



 **Talent-to-Industry Exchange**
SKILLED TRADES

A Labor Analysis of Skilled Trades Industries and Occupations in Greater Kansas City

MID-AMERICA REGIONAL COUNCIL
JANUARY 2019



This labor analysis was produced by the Mid-America Regional Council in support of KC Rising, a broad business and civic partnership working to strengthen the regional economy with focused attention on three economic drivers: trade, people and ideas.

Funding for the labor analysis was provided by the DeBruce Foundation, the Builders' Association, Associated Builders and Contractors and a U.S. Economic Development Administration grant awarded to MARC.



Heart of America Chapter



ACKNOWLEDGMENTS

MARC would like to thank the following organizations for their participation in work sessions and discussions:

BUSINESSES AND BUSINESS ASSOCIATIONS

Associated Builders and Contractors
Bayer Healthcare – Animal Health
Convergence • Dahmer Construction, Inc.
E&K of Kansas City • Ford Motor Co. • Garmin Ltd.
Greater Kansas City Chamber of Commerce
Holland 1916 • Honeywell
International Builders and Consultants
JE Dunn Construction • JPI Glass • KCPL
Magna International • Nabholz Construction
Nickell Electric Co. • Performance Contracting
Teague Electric • The Builders' Association

EDUCATORS AND CIVIC ORGANIZATIONS

Blue Valley School District • Center School District
Fort Osage School District • Independence School District
Kauffman Foundation
Kansas City Kansas Community College
Kansas City Kansas School District
Kansas City Public Schools • KC STEM Alliance
Liberty School District • Metropolitan Community College
North Kansas City School District • PREP-KC
Workforce Partnership

Special thanks to the following for their assistance in recruiting businesses to participate:

The Builders' Association, Kansas City Chapter
Associated Builders and Contractors,
Heart of America Chapter
Home Builders Association of Greater Kansas City
Heavy Constructors Association of Greater Kansas City
Electric League of Missouri and Kansas

Photo Credits: Photos on cover, page 3 and page 12 courtesy of The Builders' Association and Honeywell

Data in this report explores the skilled trades industry and its impact on the labor market in the Kansas City Metropolitan Statistical Area, including Johnson, Leavenworth, Linn, Miami and Wyandotte counties in Kansas, and Bates, Cass, Caldwell, Clay, Clinton, Jackson, Lafayette, Platte and Ray counties in Missouri.

TALENT-TO-INDUSTRY EXCHANGES

The Talent-to-Industry Exchange (TIE) concept was introduced in 2016 as a tool to gather real-time information and use it to inform strategies for growing the region's talent pool, strengthening the talent pipeline, and aligning employer and educational stakeholder interests. The concept was recommended by the KC Rising Pilot Project Task Force team and was adopted as the signature strategy in Year Two of KC Rising. With guidance from the KC Rising Human Capital Leadership Committee, project partners outlined a process for each industry-specific TIE. The following elements were deemed critical to success:

- TIEs must be industry led.
- TIEs must be regional and comprehensive in approach, covering the full education continuum, from kindergarten to graduate school.
- TIEs must be data driven and action oriented.

The TIE process has three phases: (1) a detailed economic and labor analysis, (2) a workforce action plan; and (3) plan implementation. An industry leader is identified to champion and lead each TIE. The industry leader may be an association or group of leading businesses in a chosen industry who agree to act as co-convenor and recruit employers to participate.

Educational stakeholders are engaged through GradForce KC, a regional network of education and community-based organizations focused on improving educational attainment and creating a talent pipeline for economic and civic vitality. Members of GradForce KC include the region's largest school districts, regional tech academies and representatives from a network of 17 public and nonprofit postsecondary institutions; nonprofit, philanthropic, and workforce organizations that are regional in scope and have a complementary mission; state officials located in the region whose work is related to education; and education intermediaries.

This report provides the economic and labor analysis for the occupations that are part of the skilled trades industry. It includes quantitative data about the labor market, as well as qualitative insights gathered through an online survey of industry leaders, facilitated group discussions, individual interviews with business leaders and two work sessions conducted in 2017.

This TIE is the third in an ongoing series. The Life Sciences TIE was completed in early 2017, and the KC Global Design TIE (engineering and architecture) was completed in August 2018. Both are available online at www.kcworkforce.com/reports.htm.



INTRODUCTION

The Kansas City area economy is seeing its best performance since the boom of the late 1990s. The unemployment rate is below 3 percent and the region is forecast to add nearly 21,000 jobs over the next year. With the current job market growing rapidly and a labor market this tight, the availability of a qualified workforce has emerged as a high-priority issue for businesses.

The construction industry is among the beneficiaries of the current pace of economic growth. Through the first eight months of 2018, the value of projects under contract rose 50 percent, to \$5.2 billion. Some 76 million square feet of space is either under construction or planned. This increase in demand contributed to higher wages in the construction industry, which increased 3.2 percent over the last year, rising more than twice as fast as the regional average.

This growth is helping to raise awareness that jobs besides those requiring a four-year college degree can provide decent pay — the kind of income on which one can support a family and live the American dream of a good job and a good home in a good neighborhood. At the same time, high school students are looking for ways to avoid high student loan debt. This is pushing many graduates to consider career choices that not only lead to paying jobs sooner, but also result in comparable lifetime incomes.



This report examines the past, present and future labor market for such jobs, which we define as the skilled trades. These jobs span many industries beyond construction, including manufacturing and transportation and warehousing. While the occupations differ across industries, most share the common characteristic of requiring no more than a high school diploma for entry-level positions.



EXECUTIVE SUMMARY

For purposes of this analysis, skilled trades are defined as occupations in construction and extraction; installation, maintenance and repair; production; and transportation and material moving. There are approximately 236,000 jobs in the skilled trades in the Greater Kansas City region, or about one out of every five total jobs (21 percent). Several of these occupations have a combination of large employment numbers and higher-than-average pay, making them good career options for job seekers.

INDUSTRY ANALYSIS

Manufacturing, construction, and transportation and warehousing are the top three industries hiring skilled workers in the trades. Combined, they provide about 60 percent of all the jobs for skilled workers. Other workers in the trades are spread out among many industries, the largest of which are retail trade, wholesale trade and administrative support services.

Each of these three industries has the ability to generate additional growth in other sectors of the economy. Adding 1,000 jobs to either the manufacturing and transportation and warehousing industries would generate a regional economic impact of around 4,000 jobs and just under \$500 million dollars in gross domestic product. A similar expansion in the construction industry would generate an estimated 2,100 jobs and just under \$200 million in GDP.

The degree to which an occupation is concentrated in a single industry varies significantly across the skilled trades. More than 80 percent of construction workers are employed in the construction industry, making them the most dependent on how a single industry is doing. Two-thirds of production workers work in the manufacturing industry. But transportation and material-moving employment is more balanced, with more workers employed outside the transportation and warehousing industry than within it.

Metropolitan economies grow when their firms develop specialties that allow them to sell goods and services to the rest of the world. The Kansas City region specializes in two industries that employ substantial numbers of workers in the skilled trades — transportation and warehousing and wholesale trade. Among 30 peer metros, the Kansas City region ranks sixth in transportation and warehousing specialization; 18th in manufacturing specialization; and 20th in construction.

Average wages for skilled trades workers varies considerably by industry. Across all occupations and industries, the average pay for skilled trades workers in the Kansas City area is \$44,000 per year, compared to \$52,042 for all workers. On average, the manufacturing industry pays its trades workers 18 percent more than the typical wage. The construction industry pays its workers 15 percent more than average, while the wholesale trade industry pays them 9 percent less.

Job growth in these industries compares favorably to the national average, but wages tend to be lower in the Kansas City metro than in the nation. Manufacturing employment still has not

Current employment growth in skilled trades occupations exceeds overall employment growth at both the regional and national levels.

More than half of the current workforce in skilled trades occupations will need to be replaced over the next five years.

This presents both a challenge for employers seeking qualified talent and an opportunity for students and workers looking for good jobs.

reached its pre-recession peak, but regional employment growth has outpaced national growth. Manufacturing wages have grown here, but not as fast as they have nationally. In the construction industry, both employment and wage growth closely mirror the national average. Job growth in transportation and warehousing has surpassed its pre-recession peak and recently surged past the national average. This has not translated into a surge in wages, which have remained flat here since 2016.

OCCUPATION ANALYSIS

Skilled trades jobs are divided across occupational categories. About a third of the region's 236,000 skilled trades jobs are in transportation and material moving operations. Just over one quarter are in production occupations, and one-fifth in construction and extraction occupations. Installation, maintenance and repair occupations account for nearly another fifth, while skilled trades management occupations total only 2 percent.

Older workers are overrepresented in the skilled trades, and women are underrepresented. Representation of black and white races mirror the overall workforce, while a higher percentage of Hispanics and Latinos work in the skilled trades than overall. The ages of trades workers skew older than the metro average. Women are significantly underrepresented, accounting for only 16 percent of skilled trades workers, compared to 48 percent of all workers. Overall, about 81 percent of skilled trades workers are white, 14 percent are black, and 4 percent are other races, mirroring the overall workforce. Hispanics and Latinos are more prevalent in the skilled trades (13 percent) than in the metropolitan economy overall (8 percent). However, both racial and ethnic minorities are underrepresented in skilled trades management occupations compared to all workers.

Over the last four years, employment growth more than doubled the growth rate of the previous four years in most skilled trades occupation categories. Production, construction, transportation and material moving, and skilled trades management occupations all saw growth over the last four years at least 2½ times as great as the prior four years. Installation, maintenance and repair occupations declined by 0.4 percent since 2014, largely due to cutbacks in telecommunications installation and repair, most likely due to continued employment losses at Sprint. Skilled trades occupations have also grown substantially faster than overall employment in the region and the nation since 2014.

Over the next five years, nearly 136,000 workers are expected to be hired in the skilled trades. Nearly 40 percent of them will be in the transportation and material moving occupations and a quarter will be in production occupations. The demand for workers in the construction occupations accounts for one-fifth of the total.

Most of the demand for skilled trades workers over the next five years will be replacement demand, created by existing employees switching occupations or leaving the workforce entirely. Nearly two-thirds of the workforce in transportation and material moving occupations will need to be replaced over the next five years, while roughly half the workers in the production, construction, and installation, maintenance and repair occupations will need to be replaced. Skilled trades management has the lowest expected turnover rate, with just over a third of existing workers to be replaced over the next five years.

Combining hiring demand with data on average wages reveals the occupations with the best overall economic opportunity for individuals considering entering the skilled trades. Outside of managers and supervisors, the best paying occupations in the skilled trades with high levels of anticipated hiring demand are electricians, plumbers, construction equipment operators and masons.

BUSINESS INSIGHTS

Through facilitated discussions, local industry leaders and educators shared their insights on trends, challenges and opportunities in skilled trades industries.

GROWING THE TALENT PIPELINE

One of the biggest challenges employers face when seeking talented workers for jobs in the skilled trades industry is public perception about these occupations. Completion of a four-year degree is often considered the only path to a good career. Many parents and students see the trades as a choice of last resort, and surprisingly, even parents who work in the trades often discourage their own children from taking a similar path.

Part of the problem seems to be a lack of exposure to careers in this industry. 57 percent of high school students say they receive little or no information about skilled trades career paths. Additionally, students did not recognize the titles of jobs in demand by both industrial and construction trades, and many of the jobs that were recognized were seen as undesirable.

In spite of the negative perceptions, there are a number of benefits to employment in skilled trades. These occupations do not eliminate the option of education beyond high school; in fact, many apprenticeship programs award college credit during the course of training. A postsecondary path in the trades also often offers an earning-while-learning opportunity, so rather than accumulating debt the student is earning a paycheck.

Lifetime career earnings for skilled trades often compare favorably to jobs that require college degrees, especially when the cost of college is factored in. For example, electricians and electrical engineers can both expect to reach cumulative career earnings of \$1 million in about 20 years, but the electrical engineer is much more likely to have accumulated student loan debt. Lifetime earnings for both reach more than \$3 million.

The majority of employers hire local talent, with only a small percentage recruiting entry-level talent from outside of the region. When employers do hire from outside, the primary reason is a lack of workers in the local market with the skills and experience they need.

School districts across the region have structures in place that can serve as pipelines to the trades, providing a pool of home-grown talent for entry-level positions. In addition to courses and course sequences that are offered during school hours, there are a number of out-of-school programs that engage students in competition-based, hands-on learning.

Another potential talent pool for skilled trades is overlooked — young adults who are currently underemployed. There are currently 150,000 people under the age of 35 in the Kansas City metro employed in service-sector jobs that pay less than \$35,000 per year and don't require any postsecondary education.

Workers with disabilities are also often overlooked. The Kansas City region is home to about 130,000 working-age adults with disabilities, including 25,102 between the ages of 18-34. Many of these people are willing and able to go to work.

In addition to challenges with recruiting new employees, business leaders often face challenges with retaining current employees in skilled trades occupations. Some of the most common barriers to continued employment include job site environment, physical nature of work, background checks, career growth opportunities, job security, transportation to and from work. Another challenge employers increasingly face in both recruitment and retention is the growth of substance abuse, and increasing legalization of medical and recreational marijuana compounds the problem.

There is a strong need to diversify the talent pipeline. The region's skilled trades workforce is currently dominated by white men, but employers are eager to diversify the workforce. Perceptions about jobs in the trades often lead to an overall lack of interest or awareness among women and minorities. Other barriers such as a lack of reliable transportation or child care may be particularly difficult to overcome.

WORKFORCE PREPAREDNESS

The talent needs of the skilled trades are similar to those of other industries. Firms employing the trades are looking for dependable workers who have good math and problem-solving skills, a comfort level with technology and good communication skills.

Experiential learning offers a structure for students and workers to complete meaningful job tasks in a workplace in order to develop their readiness for work and gain knowledge and skills that can support entry or advancement in a particular field. Effective experiential learning occurs across a continuum — awareness, exploration, preparation and training. Currently, only 64 percent of surveyed employers in construction and industrial trades are engaged in experiential learning activities, primarily through apprenticeships. None are engaging teachers in experiential learning, although teacher engagement is often the best way to scale up awareness.

NEXT STEPS

The industry associations involved in this analysis are committed to continuing to work together to develop a comprehensive strategy to change the perception of skilled trades, a regional strategy to strengthen communication skills among trades workers, and expand implementation of swab tests that provide more information about recent drug use.

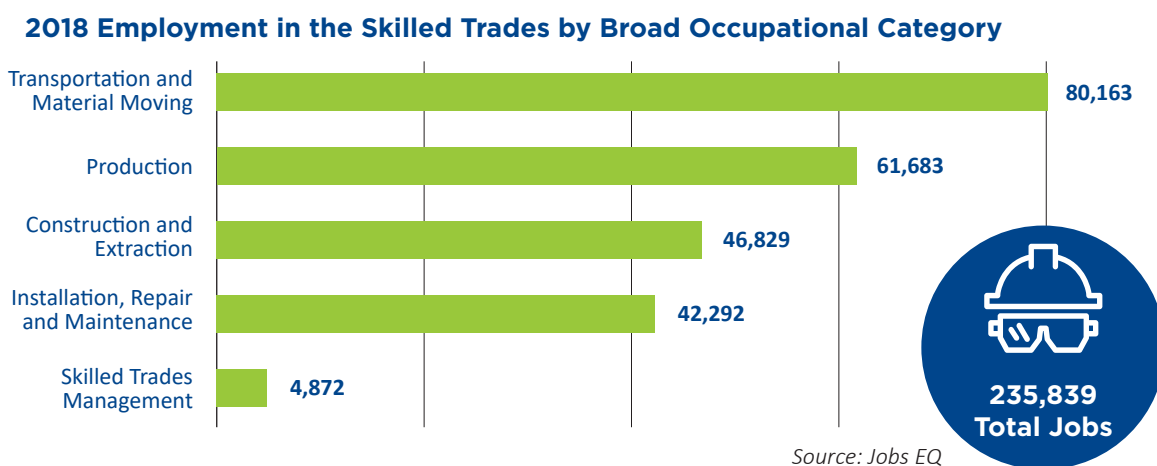
DEFINING SKILLED TRADES

For purposes of analysis, skilled trades are defined using the following standard occupational classification (SOC) codes¹ established by the U.S. Bureau of Labor Statistics:

- 47 — Construction and Extraction Occupations
- 49 — Installation, Maintenance, and Repair Occupations
- 51 — Production Occupations
- 53 — Transportation and Material Moving Occupations

With experience and dedication, workers who start in these jobs may follow a career path that leads to supervisory roles, so the skilled trades definition used in this analysis also includes the managers and supervisors of these occupations.

By this definition, there are approximately 236,000 jobs in the skilled trades in the Greater Kansas City region, or about one out of every five total jobs (21 percent). Within the skilled trades, transportation and material moving occupations account for the largest share (34 percent), followed by production occupations (26 percent) construction and extraction occupations (20 percent) and installation, maintenance and repair occupations (18 percent).



The following tables provide the 10 largest (in terms of employment numbers in the region) and 10 highest-paid occupations within each of the major categories. More complete lists are available in the appendix on page 50. Several of these occupations have both large employment numbers and high pay — including electricians, plumbers, sheet metal workers and first-line supervisors of all kinds — and so may make good career options for job seekers. (Note: Average wages are shown only for occupations with at least 100 employees. In addition, occupations that require more than a high school diploma, such as airline pilots and air traffic controllers, are excluded from the average wages shown for transportation and material moving.)

¹ For a full list of SOC code definitions and related occupations, visit www.bls.gov/soc

Top 10 Occupations in Each Broad Occupational Category

RANKED BY EMPLOYMENT

OCCUPATION	EMPLOYMENT
1 Team Assemblers.....	11,241
2 First-Line Supervisors, Production/Operations.....	4,213
3 Inspectors, Testers, Sorters, Samplers, Weighers.....	3,420
4 Packaging and Filling Machine Operators.....	3,075
5 Helpers, Production Workers.....	2,550
6 Welders, Cutters, Solderers and Brazers.....	2,330
7 Printing Press Operators.....	1,998
8 Machinists.....	1,990
9 Assemblers and Fabricators, All Other.....	1,724
10 Production Workers, All Other.....	1,592

OCCUPATION	EMPLOYMENT
1 Construction Laborers.....	8,580
2 Carpenters.....	6,588
3 Electricians.....	4,522
4 First-line Supervisors, Construction/Extraction.....	3,969
5 Plumbers, Pipefitters and Steamfitters.....	3,452
6 Painters, Construction and Maintenance.....	2,782
7 Operation Engineers/Equipment Operators.....	2,668
8 Cement Masons and Concrete Finishers.....	1,904
9 Sheet Metal Workers.....	1,260
10 Roofers.....	1,209

OCCUPATION	EMPLOYMENT
1 Laborers and Material Movers.....	20,185
2 Heavy and Tractor-Trailer Truck Drivers.....	16,044
3 Light Truck or Delivery Services Drivers.....	7,684
4 Packers and Packagers, Hand.....	5,141
5 Bus Drivers, School or Special Client.....	4,704
6 Industrial Truck and Tractor Operators.....	4,566
7 Driver/Sales Workers.....	3,677
8 Cleaners of Vehicles and Equipment.....	3,220
9 First-Line Supervisors, Vehicle Operators.....	1,751
10 First-Line Supervisors, Laborers/Material Movers.....	1,737

OCCUPATION	EMPLOYMENT
1 Maintenance and Repair Workers, General.....	10,100
2 Automotive Service Technicians and Mechanics.....	5,336
3 First-Line Supervisors, Mechanics/Installers.....	3,484
4 Heating and AC Mechanics and Installers.....	2,296
5 Bus/Truck Mechanics.....	2,253
6 Industrial Machinery Mechanics.....	1,904
7 Telecom Equipment Installers/Repairers.....	1,854
8 Installation, Maintenance and Repair Workers.....	1,286
9 Automotive Body and Related Repairers.....	1,242
10 Maintenance Workers, Machinery.....	1,188

RANKED BY WAGE

OCCUPATION	AVERAGE ANNUAL WAGE
Power Plant Operators.....	\$78,500
Gas Plant Operators.....	\$67,800
Chemical Plant and System Operators.....	\$67,200
First-Line Supervisors, Production/Operations.....	\$62,200
Tool and Die Makers.....	\$61,800
Petroleum Pump System and Refinery Operators.....	\$61,500
Painters, Transportation Equipment.....	\$48,600
Water/Wastewater Treatment Plant Operators.....	\$48,200
CNC Machine Tool Programmers.....	\$46,900
Welders, Cutters, Solderers and Brazers.....	\$46,400

OCCUPATION	AVERAGE ANNUAL WAGE
Elevator Installers/Repairers.....	\$80,000
First-line Supervisors, Construction/Extraction.....	\$73,000
Boilermakers.....	\$68,600
Insulation Workers, Mechanical.....	\$64,400
Electricians.....	\$62,700
Brickmasons and Blockmasons.....	\$62,200
Sheet Metal Workers.....	\$61,600
Plumbers, Pipefitters and Steamfitters.....	\$60,300
Structural Iron and Steel Workers.....	\$60,200
Operation Engineers/Equipment Operators.....	\$56,800

OCCUPATION	AVERAGE ANNUAL WAGE
Crane and Tower Operators.....	\$71,800
Locomotive Engineers.....	\$67,700
Railroad Conductors and Yardmasters.....	\$65,000
Transportation Inspectors.....	\$64,700
Railroad Brake, Signal and Switch Operators.....	\$60,100
First-Line Supervisors, Vehicle Operators.....	\$54,800
First-Line Supervisors, Laborers/Material Movers.....	\$54,800
Rail Yard Engineers and Hostlers.....	\$53,300
Heavy and Tractor-Trailer Truck Drivers.....	\$48,000
Excavating and Loading Machine Operators.....	\$46,000

OCCUPATION	AVERAGE ANNUAL WAGE
Electrical Power-Line Installers and Repairers.....	\$77,300
Electrical/Electronics Repairers, Powerhouse.....	\$75,700
Millwrights.....	\$66,700
Control and Valve Installers and Repairers.....	\$64,400
Signal and Track Switch Repairers.....	\$64,400
Electrical/Electronics Repairers, Industrial.....	\$62,800
First-Line Supervisors, Mechanics/Installers.....	\$61,000
Aircraft Mechanics and Service Techs.....	\$60,600
Mobile Heavy Equipment Mechanics.....	\$55,800
Electrical/Electronics Installers, Transportation.....	\$54,500

Note: Shading indicates occupations with both high employment numbers and high wages.

