

REGIONAL TALENT RETENTION & ECONOMIC GROWTH STRATEGY

VOLUME 2: TECHNICAL ANALYSIS



This report was prepared under contract with Workforce Solutions Northeast Texas, with financial support from the Office of Economic Adjustment, Department of Defense. The content reflects the views of Workforce Solutions Northeast Texas and does not necessarily reflect the views of the Office of Economic Adjustment or the Department of Defense.

CONTENTS

1: ABOUT THIS WORK 1

2: ECONOMIC ASSESSMENT: WORKFORCE AND EDUCATION 3

3: ECONOMIC ASSESSMENT: ECONOMY AND INFRASTRUCTURE 25

4: OCCUPATIONAL ANALYSIS 35

 RED RIVER ARMY DEPOT 37

 AFFECTED OCCUPATIONS 38

5: OCCUPATIONAL PROFILES 57

6: APPENDICES 102

 APPENDIX A: RRAD IMPACT 104

 APPENDIX B: STAFFING PATTERNS DETAIL 108

 APPENDIX C: TOOLS & TECHNOLOGY DETAIL 117

 APPENDIX D: EDUCATION & TRAINING INVENTORY 123

 APPENDIX E: CLASSIFICATION SYSTEMS 133

1: INTRODUCTION

This document is the second of a two-volume report prepared for Workforce Solutions Northeast Texas, the local workforce board serving Bowie, Cass, Delta, Franklin, Hopkins, Lamar, Morris, Red River, and Titus counties. It is the result of a nine-month planning process initiated, in part, as a response to potential job losses at the Red River Army Depot (RRAD). Volume 1 presents a Strategic Action Plan for leveraging local assets, mitigating obstacles and challenges, and diversifying the regional economy.

This volume provides details of related technical analyses for the 12-county impact area identified as part of the planning process. The area of impact was defined by mapping residential ZIP code data provided by RRAD for 3,300 federal civilian employees, along with an estimate of the distribution of contractor employees of other Depot tenants prepared by TIP. Counties with a minimum of 25 employees were included in the impact area. Using this threshold, the defined impact area includes Bowie, Cass, Morris, Red River, and Titus counties in Texas; McCurtain County in Oklahoma; and Hempstead, Howard, Lafayette, Little River, Miller, and Sevier counties in Arkansas. Figure 1, next page, illustrates RRAD employment concentrations in the region by ZIP code.

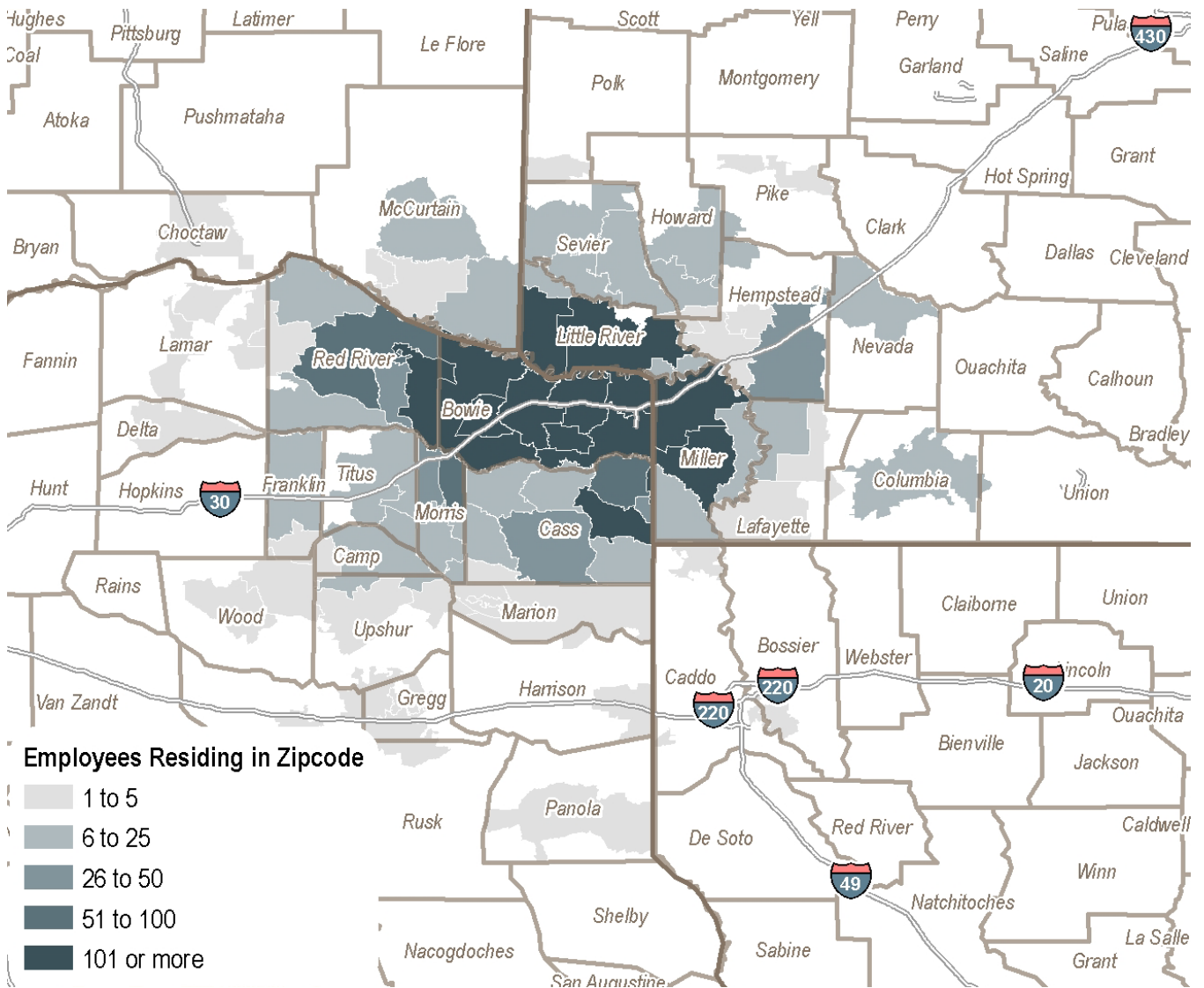
The document is divided into two major elements:

- *Economic Assessment*. This chapter examines a variety of economic and demographic factors that help illustrate the economy of the region surrounding the Red River Army Depot (RRAD). The assessment addresses such topics as demographics, educational attainment, employment trends (including unemployment rates), occupational structure, wage rates, and commuting patterns.
- *Occupational Analysis & Profiles*. This chapter expands on occupational data provided as part of the Economic Assessment and further explores the capabilities of the occupations affected by proposed reductions in workload at RRAD as well as occupational strengths of the region more generally. The Occupational Profiles provide greater detail for each of the 14 affected occupations.

