ST. LOUIS DISTRICT PROFILE: Freight and the District's Economic Future

Global trade and new technologies continue to transform the economy, redefining the way businesses operate, challenging supply chains and transportation networks, and creating new customer opportunities for Missouri businesses in places where they were once inconceivable. Businesses and their employees are more dependent than ever on integrated, agile, and efficient transportation networks to sustain economic competitiveness and facilitate journeys to work and connections to markets.

To compete in this global marketplace, businesses must optimize every asset—workforce skills, competitively priced products, and reliable transportation systems—to ensure their customers receive quality goods and services when they expect them. As the importance of trade and the demands of customers continue to evolve, Missouri companies often find freight an increasingly important factor in sustaining and enhancing their competitive position in the marketplace. Freight supports the domestic and international trade of Missouri businesses, and supports State and local economic development and job growth.

St. Louis District Population Trends

Missouri's population is projected to grow, with the 2012 population of 6,021,988 increasing to 7,159,350 by 2040. The modest population growth experienced by the MoDOT St. Louis District from 2000 to 2012 is expected to continue, with the 2012 population of 2,008,897 projected to increase by approximately ten percent to 2,220,210 by 2040.[1] The City of St. Louis and St. Louis County experienced a decline in population between 2000 and 2012, and between 2012 and 2040 the City is projected to lose population as well. St. Charles County experienced the greatest growth in population from 2000 to 2012, adding more than 82,000 residents during this period. St. Charles and Jefferson counties are expected to be responsible for most of the region's growth between 2012 and 2040. Modest population growth often tempers the expansion of non-traded sector businesses that are generally driven by population growth, such as local professional services (legal, accounting, and medical), local retail trade, real estate and financial services, and food service and restaurants.

Freight is an increasingly important factor in sustaining and enhancing the economic competitiveness of businesses in Missouri and in the St. Louis District.

Transportation Dependence: Missouri and the St. Louis District Economy

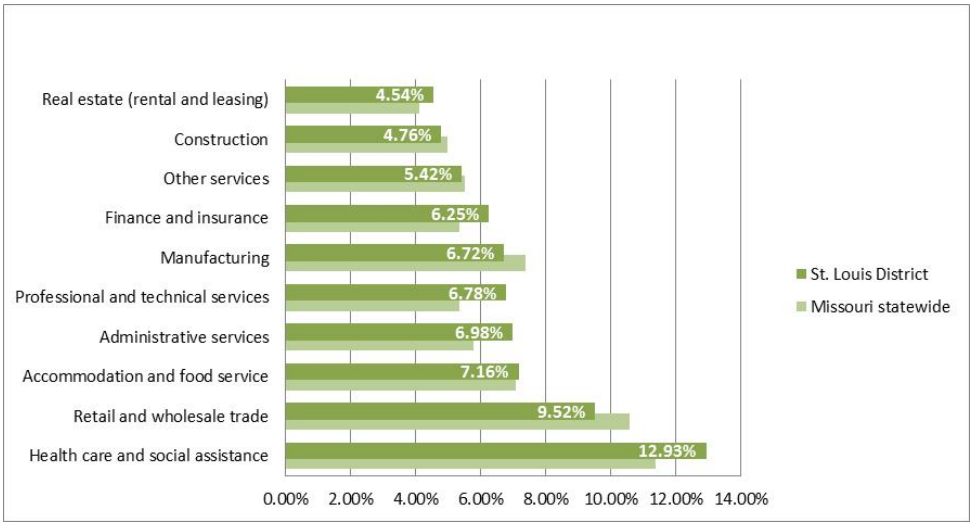
Freight transportation represents a key competitiveness factor for St. Louis District businesses. Companies today compete on more than product quality and cost. The transportation networks serving their facilities must provide reliable connections to buyers and link to a multitude of markets to ensure timely deliveries of goods and services and provide access for employees and customers. Some business sectors use transportation facilities and services more extensively than others. An industry sector's dependence on transportation can be measured by examining the amount a business sector spends on transportation

[1] US Census Intercensal Estimates, July 2000; US Census Annual Estimates; 2013 CEDDS by Woods and Poole Economics

as a share of its total output.[2] Transportation satellite accounts provide national data regarding the amount spent on transportation per dollar of output for various sectors.