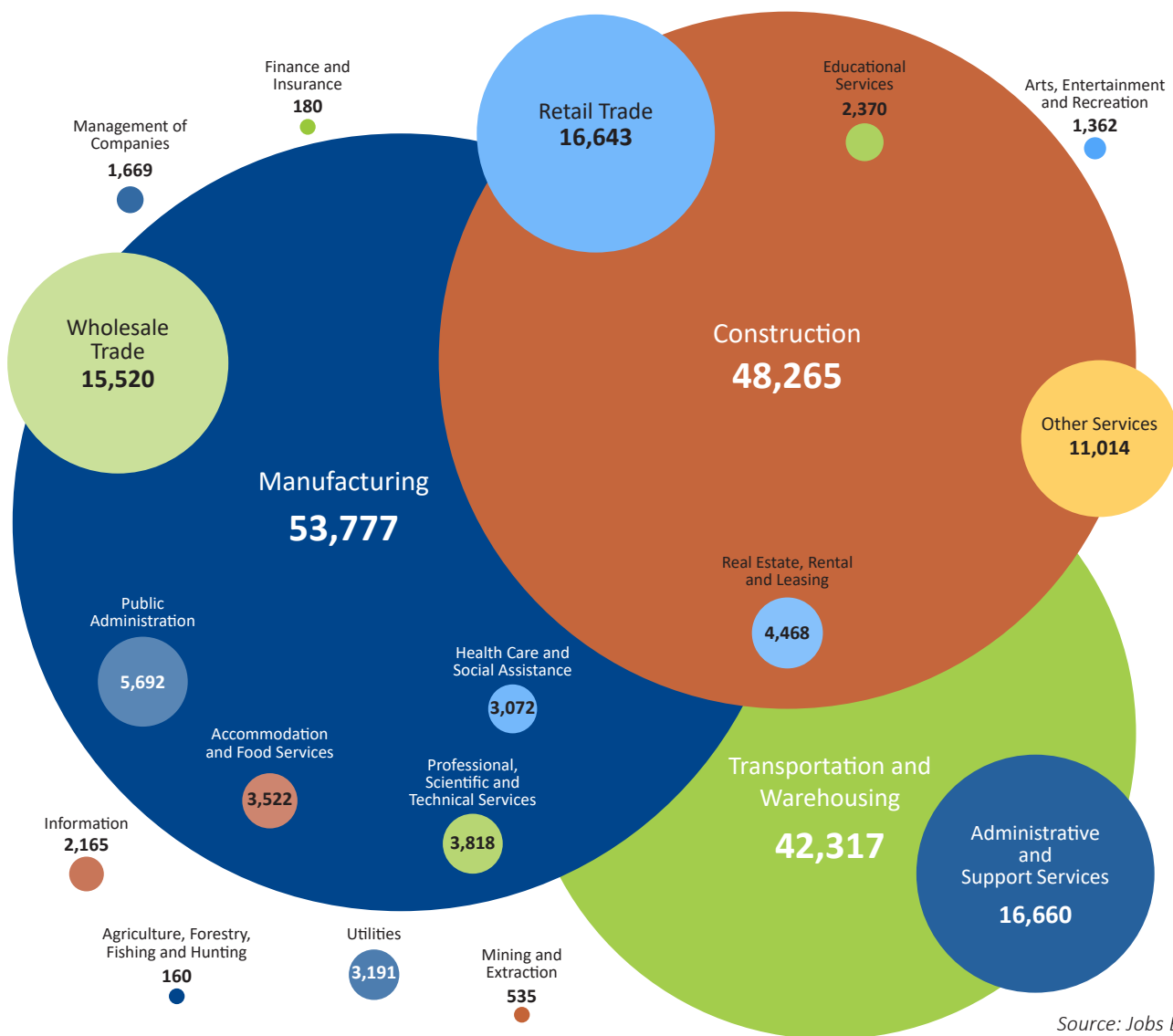
Source: Jobs EQ

INDUSTRY ANALYSIS

The demand for labor derives from the type of products a firm sells, which in turn defines its industry. To understand the demand for workers in the skilled trades, we must first understand the kinds of industries that employ them and the trends that they are experiencing. Of particular importance to the regional economy are those sectors that trade with the rest of world, as it is by serving the larger national and global economies that metro economies grow.

Not surprisingly, manufacturing, construction, and transportation and warehousing are the top three industries hiring skilled workers in the trades. Combined, they provide about 60 percent of all the jobs for skilled workers. Other workers in the trades, roughly 40 percent, are spread out among many industries, the largest of which are retail trade, wholesale trade and administrative support services. Note that administrative support includes temporary agencies, so it is likely that many of these employees in trade occupations actually work at manufacturing, construction, and transportation and warehousing sites.

Skilled Trades Employment by Industry






Economic Impact

The number of employees in an industry is only one measure of its importance to the regional economy. Also important is the ability of that industry to generate additional growth in other sectors of the economy. Generally, the more its revenue comes from sales to those outside the region and, in turn, the more that revenue is used to buy goods and services made within the region, the larger its economic impact.

The manufacturing and transportation and warehousing industries generally exceed the construction industry on both counts. In particular, manufacturing and transportation and warehousing expansions often require employing workers locally to construct new facilities, while new construction does not generate an equivalent amount of demand for additional local manufacturing or transportation and warehousing workers. As a result, given the same increase in jobs, manufacturing and transportation and warehousing typically have larger economic impacts than construction.

The data below estimates the regional economic impact if the manufacturing, the transportation and warehousing and the construction industries — the three industries that employ the most skilled trades workers — were each to add an additional 1,000 jobs. It is assumed in each case that the dollars to finance the expansion come from outside the region in order to provide an apples-to-apples comparison.

Total impact on the Greater Kansas City Economy of an Additional 1,000 Jobs in Each Industry

	 MANUFACTURING	 TRANSPORTATION & WAREHOUSING	 CONSTRUCTION
Total Employment	3,841 jobs	4,100 new jobs	2,103 jobs
Gross Domestic Product	\$481 million	\$471 million	\$187 million
Personal Income	\$282 million	\$299 million	\$151 million

Source: MARC figures derived from REMI Policy Insight Model

The manufacturing and transportation and warehousing industries are estimated to have very similar impacts, with a 1,000 job increase in each expected to generate around 4,000 jobs and just under \$500 million dollars in gross domestic product. A construction expansion comes in at roughly half that level of impact, generating an estimated 2,100 jobs and just under \$200 million in GDP. Another way to look at the importance of these industries to the regional economy, is to consider the inverse — the reductions to GDP and personal income that the region would experience if jobs were lost rather than gained.

Top Area Employers in Skilled Trades Industries



Manufacturing

Bayer Corporation, Ford Motor Co., Garmin International, Gear for Sports, General Motors Co., Honeywell, Orbital ATK, Peterson Manufacturing Co., Smithfield Foods, SPX Cooling Technologies



Contracting

Contractors: ARCO National Construction, Crossland Construction Co., Excel Constructors, HarenLaughlin Construction, JE Dunn Construction, Nabholz Construction, McCownGordon Construction, MW Builders, Turner Construction Co., Whiting-Turner

Specialized/Subcontractors: E&K, Faith Technologies, Kansas City Structural Steel, Mark One Electric, PCI, P1 Group



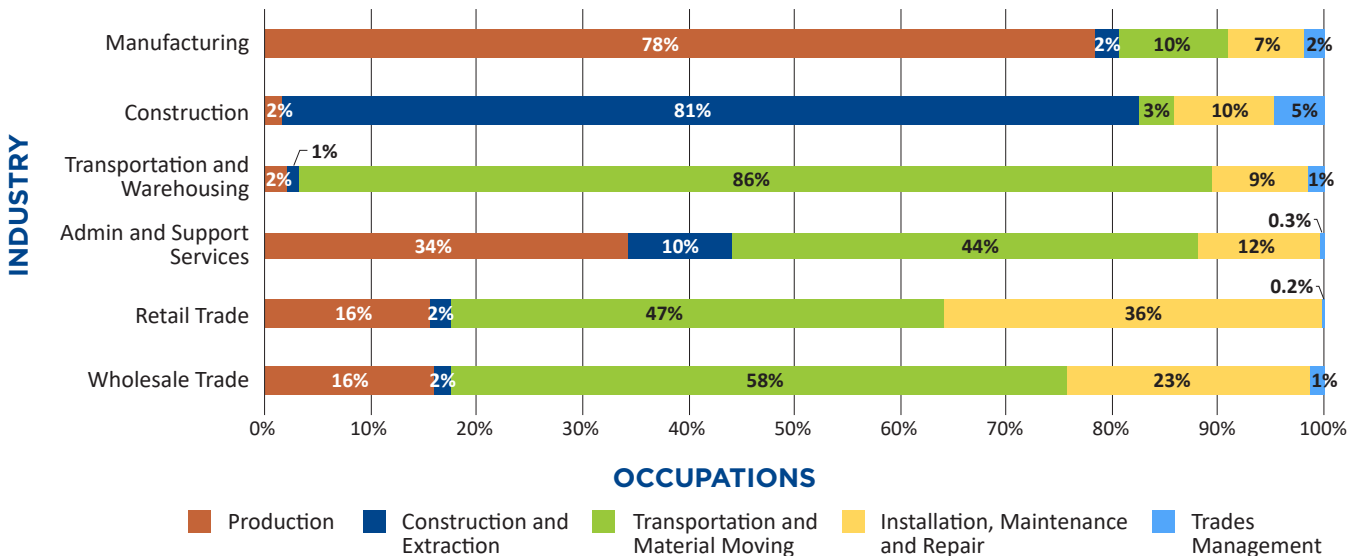
Distribution and Trucking

Amazon, American Eagle Outfitters, Associated Wholesale Grocers, Hallmark Cards, J.C. Penney Logistics Center, Musician's Friend, QuikTrip, Sysco, Target, Walmart

Sources: Kansas City Business Journal, Kansas City Area Development Council, The Builders' Association

As might be expected, the vast majority of trades workers employed in the manufacturing industry work in production occupations. Similarly, those trades workers employed in the construction industry mostly work in construction occupations and those employed in the transportation and warehousing industry mostly work in transportation and material moving occupations. But people working in these goods-moving occupations are also found in significant numbers in several other industries, including manufacturing, retail trade and wholesale trade, and workers in installation, maintenance, and repair occupations are employed by virtually all industries.

Occupational Breakdown by Industry | Six Industries Employing the Most Skilled Trades Workers



Source: Jobs EQ

The degree to which an occupation is concentrated in a single industry varies significantly across the skilled trades. More than 80 percent of construction workers are employed in the construction industry, making them the most dependent on how a single industry is doing. Production workers are the next most dependent upon one industry’s performance, as two-thirds of them work in the manufacturing industry. But more transportation and material-moving workers are employed outside the transportation and warehousing industry than within it, making those workers less vulnerable to the ups-and-downs of a single industry.

Employment by Industry

Construction Occupations



Production Occupations



Transportation and Material Moving Occupations



Trades Management Occupations



Installation, Maintenance and Repair Occupations



- Construction
- Utilities
- Manufacturing
- Retail Trade
- Transportation and Warehousing
- Accommodation and Food Services
- Educational Services
- Public Administration
- Other
- Real Estate, Rental and Leasing
- Other Services
- Wholesale Trade
- Management of Companies
- Admin. and Support Services
- Information
- Health Care and Social Assistance

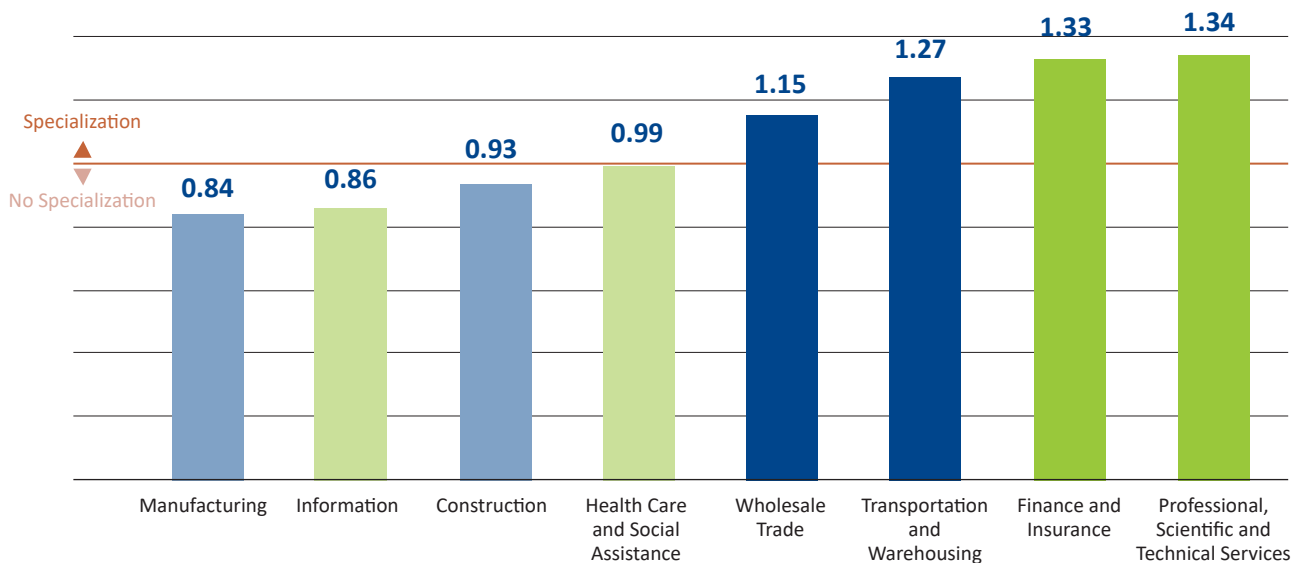
Source: Jobs EQ

About two-thirds of skilled trades managers and supervisors are concentrated in the construction and manufacturing industries. The industry employing the largest share of installation, maintenance and repair workers is retail, many of which are related to auto repair. But the retail industry only employs 14 percent of all repair workers, making them least dependent on a single industry.

Industry Specialization

Metropolitan economies grow when their firms develop specialties that allow them to sell goods and services to the rest of the world. Location quotients estimate the degree a metro specializes in an industry by comparing its share of local total employment with its share national total employment. If the local economy devotes a larger share of its jobs to this industry than the national average, then it is said to specialize in that industry. The degree of specialization is measured by taking the ratio of the two shares, and a location quotient greater than one indicates an industry in which the metro specializes.

Industry Specialization | KC Metro Location Quotients for Traded Sectors, 2018 Q3



Source: Jobs EQ

Based on these calculations, the Kansas City area economy appears to specialize more in the production of services than goods. The professional, technical and scientific services industry and the finance and insurance industry lead the way, with the share of employment in these industries being about one-third higher locally than nationally. But the region also specializes in two industries that employ substantial numbers of workers in the skilled trades — transportation and warehousing and wholesale trade. The location quotients for these two industries indicate the share of the region’s employment devoted to these sectors is 27 percent higher than average for transportation and warehousing and 15 percent higher than average for wholesale trade.

On the other hand, the regional economy does not appear to generally specialize in construction or manufacturing, the two largest employers of workers in the skilled trades, as both have location quotients below one. Yet it is important to note that there are sub-sectors within these industries where the region does have significant specialties, including auto manufacturing (LQ = 6.3), agricultural chemicals (LQ = 2.7), fabricated metal (LQ = 1.8) and electronics manufacturing (LQ = 1.4). These specialties are not surprising, given they are the industries in which Ford, General Motors, Honeywell and Garmin are located.

Peer Metro Comparison

The region’s level of specialization in industries that are the three largest employers of workers in the skilled trades can be compared to a set of 30 other peer metros. These are defined as the 15 metros immediately larger and 15 immediately smaller in population. Metro Kansas City ranks 18th in terms of manufacturing specialization and 20th in terms of construction. However, the region’s specialization in transportation and warehousing ranks sixth among the peer metros, likely due to the extensive rail and highway networks that take advantage of Kansas City’s central location.



MANUFACTURING	
San Jose	1.78
Milwaukee	1.66
Louisville	1.46
Cleveland	1.39
Cincinnati	1.28
Portland	1.27
Minneapolis	1.20
Providence	1.08
Charlotte	1.05
Virginia Beach	1.03
Indianapolis	1.03
Seattle	1.03
St. Louis	1.01
Nashville	0.98
Pittsburgh	0.91
San Diego	0.87
Memphis	0.86
KANSAS CITY	0.84
Columbus	0.81
Austin	0.68
Raleigh	0.66
Oklahoma City	0.64
Tampa	0.60
Richmond	0.58
San Antonio	0.56
Denver	0.56
Jacksonville	0.54
Baltimore	0.48
Orlando	0.44
Sacramento	0.43
Las Vegas	0.30

CONSTRUCTION	
Denver	1.27
Orlando	1.24
Jacksonville	1.24
Austin	1.20
Sacramento	1.19
Raleigh	1.19
Portland	1.16
Tampa	1.15
San Antonio	1.12
Las Vegas	1.12
Richmond	1.09
Seattle	1.09
Baltimore	1.08
San Diego	1.07
Charlotte	1.03
Oklahoma City	1.01
Pittsburgh	0.99
Indianapolis	0.97
St. Louis	0.96
KANSAS CITY	0.94
Virginia Beach	0.94
Nashville	0.93
Providence	0.92
Cincinnati	0.88
Louisville	0.88
Minneapolis	0.88
San Jose	0.85
Cleveland	0.81
Columbus	0.80
Milwaukee	0.78
Memphis	0.75

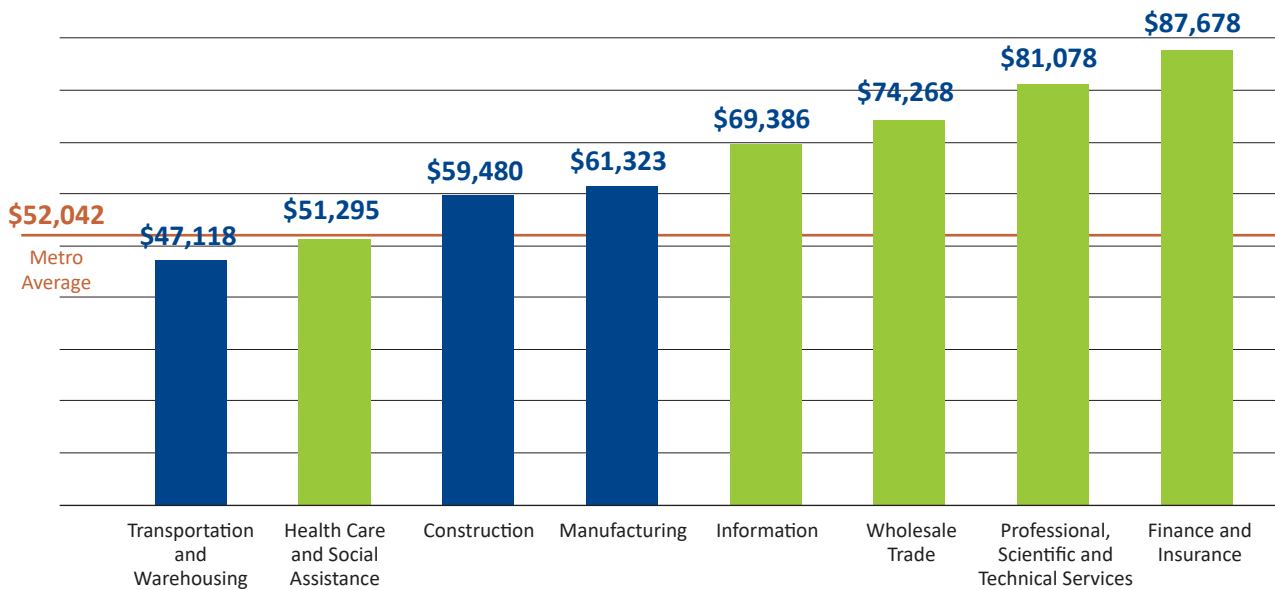
TRANSPORTATION & WAREHOUSING	
Memphis	2.63
Louisville	1.92
Indianapolis	1.67
Columbus	1.43
Jacksonville	1.41
KANSAS CITY	1.26
Nashville	1.26
Las Vegas	1.17
Cincinnati	1.16
Charlotte	1.14
Seattle	1.12
Baltimore	1.07
St. Louis	1.07
Denver	1.02
Richmond	0.99
Pittsburgh	0.98
Minneapolis	0.95
Portland	0.94
Virginia Beach	0.92
Orlando	0.90
San Antonio	0.83
Sacramento	0.83
Oklahoma City	0.81
Providence	0.80
Milwaukee	0.79
Cleveland	0.77
Tampa	0.63
San Diego	0.63
Raleigh	0.57
Austin	0.55
San Jose	0.48

Source: Jobs EQ

■ Average Wages

The industries that trade most with the rest of the world generally pay better than average, and this is true for many of the industries that employ large numbers of workers in the skilled trades. For example, the \$74,000 average wage in the wholesale trade industry is 43 percent higher than the regional average wage of \$52,000. Similarly, the average wages the manufacturing and construction industries are around \$60,000, or about 15 percent higher than the metro average. Only transportation and warehousing workers have an average wage that is below the regional average, by about 9 percent.

Average Annual Wage by Industry | Traded Sectors, 2018 Q3

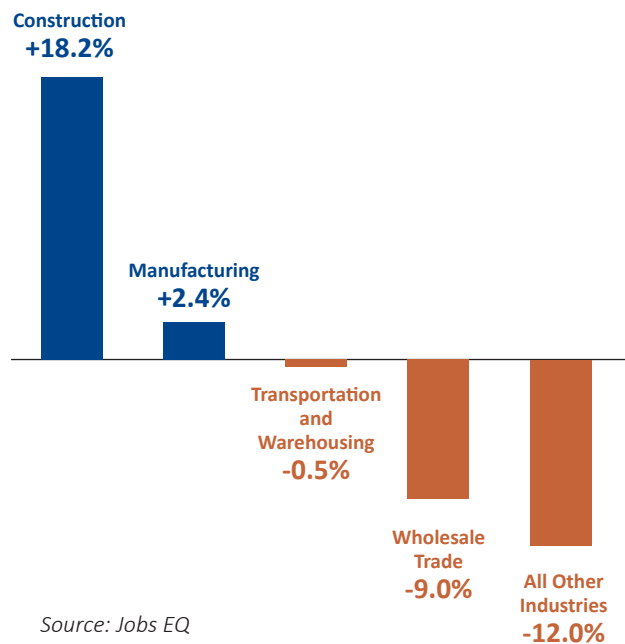


Source: Jobs EQ

The chart above averages wages for the entire workforce for an industry, and so includes executives, professionals and administrative staff as well as workers in the skilled trades. When we look only at the trades workers within each industry, a somewhat different picture emerges.

The average pay for skilled workers across all occupations and industries in the Kansas City area is \$44,000. The pay of the average skilled trade worker in each industry can vary significantly, however. For example, on average, the construction industry pays its

Difference in Average Wages
Trades Workers Compared to Overall Average



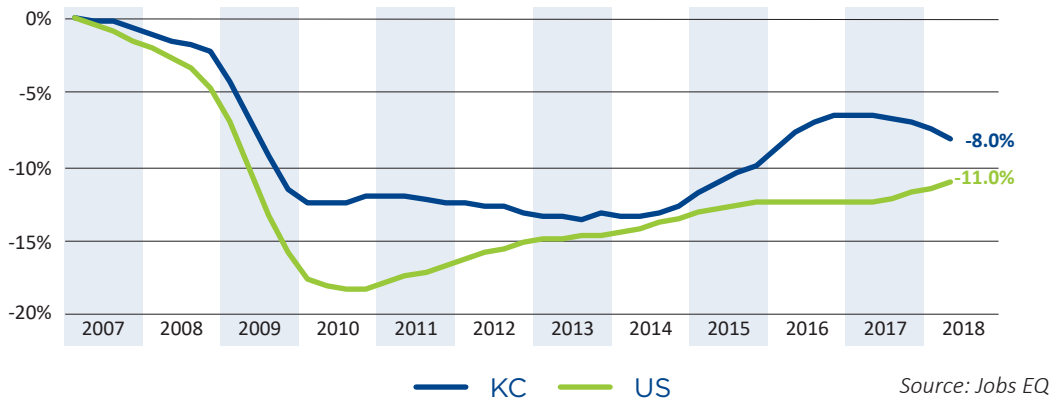
Source: Jobs EQ

trades workers 18 percent more than the typical wage, while the wholesale trade industry pays them 9 percent less. Trades workers in the manufacturing and transportation and warehousing industries pay close to the average, with the former paying slightly more and the latter slightly less. But skilled trades employees in all other industries are paid the least, on average earning 12 percent less than the typical trades worker in Greater Kansas City.