In addition, several appendices provide supporting materials. Appendix A provides the results of an economic impact analysis of “a singular substantial job loss” at RRAD. Additional details of our review of industry staffing patterns conducted as part of the occupational analysis are presented as Appendix B. This analysis was used to identify the types of industries that could employ workers affected by workload reductions at RRAD, which, in turn, informed our work on the target industry analysis presented in Volume 1. An inventory of tools and technologies commonly used by the affected occupations (ranked by the share of use across these positions) is included as Appendix C. Appendix D features the Education & Training Inventory, a compilation of completions data from the US Department of Education’s Integrated Postsecondary Education Data System (IPEDS). Finally, Appendix E provides a brief overview of the three classification systems used in this work: the North American Industrial Classification System (NAICS), the Standard Occupational Classification (SOC) System, and the Classification of Instructional Programs (CIP).

FIGURE 1: REGION OF IMPACT FOR RRAD JOB LOSSES

COUNTIES WITH 25 OR MORE RRAD EMPLOYEES BASED ON ZIP CODE OF RESIDENCE MEET MINIMUM THRESHOLD



Source: TIP Strategies based on data on ZIP Code of residence for RRAD workers and an estimate of contractor place of residence.

Note: To estimate the residential ZIP codes for contractor employees of other Depot tenants, TIP calculated the percentages of total RRAD civilian employees living in each ZIP code and applied them to the 1,402 contractors cited as employed at the Depot in a 2012 overview prepared by the Texas Military Preparedness Commission housed in the Governor’s Office of Economic Development and Tourism (http://governor.state.tx.us/files/military/Military_Flyer_RedRiver.pdf).

ECONOMIC ASSESSMENT: WORKFORCE AND EDUCATION



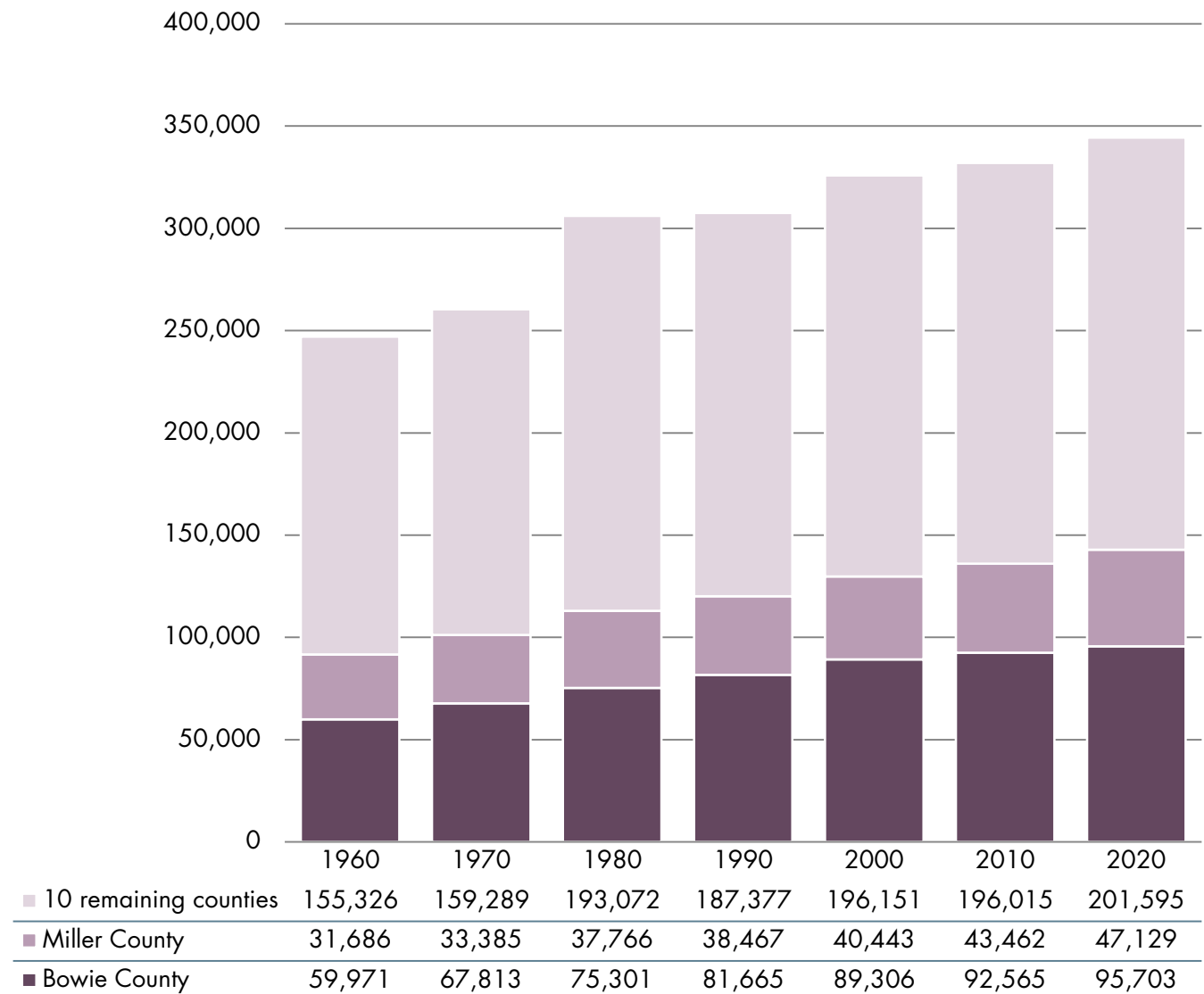
EMSI EMPLOYMENT DATA

Unless otherwise indicated, employment data presented in this report were prepared using Analyst, a suite of web-based analysis tools created by EMSI. The product integrates economic, labor market, demographic, and education data from more than 90 government and private-sector sources, creating a database that is more comprehensive and timely than publicly available datasets. The figures presented in this report are “complete” employment, rather than the “covered” employment typically produced by state and federal workforce agencies. Unlike covered employment, which captures only those industries subject to unemployment insurance (UI) requirements, complete employment includes estimates across all industries and classes of workers (those covered and exempt from UI regulations, as well as self-employed individuals).

The most recent aggregated population projections from state data centers in Texas, Arkansas, and Oklahoma show stable growth in the 12-county impact area, with growth over the remainder of the decade projected at a roughly similar pace to that experienced over the past 20 years. The area saw a rapid surge in population growth in the 1970s, adding nearly 50,000 residents, followed by a flattening of growth in the 1980s and much of the 1990s. The area’s population has increased at a moderate pace since 2010, which is projected to continue through 2020.