To better understand the role freight and goods movement play in the St. Louis District and the contribution of multimodal transportation to the economic vitality of the District's key industry sectors, the project team evaluated the importance of these key industrial sectors based on the non-government employment concentrations in the District. Just over 70 percent of the District's non-government employment is concentrated in 10 sectors: health care and social services, retail and wholesale trade, accommodation and food service, administrative services, professional and technical services, manufacturing, finance and insurance, other services, construction, and real estate.[3] **Figure 1** shows the breakdown of these employment sectors, by percentage of total employment, for the St. Louis District and for the State of Missouri.

Figure 1: Top Ten Non-Government Employment Sectors, St. Louis District



As noted in **Figure 1**, the importance of transportation to these key industry sectors can be measured by the amount each sector spent on transportation as a share of its total output.

The project team evaluated several primary industry sectors and identified the corresponding industrial classification codes for each key sector in order to compare the applicable transportation costs per dollar of product output using the transportation satellite accounts research. Key business sectors for the St. Louis District are shown in **Table 1**.

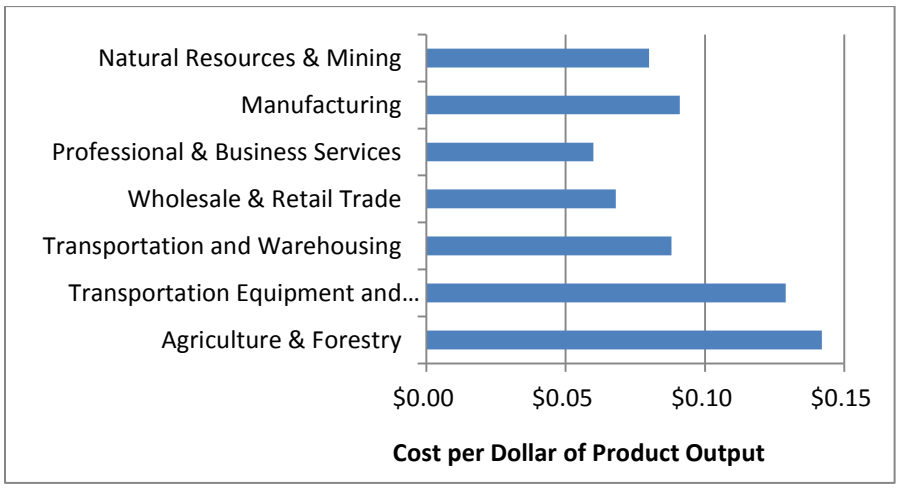
Table 1: North American Industrial Classifications for Key Industrial Sectors, St. Louis District

Industrial Sectors	North American Industrial Classification Sector
Advanced Manufacturing	Manufacturing
Agricultural Sciences and Technology	Manufacturing
Information Technology	Information
Technical and Professional Services	Professional, Scientific, and Technical Services
Transportation and Logistics	Transportation and Warehousing
Aerospace Manufacturing	Manufacturing
Industrial Machinery Manufacturing	Manufacturing

[2] "Transportation Satellite Accounts: A Look at Transportation's Role in the Economy," U.S. DOT Research and Innovative Technology Administration
[3] Bureau of Labor Statistics, US Census 2012, County Business Patterns

Figure 2 shows the transportation cost per dollar of product output for several important existing industry sectors in the St. Louis District based on their NAICS code. Improvements in transportation costs and services would have a significant effect on the profitability of companies in these industries, as lower transportation costs and more reliable service help reduce the cost of materials, resulting in lower overall production costs. Reliable delivery of materials can enhance productivity, and reducing distribution costs to the consumer may also improve competitiveness.