Industry Trends

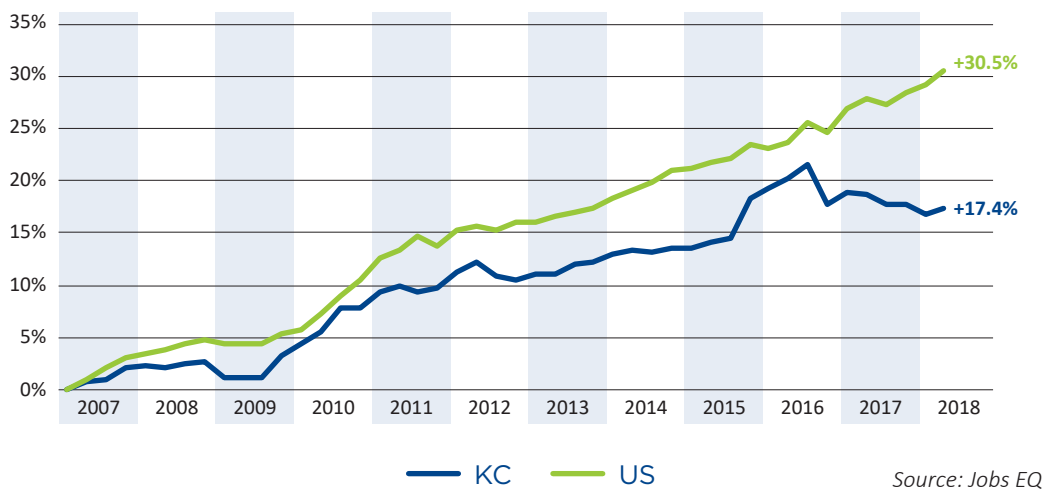
Manufacturing employment in both metro Kansas City and the U.S. remain below pre-recession levels, though the region has fared somewhat better. Greater Kansas City’s manufacturing employment remains 8 percent below its pre-recession peak compared to 11 percent below for the nation. Nonetheless, local manufacturing employment growth appears to be tapering off in recent years while national growth appears to be accelerating.

Manufacturing Employment Growth, KC vs US | Change Since 2007 Q1



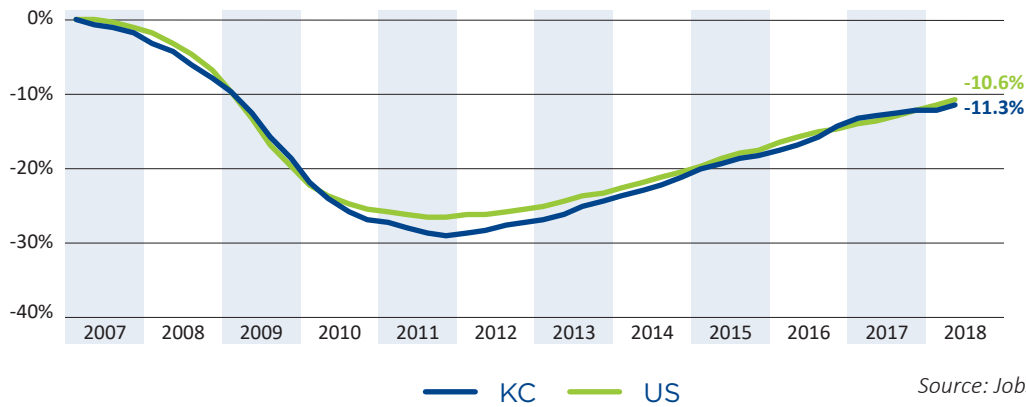
Wage growth also appears to be tapering off in the Kansas City area relative to the nation. As a low-cost place to do business, nominal manufacturing wages were already growing slower here throughout most of the recovery period. But since the end of 2016, nominal manufacturing wages have flattened locally while continuing to rise nationally. As a result, manufacturing wages have increased 31 percent post-recession nationally, about the same as construction, but they have only increased about half that amount, 17 percent, in metro Kansas City.

Manufacturing Wage Growth, KC vs US | Change Since 2007 Q1, Nominal Average Annual Wage



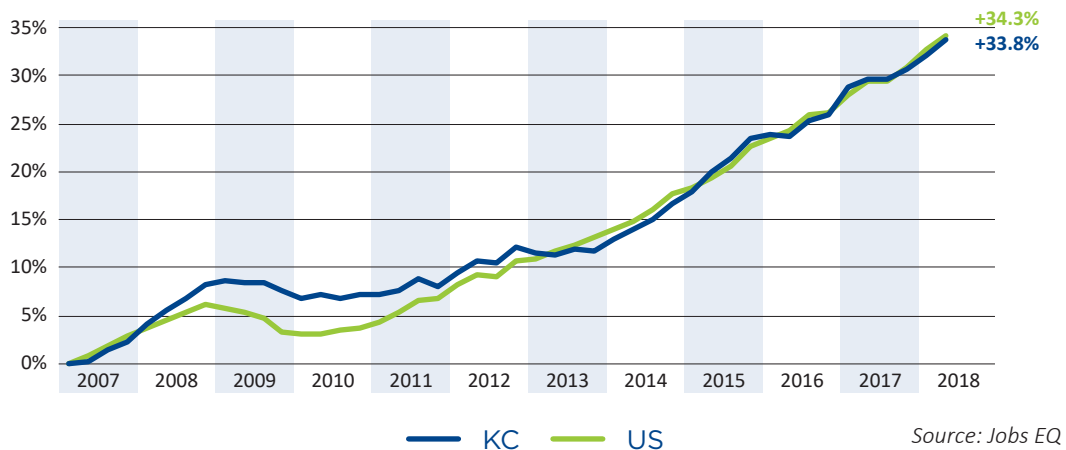
Construction employment has followed the national trend, though the recession was slightly deeper here. In both KC and the US, construction employment levels are down about 11 percent from their pre-recession peak. While non-residential and multifamily construction are strong, the number of single-family homes being built each year is still half as much as pre-recession levels.

Construction Employment Growth, KC vs US | Change Since 2007 Q1



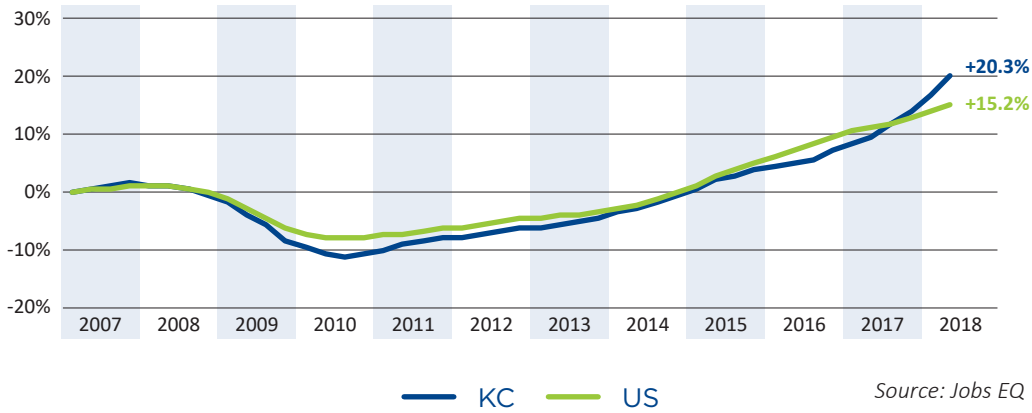
Nominal wages in the construction industry — that is, wages as paid in each year and not adjusted for inflation — show a different trend. Nominal construction wages merely flattened in the region during the recession while dipping about 3 percent nationwide. The nation’s recovery from the recession was faster though, and wage increases in both Greater Kansas City and the nation have been neck and neck over the last several years. Consequently, both have seen nominal construction wages increase of 34 percent post-recession.

Construction Wage Growth, KC vs US | Change Since 2007 Q1, Nominal Average Annual Wage



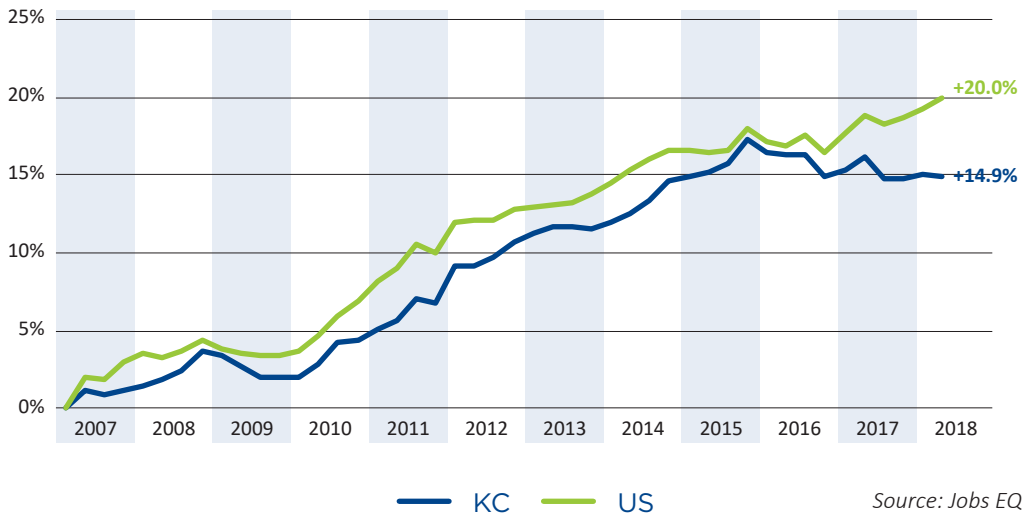
In contrast to both construction and manufacturing, employment growth in the transportation and warehousing industry has surpassed its pre-recession peak in both the region and the nation. Moreover, the region’s employment growth rate in this industry surged past the nation’s beginning in 2017. As a result, the Kansas City area’s transportation and warehousing employment has grown 20 percent post-recession, compared to 15 percent for the U.S.

Transportation and Warehousing Employment Growth, KC vs US | Percent change since 2007 Q1



This recent surge in transportation and warehousing jobs has not translated into a surge in wages in the Kansas City area, however. Wage growth has been essentially flat since 2016, a pattern very similar to manufacturing, which also reflects the region’s ability to maintain its status as a low-cost place to do business. Meanwhile, wages in the nation have continued to increase and are currently 20 percent higher than at the start of the recession. By contrast, the Kansas City region’s transportation and warehousing wages have only increased 15 percent.

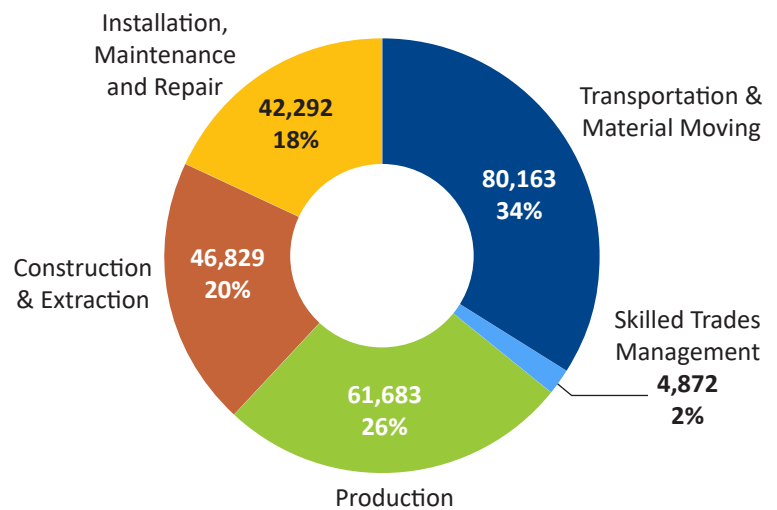
Transportation and Warehousing Wage Growth, KC vs US | Percent Change Since 2007 Q1, Nominal Average Annual Wage



OCCUPATION ANALYSIS

Of the roughly 236,000 jobs in the skilled trades, about a third are transportation and material moving occupations, at 80,200. Production workers make up about a quarter of the jobs in the skilled trades (61,700), while construction workers comprise one-fifth (46,800) and installation and repair workers just under one-fifth, at 18 percent or 42,300. Skilled trades management positions only account for 2 percent of all jobs in the skilled trades, or just under 5,000.

Skilled Trades Employment
by Broad Occupational Category, 2018



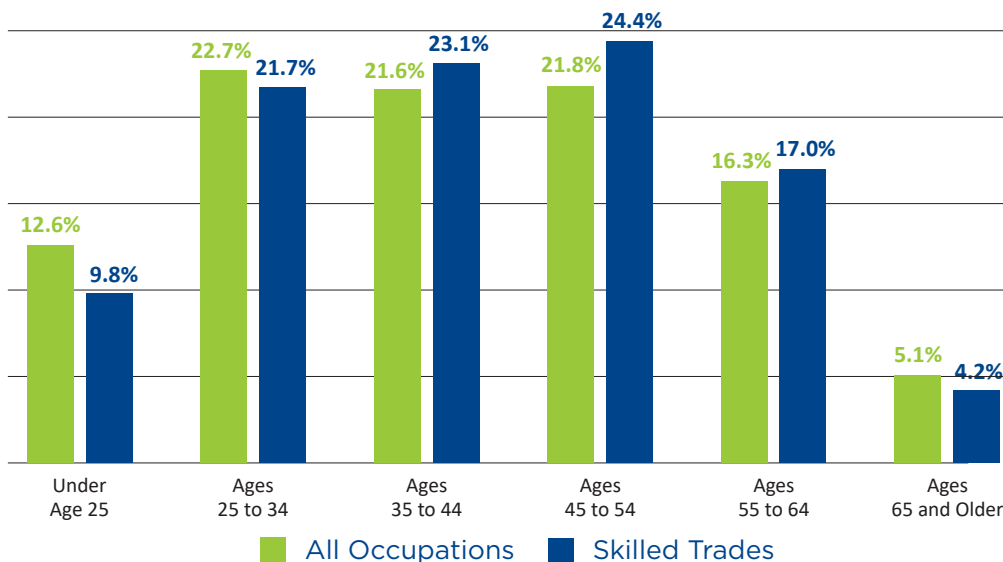
Source: Jobs EQ

Occupation Demographics

Age

The ages of trades workers skew older than the metro average, with less-than-average representation among workers younger than 35 and greater-than-average representation among workers older than 35. Metro-wide, 21.8 percent of all workers are between the ages of 45 and 54, compared to 24.4 percent of skilled trades workers, a 2.6 percent difference. Conversely, only 9.8 percent of workers in these industries are under the age of 25, compared to 12.6 percent in the Kansas City workforce overall, a difference of 2.8 percent.

Age Distribution of Workers | All Workers vs. Skilled Trades



Source: Jobs EQ

Directly calculating the difference between the age distribution of the skilled trades and total workforce reveals the pattern more clearly.

Workers under the age of 25 are most underrepresented in the skilled trades relative to the metro average, while those 45 to 54 are the most overrepresented.

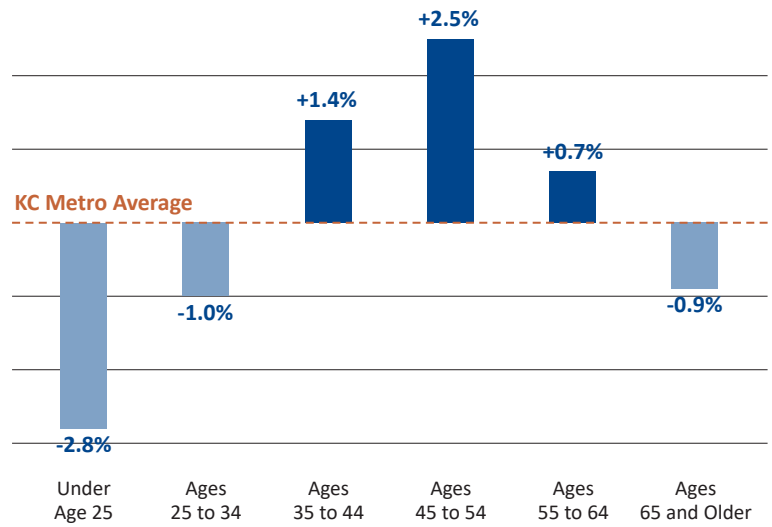
Workers 65 and over are also underrepresented, which is not surprising given the physical nature of most skilled trades occupations.

This pattern holds mostly true for each broad category of skilled trades occupations, with some exceptions.

For example, the construction occupations are the only category that is most overrepresented in the 35-44 year old age group. As a result, it is the only skilled trades occupation category with a lower percentage of workers 45 and over than the overall regional average. Meanwhile, the transportation and material moving occupation category is the only one that is most underrepresented in the 25-34 year old age group.

Age Distribution of Skilled Trades Workers

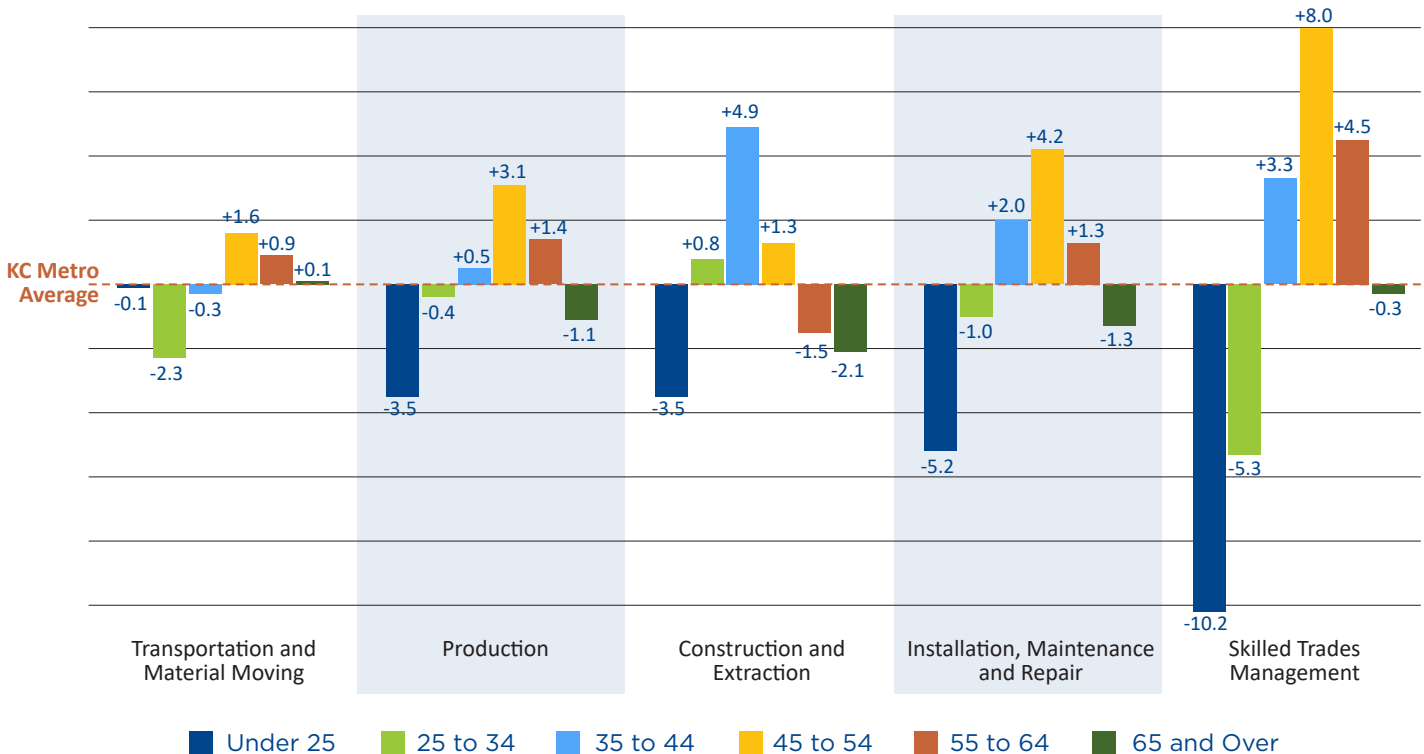
Percent Difference from KC Metro Average



Source: Jobs EQ

Age Distribution of Skilled Trades Workers by Broad Occupation Category

Percent Difference from KC Metro Average



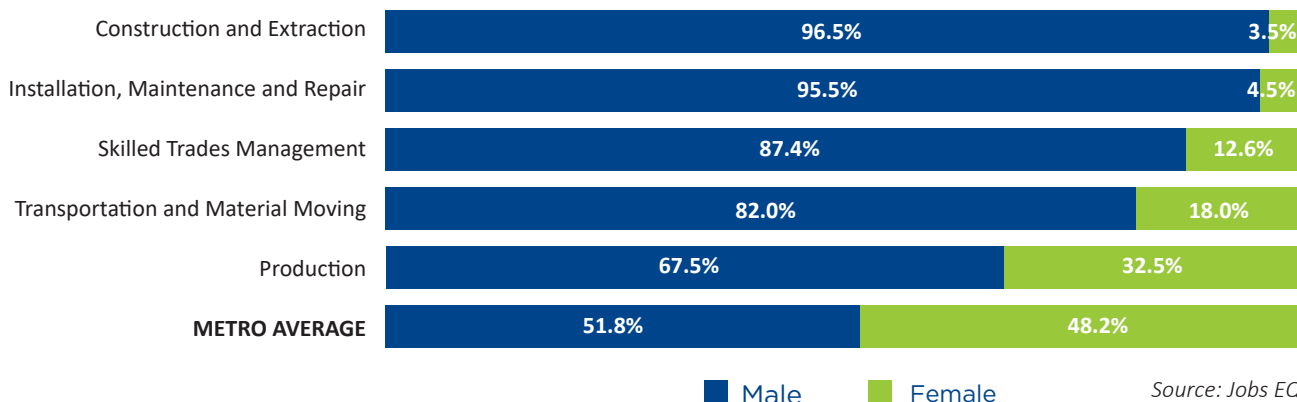
Source: Jobs EQ

The magnitudes of under- and overrepresentation do vary significantly across trades occupations. Transportation and material moving occupations deviate the least from the regional age distribution of workers, while skilled trades management deviates the most. This group skews the oldest among all skilled trades occupations. It is the only one where a significant majority (55 percent) of the workers are 45 and over, as might be expected given the level of experience needed to assume a management role.

Gender

Women are significantly underrepresented among skilled trades workers. While nearly half of all jobs in the Kansas City area are held by females (48 percent), only 16 percent of workers in the skilled trades are women. Production workers come the closest to the regional average, with women accounting for about a third of the workforce. The construction and installation, maintenance and repair occupations are the least representative when it comes to gender, with only 4 percent of their workforces being female.