FIGURE 2: POPULATION TRENDS IN THE 12-COUNTY REGION

HISTORY (1960–2010) AND PROJECTIONS (2020)



Source: US Census Bureau; University of Arkansas at Little Rock, Institute for Economic Advancement, Census State Data Center; Oklahoma Department of Commerce, Policy, Research and Economic Analysis Division; and University of Texas at San Antonio, Texas State Data Center

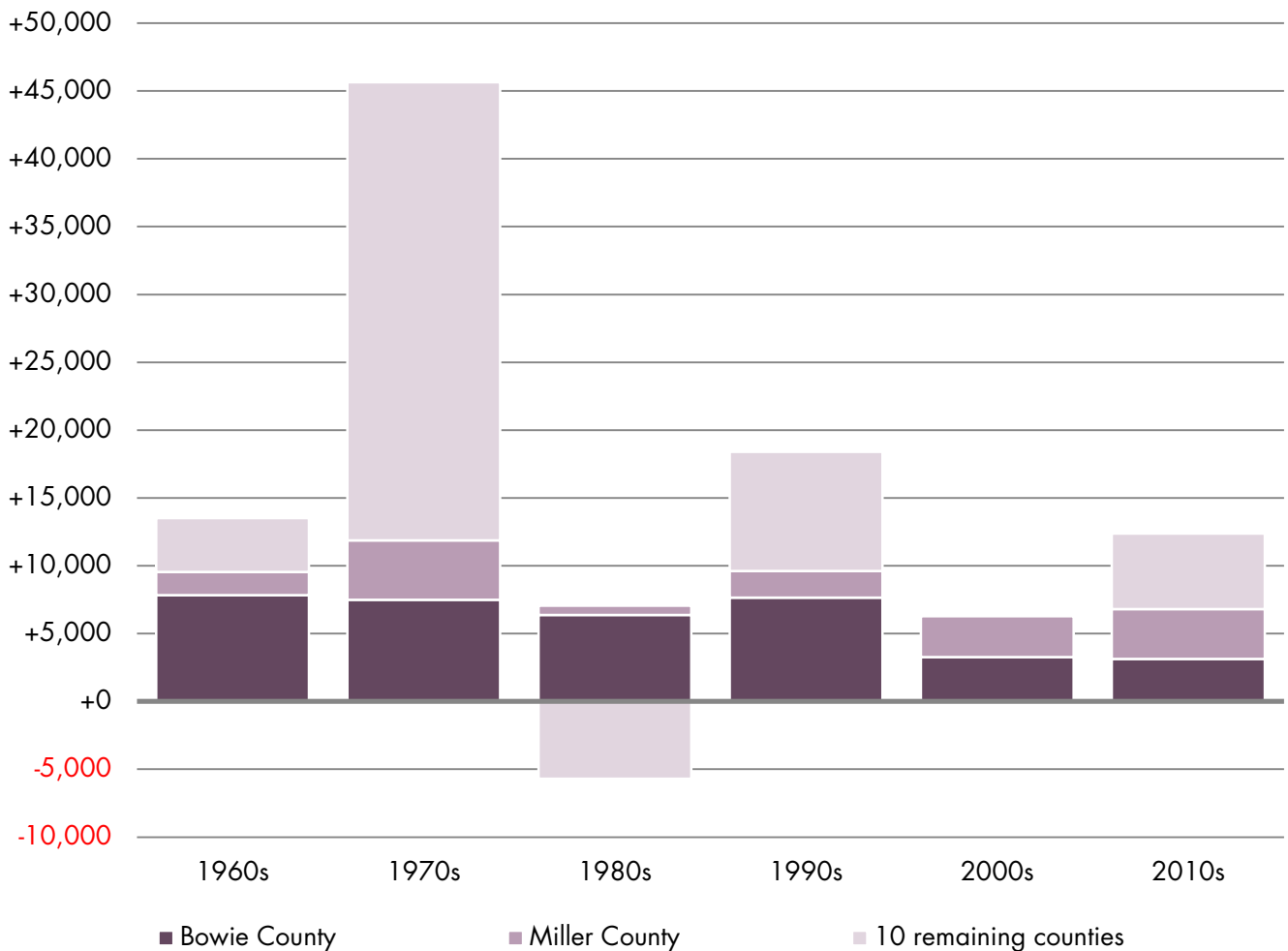
Bowie County has seen relatively consistent population growth over the last 50 years. From the 1960s through the 1990s, the county gained an average of slightly more than 7,000 residents each decade. This figure dropped by more than 50 percent in the 2000s. Growth levels are projected to remain at similar levels throughout the remainder of this decade.

Miller County's population growth has been less consistent than Bowie's, but has remained positive in each decade. The 1980s saw Miller's smallest net gains, with the county adding just 700 additional residents.

Population trends in the remaining 10 counties have varied dramatically, swinging from net gains of nearly 34,000 during the 1970s to net losses approaching 6,000 the following decade. Population gains were experienced across each of the 10 counties, with all but one experiencing double-digit percentage increases.

FIGURE 3: NET POPULATION GAINS/LOSSES BY DECADE

GROWTH PATTERNS, 1990-2020



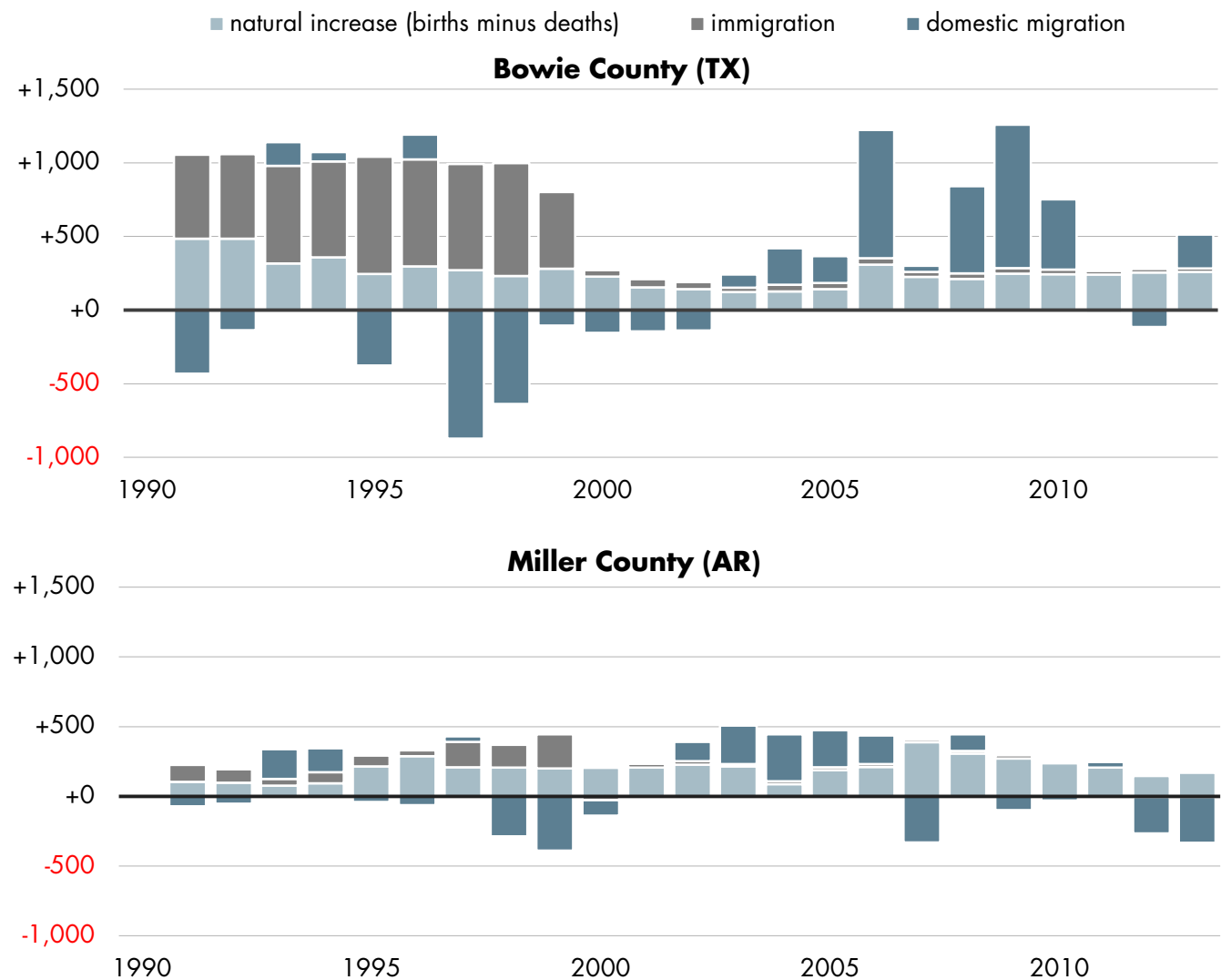
Source: US Census Bureau; University of Arkansas at Little Rock, Institute for Economic Advancement, Census State Data Center; Oklahoma Department of Commerce, Policy, Research and Economic Analysis Division; and University of Texas at San Antonio, Texas State Data Center

