federal, and local investments.
4. The need to continue reforms that will improve the state's legal climate, creating a healthy environment in which to do business.

## 2023 Manufacturing Competitiveness Index - National Rankings

		BUSINESS CLIMATE	WORKFORCE	INFRA-STRUCTURE	INNOVATION	ECONOMIC STRENGTH	TOTAL RANKINGS
1	Utah	3	2	3	11	8	27
2	North Carolina	1	3T	18	6	19	47
3T	Tennessee	6T	20	22	19	7	74
3T	Idaho	5	21	12	15T	21	74
5	Texas	20	26	6	7	16	75
6	Florida	9	15	14	12	26	76
7	Virginia	6T	6	7	34	35	88
8	Kentucky	15T	24	9	40	1	89
9	Arizona	12	27	27T	13	11	90
10	Georgia	24T	13	13	15T	30T	95
11	Nebraska	17	5	24	33	18	97
12	New Hampshire	29	3T	33	21	13T	99
13	Indiana	14	7	41	35	5	102
14T	Colorado	27	1	50	3	28	109
14T	South Dakota	2	18	5	44	40	109
16T	Washington	31T	8	49	1	22	111
16T	Michigan	15T	34	40	20	2	111
18	North Dakota	8	19	1	47	39	114
19	Wisconsin	34	11T	34T	27T	10	116
20	Kansas	35	30	8	32	13T	118
21	New Jersey	49	11T	23	8	29	120
22	Iowa	43	14	19	43	3T	122
23T	Wyoming	4	23	27T	36T	34	124
23T	Ohio	18	28	36	25	17	124
23T	Oregon	36T	46	25T	4	13T	124
26	California	50	25	42T	2	6	125
27	Maryland	38	17	10	15T	46	126
28	Missouri	10	40	39	14	24T	127
29	Mississippi	13	45	17	42	11	128
30T	Connecticut	33	10	37	23	30T	133
30T	New Mexico	21	47	2	18	45	133
32	Vermont	39	16	11	27T	42	135
33	Alabama	26	39	27T	36T	9	137
34	Massachusetts	40	9	48	5	36	138
35	South Carolina	19	37T	34T	29	20	139
36	Pennsylvania	46	31	21	10	32	140
37	Illinois	48	22	45	24	3T	142
38	Montana	22	33	4	36T	48	143
39	Minnesota	47	32	16	26	27	148
40	Delaware	28	29	32	30	37	156
41	Oklahoma	11	43	20	41	43	158
42	New York	44T	37T	30T	9	41	161
43	Arkansas	23	41	30T	45	23	162
44	Maine	36T	44	38	22	24T	164
45	Nevada	24T	36	47	31	38	176
46	West Virginia	31T	50	15	50	44	190
47	Rhode Island	41	35	44	38	47	205
48T	Hawaii	30	42	42T	49	49	212
48T	Alaska	42	49	25T	46	50	212
50	Louisiana	44T	48	46	48	33	219

top 15

bottom 15

# Recommendations

## MAKING MISSOURI A MANUFACTURING POWERHOUSE

Manufacturing is one of Missouri's most important industry sectors, in terms of both employment and contribution to GDP. Missouri is one of America's top 20 states for manufacturing employment. However, it ranks only in the middle of the pack – 28th – in Economic Leadership's index of overall manufacturing competitiveness. Missouri is among the bottom 15 states in ratings for critical factors, such as workforce and infrastructure.

What will it take to make Missouri a national leader in manufacturing? The recommendations below will require a collaborative, statewide effort to build on the state's strengths and improve weak areas. A successful strategy must be multi-pronged and built to achieve progress across these seven key areas.

### 1 **Expand Workforce Pipeline for Manufacturing Careers**

Missouri manufacturers overwhelmingly cite workforce challenges as their number one impediment to further growth, with all other issues “a distant second.” This is similar to results from the Missouri Chamber 2023 survey in which 51 percent of manufacturers named workforce as their top concern, and 62 percent said it was among the top two barriers to success.