Gender Distribution of Skilled Trades Workers by Broad Occupation Category



Race and Ethnicity

Generally, the skilled trades employ racially diverse workforces in numbers that closely mirror the distribution of minorities working in the Kansas City area. Overall, about 81 percent of skilled trades workers are white, 14 percent are black, and 4 percent are other races. This compares to a metro workforce that is 83 percent white, 12 percent black, and 5 percent other races.

Some variation exists across occupational categories, however. Minorities form a larger portion of the production and transportation and material moving workforces — 22 percent and 21 percent, respectively — than the 17 percent regional average. Conversely, minorities form a slightly smaller proportion — 15 percent — of the construction and installation, maintenance and repair workforces. Only about 8 percent of in management workers in skilled trades are minorities, which is half the rate they are represented elsewhere in the economy.

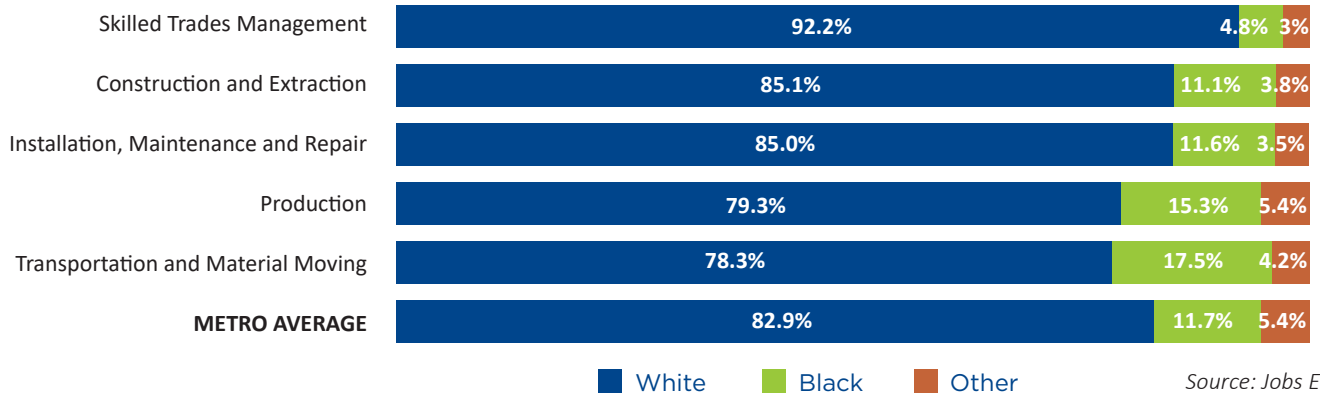
Race vs. Ethnicity

The U.S. Census Bureau considers race and ethnicity to be two separate and distinct concepts.

Race is reported in categories such as white, black, Asian, Native American, Pacific Islander and other.

Ethnicity is used to identify those of Hispanic or Latino heritage, who might be of any race.

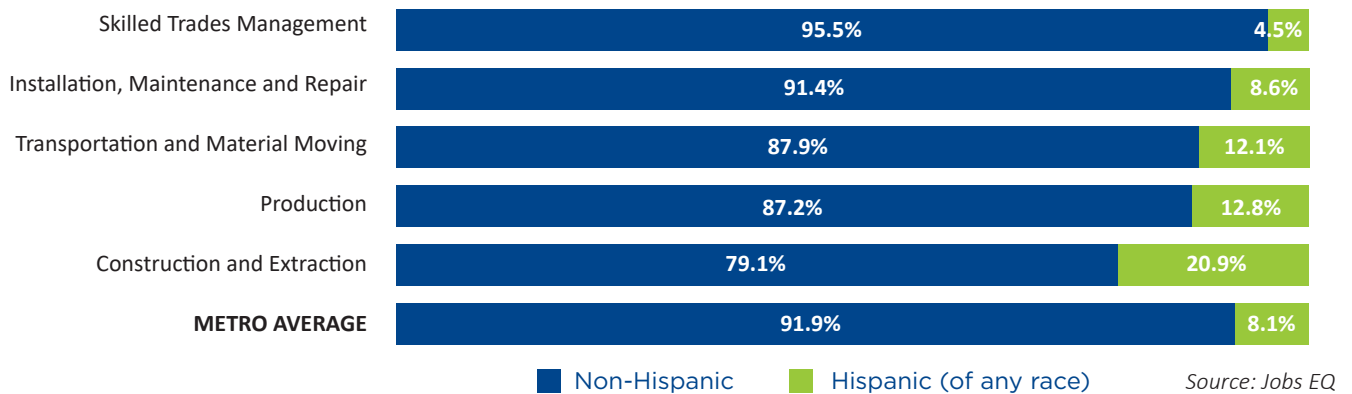
Racial Distribution of Skilled Trades Workers by Broad Occupation Category



Hispanics and Latinos may be of any race and are, in fact, more prevalent in the skilled trades than in the metropolitan economy overall. While 8 percent of all workers in the Kansas City area are of Hispanic or Latino ethnicity, in the skilled trades this rate jumps by nearly two-thirds to 13 percent. Again, there is considerable variation across occupational categories. The construction occupations lead the way with a workforce that is 21 percent Hispanic or Latino, more than 2½ times the regional average. They are followed by the production and transportation and material moving occupations, at 13 percent and 12 percent respectively. About 9 percent of installation, maintenance and repair workers are Hispanic or Latino, just over the regional average.

Only in the trades management occupations are Hispanics and Latinos underrepresented. At 4.5 percent of the workforce, this is a little over one-half the regional average and one-third of the average for the skilled trades occupations overall.

Ethnic Distribution of Skilled Trades Workers by Broad Occupation Category

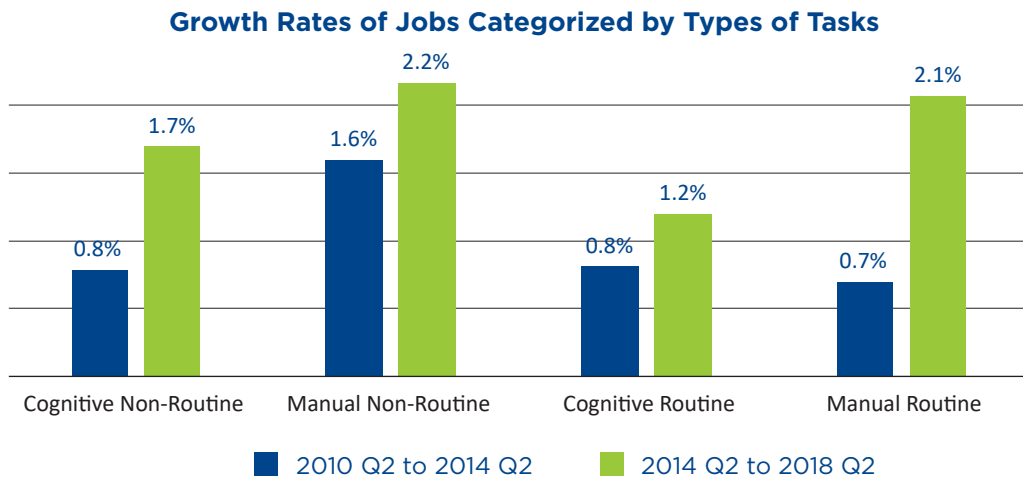


Occupational Trends

Several national studies cross-classify occupations based on the extent to which their tasks are principally manual or cognitive and the extent to which they are routine or non-routine. Manual means the work takes significant physical effort. Routine depends on workers' freedom in

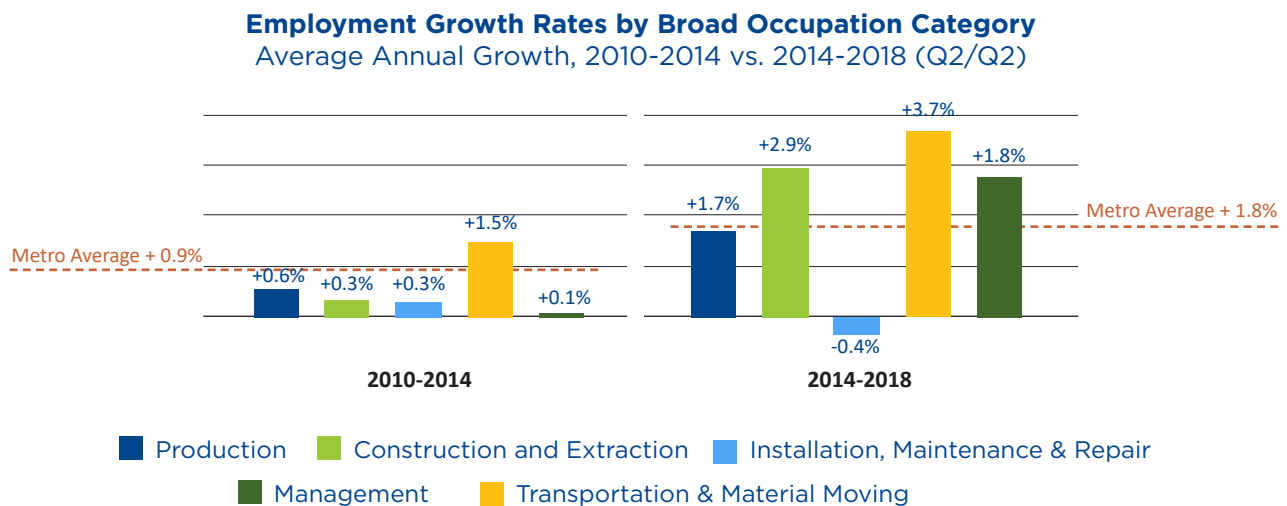
1) establishing the sequence of their tasks, 2) deciding the types of tasks to be performed on the job, 3) planning their own activities and 4) organizing their own time.²

Locally, the pattern of growth among these job classifications is very similar to national results. Jobs that are classified as “manual routine,” which mostly includes the skilled trades, have seen the largest increase in their growth rate in recent years.



Sources: Jobs EQ and OECD

The broad skilled trade occupational categories mostly follow a similar pattern, growing substantially faster between 2014 and 2018 than between 2010 and 2014. Production, construction, transportation and material moving, and skilled trades management occupations all saw growth over the last four years at least 2½ times as great as the prior four years. The one exception is the performance of installation, maintenance and repair occupations, which saw a 0.4 percent decline since 2014 compared to 0.3 percent growth the prior four years. This decline appears to be largely due to cutbacks in telecommunications installation and repair, most likely due to continued employment losses at Sprint.



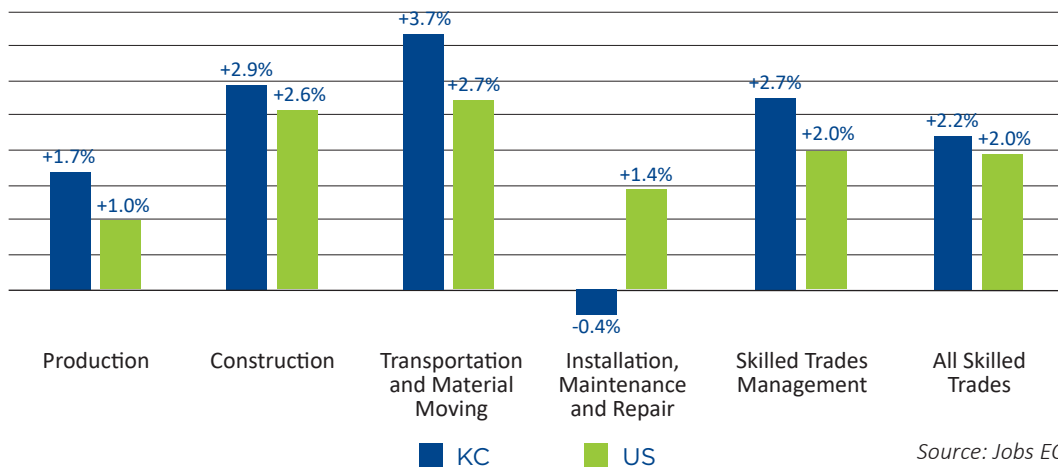
Source: Jobs EQ

² Definition of routine is from “The Routine Content of Occupations: New Cross-Country Measures Based on PIAAC,” OECD Trade Policy Paper No. 188, © OECD 2016

Not only did the skilled trades occupations grow faster in the last half of the decade compared to the first, they also grew substantially faster relative to the region, even though the regional economy itself doubled its rate of job growth. Between 2010 and 2014, only one skilled trades occupational category added jobs at a faster clip than the region’s 0.9 percent average annual growth — transportation and material moving, at 1.5 percent. Since then, this occupation has grown twice as fast as the metro economy, growing 3.8 percent per year between 2014 and 2018 compared to 1.8 percent for the region overall. Two additional skilled trades occupations are also growing faster than the overall economy — construction and skilled trades management, averaging 2.9 percent and 2.7 percent per year, respectively — while production occupations are growing almost as fast as the region, at an average annual rate of 1.7 percent.

Moreover, local employment in several of the skilled trades occupations has been growing much faster here than in the nation as a whole since 2014. For example, even though the employment growth of metropolitan Kansas City’s production occupations has been slightly slower than the regional average, its 1.7 percent growth is still more than two-thirds faster than the 1 percent average annual job growth experienced nationally by the production occupations. Similarly, both skilled trades management and the transportation and material moving occupations grew more than one-third faster locally than nationally during the most recent 4-year period, while construction occupations grew 13 percent faster. Only the installation, maintenance and repair occupations appear to be currently growing more slowly in metropolitan Kansas City than in the U.S., again likely due to cutbacks at Sprint. Overall, though, employment in the skilled trades grew an average of 2.2 percent per year in Greater Kansas City between 2014 and 2018, somewhat faster than the average 2 percent growth rate experienced throughout the U.S. during this period.

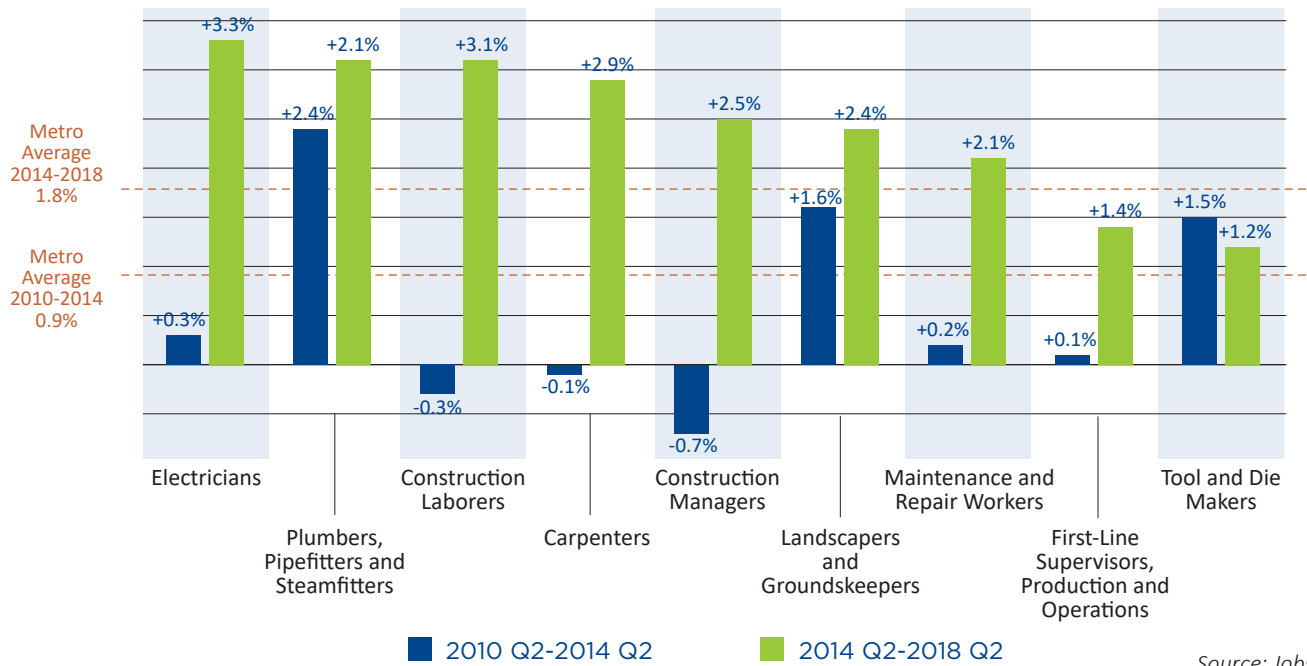
Employment Growth Trends by Broad Occupation Category
Average Annual Growth, KC vs. US, 2014-2018 (Q2/Q2)



Many of these same trends hold true for individual occupations within the broad classes of skilled trades jobs. For example, of the nine skilled trades occupations selected for more in-depth analysis, only three added jobs faster than the metro job growth average during the 2010-2014 period — plumbers, landscaping workers and tool and die makers. During the 2014-2018 period, seven of the nine grew faster than the metro average. Plumbers and landscaping workers were the only occupations to grow faster than average in both periods.

Change in Employment Growth Rates for Selected Occupations

Average Annual Percent Change, 2010-2014 vs. 2014-2018

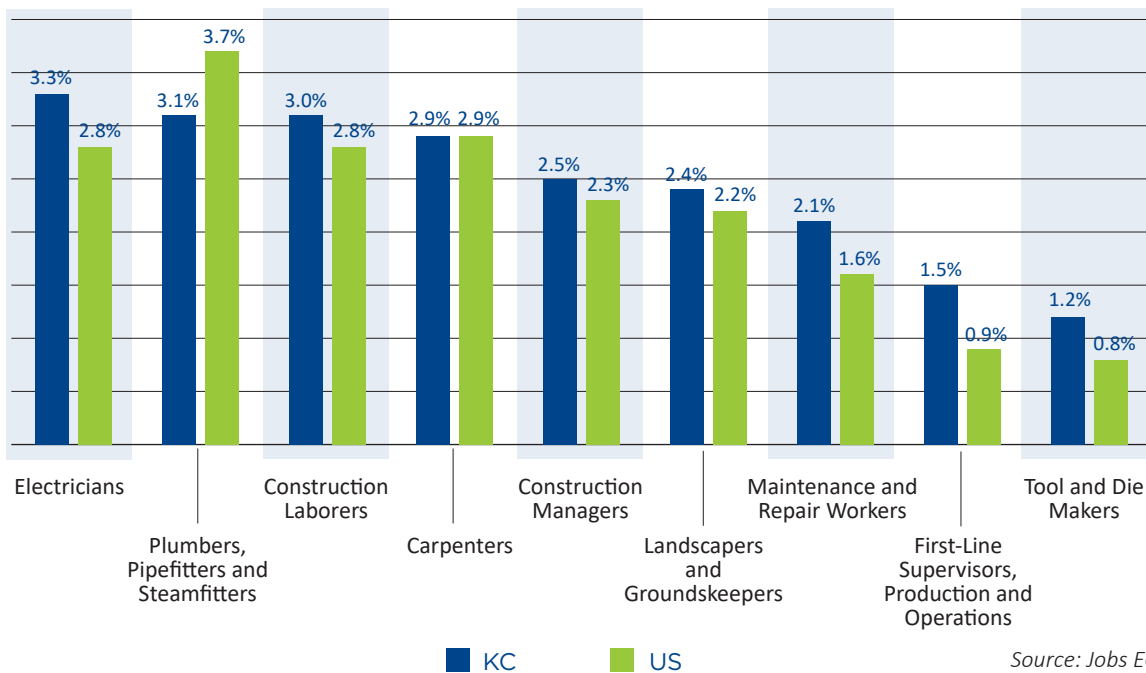


Source: Jobs EQ

Similarly, Greater Kansas City is adding jobs faster than the national average in most of the selected skilled trades occupations. This is especially true for electricians, general maintenance and repair workers, first-line supervisors of production workers, and tool and die makers. Only plumbers are seeing significantly more rapid growth nationally than locally.

Employment Growth Rates for Selected Occupations

KC vs US, 2014 Q2-2018 Q2

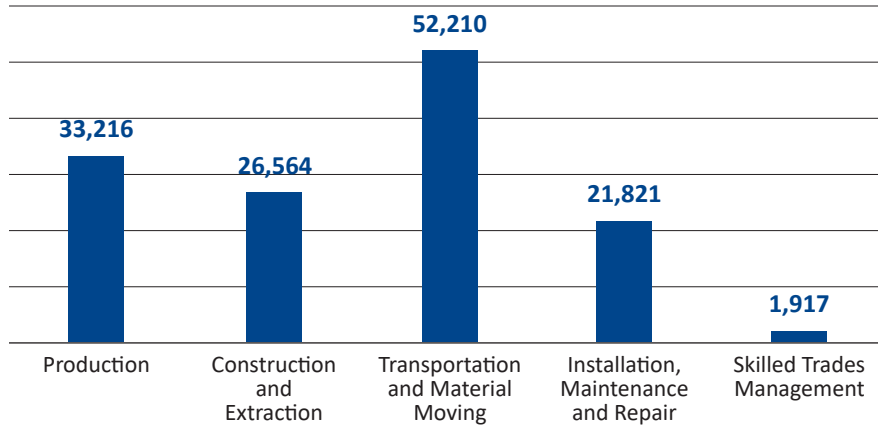


Source: Jobs EQ

Hiring Demand

Over the next five years, nearly 136,000 workers are expected to be hired in the skilled trades. Nearly 40 percent of them (52,200) will be in the transportation and material moving occupations and a quarter of them (33,200) will be in production occupations. The demand for 26,600 workers in the construction occupations accounts for one-fifth of the total, while 21,800 installation, maintenance and repair workers will account for 16 percent. Demand for skilled trades managers, at 1,900, makes up 1.4 percent of the total.

Skilled Trades Hiring Demand | Next Five Years



Source: Jobs EQ

Hiring demand consists of growth demand plus replacement demand. Growth demand results when area firms need a larger number of workers in a particular occupation. Replacement demand results when existing employees decide to switch occupations or leave the workforce entirely, such as when a worker returns to school, stops working to take care of family, becomes disabled or retires. While the trends above illustrate the increase in total hiring demand, an average of 96 percent of the demand for skilled trades workers over the next five years will be created by replacement demand.