Figure 2: Transportation Cost as a Share of Sector Output.
(Transportation cost per $ of product value)



Source: Transportation Satellite Accounts database, Bureau of Transportation Statistics, Research and Innovation Technology Administration

The St. Louis District has been successful in retaining and attracting transportation-dependent businesses in several significant economic sectors as described in **Table 2**:

Table 2: Economic Sectors the St. Louis District has retained and attracted transportation-dependent businesses

Transportation, Logistics, and Freight	Machine Manufacturing	Chemical Manufacturing
SYSCO Corporation	Lincoln Industrial	Sigma-Aldrich
Graybar	True Manufacturing	Solutia
UPS	Crane Merchandising Systems	ICL Performance Products LP
Exel	Avmats	Purina Mills LLC
C.H. Robinson	Central Mine Equipment	Pfizer
Cheyenne Logistics	Mark Andy Inc.	K-V Pharmaceutical Co.
Artur Express	Ingersoll-Rand	Sanofi-Aventis U.S.
World Wide Technology	Coinco Products	Meridian Medical Tech Inc.
Hogan 1	Duke Manufacturing	Carboline Company
UniGroup	Melton Machine & Control	The Dial Corporation

Economic Development Trends

Advanced Manufacturing

Advanced manufacturing employed 100,336 Missouri residents in 2012, more than 40 percent of the State's manufacturing workforce. The St. Louis District houses a significant cluster of advanced manufacturing firms including several Fortune 500 companies. Innovative companies include Zoltek, a carbon fiber manufacturer with two facilities in the area, which is locating its new research and development and manufacturing facility in St. Peters; and Emerson, an international manufacturer of electrical, electromechanical, and electronic products with headquarters in St. Louis. Watlow, a leading global thermal systems manufacturer headquartered in St. Louis, announced in March 2014 it plans to construct an advanced technology center at its facility in Maryland Heights to house its research and development team. SunEdison, also headquartered in St. Louis, is a leading producer of silicon wafers used in microprocessors and logic devices as well as solar cells, and numerous firms in the area supply chemicals, batteries, modules, electronics, and testing equipment for the solar power industry. Automobile manufacturing is well-represented in the area as well. Emerald Automotive will build hybrid electric vans at a new $175 million facility in Hazelwood, and in 2011 General Motors announced an additional investment of $380 million in its Wentzville operations, where it makes pickups and vans. Lear Corporation, also in Wentzville, makes automobile seating and electrical systems.

Colleges and universities in the area offer programs that support the advanced manufacturing sector. Several offer associate's level degrees in precision production, and the Emerson Center for Engineering at St. Louis Community College features lab space, classrooms, and state-of-the-art tooling and equipment for training in materials, quality assurance, civil engineering, electronics, computer drafting and design, and skilled trades. Missouri Tech, Saint Louis University, the University of Missouri-St. Louis, Vatterott College, and Washington University all have bachelor's and graduate level programs in engineering. Washington University also houses the Center for Materials Innovation, which focuses on magnetic, biological, biomedical, and amorphous materials and nanomaterials; and the Institute of Materials Science and Engineering, which brings together researchers in engineering, physics, chemistry, and earth and planetary sciences to leverage interdisciplinary materials research.

Aerospace Manufacturing, Research, and Development

The aerospace industry, a specialized segment of the advanced manufacturing sector, employed 17,518 workers in Missouri in 2012[4] Boeing has more than 15,000 employees at its Defense, Space, and Security Unit in St. Louis, which includes military aircraft, missiles, airborne lasers, unmanned combat air vehicles, and information and communications satellites. The unit also holds a prime contract with NASA to support the International Space Station. LMI Aerospace, which is expanding its headquarters and manufacturing facilities in St. Charles, manufactures door and cockpit window frames, skins for wings and fuselages, and interior components. GKN Aerospace is a first-tier supplier of structures, components, and engineering services to Boeing and other aircraft and engine manufacturers. The industry cluster is supported by the Aerospace Research and Education Center (AeREC), a consortium of Washington University, Saint Louis University, the University of Missouri-Columbia, and Missouri University of Science and Technology. AeREC partners with the aerospace industry and with government and provides education through innovation, research, and technology development and transfer. Other college and university centers focused on the aerospace industry include the Aerospace Institute at St. Louis Community College, which trains potentials workers for entry-level technician positions; the Center for Aviation Safety Research at St. Louis University, established by Congress to serve as the central resource for developing sustainable safety initiatives; and the Space System Research Laboratory, also at St. Louis University, which focuses on design, fabrication, and operations.