Natural increase (crudely, the excess of births over deaths) has played a relatively small and diminishing role in Bowie County's population growth from year to year. From a peak natural increase of nearly 500 per year in the early 1990s, the natural increase of the Bowie County's population has recently been running at roughly 250 annually. This component plays a larger role proportionately in Miller County.

Immigration over the past two decades has been inconsistent. In the 1990s, it was the leading contributor to Bowie County's growth. In the past decade, immigration has nearly ceased, reflecting stronger US border controls as well as a weaker national economy. Domestic migration has been the most volatile component of population growth. The heavy exit of existing residents in the late 1990s reversed for Bowie County in the early 2000s as net domestic migration picked up. Net domestic migration in Miller County has been largely negative since 2007, returning to levels similar to those experienced in the late 1990s.

FIGURE 4. COMPONENTS OF GROWTH FOR BOWIE AND MILLER COUNTIES

GROWTH PATTERNS, 1991-2013

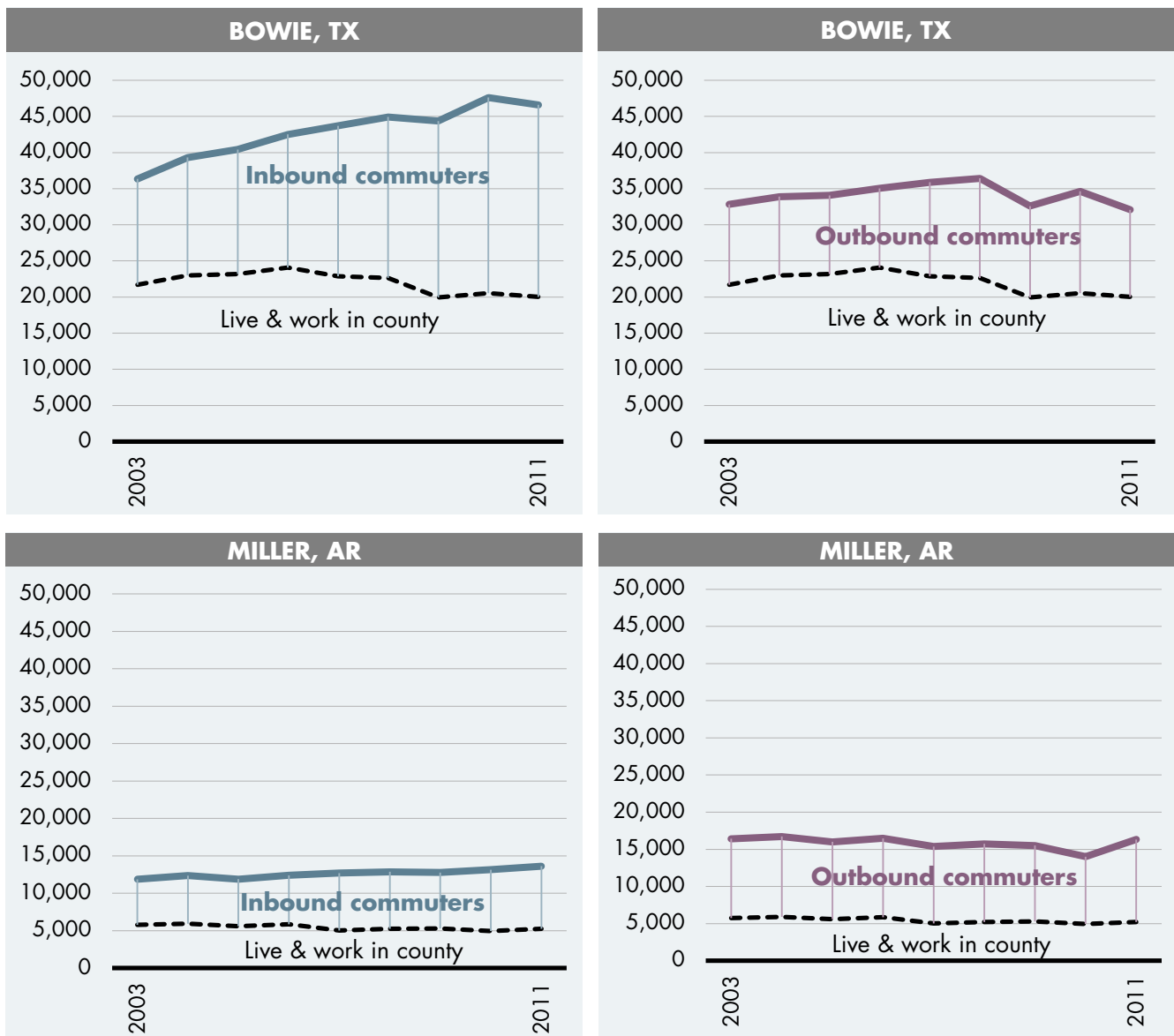


Source: US Census Bureau; Moody's Analytics

Based on commuting data, Bowie County—home to Red River Army Depot—appears to be the impact area's primary job center. Bowie County attracts a strong net inflow of inbound commuters, and this influx of workers has expanded steadily over the 8-year period from 2003 through 2011. (Note: 2011 is the most recent year for which data are available.) Miller County also attracts a strong flow of inbound commuters in percentage terms and this inbound flow has increased over time. However, outbound flows are larger than inbound, with more residents leaving the county for work than remaining in the county or coming in to work from outside. The remaining counties tend to experience marginal net outflows of commuters.