Both hiring and retention are viewed as huge challenges. Wage pressures are great, with multiple employers competing over a few available workers. Some smaller firms report greater workforce stability and fewer hiring challenges. However, even these firms are very concerned about what will happen when their most experienced employees retire soon. Not surprisingly, manufacturing companies across Missouri cite the workforce as their number one business challenge and a frequent constraint on company growth.

When asked whether quantity or quality is the bigger problem, the typical answer is “both.” The total size of the U.S. labor force (and its lack of growth) is recognized as a “structural problem” and a “math problem that we don't want to face.” Companies must compete over small numbers of workers, especially for in-demand fields such as engineering, biopharma manufacturing, and the skilled trades. The quantity issue has become “more desperate” post-COVID. As one person summarizes it, firms will increasingly need to “do more with fewer people.”

Because workforce is such complex problem, multiple approaches are recommended.



**a. Increase funding for workforce education and training**

As manufacturing stakeholders noted, numerous existing workforce education and training programs in Missouri are valuable and effective. However, they are often not funded as well as they are in competing states or sufficiently to scale up qualified workforce numbers across the state. One of the state's top economic development priorities should be to fund workforce development programs so they can be scaled up across the board. This should include the Fast Track grant program, community colleges, public school CTE programs, apprenticeships, and the new Upskill Credential initiative.

**b. Accelerate adoption of apprenticeship models**

Missouri should increase assistance to manufacturing firms to adopt proven models for implementing apprenticeship programs. The Missouri Chamber has a robust apprenticeship grant program that provides funding to IT and health care organizations to increase apprenticeship training. During the life of the grant, the Missouri Chamber Foundation will help train more than 6,500 apprentices. The Missouri Chamber seeks to expand that model to manufacturing.

European-based firms operating in Missouri and the Midwest office of the German American Chamber of Commerce can provide a model for developing an apprenticeship program. Small and mid-size manufacturers in

“We have to get back into the apprenticeship model in our schools, helping our young people to see manufacturing as a career pathway that is economically viable for them.”

- MANUFACTURING LEADER INTERVIEWEE

particular can benefit from help when establishing an apprenticeship program.

**WHAT OTHER STATES ARE DOING:**

**Ohio** has seen robust growth in its apprenticeship programs, increasing the number of active participants by 69 percent since 2014. Ohio has the nation's third largest number of active apprentices. According to Apprentice Ohio, new graduates of apprenticeship programs in the state earn an average wage of \$32 per hour. Partners helping to grow interest include Franklin County and its Building Futures program in the Columbus area. Building Futures is a 12-week pre-apprenticeship program for lower-income residents, focusing on skilled trades.<sup>xvi</sup>

Missouri should also consider enacting an apprenticeship tax credit for employers. It currently offers a credit for at-risk youth in internships and apprenticeships through the Youth Opportunities Program, but that is a narrower program that comes with its own red tape. Neighboring **Kansas** provides a broader tax credit of \$2,500 per apprentice, while **Tennessee** offers \$2,000 per apprentice and training assistance grants.

**c. Support manufacturing talent attraction and recruitment**

The state of Missouri should develop and distribute fresh talent attraction recruiting materials for use by Missouri employers recruiting outside the state. The messaging should emphasize essential decision factors, such as cost of living, cost of housing, and job demand in growing scientific and technical fields.

#### d. Increase labor force participation

Missouri companies report expanding efforts to find quality employees, starting with growing their human resources departments. More manufacturers are trying harder to reach any untapped group, including veterans, immigrants, and women who are open to changing careers. Other companies are dropping education requirements with some success. When it comes to recruiting higher-skilled talent – scientific, professional, and engineering positions – firms say it is difficult to recruit to Missouri. This could be due to coastal bias in the U.S., the relative lack of job opportunities in their field in Missouri, and crime concerns in the St. Louis area. Several business leaders think that the lack of national immigration reform is hurting manufacturing. They support “closing the back door” of illegal entry while “opening the front door” for increased legal immigration.