St. Louis has a strong aerospace manufacturing industry with substantial support in workforce training and research and development. Growth in these areas depends in large part on the domestic and global economies, however. Demand for both passenger and cargo aircraft is expected to grow, following contractions in both fleets since the recent global recession. A dramatic increase is forecast in annual production levels of commercial aircraft by 2023, driven by increased passenger travel (especially in the Middle East and Asia/Pacific regions) and the need to replace obsolete aircraft with the next generation of fuel efficient vehicles. New global competition in this market, and its impact on the supply chain, are challenges to consider, however. Defense spending is expected to contract over the next few years with the end of conflicts in Iraq and Afghanistan, and the U.S. and most other countries are scaling back on military spending.[5] One bright spot lies in unmanned aircraft systems, which Boeing's St. Louis campus supports. Worldwide annual spending on research, development, testing, and evaluation

[4] Bureau of Labor Statistics, Quarterly Census of Employment and Wages, 2012.
[5] Deloitte, "2014 Outlook on Aerospace & Defense." www.deloitte.com/view/en_US/us/Industries/industry-outlook.

procurements for such systems are projected to grow from $6.6 billion in 2013 to $11.4 billion in 2033, with spending over the next ten years totaling $89.1 billion.[6]

Industrial Machinery Manufacturing

The industrial machinery manufacturing sector produces equipment for sawmills and other woodworking processes, the plastics and rubber industry, and for manufacturing paper, textiles, printing, food products, and semiconductors. It employed over 1,700 in the state in 2009 at an average wage of $47,732, and exported $75 million that year, primarily to Canada and Mexico but also to Singapore, the U.K., Germany, Nigeria, China, Australia, Malaysia, and India. Both St. Louis County and Franklin County have a concentration of jobs in this sector. Mark Andy Inc. in Chesterfield makes web printing equipment under the Comco, Mark Andy, and Rotoflex brands. As the global economy recovers, analysts expect "quite impressive" growth in the worldwide market for all industrial machinery in the next four years. Annual growth is projected to be 6.3 percent in 2014, more than double the 2013 increase of 2.9 percent, and growth should average between five and six percent through 2018.7

Agricultural Sciences and Technology

Another important sector for the St. Louis District centers on the research and technology side of the agriculture industry. Monsanto, a global leader in bioscience and sustainable agriculture research, announced in April 2013 it would invest over $400 million in a new state-of-the-art research building, 36 new greenhouses, and 250 new labs to further develop its seed and trait pipeline. The expansion will add 675 jobs over three years to the 1,000 employees who already work at the site. The Danforth Plant Science Center supports education, industry, and innovation at its research center in St. Louis, focusing on plant-based energy, new green technology, and better food crops through live cell imaging and electron microscopy. Industry partners include Monsanto and Enterprise Rent-A-Car.

Anheuser-Busch has its headquarters in St. Louis. As the leading brewer of beers in the U.S., its share of retail beer sales is almost 48 percent. PepsiCo and Coca-Cola also have facilities in the St. Louis area. Bunge North America, also headquartered in St. Louis, is involved in oilseed processing, edible oils and shortening, and corn milling. Its products include animal feed, breakfast cereals, snack foods, and bread. ICL Performance Products, a wholly-owned subsidiary of Israel Chemical Limited, is a leading producer of fertilizers and phosphate products for food and technical applications. Solae, another St. Louis-based global firm, is a joint venture between DuPont and Bunge that manufactures soy protein for beverages and meatless foods, as well as soy polymers for the paper industry. Firms such as these should prosper as they seek solutions to the challenges of developing more efficient ways to feed and fuel the growing global population.