FIGURE 5. COMMUTING FLOWS IN BOWIE AND MILLER COUNTIES

ESTIMATES BASED ON DIFFERENCES BETWEEN JOB LOCATION AND RESIDENCE LOCATION*



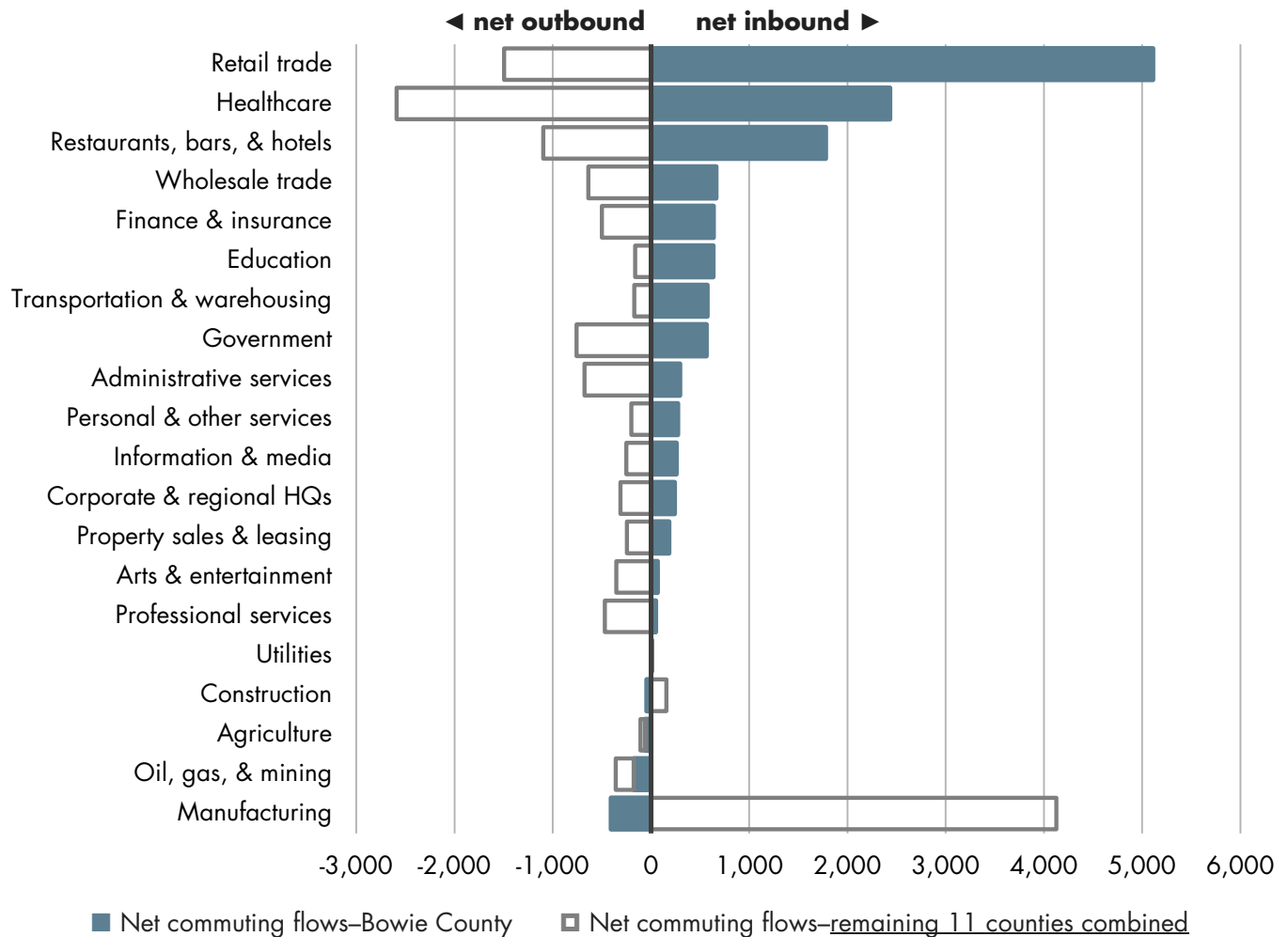
*Note: Not all jobs require daily commuting. Construction and oilfield workers, for example, sometimes work in distant locations for extended periods of time.

Source: US Census Bureau, Local Employment Dynamics (LED) database, 2003-2011

Net inbound commuting to Bowie County is strong across most economic sectors. However, net inflow is strongest in the retail trade, healthcare, and dining/hospitality sectors. This trend points to Texarkana being the primary regional center between Little Rock and DFW for services and goods. In only a few industries—among them, manufacturing, oil & gas, and agriculture—does Bowie County have a net outflow of workers.

The other 11 counties together experience a net outflow of commuters in most economic sectors with the exception of manufacturing and construction, each of which draws a net inflow of workers across the 11 counties when considered as a group. A closer look at the data reveals that two counties—Titus and Howard—account for all of the positive flows, with these counties drawing in an average of between 1,800 and 3,000 more manufacturing workers than they "export" to other counties.

FIGURE 6. REGIONAL COMMUTING PATTERNS BY INDUSTRY
 AVERAGE NET INFLOW/OUTFLOW FOR 2009-2011 IN MAJOR ECONOMIC SECTORS



Note: Because of volatility in the data from year to year, the findings presented are based on an average of the most recent 3 years available.