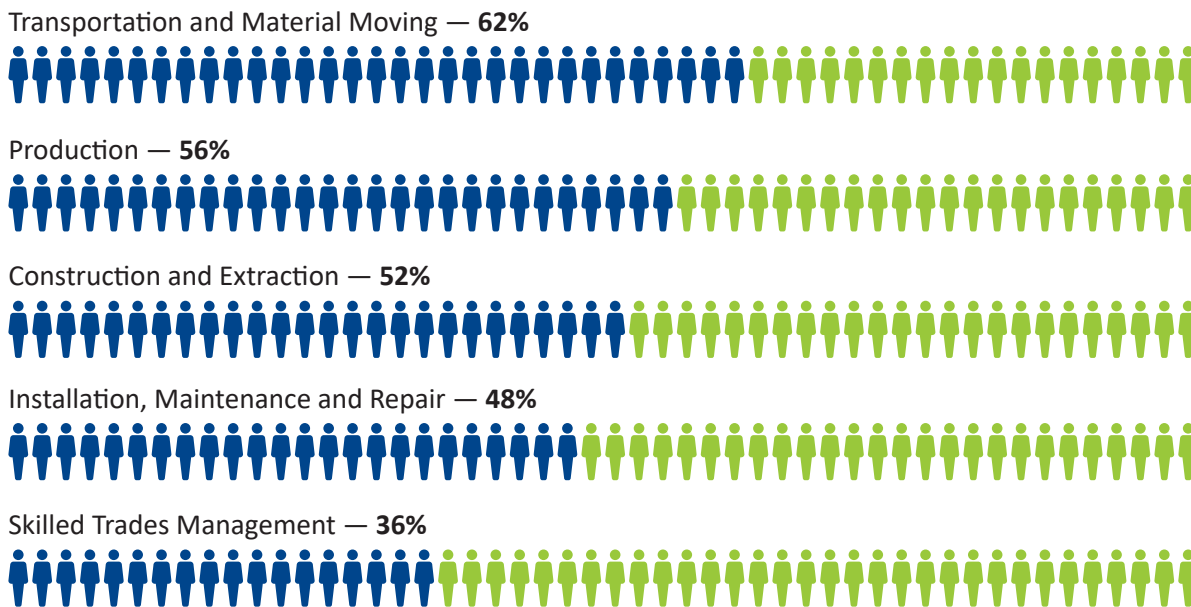
Skilled Trades Hiring Demand | Next Five Years
Percent Arising from Replacement and Net Growth Demand

	Replacement		Net Growth
	Leaving Workforce	Switching Occupations	
Transportation and Material Moving	38%	56%	5%
Production	38%	65%	-3%
Construction and Extraction	32%	60%	8%
Installation, Maintenance and Repair	35%	59%	6%
Skilled Trades Management	30%	61%	9%
Total Skilled Trades	36%	60%	4%

Source: Jobs EQ

By taking projected replacement as a percentage of the current workforce levels, the replacement or turnover rate can also be calculated. Nearly two-thirds of the workforce in transportation and material moving occupations will need to be replaced over the next five years, while roughly half the workers in the production, construction, and installation, maintenance and repair occupations will need to be replaced. Skilled trades management has the lowest expected turnover rate, with just over a third of existing workers to be replaced over the next five years.

Percent of Current Workforce to be Replaced over the Next Five Years



Source: Jobs EQ

Hiring demand by itself indicates which occupations provide the largest number of expected job openings in the near- to mid-term future. Combining hiring demand with data on average wages reveals the occupations with the best overall economic opportunity for individuals considering entering the skilled trades. The following table ranks by wage specific skilled trades occupations expected to have at least 1,000 job openings in metropolitan Kansas City in the next five years.

Outside of managers and supervisors, the best paying occupations in the skilled trades with high levels of anticipated hiring demand are electricians, plumbers, construction equipment operators and masons. The average annual wage for these occupations ranges from \$52,900 to \$62,700, and all exceed the metro average wage of \$49,300.³ Paying just below the metro average are heating and air conditioning mechanics, heavy truck drivers, bus and truck mechanics, welders and painters.

³ The data for wages by occupation excludes bonuses and overtime pay, unlike the data on wages by industry. This is why the average annual wage for the Kansas City metro shown here (\$49,300) is lower than that shown for traded sectors (\$52,042) on page 15.

Highest Paying Skilled Trades Occupations

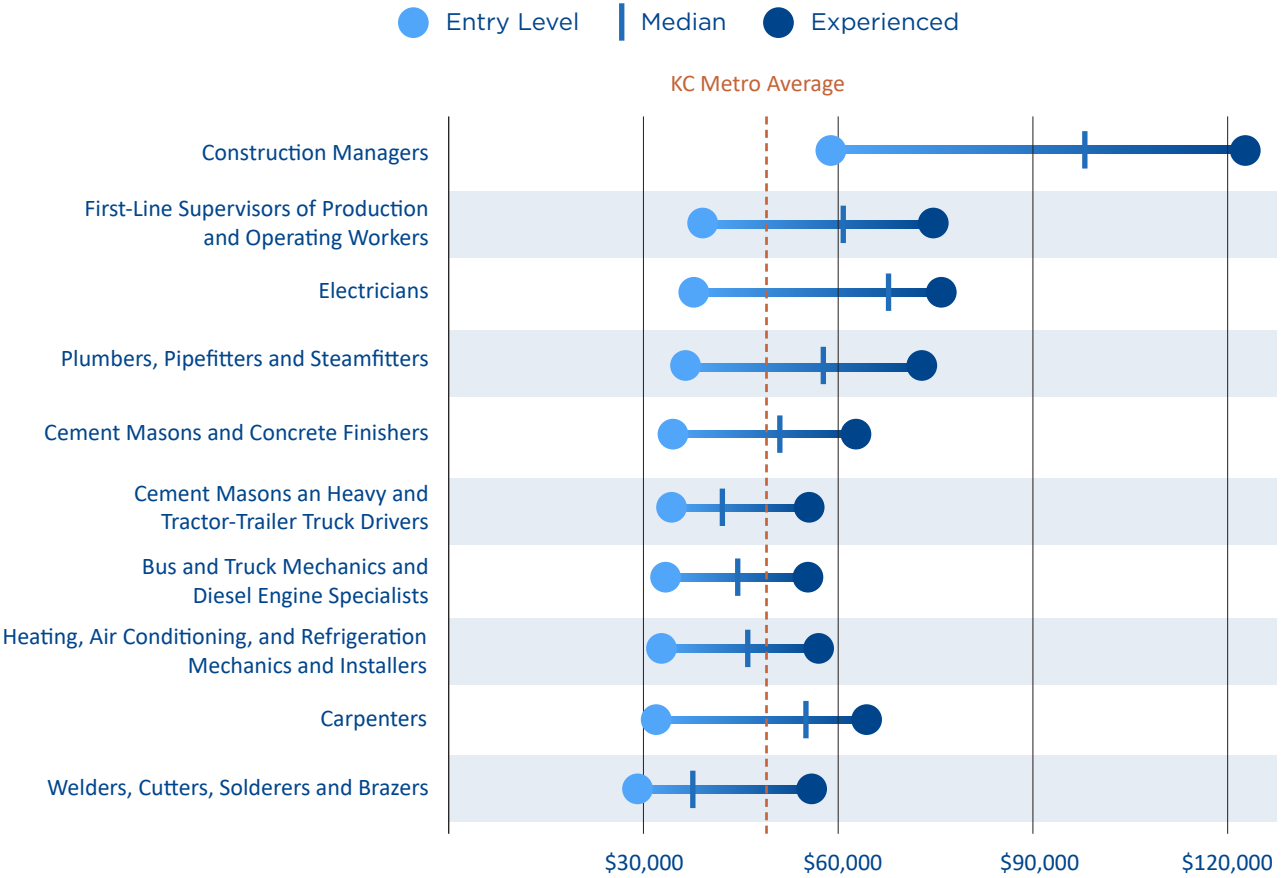
Occupations with at Least 1,000 Openings in the Next Five Years

Occupation	Current Employment	Average Annual Wages	Total 5-Year Hiring Demand
Construction Managers	2,632	\$101,000	1,053
First-line Supervisors of Construction and Extraction Workers	3,969	\$73,000	2,178
Electricians	4,522	\$62,700	2,758
First-Line Supervisors of Production and Operating Workers	4,213	\$62,200	2,043
First-Line Supervisors of Mechanics, Installers and Repairers	3,484	\$61,000	1,631
Plumbers, Pipefitters and Steamfitters	3,452	\$60,300	2,150
Operating Engineers and Other Construction Equipment Operators	2,668	\$56,800	1,665
First-Line Supervisors of Helpers, Laborers and Material Movers	1,737	\$54,800	1,009
Carpenters	6,588	\$53,000	3,270
Cement Masons and Concrete Finishers	1,904	\$52,900	1,160
Heating, Air Conditioning, and Refrigeration Mechanics and Installers	2,296	\$48,400	1,323
Heavy and Tractor-Trailer Truck Drivers	16,044	\$48,000	9,149
Bus and Truck Mechanics and Diesel Engine Specialists	2,253	\$47,500	1,122
Welders, Cutters, Solderers and Brazers	2,330	\$46,400	1,297
Painters, Construction and Maintenance	2,782	\$46,100	1,251
Machinists	1,990	\$43,900	1,019
Construction Laborers	8,580	\$43,500	5,006
Automotive Service Technicians and Mechanics	5,336	\$43,500	2,659
Inspectors, Testers, Sorters, Samplers and Weighers	3,420	\$42,400	1,806
Team Assemblers	11,241	\$40,600	5,954

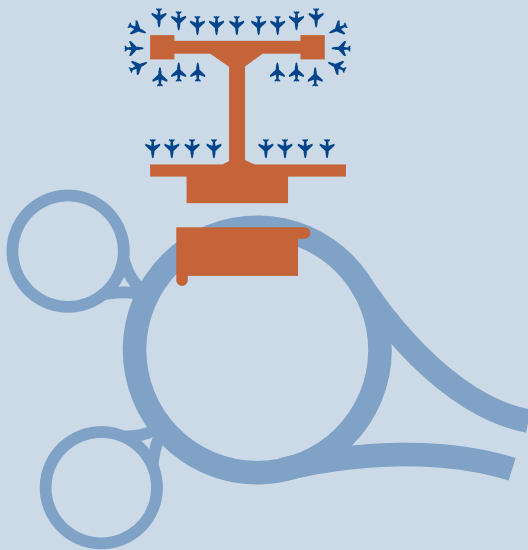
Source: Jobs EQ

In general, entry level workers can expect to make about 60 percent of the average, while experienced workers can expect to make about 20 percent more than the average. Over the span of a career, most workers expect their wages to approximately double.

Annual Wage Comparison | Selected Skilled Trades Occupations



Source: Jobs EQ



The KCI Effect

Hiring demand for construction workers — occupations already anticipating turnover rate of more than 50 percent in the next five years — will be exacerbated by planned construction projects. The construction of a new terminal at Kansas City International Airport will have a significant impact on the regional economy. In the first year of construction at KCI, construction employment for the region is forecast to increase by 4,000 jobs just for this project, in addition to the 26,600 openings already expected in the next five years. This increased demand may drive average wages for construction workers higher.



Talent-to-Industry Exchange

SKILLED TRADES

In 2018, the Mid-America Regional Council hosted facilitated discussions with local industry leaders and educators to capture their insights on trends, challenges and opportunities in the skilled trades industry. In addition, 85 CEOs and human resource managers completed an online survey and a number of individual interviews were conducted.

The insights gained from these leaders reinforces many of the findings in the analysis of quantitative data in the previous section of this report. Key insights, including gaps and potential opportunities, are summarized in this section in two general categories: growing the talent pipeline and workforce preparedness

GROWING THE TALENT PIPELINE

One of the biggest challenges employers face when seeking talented workers for jobs in the skilled trades industry is public perception about these occupations. Early exposure to opportunities in this industry can help develop home-grown talent. Maximizing retention of current employees and diversifying the workforce can also add to the region's talent pipeline for this industry.

■ Changing Perceptions

In the court of public opinion, colleges are winning. Completion of a four-year degree is often considered the only path to a good job. College recruiters typically have various opportunities for face time with students before they graduate from high school and college recruiters also receive a warm welcome from teachers, students, administrators and parents. That same welcome does not seem to be universal for all postsecondary pathways. Many parents and students see the trades as a choice of last resort, a lesser option. Surprisingly, even parents who work in the trades often discourage their own children from taking a similar path.

The assertion that colleges are winning can be demonstrated in the numbers. There are approximately 20 million young people enrolled in college today and only 500,000 in trade and technical education schools. About 2 million students graduate from college each year, and only 50,000 from trade and vocational schools. By contrast, there were only 500,000 college graduates in 1950.⁴



"My parents said they worked hard so I don't have to have a job like that."

"My dad was an electrician and we did fine. But he wants me to go to college."

— Area students

⁴ DeBruce Foundation, Overview of the Trades, 2018

Those outside the trades often have a negative view of these occupations and describe them as opportunities for young people with discipline problems or those who lack the intellectual aptitude to complete a four-year college program. The jobs may be viewed as dirty, low skilled or boring due to repetitive tasks. Those inside the trades, however, tell a different story about the variety and complexity of problems to be solved on a job site or shop floor and the intellectual aptitude, persistence, and creativity that is necessary to be skilled at this type of work.



“When we were kids, we learned that when little Johnny is not that bright and has a discipline problem, he goes to work in construction.”

— Business Leader

“If you go to a trade school, you’ll be seen as less educated.”

— Student

“In high school there was a huge push to go to college. I had good grades, nobody said there’s another way after high school.”




— Young Professional

In a national survey, 54 percent of teens said there is a better future working in computers than in skilled trades; 37 percent said working in an office is more respected than working with their hands; and 15 percent said there’s not a lot of opportunity in the trades.⁵

Lack of Exposure

Part of the problem seems to be a lack of exposure to careers in this industry. When students who participated in online surveys and focus groups led by the DeBruce Foundation in collaboration with KC STEM Alliance were asked, “How much information have you been given about the skilled trades?” only 7 percent said they had been given a lot of information. A combined 93 percent lacked exposure, with 57 percent reporting no or very little information and 36 percent some information. Additionally, students did not recognize the titles of jobs in demand by construction, warehousing or industrial trades.

Three Jobs Students Don’t Recognize

<p>88% don’t know that a BOILERMAKER makes and installs boilers and other large containers</p> 	<p>81% don’t know that a RIGGER specializes in lifting and moving heavy objects with cranes or hoists</p> 	<p>63% don’t know that a MASONRY WORKER builds or maintains brick or stone structures</p> 
--	---	---







Jobs in Demand Across Industries that Students See as Undesirable

	PLUMBER	BOILERMAKER	RIGGER	ELECTRICIAN
Percent of students rating job as undesirable:	77%	73%	71%	40%
Average annual wage:	\$60,300	\$68,600	\$42,000	\$62,700
10-year total demand (growth & replacement):	+4,326	+119	+119	+5,531

Source: The DeBruce Foundation in collaboration with KC Stem Alliance, High School Student Perceptions of Skilled Trades, 2018, and Jobs EQ

5 RIDGID survey, Skilled Trades Rank Low in Teen’s Career Options, 2012

The Benefits of Skilled Trades

<p>Ease of Entry</p> <ul style="list-style-type: none"> • No college debt • Full-time job and education combo • Can start relatively quickly after high school 	<p>Stability</p> <ul style="list-style-type: none"> • Jobs available in many industries • Good salaries, benefits and pension • Early retirement options 	<p>On-the-Job Benefits</p> <ul style="list-style-type: none"> • Work with your hands • Lots of variety • Learn and use high-tech skills 
<p>Personal Benefits</p> <ul style="list-style-type: none"> • Rewarding to create something tangible • Self-esteem and empowerment • Camaraderie with coworkers 	<p>Career Growth</p> <ul style="list-style-type: none"> • Upward mobility • Path to autonomy or entrepreneurship • Skills are universal and transferable 	<p>Continuing Education</p> <ul style="list-style-type: none"> • Early path to further education • College credits • Tuition reimbursement 

Source: Clear Box Insights Focus Groups

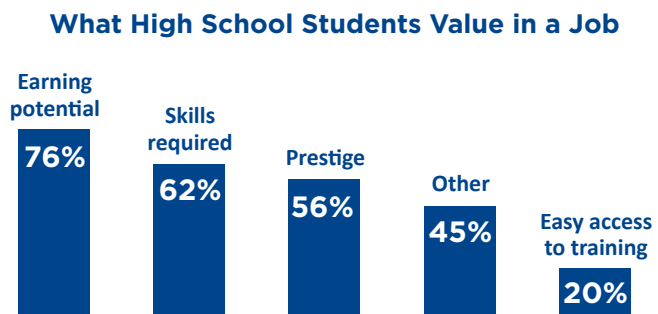
In spite of the negative perceptions, there are a number of benefits to employment in the trades.

A postsecondary pathway that leads to a career in the trades does not eliminate the option of education beyond high school; in fact, many apprenticeship programs award college credit during the course of training. These credits can be applied to an associate or bachelor’s degrees should students choose to continue their education.

Unlike the traditional college path, a postsecondary path in the trades also often offers an earning-while-learning opportunity, so rather than accumulating debt the student is earning a paycheck. Many employers in the trades offer tuition reimbursement, which helps facilitate continued learning. Additionally, many occupations in the skilled trades offer above-average wages and workers are in high demand.

RECOMMENDATION **Communicate the benefits of the trades to parents and their kids.**

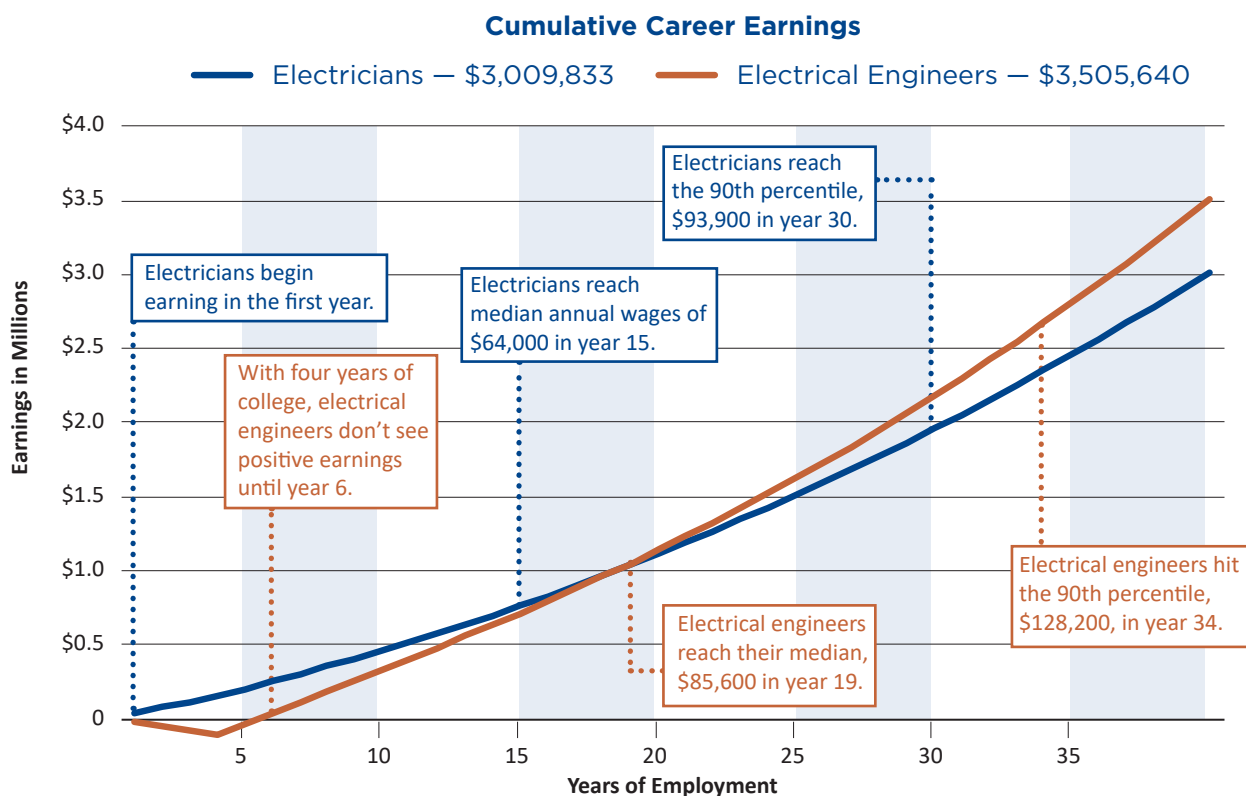
When asked what would draw them to a career, 76 percent of students said earning potential is the strongest hook.⁶ Lifetime career earnings for skilled trades often compare favorably to jobs that require college degrees, especially when the cost of college is factored in.



⁶ DeBruce Foundation in collaboration with KC STEM Alliance, High School Student Perceptions of Skilled Trades, 2018

Earning Potential

The average annual household wage in the metro area in the second quarter of 2018 was \$49,400.⁷ An electrician can expect to earn above that average wage with less than 10 years of experience, and reach cumulative career earnings of \$1 million in less than 20 years, often with no student loan debt. In comparison, an electrical engineer will also reach approximately \$1 million in cumulative career earnings around the 20 year post-graduation mark. However, an engineer is more likely to have accumulated student loan debt. The average student loan debt for students in the U.S. in 2018 is \$39,400.⁸ Student debt is often higher for specialties like engineering because of additional fees for specialized training added to the cost of tuition.



Lifetime earnings for both the electrician and the electrical engineer reach more than \$3 million. In addition, many electricians retire after 30 years and supplement pensions with a second career, which can bring their cumulative earnings even closer to that of electrical engineers.

A postsecondary path in construction or industrial trades offers additional benefits such as a path to entrepreneurship or a sense of satisfaction and reward for work that creates something tangible that may last for generations.

RECOMMENDATION

Share career earnings data for skilled trades with teachers, counselors, parents and students.

⁷ JobsEQ

⁸ Mark Kantrowitz, Private Student Loans Guru

Non-Traditional Pathways

College pathways are usually very clear to students:

- Graduate from high school, get ready in the summer and report to college in the fall.
- Spend the next two to four years focused on a course of study that falls within a defined academic plan.

Postsecondary career pathways that bypass college completion are not as clearly understood. Parents’ hopes are often focused on college, not trades. Clearly communicating the variety of available postsecondary pathways will expand opportunities for students and families in the community.



“A lot of people don’t realize you don’t have to have a four-year degree in construction to get on a pathway to owning your own business, to be a company president, or to be an executive.”

— Business Leader

“We fall short in showing kids pathways into the trades. We need to show kids the opportunities or the pathways. That would be huge.”

— Educator

RECOMMENDATION

Strengthen understanding of entrepreneurial postsecondary pathways related to the trades.