State agencies and state-level organizations must scale up efforts to engage untapped talent for manufacturing across a wide range of groups. These include women, ex-offenders, disengaged youth, older workers, and foreign-born workers. The state should ensure sufficient resources are allocated to support the Missouri Department of Higher Education and Workforce Development’s Sixty for All goal of upskilling 150,000 rural, Black, and Hispanic adults to obtain credentials for high-demand occupations.

#### WHAT OTHER STATES ARE DOING:

An effective state model for raising the numbers of ex-offenders who are ready for employment upon release is **Indiana’s** Hoosier Initiative for Re-Entry, or HIRE. HIRE started over a decade ago and is focused on three service areas:

- a) pre-release and post-release education and training services for offender clients;

- b) outreach to businesses in nine regions around the state to match clients with employers while helping firms with the Work Opportunity Tax Credit and federal bonding program;
- c) outreach to community organizations that can help ex-offenders overcome the barriers they often face when returning to work and community life.

Since 2012, HIRE and 3,000 participating companies have placed over 15,000 returning citizens in jobs. The Indiana Department of Correction states that the recidivism rate of HIRE completers is 14 percent, less than half that of the overall prison population.<sup>xvii</sup>

#### e. Incentivize child care availability and affordability

Child care is named as the primary barrier to greater labor force participation. This includes both the cost (if a parent has two or more kids, it “might not make sense to work”) and availability, especially during second and third shifts. In a 2023 Missouri Chamber survey, 66 percent of manufacturers said that child care issues keep at least some people out of the workforce. (Note: According to a recent report by the Federal Reserve Bank of Atlanta, 53 percent of the U.S. workforce are parents, and 37 percent have young children.)<sup>xviii</sup> Several interviewees are exploring on-site or sponsored child care but have not moved forward yet.

A majority of states are now proactively promoting the expansion of child care availability and subsidizing the cost. Unfortunately, Missouri has not been successful in passing an innovative proposal of that would provide a 30 percent tax credit for employers who provide child care. The proposal would also offer a tax credit for those who make contributions to support child care service providers (with a goal of reducing “child care deserts” across the state) and for child care providers themselves.

Missouri must be diligent in pursuing policies to address child care in the next legislative session.

### WHAT OTHER STATES ARE DOING:

**Iowa's** Child Care Business Incentive Grant program aids businesses in developing on-site child care (e.g., paying for needed infrastructure) or contracting with a child care provider to add more slots. The program has helped to add more than 10,000 new slots in Iowa since 2022. The state also has a tax credit for employers providing child care for their workforce.

**Georgia** offers a 75 percent tax credit for employers providing on-site care. For companies that subsidize child care for their workers, **Kentucky** can match their expenditures 100 percent. When firms in **West Virginia** build on-site child care facilities, the state gives a tax credit equal to 50 percent of the improvement value. **Kansas** has a 50 percent tax credit for the establishment and annual operation of on-site care.

In 2024, the **North Carolina** Department of Commerce created the new position of Child Care Business Liaison to strengthen cooperation between government, employers, philanthropy, and child care providers and develop strategies for employers to provide child care support for their workforce.

ethic of existing, older workers is generally strong, but employers are worried about an aging workforce and impending retirement of good employees. For new hires, Missouri manufacturers are happy to find quality individuals who are “not trained but [at least] trainable.” In the 2023 Missouri Chamber survey, 75 percent of manufacturing respondents said Missouri high school graduates are not well prepared for the workforce.

Companies increasingly must “do more with fewer people”

One promising approach in Missouri is the Missouri CTE Advisory Council developed the Career and Technical Education Certificate that was launched in 2020-2021. The CTE Certificate is built around 8 core criteria of what students enrolled in CTE coursework must achieve to obtain the certificate at the time of graduation. Students must demonstrate proficiency in both technical skills and employability skills or soft skills. They must complete a minimum of 50 hours of appropriate work-based learning experiences aligned with the student's CTE area of concentration.