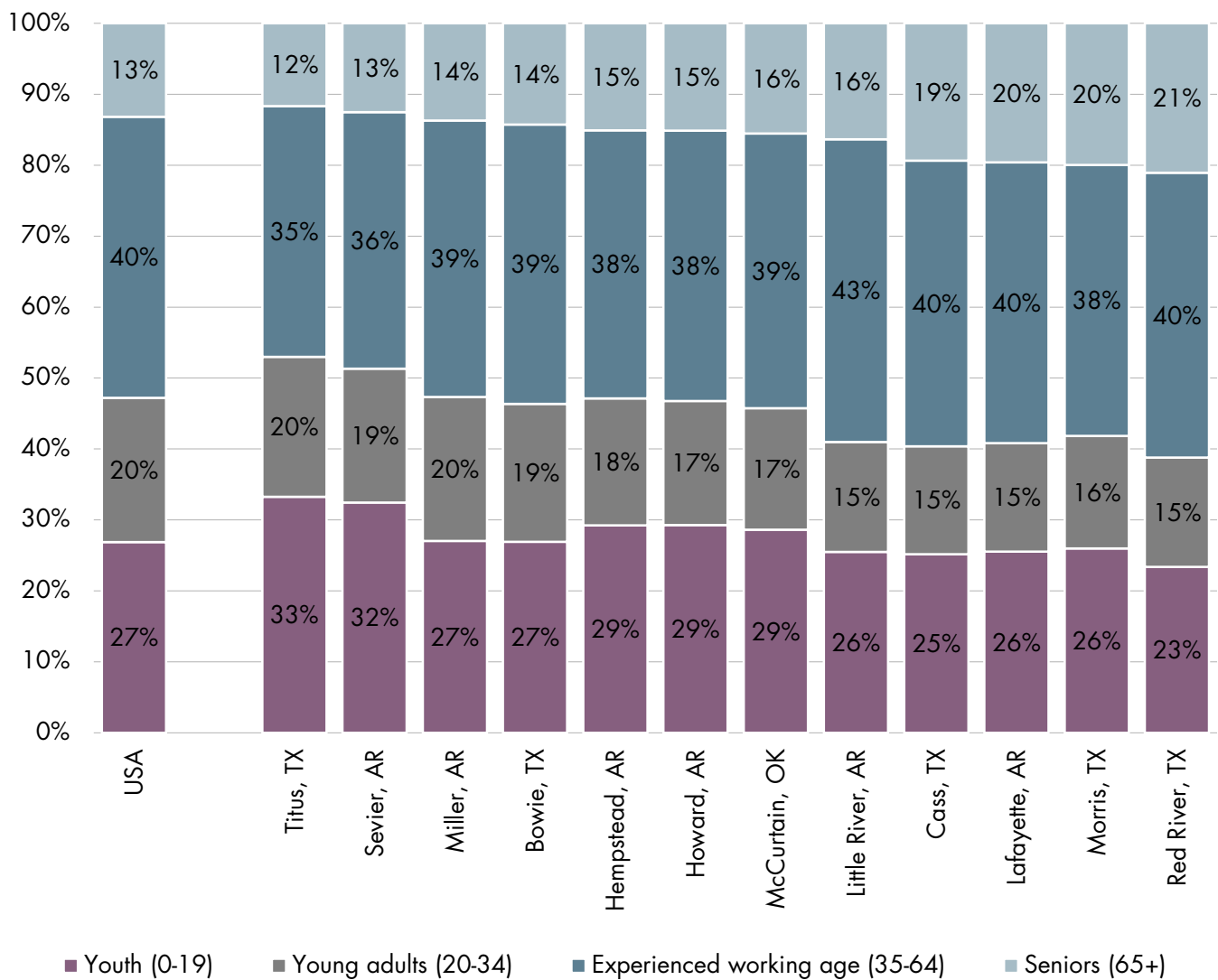
Source: U.S. Bureau of the Census, Local Employment Dynamics (LED) database, 2009-2011

Age structures in the US can differ dramatically from one place to another. Within the 12-county impact area, the age structure in both Bowie and Miller counties is remarkably similar to the US overall.

In the other, more rural counties, the differences are more perceptible. In counties such as Cass, Lafayette, Morris, and Red River, there are fewer young adults (perhaps they have left for college or to find work somewhere else) and the share of senior citizens is larger. Titus and Sevier have the largest youth populations in percentage terms, with roughly one-third of the population in each county estimated to be less than 20 years old.

With few exceptions, the size of the cohort for those prime working years between the ages of 35 and 64 is similar to the US average—roughly 40 percent.

FIGURE 7. COMPARATIVE POPULATION DISTRIBUTION BY AGE



Source: US Census Bureau (2008-2012 American Community Survey 5-Year Estimates)

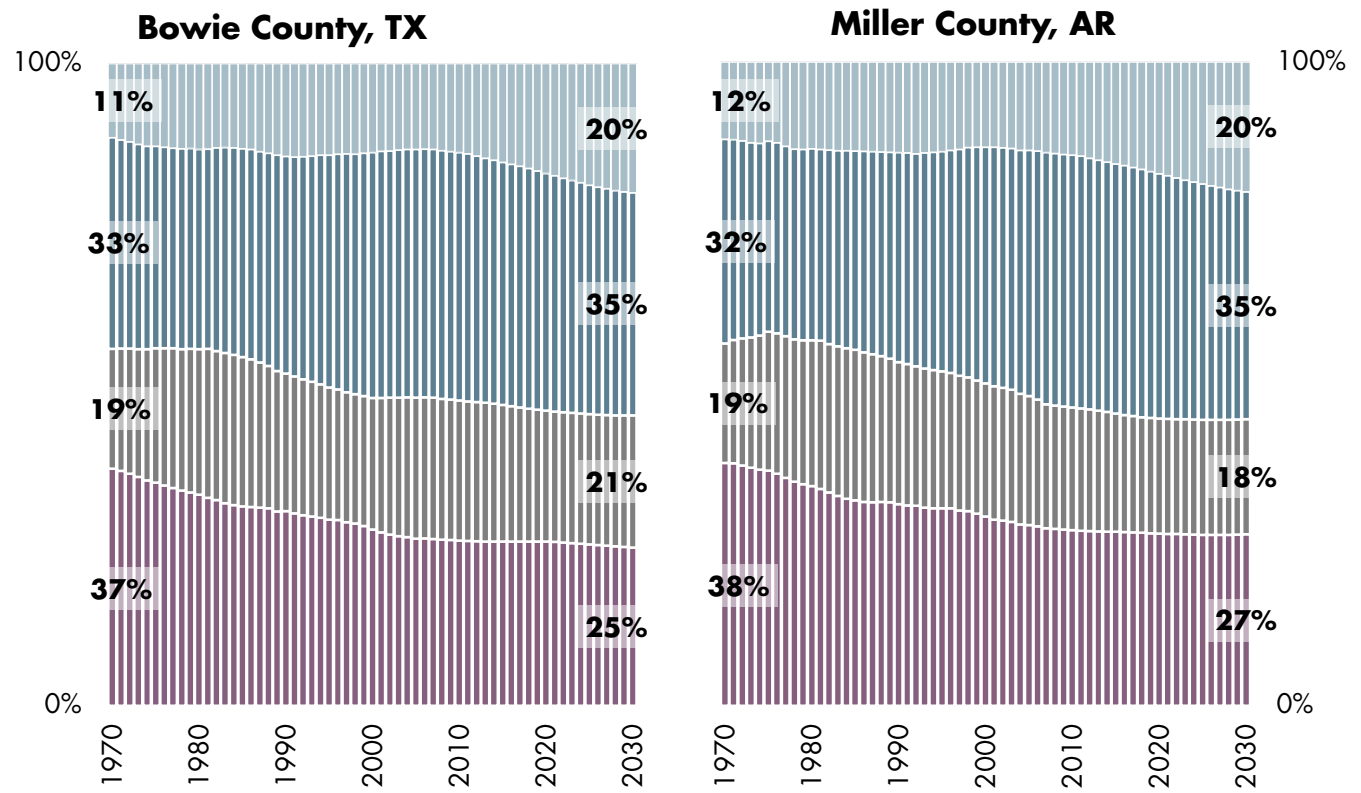
Age structure is not static; long-term demographic changes are underway nationwide that can also be detected locally. Figures for Bowie County and Miller County illustrate the impacts of these trends.

In 1970, there were more than 3 people under 20 years old in the region for every senior citizen. As baby boomers retire over the next two decades, the ratio of children to senior citizens will narrow to slightly more than 1 child for each person age 65 years and older.