Technical and Professional Services

Professional and technical services accounted for 12 percent of the new businesses formed in Missouri in 2013, continuing a three-year growth trend. Much of this growth took place in the metro areas, including the St. Louis region, which had over 40 percent of all new business formations in the state. St. Louis was 14th on the Forbes list of Best Cities for Young Professionals for 2013, surpassing Chicago, Dallas, and Raleigh. Forbes also noted that only five cities had more companies on its Best 400 Businesses and Best 400 Small Businesses lists. Fortune 500 companies are represented by Emerson Electric, Express Scripts, Anheuser-Busch, Ameren, Monsanto, Charter Communications, Peabody Energy, and Graybar Electric, all with headquarters in the St. Louis area. Other nationally known firms such as A.G. Edwards, Enterprise Rent-A-Car, and Edward Jones have a presence in the area. These firms hire employees from a broad range of skill sets including accounting, information technology, law, and marketing. In all more than 6,000 St. Louis area firms in the sector employed over 58,000 workers in the first quarter of 2014, an increase of 2.4 percent over the previous year.[8] Jobs in professional and technical services are projected to have above average availability and wages.

Information Technology and Telecommunications

Telecommunications and IT are important sub-sectors of the technical and professional services sector for the St. Louis District. Information technology is one of seven growth industries targeted by the governor's Strategic Initiative for Economic Growth task force in December 2010, and the state has invested in attracting and supporting businesses in the industry. The St. Louis Economic Development Partnership has focused on connecting IT professionals and encouraging both startup and established businesses to build on this critical sector. In the St. Louis region, the information technology sector is growing as partnerships develop between established industries including bioscience and healthcare, food technology and agricultural research, and advanced manufacturing. Boeing announced plans in June 2013 to open an information technology center at its St. Louis County

[6] Federal Aviation Administration Aerospace Forecast: Fiscal Years 2013-2033 accessed at http://www.aia-aerospace.org/assets/FAA_2013_to_2033_Aerospace_Forecast.pdf
[7] Cassell, Jonathan. "Rise of the Machines: Industrial Machinery Market Growth to Double in 2014." IHS Technology, April 16, 2014.
[8] MERIC, Top High Growth Industries for St. Louis Region, First Quarter 2014, at missouriconomy.org.

location, bringing at least 400 IT jobs to the area,9 and Charter Communications, one of the nation's largest cable and internet providers, has its corporate offices in the city.

Transportation and Logistics

St. Louis boasts four major interstate highways (I-44, I-55, I-64, and I-70), as well as US-40, US-51, US-60, and US-67. The area is served by the Burlington Northern Santa Fe, Canadian National, Norfolk Southern, CSX, and Union Pacific railroads and is the third largest rail hub in the U.S. The Port of St. Louis is the busiest inland water port in the country. Lambert-St. Louis International Airport is the air cargo facility for the region, and it has a Foreign Trade Zone.

The St. Louis area is home to numerous distribution centers for companies including Aldi Foods, American Red Cross, Coca-Cola, Macy's, Rawlings Sporting Goods, SuperValu, SYSCO, Trane, and UPS, thanks to its strategic location and extensive freight infrastructure. Third party logistics companies include C.H. Robinson, Cheyenne Logistics, Exel, Fastrans Logistics, Graybar, The Hub Group, LMS, Materialogic, and World Wide Technology, and several of these are headquartered in St. Louis. Because of the continuing growth in this sector, laborers and freight, stock, and material movers is listed as one of the District's top growth occupations; 5,941 job openings are predicted between 2012 and 2022, an increase of 43 percent. The outlook for logistics professionals is also well above average, with 432 openings projected between 2012 and 2022—a 30 percent increase.10

Artur Express, an independent contractor trucking company, is expanding its headquarters in south St. Louis County. Other trucking firms include Hogan 1, Slay Industries, UniGroup Inc., and Witte Brothers Exchange Inc. But as of August 2014 a nationwide shortage of truck drivers means as many as 40,000 openings across the country are not being filled. Truck drivers are third on the list of ManpowerGroup's 2013 Talent Shortage Survey,[11] and freight stakeholders in the St. Louis region indicate that the shortage is an issue in the St. Louis area. East Central Community College in Union is one of six post-secondary institutions in the State that offer programs in truck driver training.