However, more awareness is needed by both employers and school administrators on the value that the CTE Certificate for helping students find meaningful employment upon graduation.

### f. Strengthen workforce readiness

The workforce deficits cited most often by Missouri manufacturers are soft skills, such as reliability, commitment, and communication. It is important to increase training and verification of essential employability skills, especially among young people.

Almost all interviewees mention problems with basic employability skills like reliability and commitment, along with some communication shortcomings. This is in line with the recent Missouri Chamber survey in which 60 percent of manufacturers said soft skills were the primary worker quality concern. Twenty-four percent prioritized technical skills. The work

### WHAT OTHER STATES ARE DOING:

**Tennessee's** Work Ethic Distinction credential began in schools in the northeastern part of the state and has spread to all parts of Tennessee. Work Ethic Distinction is built around standards in 13 areas, from student attendance and CTE coursework to industry certifications and work experience. Students must earn 32 points from among these standards to earn the credential. If they do, they are automatically eligible to be interviewed for any relevant job opening by more than 220 industry partners in manufacturing and many other sectors.

### g. Expand career coaching for young people

In 2024, the Strada Education Foundation debuted a nationwide State Opportunity Index, designed to evaluate the links between post-high school education and pathways to career opportunities in each state. It measures states on five metrics: Clear Outcomes, Quality Coaching, Affordability, Work-Based Learning, and Employer Alignment.

Missouri's lowest rating came in Quality Coaching, providing guidance for individuals trying to make the education-to-career transition. Quality Coaching assists people in reviewing their talents and interests, helps them to choose career goal(s), and maps pathways to get there.

In almost every state, there are too few guidance counselors to provide helpful career coaching for high school and middle school students. Counselors often deal primarily with disciplinary issues and college applications. As a result, some states are creating a separate corps of career coaches who focus on career exposure and illustrating paths to high-demand careers within their region.

In Missouri, the non-profit rootEd Alliance trains and places college and career counselors in mostly rural schools. Established in Missouri in 2019, rootEd now has counselors in 135 high schools across the state.

#### WHAT OTHER STATES ARE DOING:

**Arkansas'** College and Career Coach initiative began as a pilot in a few counties in 2010 and has spread across Arkansas with funding support from the state legislature. College and Career Coaches serve students in the seventh through 12th grades. Several years ago, new metrics were added to track progress on industry-recognized credential attainment and work-based learning.

**Mississippi** has used ARPA and state funds to grow its career coaching program from 20 coaches in 2021-2022 to 185 in 2023-2024. Coaches are now deployed in 78 percent of

public high schools in Mississippi. **Montana** started a career coach program in 2023.

In addition to career counseling, tracking student career readiness data is valuable for monitoring progress. **Kansas** measures students' social-emotional learning skills that can equate to key employability skills. It also creates a report for high schools with information on the share of students that complete career interest surveys and write post-secondary goals and plans. Kansas tracks student portfolios of internship records, dual course credits, certifications, and applications to higher education.

### h. Boost manufacturing career awareness

Nearly all manufacturing stakeholders believe Missouri could benefit from a high-impact awareness campaign touting the attractiveness of manufacturing and skilled trade careers. The Missouri Chamber has had success in its Virtual Manufacturing Day program, which reaches several thousand students each year in their classrooms via Zoom. Manufacturing representatives speak to students about the benefits of a manufacturing career and students have the opportunity to ask questions through the interactive forum. The Missouri Chamber also continues to grow its Show-Me Careers program, which takes educators and counselors into businesses across the state, including manufacturing facilities, to learn about career opportunities for their students.

#### WHAT OTHER STATES ARE DOING:

Since it debuted in **Arkansas** in 2016, the successful Be Pro Be Proud program has spread to Georgia, South Carolina, North Carolina, Tennessee, and New Mexico. The Be Pro Be Proud website highlights the demand and high earnings of occupations in skilled professions. This is complemented by custom built, tractor trailer Mobile Workshops that feature hands-on, virtual reality and augmented reality tools to experience career opportunities.