FIGURE 8. POPULATION DISTRIBUTION BY AGE: BOWIE AND MILLER COUNTIES

HISTORY AND PROJECTIONS, 1970-2030

■ Seniors (65+) ■ Experienced working age (35-64) ■ Young adults (20-34) ■ Youth (0-19)

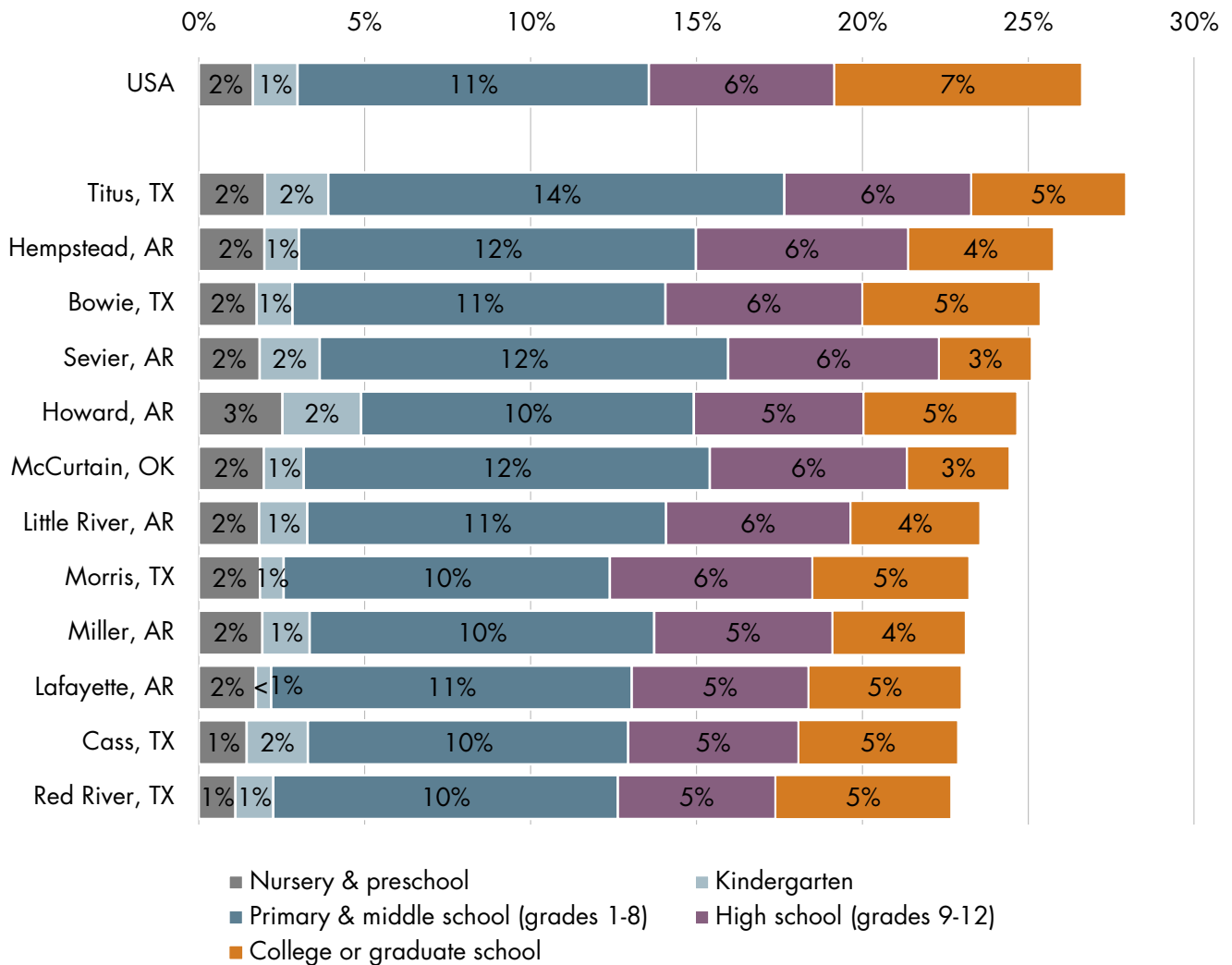


Source: US Census Bureau; Moody's Analytics

Enrollment data in the region's 12 counties mostly parallels US patterns up through the high school level. Titus County's enrollment exceeds the US average, the only one of the 12 counties to do so. The county's higher enrollment figures are due to a 3-percentage point difference in elementary and middle school enrollment.

For enrollment above the high school level, slight differences of 2 to 3 percent between the US average and the region's counties can be seen. More than anything else, this is likely a reflection of simple supply and demand. Major college towns from Fayetteville to Nacogdoches to College Station can attract students away from the region to locations where educational opportunities are available. If most of the educational institutions within the 12-county region draw only local students (i.e., they don't attract huge enrollments from outside the immediate area), then it makes sense that the area's college enrollment numbers might fall a little below the US average.

FIGURE 9. CURRENT ENROLLMENT STATUS OF THE POPULATION



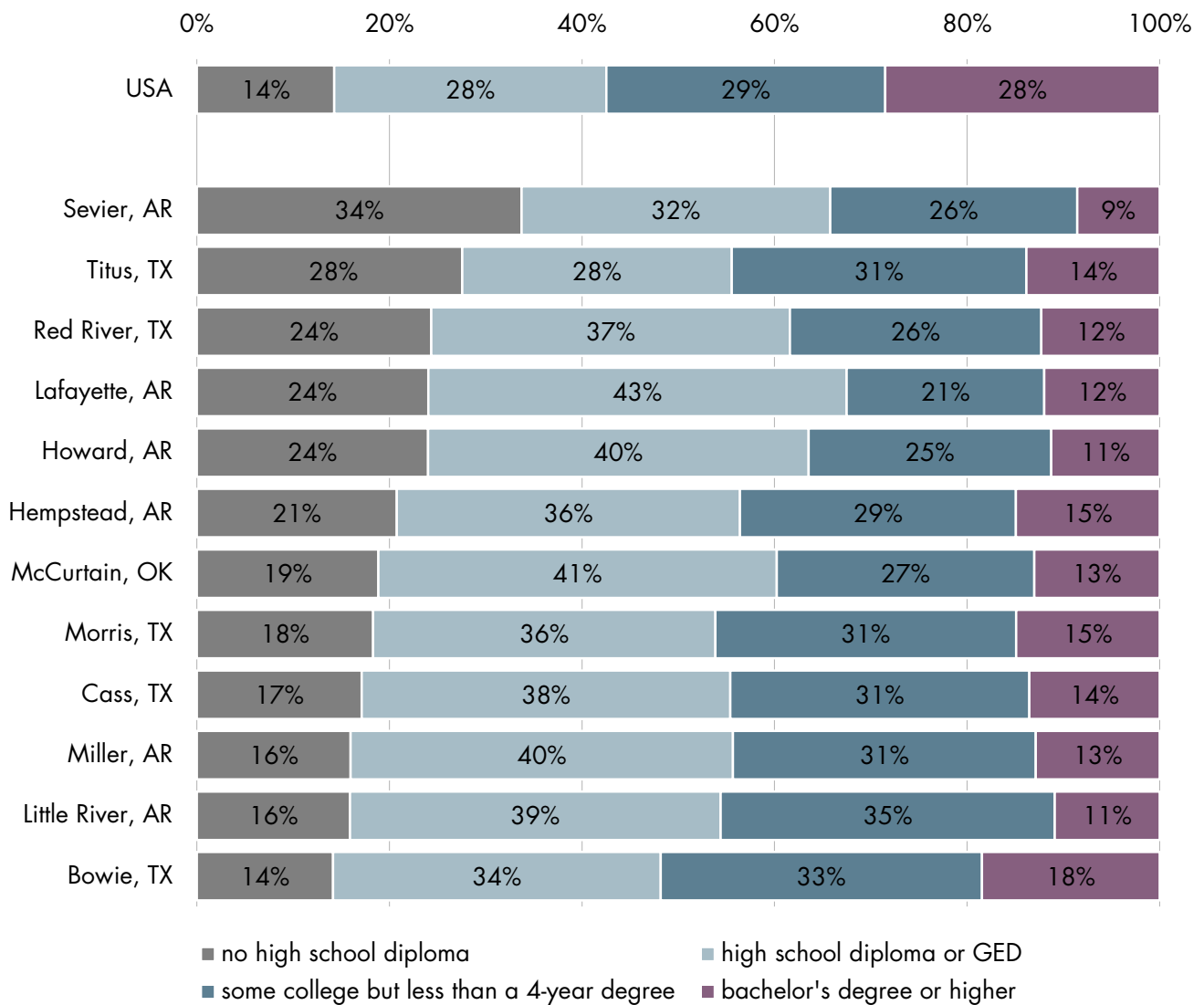
Source: US Census Bureau (2008-2012 American Community Survey 5-Year Estimates)