Importance of Freight to the Economic Development Future of the St. Louis District

Manufacturing and Exports

Manufacturing continues to be a vital part of Missouri's economy and exports of Missouri manufactured goods continue to increase. Missouri businesses exported over $3 billion in goods by the close of the first quarter of 2014, and nearly $13 billion in 2013.[12,13] Four primary industries in the manufacturing sector accounted for over 62 percent of Missouri exports: transportation equipment, chemicals, food and kindred products, and machinery-related businesses. These industries exported over $8 billion in products in 2013.[14] Agricultural products, fabricated metal products, electrical equipment, minerals and ores, primary metal manufacturing, and computer and electronic products round out the top 10 exports from the state in 2013. Over 6,100 businesses in Missouri exported products and services in 2012, and 89.5 percent of Missouri's exports are manufactured goods produced in communities around the state. Manufacturing exports support nearly 107,000 jobs in the State, and 85 percent of the companies engaged in exporting goods and services are small businesses.[15]

Manufacturing matters in Missouri because:

- Employees in manufacturing firms earn an average of $77,060 annually in pay and benefits, while average workers in all industries earn $60,168. This means manufacturing jobs pay, on average, 19.9 percent more than non-manufacturing jobs. [16]
- Manufacturing firms account for nearly two-thirds of all research and development in the U.S. and are a leading user of new technologies and processes.[17]
- Manufacturing has the highest multiplier effect of any economic sector; for every dollar spent in manufacturing another $1.48 is added to the economy, helping to stimulate economic growth.

[9] "Global aerospace giant Boeing expected to add 400 jobs to St. Louis County location," June 17, 2013. Accessed at http://governor.mo.gov/news.
[10] MERIC, "Top Ten Occupations by Projected Growth," at missourieconomy.org.
[11] Williams, G. Chambers. "Trucking industry faces uphill battle to recruit drivers." The Tennesseean, August 25, 2014.
[12] WISER Export Trade data, 2014
[13] U.S. Census Freight Trade State Exports, Missouri
[14] Missouri Economic Research and Information Center, Missouri Department of Economic Development, March 2013
[15] U.S. Department of Commerce, International Trade Administration, National Association of Manufacturing, 2013
[16] Bureau of Economic Analysis, Industry Economic Accounts, 2011
[17] Brookings Institute, Metropolitan Policy Program, "Why Does Manufacturing Matter?" February 2012

- Missouri's economy is intrinsically linked to its ability to move people, materials, components, and finished goods within the state and to national and international destinations.
- Missouri's principal trading partners are Canada, Mexico, China, Japan, and Korea.[18] The five industries with the most significant job dependence on exports include grain farming, oilseed farming, wholesale trade, and aircraft manufacturing.
- Export products are intrinsically dependent on multimodal freight transportation.

Conclusion

The economy of the St. Louis District relies on diverse industries, from information technology, advanced manufacturing, and aerospace to more traditional sectors such as food and beverage processing and industrial machinery. The area is home to both established Fortune 500 companies and innovative startups, accounting for more than 40 percent of all new businesses in the State in 2013, and it ranked above Raleigh, Dallas, and Chicago on Forbes list of Best Cities for Young Professionals. The St. Louis area is working hard to maintain and grow its economy, and the outlook for many of its key industries is promising.

Central to its success is a reliable and efficient freight transportation system. As the largest inland river port and third largest freight rail hub, and with multiple Interstate and US highways, the region's freight infrastructure is critical to the economies of St. Louis and its surrounding counties, the State of Missouri, and the nation. As the level of freight flowing to, from, and within the region continues to increase, the infrastructure on which it depends must keep pace. Research in the U.S. and in other countries has shown that investment in physical infrastructure reduces costs and improves efficiencies in conducting business, boosts job creation, and fosters growth cycles within countries.[19] Based on this research, maintaining the existing freight network—in all modes—and expanding both its capacity and its connectivity in ways that increase reliability and lower transportation costs for producers, shippers, and consumers will be crucial to the future prosperity of the St. Louis District.

[18] US Census, State Exports, Foreign Trade, 2013
[19] Deloitte LP and the Council on Competitiveness, "2013 Global Manufacturing Competitiveness Index."