THE COLLEGE PATHWAY DOESN'T WORK FOR EVERYONE

For every 100 high school freshmen in Kansas and Missouri:

An average of 87 will graduate from high school (86-KS, 88-MO)



An average of 60 will enroll in a two- or four-year postsecondary institution (69-KS, 51-MO)



An average of 40 will complete one year of college (45-KS, 35-MO)



An average of 27 will complete a postsecondary credential (31-KS, 24-MO)



Source: Ewing Marion Kauffman Foundation using KSDE and MoDESE data

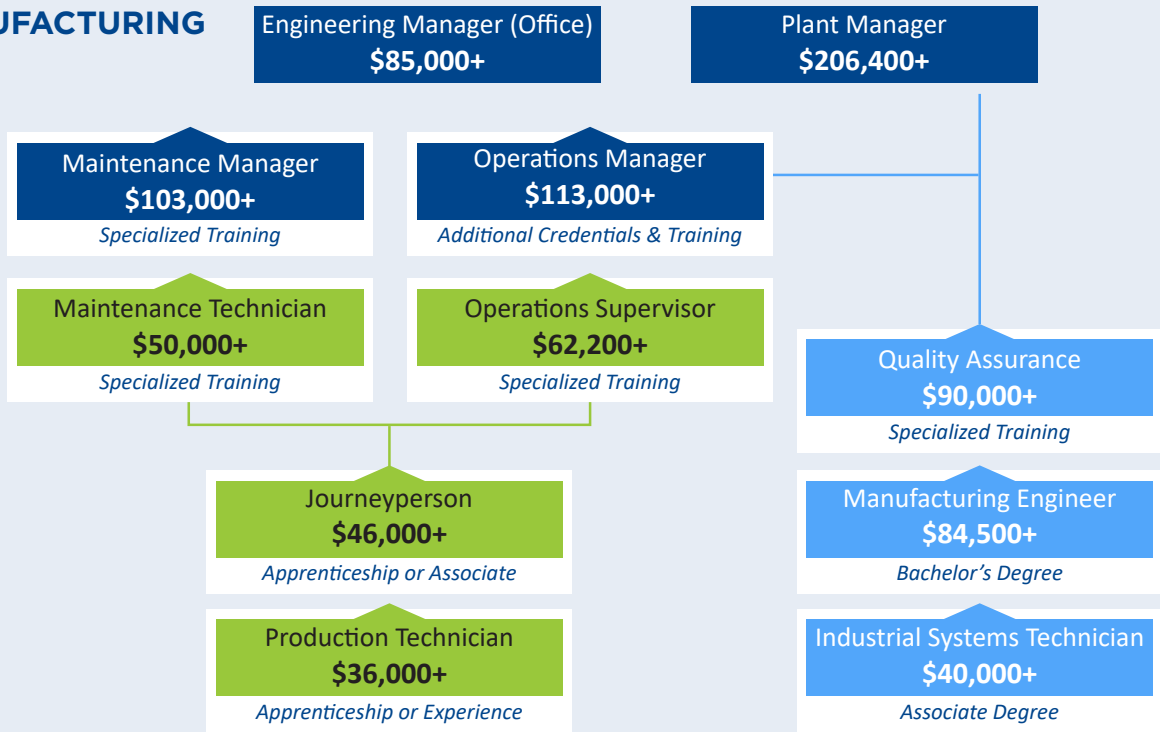
RECOMMENDATION

Measure postsecondary success using key indicators beyond college enrollment rates, such as placement in a good job.

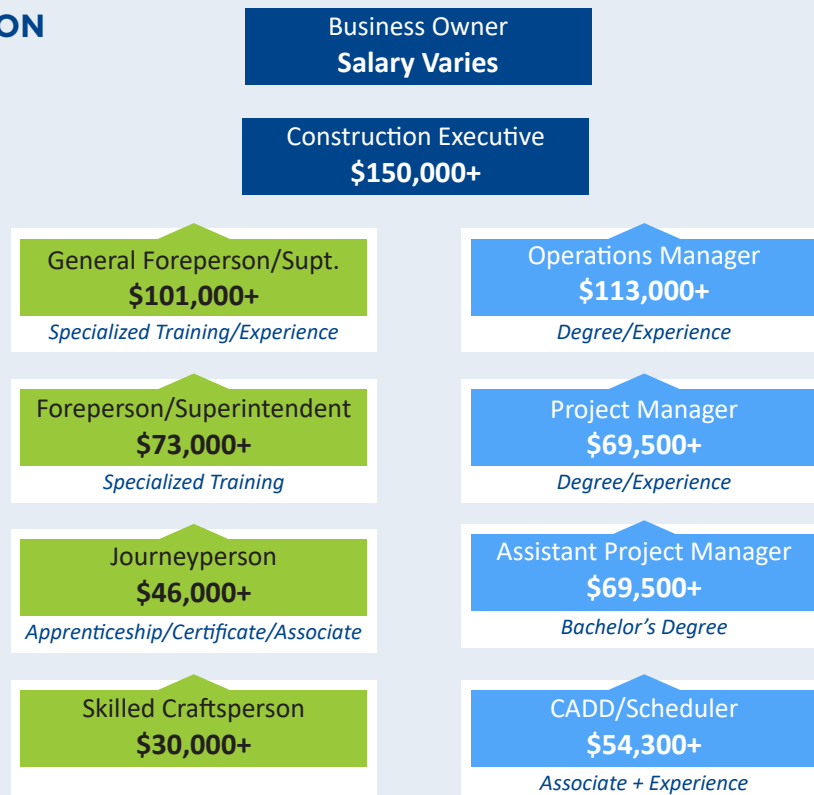
EXPANDED POSTSECONDARY PATHWAYS

Courtesy of Metropolitan Community College

ADVANCED MANUFACTURING



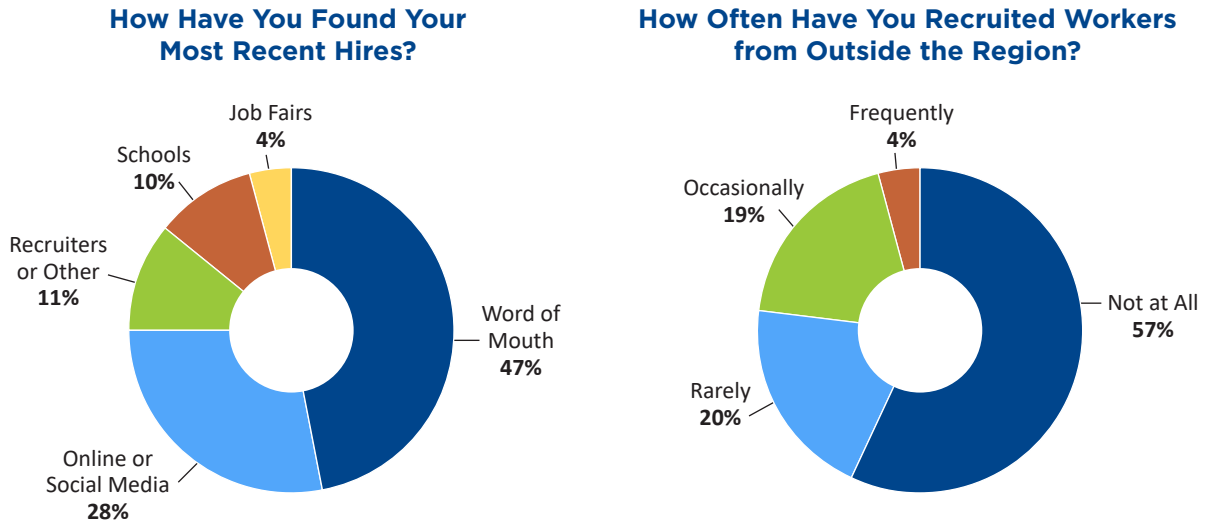
CONSTRUCTION



■ Identifying Talent

When asked how they found their most recent hires, nearly 50 percent of employers said by word of mouth. Another 28 percent said they used online search tools. Schools and recruiters accounted for about 20 percent, and only 4 percent reported successful hires through job fairs.

The majority of employers hire local talent, with only a small percentage of survey respondents saying they frequently recruit entry-level talent from outside of the region. When they do hire from outside, the primary reason is a lack of workers in the local market with the skills and experience they need.



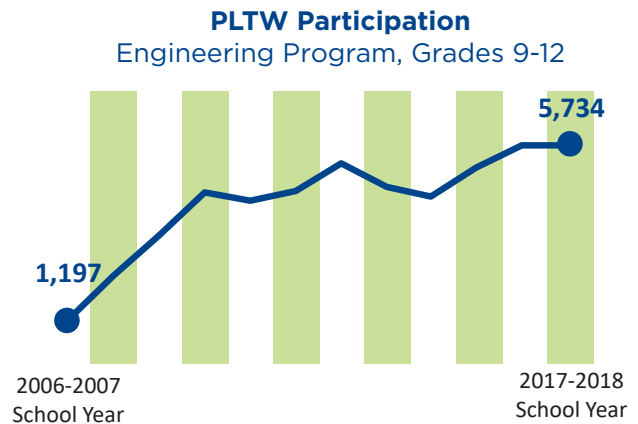
Source: MARC Survey

More than half — 53 percent — of employers surveyed said that no experience is required for entry level positions. The remaining 47 percent require less than three years of experience; none of those surveyed required more than three years of experience for entry level positions.

K-12 Pipeline

School districts across the region have structures in place that can serve as pipelines to the trades, providing a pool of home-grown talent for entry-level positions. For example, Project Lead The Way (PLTW) provides a project-based curriculum that is the basis for many career pathway programs in metro school districts, and has the largest reach of programs in the Kansas City region. In the 2018-2019 academic year, KC STEM Alliance worked with 34 school districts and 11 private/charter schools to implement PLTW.

PLTW reaches students in grades K-5 through its Launch program, grades 6-8 through the Gateway program and grades 9-12 via three primary career pathways in engineering, bioscience and computer science. Oversight is provided by the KC STEM Alliance, www.kcstem.org, a collaborative network of educators, business partners and affiliates.



PLTW's engineering pathway teaches skills important to trades

The first course in PLTW's engineering pathway for high school students, Introduction to Engineering Design, allows students to dig deep into the design process. Students apply math, science and engineering standards to hands-on projects like designing a new toy or improving an existing product — skills that are important to the trades.

In the 2017-2018 school year, 2,874 students completed this introductory course. The engineering pathway includes courses on the principles of engineering, digital electronics, civil engineering and architecture, computer integrated manufacturing, engineering design and development, and aerospace engineering.

The future pipeline looks even brighter, as more and more students at the elementary and middle school levels are now participating in PLTW. When these students reach high school, they will have already been exposed to design principles and many will undoubtedly look to study them more in depth.



Out-of-School Programs

In addition to courses and course sequences that are offered during school hours, there are a number of robotics programs that engage students in competition based, hands on learning out-of-school, including FIRST Robotics, BotsKC and VEX. These programs help young people build skills that are important to the trades and reach thousands of students across the region. There are numerous out-of-school opportunities to strengthen the talent pipeline for the trades, including YMCA programs that incorporate STEM experiences, 4-H Clubs, Girl Scouts and Boy Scouts, library programs, community-based maker spaces, the Academic Camp for Enrichment, National Institute of Construction Excellence and National Association for Women in Construction.



“Average is over, that died in the recession. If you want to be in construction, you better be in the top 30 percentile of your class. It’s a huge misconception that’s insulting when people say ‘this guy is in the bottom 10 percent in his class, he can always be a carpenter.’”

— Business Leader

“Businesses are going to have to compete for these kids. They have a lot of opportunities and they’re not just going to come knocking on your door.”

— Educator

High School Trade Programs

High schools in Missouri and Kansas offer courses that prepare students for the trades. Data from the Missouri Department of Elementary and Secondary Education (DESE) shows that overall participation in these courses in eight metro school districts has remained stable, rising slightly from 685 students to 702 over the past year. The machinist program remains the most popular, with 301 students enrolled. Carpentry was the second most popular course, with an enrollment of 155. Gender equity remains an issue, as females make up just 8.4 percent of the total enrollment.

Data provided by Kansas State Department of Education (KSDE) for 18 metro area districts shows similar stability in enrollment in courses related to the trades over the past few years. Drafting and design technology courses are most popular, with 2,019 students enrolled in 2018, followed by carpentry courses, with an enrollment of 1,536. More information is available in “Career and Tech Education in Greater Kansas City,” online at www.kcworkforce.com/reports.htm

Missouri Participation in High School Trade Programs, 2014-2018

Excelsior Springs, Fort Osage, Harrisonville, Independence, Kansas City, Lee’s Summit, Platte County R-III and Raytown School Districts

	2014	2015	2016	2017	2018
AC, Heating and Refrigeration	63	76	55	41	40
Carpentry	115	123	131	159	155
Construction Technology	114	102	162	175	131
Drafting and Design Technology	80	58	51	18	38
Electrician	22	22	28	26	23
Machinist	291	312	281	293	301
Manufacturing Technology	—	—	—	—	14
TOTAL	685	693	708	712	702

Participation rates average about 3.4 percent of high school enrollment in these Missouri districts.

Source: MO DESE

Kansas Participation in High School Trade Programs, 2014-2018

Basehor-Linwood, Blue Valley, Bonner Springs, De Soto, Easton, Gardner-Edgerton, Kansas City, Lansing, Leavenworth, Louisburg, Olathe, Osawatomie, Paola, Piper, Shawnee Mission, Spring Hill, Tonganoxie and Turner School Districts

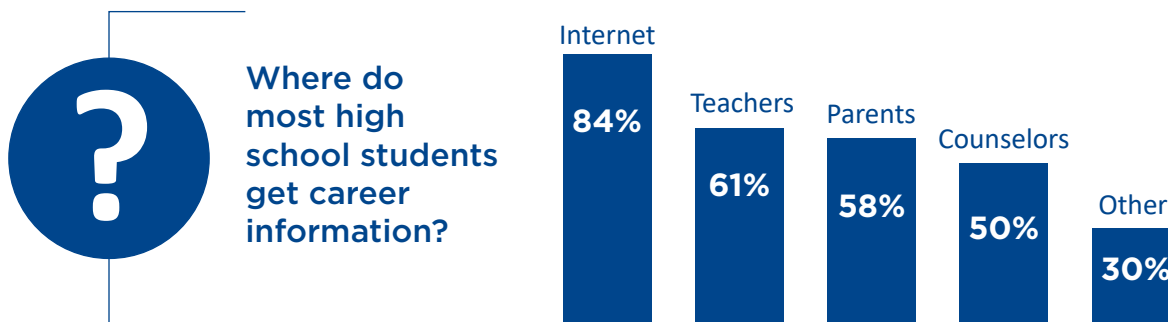
	2014	2015	2016	2017	2018
Carpentry	1,364	1,426	1,447	1,600	1,536
Construction	52	11	21	16	20
Drafting and Design Technology	2,098	2,348	2,510	2,249	2,019
Electrical	4	17	3	11	5
Heating/Refrigeration	0	9	2	3	11
Manufacturing	649	818	697	701	905
TOTAL	4,167	4,629	4,680	4,580	4,496

Participation rates average about 10.2 percent of high school enrollment in these Kansas districts.

Source: KSDE

RECOMMENDATION

Engage with K-12 schools and encourage individuals to make postsecondary choices based on aptitude and interest.



Source: DeBruce Foundation

Engaging the Underemployed

Another potential talent pool for skilled trades is overlooked — young adults who are currently underemployed.

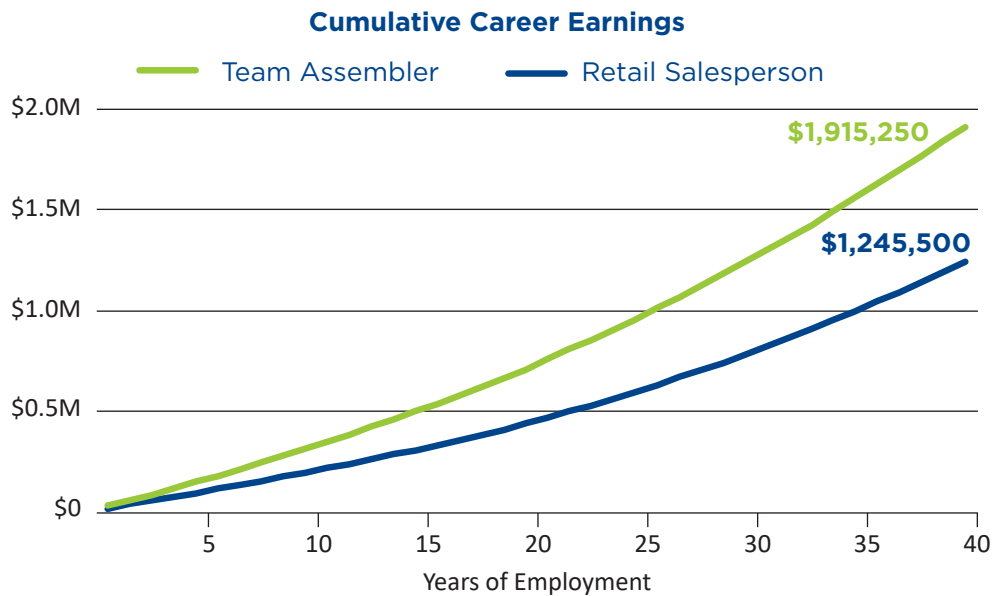
There are currently 150,000 people under the age of 35 in the Kansas City metro employed in service sector jobs that pay less than \$35,000 per year and don't require any postsecondary education.

The income and stability offered by jobs in the construction or industrial trades could have a lifelong impact on these individuals and their families.

Underemployed Workers Low-wage occupations with the most workers under age 35

Cashiers	15,285
Fast Food Worker	14,904
Retail Salespersons.....	14,584
Waiters and Waitresses.....	13,045
Stock Clerks	7,224
Office Clerks	6,779
Cooks.....	4,104
Janitors	3,867
Personal Care Aides.....	3,833
Food Preparation Workers.....	3,755
Child Care Workers.....	3,480
Receptionists.....	3,170

A team assembler can expect to earn about \$700,000 more than a retail salesperson over the course of a 40-year career. Neither occupation requires a postsecondary credential.



Source: Jobs EQ, MARC Calculations

RECOMMENDATION

Expand recruiting efforts to reach young workers currently employed in low-wage occupations.

Workers with disabilities may also be an untapped talent pool. The U.S. Department of Labor has established a national aspirational goal of 7 percent utilization of qualified individuals with disabilities. The Kansas City region is home to about 130,000 working-age adults with disabilities, including 25,102 between the ages of 18-34. Many of these people are willing and able to go to work.



“Employing people with disabilities has been shown to benefit businesses ... as a result of lower turnover, increased productivity and access to a broader pool of skilled workers.”

— National Conference of State Legislators

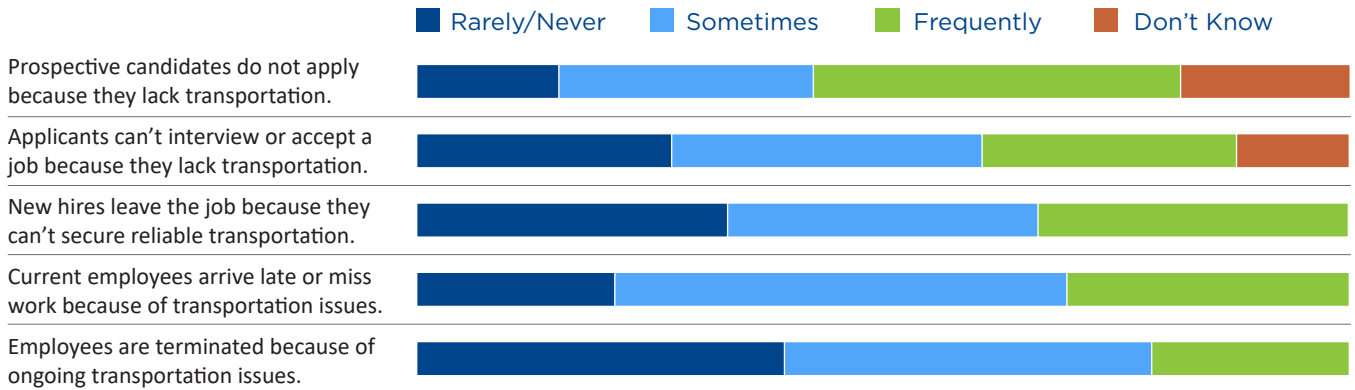
Maximizing Retention

In addition to challenges with recruiting new employees, business leaders provided insight into challenges with retaining current employees in skilled trades occupations. Some of the most common barriers to continued employment include:

- **Job site environment** — Many skilled trades occupations involve outdoor work in all types of weather.
- **Physical nature of work** — Jobs can be physically demanding, requiring strength, flexibility and endurance.
- **Background checks** — Workers must typically undergo a background check before hiring on and pass drug tests at the time of hire and randomly thereafter.
- **Career growth opportunities** — It can take time to learn a craft and become skilled. Also, the path to management or other growth opportunities is not always clear in the trades.
- **Job security** — Some work is seasonal in nature, or may fluctuate with economic growth and decline.

Another barrier to continued employment identified by both employers and employees is transportation to and from work. The Mid-America Regional Council recently conducted a survey of employers and employees in intermodal and industrial parks to further explore transportation challenges.

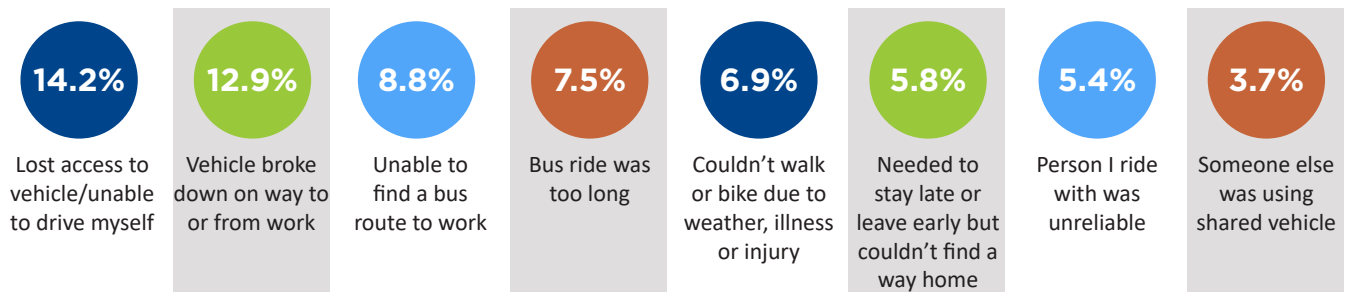
Transportation Challenges: Employer Perspectives



Source: MARC Employer Transportation Survey

Transportation Challenges: Employee Perspectives

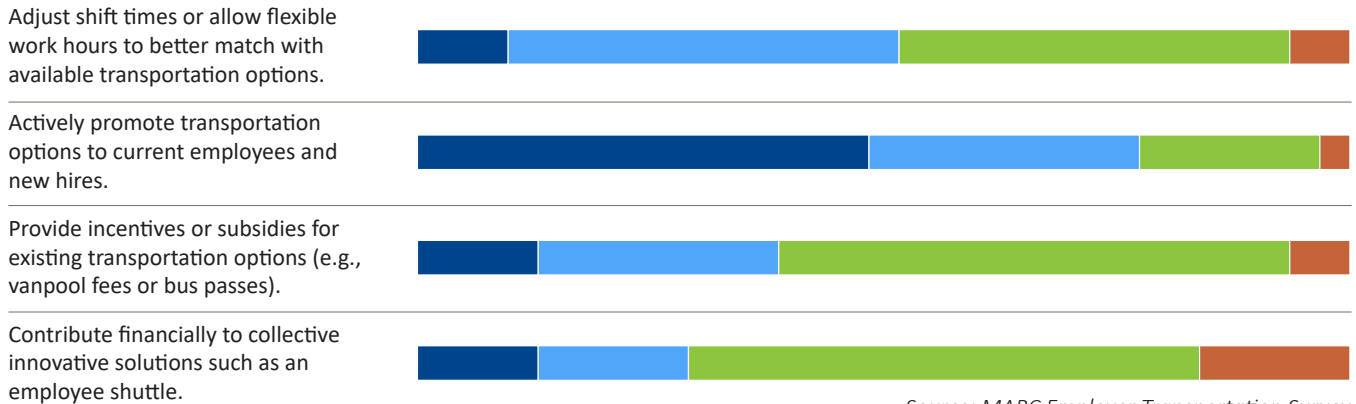
I had trouble getting to work in the past six months because...



Source: MARC Employer Transportation Survey

Potential Solutions: Employer Perspectives

■ Very likely ■ Somewhat likely ■ Not too likely ■ Not at all likely ■ Don't Know



Source: MARC Employer Transportation Survey

RECOMMENDATION

Work with employees to identify and address barriers that impact attendance/job retention.