## Provide incentives and technical assistance to increase capital investment

Future success in manufacturing will come to those firms that invest to modernize and automate. According to Economic Leadership's Manufacturing Competitiveness Index, a specific weakness in Missouri is the level of capital investment per employee.

The first action needed to spur new investments is to review and realign the state's tax credits and other incentive policies to reward manufacturers that invest to modernize. Incentive policies need to take capital investment into account as much as they do job creation. Other states like Indiana (see box to the right) are also providing grant funds to support advanced manufacturing investments. Missouri should increase funding for programs that promote investment in innovation, such as MOBUCK\$ and Missouri Technology Corporation programs.

Workforce shortages are making automation investments "mandatory"

Beyond that, the state and service providers like Missouri Enterprise (the state's Manufacturing Extension Partnership network member) must collaborate effectively to provide outreach and technical assistance so that firms can plan and implement automation strategies. Small and mid-sized companies in particular can benefit from technical assistance, mentoring, and case studies of successful modernization investments in Missouri.

### WHAT OTHER STATES ARE DOING:

**Indiana** has awarded \$57 million in Manufacturing Readiness Grants since 2020, supporting \$813 million in advanced manufacturing modernization projects at 465 companies across the state. In the 2023 round of funding, 79 percent of recipient firms were more than 10 years old, 72 percent had less than 100 employees, and 28 percent were located in rural Indiana counties. The Manufacturing Readiness Grants are a joint program of the Indiana Economic Development Corporation and Conexus Indiana, a non-profit that supports advanced manufacturing and logistics growth.

The **Virginia** Investment Performance Grant (VIP) is a discretionary state program only for existing manufacturers (or R&D providers that support manufacturing) in Virginia making at least \$25 million in new investment for "added capacity, modernization, increased productivity, or the creation, development, and utilization of advanced technology." VIP grants are determined by the state Secretary of Commerce and Trade based on expected return on investment and other factors and are paid out in five equal annual installments. There is no requirement for new job creation.

**Oklahoma's** manufacturing incentives include the Business Expansion Incentive Program for firms that make at least a \$2 million investment in machinery, equipment, and/or buildings to expand operations in Oklahoma. Like Virginia, this incentive takes the form of annual cash grant payments. Oklahoma also offers a tax credit through the Investment / New Jobs Package, in which growing manufacturers can take a credit for either capital investment or new job creation. For capital investments, the tax credit is one percent of the investment value, taken over five years.



## Invest in infrastructure to support manufacturing – transportation, broadband and energy

To support manufacturing, another pressing need across Missouri is maintaining and upgrading the state's many infrastructure assets, from roads, bridges, rail, and river ports to broadband internet and the electric power grid.

### Continue the recent momentum of investment in transportation assets

The state has made progress in addressing these needs by increasing investment in our transportation system and winning major federal broadband grant funds. The increased transportation funds are allowing Missouri to address the backlog of major road improvement projects (especially for Interstates 70 and 44), which will then free up funds for smaller road and bridge projects across the state. Missouri's five-year Statewide Transportation Improvement Program (STIP) incorporates much greater public and stakeholder input than some other states.

### Ensure that Missouri maximizes broadband opportunity

Missouri can add to this momentum by making sure state and private sector funds are ready to match federal broadband dollars and streamlining the process to implement internet expansion projects. The state should also consider the issuance of bonds on a larger scale to tackle urgent transportation repair, replacement, and system upgrade needs. More states are entering into public-private partnerships, design-build, and other contracting methods to save money and time.

### Expand access to reliable and affordable energy

The availability, capacity, cost, and reliability of energy – especially the electric grid – is now an issue of great importance to manufacturers. Due to rising demand, energy concerns are increasing across Missouri and all of America. Energy-related factors have risen to the top of corporate site selection criteria over the last two years. It is critical that the state, utility partners, and industry collaborate on ways to strengthen Missouri's

energy infrastructure. Priorities include 1) modernizing and upgrading the electric grid, and 2) supporting and possibly incentivizing utilities to increase energy production.

### WHAT OTHER STATES ARE DOING:

Important state efforts to overhaul aging infrastructure include **Indiana's** 20-year Next Level Roads program (as well as the state's Next Level Connections Broadband Grant Program), **Tennessee's** Transportation Modernization Act, and the Rebuild **Illinois** Initiative. **Michigan** is issuing \$3.5 billion in road project bonds, while debt service on **Connecticut's** \$1.6 billion in transportation bonds will be paid from a dedicated revenue stream, the Special Transportation Fund.

For broadband service expansion, more states are adding state appropriations to the federal dollars that are widely used. The **Arizona** legislature allocated \$23 million to its new Rural Broadband Accelerated Match Fund in 2023, while the new **Texas** Broadband Infrastructure Fund received initial funding of \$1.5 billion to match dollars from the federal Broadband Equity Access and Deployment (BEAD) program.

There is rapidly increasing state focus on the capacity, reliability, and cost of electric power grids. In July 2024, ten states and the U.S. Department of Energy (DOE) signed a Memorandum of Understanding to create the **Northeast States Collaborative on Interregional Transmission**. This collaborative will allow states, utility providers, and other stakeholders to coordinate with the DOE on planning for more efficient electric power transmission, incorporating offshore wind and other clean energy technologies. Elsewhere, **Virginia** in 2024 adopted a measure to promote the adoption of grid-enhancing technologies (GETs) among utility providers in the state.

GETs can substantially increase the capacity and efficiency of electric grids. **Kansas** passed legislation providing for greater cost recovery for electric utility investment projects.

## 4 Support recruitment of new manufacturers and expansion of existing operations

States are making aggressive and intentional moves to recruit new manufacturers and support expansion by existing firms. Missouri is no exception. Missouri policymakers have recently made record investments in target industries and Missouri Partnership, the recruiting arm of the state of Missouri, continues to sharpen the focus on attracting manufacturers to our state.

### a. Protect Missouri's competitive position as a low-cost manufacturing state

Missouri has a fantastic manufacturing story to tell. Missouri provides a cost-competitive, pro-business and innovative environment for manufacturers to thrive. Missouri's central location gives manufacturers access to raw materials and a globally connected logistics infrastructure that significantly reduces shipping costs and time to market. Our utilities work hard to keep rates affordable. Missouri's tax climate is among the lowest in the nation. Missouri must stay vigilant to protect its cost advantages and promote these benefits to prospective employers.

### b. Lean into reshoring movement

Missouri can also take advantage of high levels of supply chain reshoring activity and capital investment by U.S. manufacturers. Many states are targeting companies and projects spurred by incentives contained in the recent federal CHIPS, IRA, and IIJA legislation. Existing manufacturers in the state can also help to identify key overseas suppliers that may consider relocating to Missouri.

To recruit reshoring and expansion projects, Missouri can tout its low operating costs and tax burden, relatively affordable land and buildings, strategic central location, and a large manufacturing workforce.

### c. Enact right-to-work in Missouri

Missouri often misses out on new manufacturing projects because of its right-to-work status. It has been six years since a statewide referendum overturned a Missouri right-to-work law, and it is possibly time to revisit this important economic competitiveness issue. In the 2024 Top States for Business rankings by CNBC, each of the top five states has enacted right-to-work legislation. Research findings on the topic vary, but a 2021 study by economic researchers at Harvard found that right-to-work states experience higher manufacturing employment, lower unemployment rates, greater population growth, lower poverty rates, and greater upward economic mobility for residents.