Another challenge employers increasingly face in both recruitment and retention is the growth of substance abuse. Because workers impaired by drugs or alcohol are far more likely to be involved in accidents and fatalities on the job, most employers in skilled trades industries require pre-employment drug tests, as well as random testing for current employees, and many have zero-tolerance policies in place.



“I need a drug test that can tell me if a person is high right now, as opposed to someone who engaged in recreational activities on the weekend.”
 — Industry Leader

However, as the use of marijuana (medical and recreational) becomes more prevalent, zero-tolerance policies present new challenges. Thirty-three states, including Missouri, have legalized some form of marijuana use. Common drug tests cannot distinguish whether a person is currently impaired by marijuana or has used it in the recent past. Unlike alcohol, which dissipates within a few hours, marijuana can result in a positive test days or even weeks after use.

Illicit Drug Use by Industry, 2008-2012
 Percent of Full-Time Workers Ages 18-64 Using Illicit Drugs in the Past Month

Accommodations/Food Services	19.1%
Construction	13.9%
Arts/Entertainment	13.7%
Management of Companies	12.1%
Information	11.7%
Other Services	11.2%
Real Estate/Rental/Leasing	10.9%
Retail Trade	10.3%
Professional/Scientific/Tech Services	9.0%
Wholesale Trade	7.8%
Manufacturing	7.4%
Finance/Insurance	6.5%
Utilities	6.1%
Transportation/Warehousing	5.9%
Agriculture	5.7%
Health Care	5.5%
Mining	5.0%
Educational Services	4.8%
Public Administration	4.3%

Source: Substance Abuse and Mental Health Services Administration

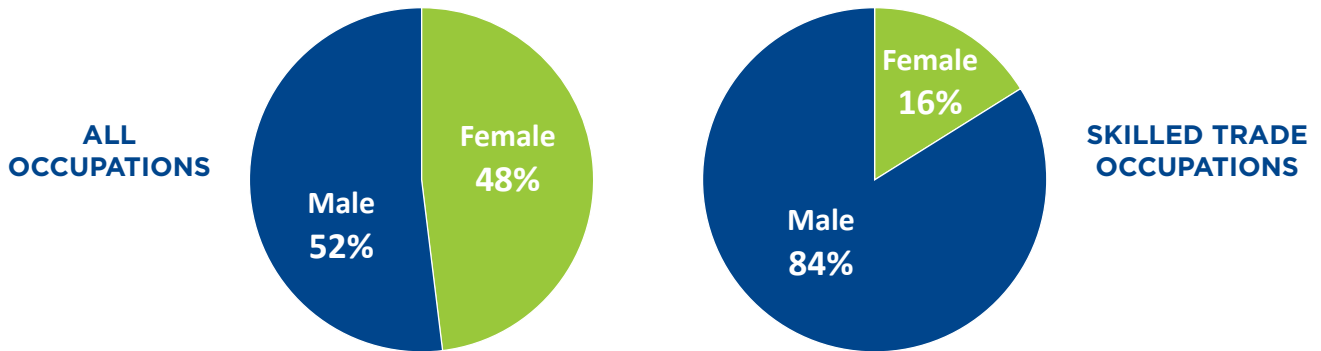
RECOMMENDATION

Develop improved drug tests that distinguish current impairment from prior use.

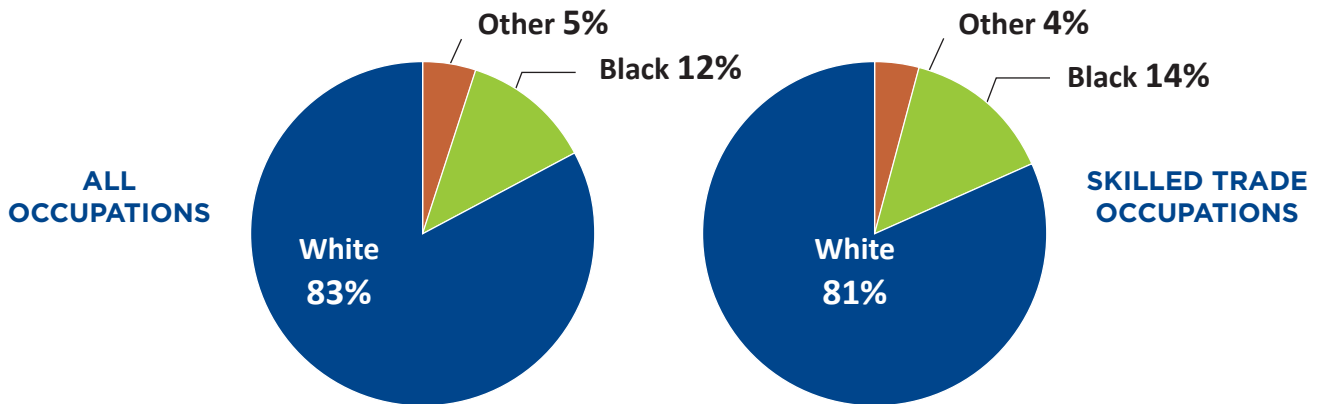
■ Diversifying the Talent Pipeline

The region’s skilled trades workforce is currently dominated by white men. Business leaders in construction and industrial trades recognize the need for change — in part, to help fill job openings where demand currently exceeds supply, and in some cases to meet requirements set out in contracts for minority and female participation on job sites.

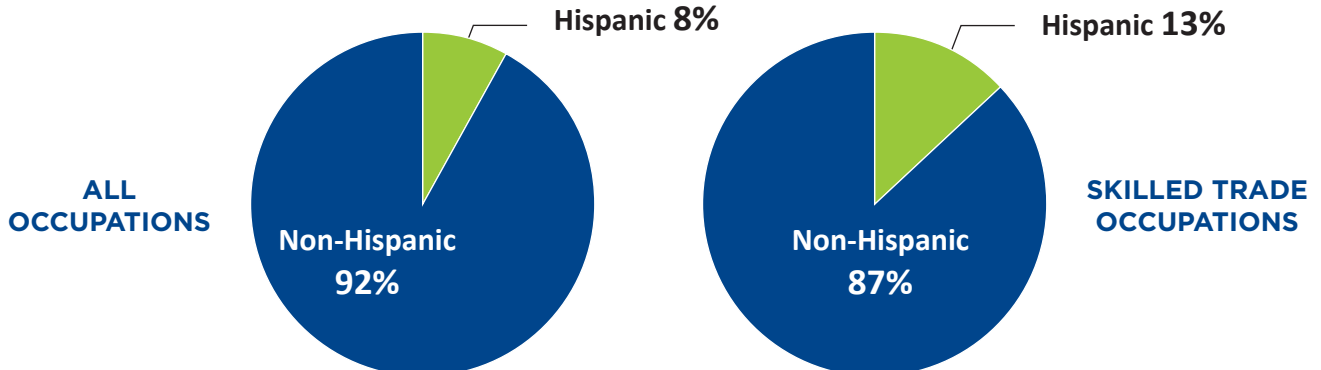
Employment by Gender



Employment by Race



Employment by Ethnicity



Source: Jobs EQ



During facilitated discussions, business leaders identified several challenges with finding and hiring minority and female workers. Perceptions about jobs in the trades often lead to an overall lack of interest or awareness. Women may perceive that they would not be good at construction and skilled trades or consider them to be “men’s work.”

Minority populations may have language barriers that would require a company to have bilingual employees or supervisors on each job site. Citizenship or legal immigration status are required for all employees, and some positions require a valid driver’s license.

Other barriers such as a lack of reliable transportation or child care may be particularly difficult for women and minorities to overcome. The current lack of diversity in skilled trades jobs may make it more difficult for both women and minorities to fit in and feel like an accepted part of the team.

“You want to know who in the labor force is ready now? Minorities and women. It’s important to build that pipeline to reach kids, but we can’t forget there are people available right now. We have to be more intentional and know that they may come with barriers.”

— Educator

“I believe the trades are not female-friendly.”

— Student

“Many systems and regulations are in place via OSHA on heavy lifting. Employers need to recognize these guidelines and have the requisite systems and oversight so that physical differences between men and women can be normalized as much as possible.”

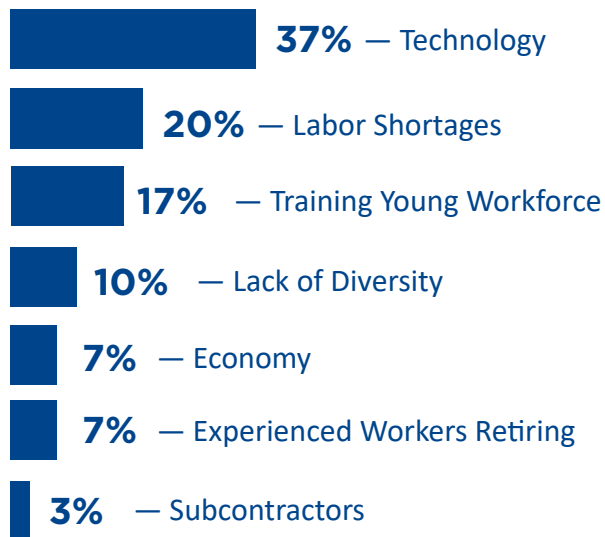
— Business Leader

RECOMMENDATION

Look for ways to overcome barriers and entice more minority and female workers into the field.



What do business leaders see as the biggest industry disruptors in the future?








Source: MARC Survey

WORKFORCE PREPAREDNESS

The talent needs for skilled trades workers are similar to those of other industries. Firms in the trades are looking for dependable workers who have good math skills, a comfort level with technology and good communication skills. Some of the unique qualifications include a propensity for science, art and creativity — keys to becoming a great craft professional. Workers must also be able to meet the physical demands of the job and pay attention to safety guidelines for the benefit of themselves and others.

What Employers Look for in Skilled Trades Workers

 <p>Academic Abilities</p> <ul style="list-style-type: none"> • Has a propensity for art/science • Has strong math skills • May or may not be on a college path 	 <p>Personality</p> <ul style="list-style-type: none"> • Is bright and motivated • Is creative • Is a good communicator 	 <p>Talent</p> <ul style="list-style-type: none"> • Has spatial reasoning ability • Is comfortable with technology • Likes to fix and assemble things 	 <p>Work Ethic</p> <ul style="list-style-type: none"> • Is dependable • Is willing to learn and follow safety guidelines • Is physically able to perform hard work 	 <p>Useful Experience</p> <ul style="list-style-type: none"> • Career tech education & training classes • Certification or on-the-job experience • Military experience
--	--	--	--	---

Source: Clear Box Insights Focus Groups

Communications Gap

Skilled trades require a unique balance between technology and interpersonal communications. Workers must be comfortable enough with technology to use it successfully on the job, but becoming distracted by a mobile phone or other technology can be a safety risk.

Skilled trades workers need to be able to actively listen, effectively follow instructions and safety guidelines, communicate effectively with colleagues and office staff in person, and document interactions along the way.



“The younger generation relies on their phones, and I truly believe that is not a good form of communication when you’re out on the jobsite trying to interact with people. In fact, it makes you have poor communication skills. I do think that there is need for technology, but we encourage people to communicate face-to-face as much as possible.”

— Business Leader

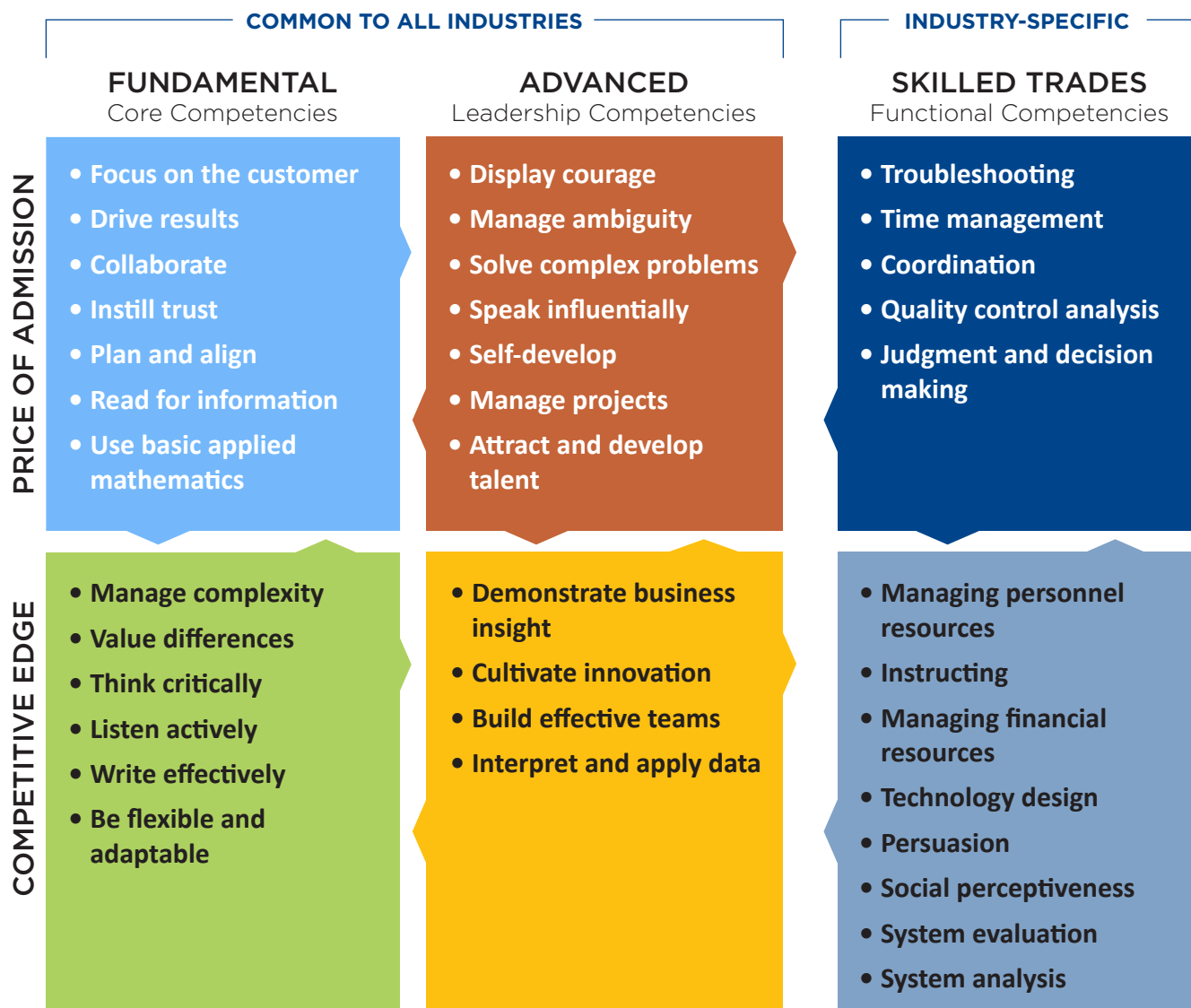
RECOMMENDATION

Provide on-the-job or outsourced training to continuously strengthen communication skills.

■ Core Competencies

The KC Rising Human Capital Common Sector Competencies Task Force developed a model to illustrate the progression in competencies that leads to a more skilled workforce. Common sector competencies (in the left and middle columns) are key strengths and essential qualifications for employee performance across critical industries and sectors in the Kansas City region.⁹ Specific competencies for construction and industrial trades are shown in the right column. In addition, competencies are grouped by “price of admission” in the top row – skills that are essential for hiring, retention and promotion, often included in the required qualification for employment – and “competitive edge” in the bottom row – skills that are less intuitive, more difficult to develop and often in short supply, included as preferred qualifications for employment.

The lists common to all industries were created using established collections of competencies, job postings, and surveys of hiring managers and industry leaders about their competency needs. The industry-specific competencies were derived from a survey of employers of skilled trades workers.



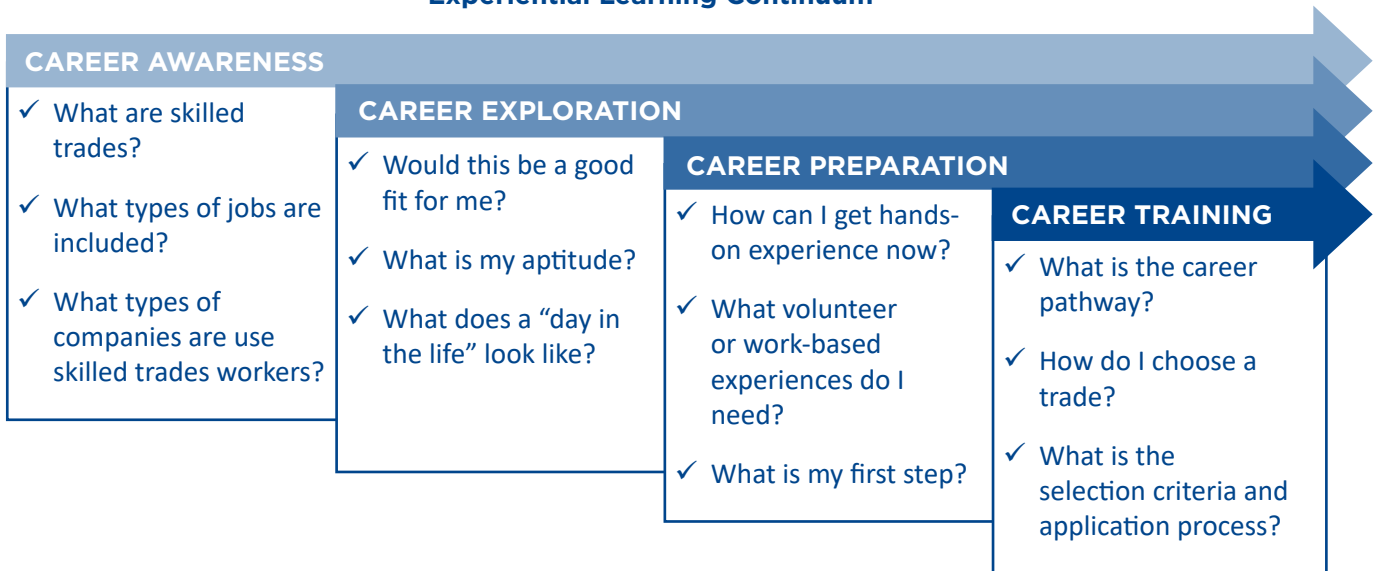
⁹ See the full report, online at <http://www.kcworkforce.com/Assets/reports/CommonSectorCompetenciesReport.pdf>

■ Experiential Learning

Experiential learning offers a structure for students and workers to complete meaningful job tasks in a workplace in order to develop their readiness for work and gain knowledge and skills that can support entry or advancement in a particular field. This type of learning has proven effective for a variety of people, including high school and college students, out-of-school youth, adult jobseekers and incumbent workers. For high school students, applied learning in context increases graduation rates; 45 percent of students stating that real world examples helped them better understand academic classes.¹⁰

While an effective tool, successful experiential learning is not a one-off. It often occurs across a continuum — awareness, exploration, preparation and training — allowing the individual to build a broader understanding of the workplace and job opportunities. An effective experiential learning system provides multiple touch points with the individual. When implemented at scale, experiential learning can grow both the talent pool for employers and opportunities for students and workers.

Experiential Learning Continuum



Source: Linked Learning Alliance

According to the industry leader survey conducted as part of this analysis, only 64 percent of employers in the trades are engaged in experiential learning activities. Not surprisingly, the predominant type of experiential learning they offer is apprenticeships. Of those responding, however, only 36 percent engage in apprenticeships programs. Next highest is internships, at 19 percent, followed by mentorships (5 percent) and client projects (4 percent).

None of the employers surveyed are engaging teachers in experiential learning opportunities — a strategy previous analyses have found to be the best opportunity to scale up the system, because each teacher reaches thousands of students over the course of a career.

RECOMMENDATION

Develop a long-term, proactive, regional strategy around a broad spectrum of experiential learning activities in the trades.

¹⁰ Advance CTE: State Leaders Connecting Learning to Work, www.careertech.org

CONCLUSION AND NEXT STEPS

Trades workers are employed in multiple industries and remain in high-demand. However, young people are not entering these occupations at rates needed to maintain the current workforce, let alone meet expected growth demand. Workers under 25 are most underrepresented relative to the metro average, while those 45 to 54 are the most overrepresented. There is an opportunity to recruit workers from the thousands of high school graduates who are exposed to skilled trades through career and technical education programming in high school. Skilled trades employers can also recruit from more than 100,000 young adults currently in service industry jobs that pay less than occupations in the skilled trades. Some of the barriers to recruitment and retention identified by employers are communication skills and mandatory drug testing. Both of these are important to job safety for the worker and others.

Conversations with business leaders and educators held in late 2018 identified common themes. Challenges to growing the talent pipeline centered around changing perceptions of trades occupations, identifying talent and increasing diversity among skilled workers. Challenges in workforce preparedness included the need to strengthen communication skills, expand experiential learning opportunities and maximize retention.

Industry leaders convened in early 2019 to discuss next steps in response to what was learned through the TIE process. Some emerging priorities have been identified.

- Design a comprehensive marketing campaign to change the perception of skilled trades, as a collaborative effort among regional industry associations and civic organizations. The campaign could address several recommendations:
 - » Expose youth and the underemployed to skilled trades occupations.
 - » Communicate the benefits of the trades to parents and young people.
 - » Share career earnings data with teachers, counselors, parents and students.
 - » Strengthen understanding of entrepreneurial postsecondary pathways to the trades.
 - » Encourage K-12 students to make decisions based on aptitude and interest.
 - » Measure postsecondary success using key indicators beyond college enrollment rates, such as placement in a good job.
- Create a regional strategy to strengthen communication skills of trades workers. This might be through outsourced or on-the-job training. Experiential learning is also an effective tool for learning these skills early. There is a need to grow a wide variety of trades-related experiential learning or work-based learning opportunities in the region. A continuum of opportunities might include client projects, internships, apprenticeships or externships.
- Collaborate with drug testing entities to expand implementation of a swab test that provides information around how recently a person has used drugs, such as smoking marijuana. This is important to the recruitment and retention of workers as laws permitting the use of marijuana and the acceptability of its use are changing. There is continued work to do with employers to address zero-tolerance policies and a need to meet safety guidelines.

The industry associations involved in this analysis are committed to continue to working together to explore ways to address these priorities.