### d. Support creation of megasites to attract large projects

Missouri could also become more attractive for major manufacturing reshoring and expansion projects. Land availability for industrial development is generally considered good in Missouri, but there are areas of weakness. Industrial land with the necessary infrastructure is difficult to find in rural areas, and larger development-ready tracts are scarce across the state. In particular, Missouri does not compete well in offering "megasites" of 1,000 acres or more that can attract transformational projects. To elevate Missouri's status as a state that is willing and able to compete for larger manufacturing projects, the state should increase efforts to develop two or more megasites that can be served by all needed infrastructure and are strategically located to access the multi-modal transportation network, as well as an ample manufacturing labor supply. Identification and development of megasites will take strong cooperation between local and state government. Increasingly, public-private partnerships are being used to speed up industrial site development, and Missouri should consider this tool as well.

### WHAT OTHER STATES ARE DOING:

Southeastern states have often led in the development of industrial “megsites” of 1,000 acres or more that are capable of hosting the nation’s largest manufacturing investments. Recent government action shows they are not letting up on these efforts. **North Carolina** created its Megsites Readiness Program in the 2022-23 legislative session and added greater funding the following year. The Megsites Readiness Program provides \$10 million for 2023-24 and \$98 million in 2024-25 to assist local governments (or partnerships of multiple localities) with identification, due diligence, and site development. In 2023, **Alabama** put \$30 million into its Site Evaluation and Economic Development Strategy Act (SEEDS). A few states have special entities – like the Tobacco Region Revitalization Commission in **Virginia** – that make substantial grants for large site work.

While Southeastern states have been traditional leaders, more Midwestern states are ramping up their megasite competitiveness. Illinois funded its Megsites Investment Program with \$23 million in 2023. Recently, **Michigan** announced \$9.2 million in funding to prepare a 1,200-acre industrial site near Flint.

## Increase exports

An important goal for improving the state’s manufacturing competitiveness should be to raise Missouri’s ranking as an exporter of goods from 27th in the U.S. into the top 20. Some states and regions target smaller but growing companies in high-growth manufacturing subsectors for assistance. Many smaller and mid-sized firms are completely unaware of how to begin exporting, and outreach to them through regional seminars, online information, and one-on-one contacts can be of great value.

### WHAT OTHER STATES ARE DOING:

**Kentucky**, the nation’s 15th largest exporter, has operated its State Trade Expansion Program (STEP) for the last 11 years. It has leveraged \$4.4 million from the U.S. Small Business Administration into assistance for 235 businesses, helping many small and medium-sized firms begin exporting goods or services. New business clients can be reimbursed by up to \$10,000 in STEP funds for export training, marketing, and developing websites for international audiences. Existing clients can also use funds for international trade shows, foreign market visits, and compliance testing. Expert advice for participating firms comes through the Kentucky Export Initiative.



## 6 Strengthen Missouri's legal climate

The atmosphere in a state regarding lawsuits, damages, and related legal matters plays a significant role when businesses consider major investments and headquarters decisions. Missouri has made progress since being ranked 44th in the country for its overall legal climate in 2019. For example, the General Assembly passed SB 591 in 2020 which addressed punitive damages. However, much more remains to be done in order for Missouri's legal climate to be considered a factor that spurs economic competitiveness and innovation.

One area of focus is the need to reduce the statute of limitations, which is currently five years for personal injury lawsuits. Five neighboring states have a two-year statute of limitations. In the 2024 legislative session, SB 853 and HB 1964 would have greatly improved the statute of limitations in Missouri, but both bills failed to reach the governor's desk. Other litigation-related issues to address include the practice of litigation lending and asbestos litigation cases.

Additional priority issues that must be addressed to improve the state's legal climate are a) employment dispute resolution, b) regulatory changes affecting existing products, and c) the process for selecting judges.

### WHAT OTHER STATES ARE DOING

In the most recent Institute for Legal Reform rankings from 2019, **Maine** rose from 15th to 2nd over four years. It moved up 12 spots in the Damages category and 25 places for the Quality of Appellate Review.

**Connecticut** rose 10 places to 3rd overall in just two years. The state ranks 2nd nationally in the areas of Damages, Jury Fairness, Trial Judge Impartiality, and Treatment of Tort & Contract Litigation.

**Nebraska** ranks among the 10 best legal climates, placing 4th nationally for use of Scientific & Technical Evidence, Proportional Discovery, and Damages.

## 7 Address public safety

Too many manufacturing leaders say the issues of crime and violence – especially in and around St. Louis – harm their ability to recruit and retain valuable talent. The status of public safety in Missouri must improve for the state to reach its potential for workforce attraction and economic competitiveness. Public safety concerns affect all employers and residents in the state.

Successfully improving public safety conditions will require participation from stakeholders at the local, regional, and state levels across a wide variety of issues. Challenges to address include:

- Staffing and pay levels for law enforcement
- Reducing crime hot spots
- Recidivism rates and better training for ex-offenders to succeed in the workforce
- Adequate resources to upgrade mental health and substance abuse services
- Increasing consistency, accountability, and transparency among prosecutors and judges.

### WHAT OTHER STATES ARE DOING:

States that are now providing financial incentives to boost hiring and retention of law enforcement professionals include **Nebraska** – through its Law Enforcement Attraction and Retention Act in 2022 – and **New Mexico**. **North Carolina** is helping law enforcement agencies across the state to recruit and keep a more diverse workforce.

Meanwhile, more states are addressing accountability measures for prosecuting attorneys and judges. **Georgia's** governor signed into law the creation of the Georgia Prosecuting Attorneys Qualification Commission, and in 2023, **Texas** adopted a bill that allows courts to remove district attorneys for misconduct. The **New York** State Senate passed a measure to increase the authority of the state Commission on Judicial Conduct, but the proposal has not yet been enacted.

# Appendix

## Return on Investment for Manufacturing Automation

The anticipated return on investment (ROI) from purchasing new robotics or other automated machinery for manufacturing processes is a key consideration in any modernization purchase decision. However, calculating a realistic ROI is not a simple process as conditions relating to the investment will vary in each case. The basic formula for calculating a percentage ROI is straightforward:

$$\text{ROI} = \frac{\text{Revenues Gained} - \text{Investment}}{\text{Investment}} \times 100$$

The true costs of automated equipment and machinery can include many expenses, such as:

- Installation costs
- Training costs – to get team members up to speed on new machinery.
- Operational costs – power consumption (new equipment will often use less energy than older machinery), labor costs for programming and operating.
- Maintenance costs – which may be lower but need to include scheduled downtime.
- Financing costs – if the automation equipment is not paid for up front, the monthly payments to pay off the purchase.

The benefits that lead to additional revenues will vary as well, depending on:

- Productivity rate – the ability to work more quickly, efficiently, and with less downtime than manual manufacturing processes. Greater output often equals increased revenues. An engineering firm suggests that productivity gains are often in the range of 25 percent to 50 percent, and one ROI calculator uses 27 percent to estimate productivity increases.<sup>xxi</sup>
- Labor savings – the potential for considerable savings due to fewer employees and less turnover in positions that involve tedious, repetitive, dangerous, or error-prone tasks.<sup>xx</sup>

Other benefits of automation can include greater accuracy in production, less waste, higher quality, and fewer product recalls. The increased capacity from higher productivity can lead to fewer instances of having to turn down work due to staff limitations. Labor savings can build over the long term due to decreased costs for hiring and onboarding (if enough people with the skills to interact with technology can be hired). Increased safety and potentially lower expenses for safety equipment, safety training, and workplace injury issues can be additional benefits.

There is no standard percentage ROI for manufacturing automation, but industrial advisors do provide a typical timeframe for when investment returns become positive. One source suggests that most investments start to be profitable 12 to 36 months after implementing an automation project,<sup>xxi</sup> while an industry non-profit organization says that 24 months is an average time.<sup>xxii</sup>

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