Appendix A: Skilled Trades Occupations

Construction and Extraction Occupations | Total Employment and Average Annual Wages

SOC	Title	# Jobs	Wages
47-0000	Construction and Extraction Occupations	47,436	\$53,900
47-4021	Elevator Installers and Repairers	170	\$80,000
47-1011	First-line Supervisors of Construction Trades and Extraction Workers	3,969	\$73,000
47-2072	Pile-Driver Operators	27	\$69,400
47-2011	Boilermakers	113	\$68,600
47-5061	Roof Bolters, Mining	3	\$64,600
47-2132	Insulation Workers, Mechanical	220	\$64,400
47-2111	Electricians	4,522	\$62,700
47-2021	Brickmasons and Blockmasons	690	\$62,200
47-2211	Sheet Metal Workers	1,260	\$61,600
47-5012	Rotary Drill Operators, Oil and Gas	18	\$61,200
47-2152	Plumbers, Pipefitters and Steamfitters	3,452	\$60,300
47-2221	Structural Iron and Steel Workers	481	\$60,200
47-5041	Continuous Mining Machine Operators	25	\$59,900
47-5021	Earth Drillers, Except Oil and Gas	98	\$57,800
47-5042	Mine Cutting and Channeling Machine Operators	12	\$57,000
47-2073	Operating Engineers and Other Construction Equipment Operators	2,668	\$56,800
47-2151	Pipelayers	235	\$56,800
47-2071	Paving, Surfacing and Tamping Equipment Operators	503	\$55,900
47-2082	Tapers	190	\$55,700
47-5099	Extraction Workers, All Other	10	\$55,200
47-5049	Mining Machine Operators, All Other	6	\$55,200
47-4011	Construction and Building Inspectors	686	\$55,100
47-2171	Reinforcing Iron and Rebar Workers	151	\$54,200
47-2121	Glaziers	326	\$53,900
47-2031	Carpenters	6,588	\$53,000
47-2051	Cement Masons and Concrete Finishers	1,904	\$52,900
47-5011	Derrick Operators, Oil and Gas	8	\$51,700
47-2041	Carpet Installers	312	\$51,600
47-2042	Floor Layers, Except Carpet, Wood and Hard Tiles	163	\$50,400
47-2053	Terrazzo Workers and Finishers	32	\$49,600
47-2181	Roofers	1,209	\$49,500

47-2161	Plasterers and Stucco Masons	251	\$48,500
47-2231	Solar Photovoltaic Installers	80	\$46,800
47-2131	Insulation Workers, Floor, Ceiling and Wall	266	\$46,700
47-2081	Drywall and Ceiling Tile Installers	790	\$46,300
47-2141	Painters, Construction and Maintenance	2,782	\$46,100
47-2044	Tile and Marble Setters	471	\$46,000
47-4099	Construction and Related Workers, All Other	312	\$46,000
47-4091	Segmental Pavers	16	\$46,000
47-2142	Paperhangers	45	\$44,600
47-4061	Rail-Track Laying and Maintenance Equipment Operators	205	\$43,800
47-2061	Construction Laborers	8,580	\$43,500
47-5071	Roustabouts, Oil and Gas	87	\$43,400
47-5031	Explosives Workers, Ordnance Handling Experts and Blasters	35	\$43,200
47-3011	Helpers—Brickmasons, Blockmasons, Stonemasons and Tile and Marble Setters	180	\$42,800
47-2043	Floor Sanders and Finishers	59	\$42,800
47-3015	Helpers—Pipelayers, Plumbers, Pipefitters and Steamfitters	429	\$42,300
47-4041	Hazardous Materials Removal Workers	300	\$41,800
47-5051	Rock Splitters, Quarry	19	\$41,600
47-5013	Service Unit Operators, Oil, Gas and Mining	62	\$40,900
47-5081	Helpers—Extraction Workers	33	\$40,200
47-3014	Helpers—Painters, Paperhangers, Plasterers and Stucco Masons	86	\$38,600
47-4051	Highway Maintenance Workers	802	\$36,600
47-2022	Stonemasons	150	\$36,600
47-3019	Helpers, Construction Trades, All Other	161	\$36,500
47-4071	Septic Tank Servicers and Sewer Pipe Cleaners	223	\$35,500
47-3013	Helpers—Electricians	323	\$34,400
47-4031	Fence Erectors	284	\$33,200
47-3016	Helpers—Roofers	93	\$32,400
47-3012	Helpers—Carpenters	262	\$28,300

Installation, Maintenance and Repair Occupations | Total Employment and Average Annual Wages

SOC	Title	# Jobs	Wages
49-0000	Installation, Maintenance and Repair Occupations	42,683	\$46,500
49-9071	Maintenance and Repair Workers, General	10,100	\$39,600
49-3023	Automotive Service Technicians and Mechanics	5,336	\$43,500
49-1011	First-Line Supervisors of Mechanics, Installers and Repairers	3,484	\$61,000
49-9021	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	2,296	\$48,400
49-3031	Bus and Truck Mechanics and Diesel Engine Specialists	2,253	\$47,500
49-9041	Industrial Machinery Mechanics	1,904	\$54,400
49-2022	Telecommunications Equipment Installers and Repairers, Except Line Installers	1,854	\$45,200
49-9099	Installation, Maintenance and Repair Workers, All Other	1,286	\$43,600
49-3021	Automotive Body and Related Repairers	1,242	\$43,300
49-9043	Maintenance Workers, Machinery	1,188	\$50,200
49-3042	Mobile Heavy Equipment Mechanics, Except Engines	1,162	\$55,800
49-3093	Tire Repairers and Changers	910	\$28,100
49-9051	Electrical Power-Line Installers and Repairers	854	\$77,300
49-2011	Computer, Automated Teller and Office Machine Repairers	800	\$42,900
49-9052	Telecommunications Line Installers and Repairers	777	\$49,500
49-9098	Helpers—Installation, Maintenance and Repair Workers	727	\$26,000
49-3043	Rail Car Repairers	725	\$39,600
49-2098	Security and Fire Alarm Systems Installers	633	\$48,000
49-3011	Aircraft Mechanics and Service Technicians	482	\$60,600
49-9062	Medical Equipment Repairers	453	\$48,200
49-9091	Coin, Vending, and Amusement Machine Servicers and Repairers	332	\$29,800
49-2094	Electrical and Electronics Repairers, Commercial and Industrial Equipment	318	\$62,800
49-9044	Millwrights	303	\$66,700
49-9094	Locksmiths and Safe Repairers	258	\$38,100

49-9031	Home Appliance Repairers	221	\$41,300
49-9012	Control and Valve Installers and Repairers, Except Mechanical Door	220	\$64,400
49-2097	Electronic Home Entertainment Equipment Installers and Repairers	207	\$30,500
49-3053	Outdoor Power Equipment and Other Small Engine Mechanics	169	\$41,600
49-3041	Farm Equipment Mechanics and Service Technicians	163	\$40,100
49-2093	Electrical and Electronics Installers and Repairers, Transportation Equipment	162	\$54,500
49-9097	Signal and Track Switch Repairers	162	\$64,400
49-9011	Mechanical Door Repairers	158	\$41,900
49-2095	Electrical and Electronics Repairers, Powerhouse, Substation and Relay	140	\$75,700
49-3051	Motorboat Mechanics and Service Technicians	135	\$46,100
49-3022	Automotive Glass Installers and Repairers	132	\$35,100
49-3052	Motorcycle Mechanics	130	\$37,500
49-2092	Electric Motor, Power Tool and Related Repairers	126	\$50,800
49-2096	Electronic Equipment Installers and Repairers, Motor Vehicles	118	\$41,600
49-9096	Riggers	109	\$42,000
49-3091	Bicycle Repairers	104	\$28,800
49-2021	Radio, Cellular, and Tower Equipment Installers and Repairers	94	\$63,700
49-3092	Recreational Vehicle Service Technicians	91	\$34,100
49-9069	Precision Instrument and Equipment Repairers, All Other	86	\$43,100
49-2091	Avionics Technicians	82	\$53,200
49-9063	Musical Instrument Repairers and Tuners	68	\$30,600
49-9081	Wind Turbine Service Technicians	29	\$55,500
49-9092	Commercial Divers	29	\$54,100
49-9061	Camera and Photographic Equipment Repairers	28	\$41,600
49-9095	Manufactured Building and Mobile Home Installers	27	\$31,200
49-9064	Watch Repairers	9	\$38,700
49-9045	Refractory Materials Repairers, Except Brickmasons	6	\$49,100
49-9093	Fabric Menders, Except Garment	2	\$28,900

Production Occupations | Total Employment and Average Annual Wages

SOC	Title	# Jobs	Wages
51-0000	Production Occupations	61,885	\$39,900
51-8011	Nuclear Power Reactor Operators	13	\$102,800
51-8012	Power Distributors and Dispatchers	93	\$92,800
51-8013	Power Plant Operators	364	\$78,500
51-8092	Gas Plant Operators	120	\$67,800
51-8091	Chemical Plant and System Operators	212	\$67,200
51-1011	First-Line Supervisors of Production and Operating Workers	4,213	\$62,200
51-4111	Tool and Die Makers	444	\$61,800
51-8093	Petroleum Pump System Operators, Refinery Operators and Gaugers	178	\$61,500
51-4061	Model Makers, Metal and Plastic	40	\$59,700
51-8099	Plant and System Operators, All Other	74	\$57,700
51-8021	Stationary Engineers and Boiler Operators	81	\$56,700
51-7031	Model Makers, Wood	9	\$56,700
51-7032	Patternmakers, Wood	10	\$56,400
51-6092	Fabric and Apparel Patternmakers	23	\$54,200
51-4023	Rolling Machine Setters, Operators and Tenders, Metal and Plastic	94	\$50,400
51-4062	Patternmakers, Metal and Plastic	20	\$50,000
51-4035	Milling and Planing Machine Setters, Operators and Tenders, Metal and Plastic	95	\$49,500
51-6091	Extruding and Forming Machine Setters, Operators and Tenders, Synthetic and Glass Fibers	104	\$49,100
51-9122	Painters, Transportation Equipment	466	\$48,600
51-2031	Engine and Other Machine Assemblers	57	\$48,500
51-8031	Water and Wastewater Treatment Plant and System Operators	734	\$48,200
51-4012	Computer Numerically Controlled Machine Tool Programmers, Metal and Plastic	129	\$46,900
51-4121	Welders, Cutters, Solderers and Brazers	2,330	\$46,400
51-9197	Tire Builders	93	\$45,800
51-4051	Metal-Refining Furnace Operators and Tenders	30	\$45,500
51-9071	Jewelers and Precious Stone and Metal Workers	183	\$44,800
51-4192	Layout Workers, Metal and Plastic	37	\$44,600
51-9041	Extruding, Forming, Pressing and Compacting Machine Setters, Operators and Tenders	448	\$37,300

51-4034	Lathe and Turning Machine Tool Setters, Operators and Tenders, Metal and Plastic	120	\$37,200
51-9011	Chemical Equipment Operators and Tenders	594	\$37,100
51-4122	Welding, Soldering and Brazing Machine Setters, Operators and Tenders	263	\$36,500
51-9111	Packaging and Filling Machine Operators and Tenders	3,075	\$36,400
51-4033	Grinding, Lapping, Polishing and Buffing Machine Tool Setters, Operators and Tenders, Metal and Plastic	431	\$36,400
51-4199	Metal Workers and Plastic Workers, All Other	135	\$36,400
51-9031	Cutters and Trimmers, Hand	79	\$35,600
51-7011	Cabinetmakers and Bench Carpenters	751	\$35,100
51-6052	Tailors, Dressmakers and Custom Sewers	253	\$35,000
51-9051	Furnace, Kiln, Oven, Drier and Kettle Operators and Tenders	150	\$34,900
51-3092	Food Batchmakers	827	\$34,800
51-3021	Butchers and Meat Cutters	786	\$34,500
51-9032	Cutting and Slicing Machine Setters, Operators and Tenders	411	\$34,100
51-6099	Textile, Apparel, and Furnishings Workers, All Other	93	\$34,100
51-4071	Foundry Mold and Coremakers	41	\$33,900
51-9121	Coating, Painting and Spraying Machine Setters, Operators and Tenders	354	\$33,700
51-4021	Extruding and Drawing Machine Setters, Operators and Tenders, Metal and Plastic	568	\$33,500
51-7042	Woodworking Machine Setters, Operators and Tenders, Except Sawing	256	\$33,200
51-9199	Production Workers, All Other	1,592	\$32,700
51-9195	Molders, Shapers and Casters, Except Metal and Plastic	500	\$32,600
51-9151	Photographic Process Workers and Processing Machine Operators	183	\$32,600
51-6093	Upholsterers	184	\$32,100
51-5113	Print Binding and Finishing Workers	707	\$31,900
51-6061	Textile Bleaching and Dyeing Machine Operators and Tenders	30	\$31,800
51-6063	Textile Knitting and Weaving Machine Setters, Operators and Tenders	37	\$31,700

51-6064	Textile Winding, Twisting and Drawing Out Machine Setters, Operators and Tenders	38	\$31,500
51-4032	Drilling and Boring Machine Tool Setters, Operators and Tenders, Metal and Plastic	61	\$44,500
51-4081	Multiple Machine Tool Setters, Operators and Tenders, Metal and Plastic	716	\$44,400
51-4041	Machinists	1,990	\$43,900
51-4052	Pourers and Casters, Metal	18	\$43,500
51-9193	Cooling and Freezing Equipment Operators and Tenders	57	\$43,200
51-9023	Mixing and Blending Machine Setters, Operators and Tenders	919	\$42,900
51-2041	Structural Metal Fabricators and Fitters	386	\$42,800
51-9061	Inspectors, Testers, Sorters, Samplers and Weighers	3,420	\$42,400
51-9141	Semiconductor Processors	228	\$42,400
51-4194	Tool Grinders, Filers and Sharpeners	43	\$42,300
51-9082	Medical Appliance Technicians	87	\$42,100
51-5111	Prepress Technicians and Workers	411	\$41,100
51-2093	Timing Device Assemblers and Adjusters	4	\$40,700
51-2092	Team Assemblers	11,241	\$40,600
51-2099	Assemblers and Fabricators, All Other	1,724	\$40,600
51-4193	Plating and Coating Machine Setters, Operators and Tenders, Metal and Plastic	158	\$40,200
51-4022	Forging Machine Setters, Operators and Tenders, Metal and Plastic	113	\$40,100
51-9081	Dental Laboratory Technicians	505	\$39,800
51-4011	Computer-Controlled Machine Tool Operators, Metal and Plastic	828	\$38,700
51-9012	Separating, Filtering, Clarifying, Precipitating and Still Machine Setters, Operators and Tenders	222	\$38,700
51-3091	Food and Tobacco Roasting, Baking and Drying Machine Operators and Tenders	114	\$38,700
51-5112	Printing Press Operators	1,998	\$38,500
51-2011	Aircraft Structure, Surfaces, Rigging and Systems Assemblers	101	\$38,300
51-2091	Fiberglass Laminators and Fabricators	89	\$38,100
51-9021	Crushing, Grinding and Polishing Machine Setters, Operators and Tenders	184	\$37,800
51-4031	Cutting, Punching, and Press Machine Setters, Operators and Tenders, Metal and Plastic	968	\$37,500

51-9196	Paper Goods Machine Setters, Operators and Tenders	874	\$37,300
51-9123	Painting, Coating and Decorating Workers	108	\$31,200
51-9194	Etchers and Engravers	70	\$31,100
51-3093	Food Cooking Machine Operators and Tenders	200	\$30,400
51-3023	Slaughterers and Meat Packers	263	\$30,300
51-9198	Helpers—Production Workers	2,550	\$30,200
51-4072	Molding, Coremaking and Casting Machine Setters, Operators and Tenders, Metal and Plastic	939	\$30,200
51-6051	Sewers, Hand	96	\$30,000
51-6041	Shoe and Leather Workers and Repairers	43	\$30,000
51-6042	Shoe Machine Operators and Tenders	3	\$30,000
51-9191	Adhesive Bonding Machine Operators and Tenders	136	\$29,700
51-2021	Coil Winders, Tapers and Finishers	43	\$29,600
51-4191	Heat Treating Equipment Setters, Operators and Tenders, Metal and Plastic	90	\$29,500
51-9022	Grinding and Polishing Workers, Hand	137	\$29,400
51-2022	Electrical and Electronic Equipment Assemblers	1,201	\$28,900
51-2023	Electromechanical Equipment Assemblers	239	\$28,900
51-9083	Ophthalmic Laboratory Technicians	229	\$28,700
51-6031	Sewing Machine Operators	666	\$28,300
51-3099	Food Processing Workers, All Other	236	\$28,300
51-9192	Cleaning, Washing and Metal Pickling Equipment Operators and Tenders	85	\$27,200
51-7041	Sawing Machine Setters, Operators and Tenders, Wood	155	\$26,800
51-3011	Bakers	1,302	\$26,300
51-7021	Furniture Finishers	86	\$26,100
51-3022	Meat, Poultry and Fish Cutters and Trimmers	502	\$25,600
51-7099	Woodworkers, All Other	81	\$24,400
51-6021	Pressers, Textile, Garment and Related Materials	237	\$22,900
51-6011	Laundry and Dry-Cleaning Workers	1,518	\$22,500
51-6062	Textile Cutting Machine Setters, Operators, and Tenders	60	\$21,400

Transportation and Material Moving Occupations | Total Employment and Average Annual Wages

SOC	Title	# Jobs	Wages
53-0000	Transportation and Material Moving Occupations	79,498	\$37,200
53-7062	Laborers and Freight, Stock, and Material Movers, Hand	20,185	\$30,200
53-3032	Heavy and Tractor-Trailer Truck Drivers	16,044	\$48,000
53-3033	Light Truck or Delivery Services Drivers	7,684	\$36,300
53-7064	Packers and Packagers, Hand	5,141	\$27,100
53-3022	Bus Drivers, School or Special Client	4,704	\$31,800
53-7051	Industrial Truck and Tractor Operators	4,566	\$38,500
53-3031	Driver/Sales Workers	3,677	\$29,600
53-7061	Cleaners of Vehicles and Equipment	3,220	\$25,500
53-1031	First-Line Supervisors of Transportation and Material-Moving Machine and Vehicle Operators	1,751	\$54,800
53-1021	First-Line Supervisors of Helpers, Laborers, and Material Movers, Hand	1,737	\$54,800
53-3041	Taxi Drivers and Chauffeurs	1,566	\$24,900
53-6021	Parking Lot Attendants	947	\$23,200
53-4031	Railroad Conductors and Yardmasters	838	\$65,000
53-4011	Locomotive Engineers	818	\$67,700
53-7081	Refuse and Recyclable Material Collectors	809	\$33,500
53-6031	Automotive and Watercraft Service Attendants	696	\$25,200
53-7063	Machine Feeders and Offbearers	592	\$39,000
53-3099	Motor Vehicle Operators, All Other	462	\$25,400
53-4021	Railroad Brake, Signal, and Switch Operators	422	\$60,100
53-2021	Air Traffic Controllers	365	\$127,300
53-7011	Conveyor Operators and Tenders	326	\$33,300
53-7032	Excavating and Loading Machine and Dragline Operators	291	\$46,000
53-7021	Crane and Tower Operators	262	\$71,800
53-2031	Flight Attendants	253	\$54,100
53-2011	Airline Pilots, Copilots, and Flight Engineers	226	\$148,100
53-3021	Bus Drivers, Transit and Intercity	222	\$44,100
53-6051	Transportation Inspectors	221	\$64,700
53-7199	Material Moving Workers, All Other	177	\$36,600
53-2012	Commercial Pilots	166	\$91,800
53-6099	Transportation Workers, All Other	146	\$36,100

53-6061	Transportation Attendants, Except Flight Attendants	138	\$32,600
53-4013	Rail Yard Engineers, Dinkey Operators, and Hostlers	106	\$53,300
53-3011	Ambulance Drivers and Attendants, Except Emergency Medical Technicians	79	\$27,400
53-7121	Tank Car, Truck, and Ship Loaders	76	\$42,300
53-2022	Airfield Operations Specialists	70	\$50,100
53-4099	Rail Transportation Workers, All Other	67	\$61,500
53-4041	Subway and Streetcar Operators	62	\$65,600
53-5021	Captains, Mates, and Pilots of Water Vessels	55	\$83,100
53-1011	Aircraft Cargo Handling Supervisors	52	\$51,300
53-5011	Sailors and Marine Oilers	51	\$47,800
53-7072	Pump Operators, Except Wellhead Pumpers	46	\$48,300
53-6041	Traffic Technicians	38	\$52,100
53-4012	Locomotive Firers	25	\$63,900
53-6011	Bridge and Lock Tenders	25	\$48,500
53-5031	Ship Engineers	17	\$80,000
53-7071	Gas Compressor and Gas Pumping Station Operators	17	\$63,600
53-7041	Hoist and Winch Operators	16	\$56,400
53-7073	Wellhead Pumpers	14	\$39,800
53-5022	Motorboat Operators	11	\$47,100
53-7031	Dredge Operators	11	\$42,700
53-7033	Loading Machine Operators, Underground Mining	5	\$53,200
53-7111	Mine Shuttle Car Operators	2	\$58,000

Appendix B: Occupation Classification by Cognitive/Manual, Routine/Non-Routine

Cognitive, Non-Routine

SOC	Title	# Jobs
11-0000	Management Occupations	66,898
13-0000	Business and Financial Operations Occupations	66,142
15-0000	Computer and Mathematical Occupations	43,802
17-0000	Architecture and Engineering Occupations	19,264
19-0000	Life, Physical and Social Science Occupations	7,912
21-0000	Community and Social Service Occupations	16,953
23-0000	Legal Occupations	9,459
25-0000	Education, Training and Library Occupations	53,903
27-0000	Arts, Design, Entertainment, Sports and Media Occupations	19,009
29-0000	Healthcare Practitioners and Technical Occupations	68,272
	Total	371,614

Cognitive, Routine

SOC	Title	# Jobs
41-1000	Supervisors of Sales Workers	13,388
41-3000	Sales Representatives, Services	17,401
41-4000	Sales Representatives, Wholesale and Manufacturing	14,570
41-9000	Other Sales and Related Workers	7,691
43-1000	Supervisors of Office and Administrative Support Workers	11,066
43-2000	Communications Equipment Operators	1,030
43-3000	Financial Clerks	25,538
43-4000	Information and Record Clerks	47,160
43-5000	Material Recording, Scheduling, Dispatching and Distributing Workers	31,983
43-6000	Secretaries and Administrative Assistants	34,031
43-9000	Other Office and Administrative Support Workers	28,728
	Total	232,586

Manual, Non-Routine

SOC	Title	# Jobs
31-1000	Nursing, Psychiatric, and Home Health Aides	16,346
31-2000	Occupational Therapy and Physical Therapist Assistants and Aides	1,489
31-9000	Other Healthcare Support Occupations	10,016
35-1000	Supervisors of Food Preparation and Serving Workers	8,078
35-2000	Cooks and Food Preparation Workers	23,582
35-3000	Food and Beverage Serving Workers	51,623
35-9000	Other Food Preparation and Serving Related Workers	10,278
39-1000	Supervisors of Personal Care and Service Workers	2,117
39-2000	Animal Care and Service Workers	2,166
39-3000	Entertainment Attendants and Related Workers	4,379
39-4000	Funeral Service Workers	463
39-5000	Personal Appearance Workers	6,050
39-6000	Baggage Porters, Bellhops, and Concierges	299
39-7000	Tour and Travel Guides	156
39-9000	Other Personal Care and Service Workers	24,968
41-2000	Retail Sales Workers	62,426
	Total	224,436

Manual, Routine

SOC	Title	# Jobs
33-0000	Protective Service Occupations	21,324
37-0000	Building and Grounds Cleaning and Maintenance Occupations	34,368
45-0000	Farming, Fishing, and Forestry Occupations	1,941
47-0000	Construction and Extraction Occupations	47,436
49-0000	Installation, Maintenance, and Repair Occupations	42,683
51-0000	Production Occupations	61,885
53-0000	Transportation and Material Moving Occupations	79,498
	Total	289,135



Contact:

Frank Lenk, Director of Research Services
Mid-America Regional Council
600 Broadway, Suite 200, Kansas City, MO 64105
flenk@marc.org or 816-701-8237