If the previous exhibit indicated that young adults were leaving the impact area to go to college (or to pursue employment opportunities), then this exhibit suggests they aren't returning home in large numbers once they earn a diploma. About 28 percent of US adults have at least a four-year degree. Within the 12-county impact area, this ratio varies from 9 percent to 18 percent.

To some extent, it's natural and beneficial for young people to leave a rural area in pursuit of education, experience, and capital. The critical challenge for most rural areas is to create the employment opportunities and quality of place assets to enable them to return home once they reach a more mature age/stage in life.

FIGURE 10. EDUCATIONAL ATTAINMENT

HIGHEST LEVEL OF EDUCATION ACHIEVED BY THE POPULATION AGE 25 OR OLDER



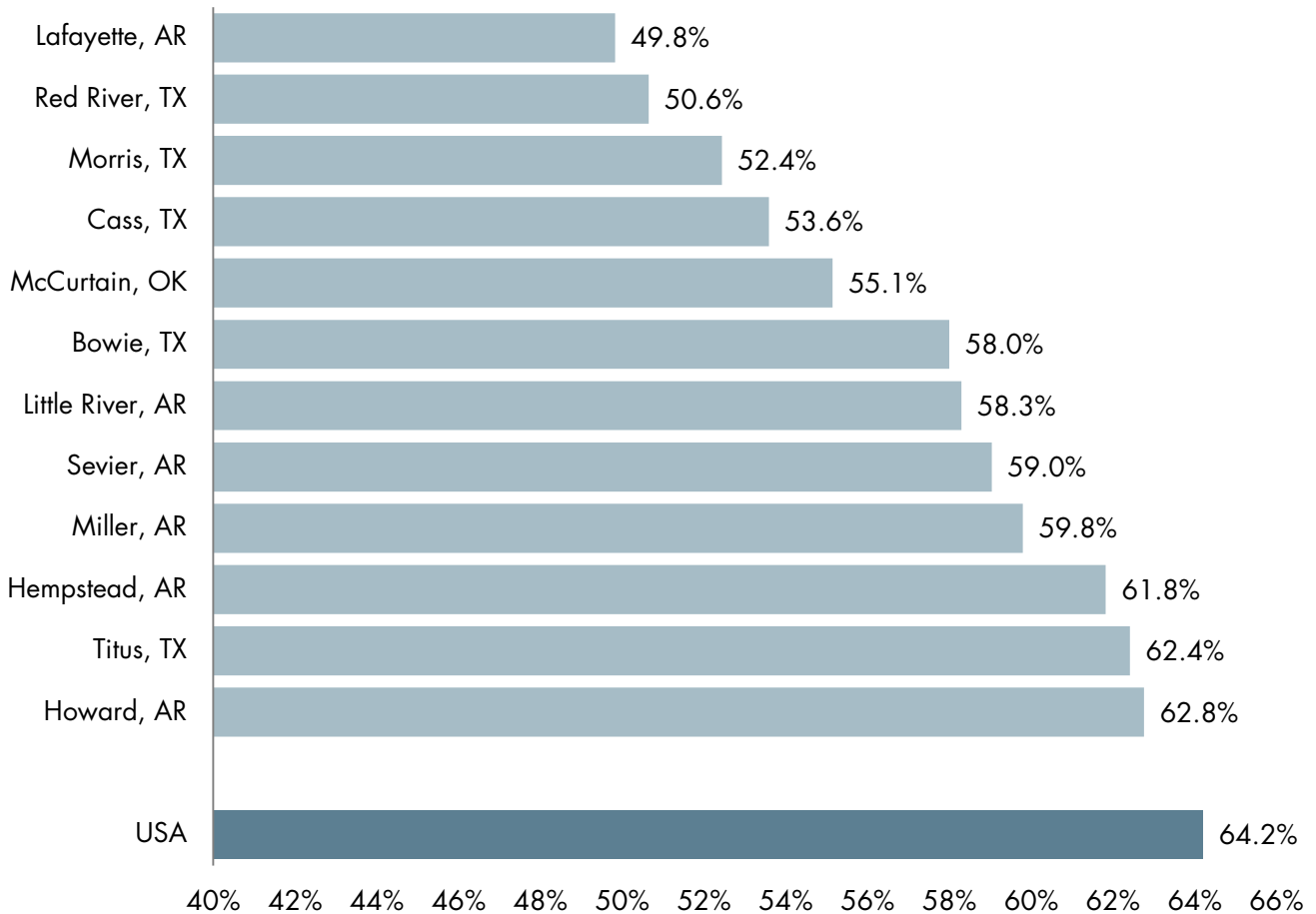
Source: US Census Bureau (2008-2012 American Community Survey 5-Year Estimates)

Labor force participation is the share of the population age 16 or above that is currently employed or seeking to be employed.

Official civilian labor force (CLF) participation rates are calculated by the U.S. Bureau of Labor Statistics, but these rates are not readily available below the state level. An alternative can be crudely calculated from a different sample available from the U.S. Census Bureau's annual American Community Survey.

This alternative calculation shows noticeably lower CLF participation rates in the 12-county region than the national average of 64 percent. Part of this may be explained by demographics—previous exhibits showed slightly higher ratios of seniors in some counties and lower ratios of young adults—but age structure doesn't entirely explain why labor force participation rates might be this low.

FIGURE 11. LABOR FORCE PARTICIPATION RATE



Source: U.S. Census Bureau (2008-2012 American Community Survey 5-Year Estimates)

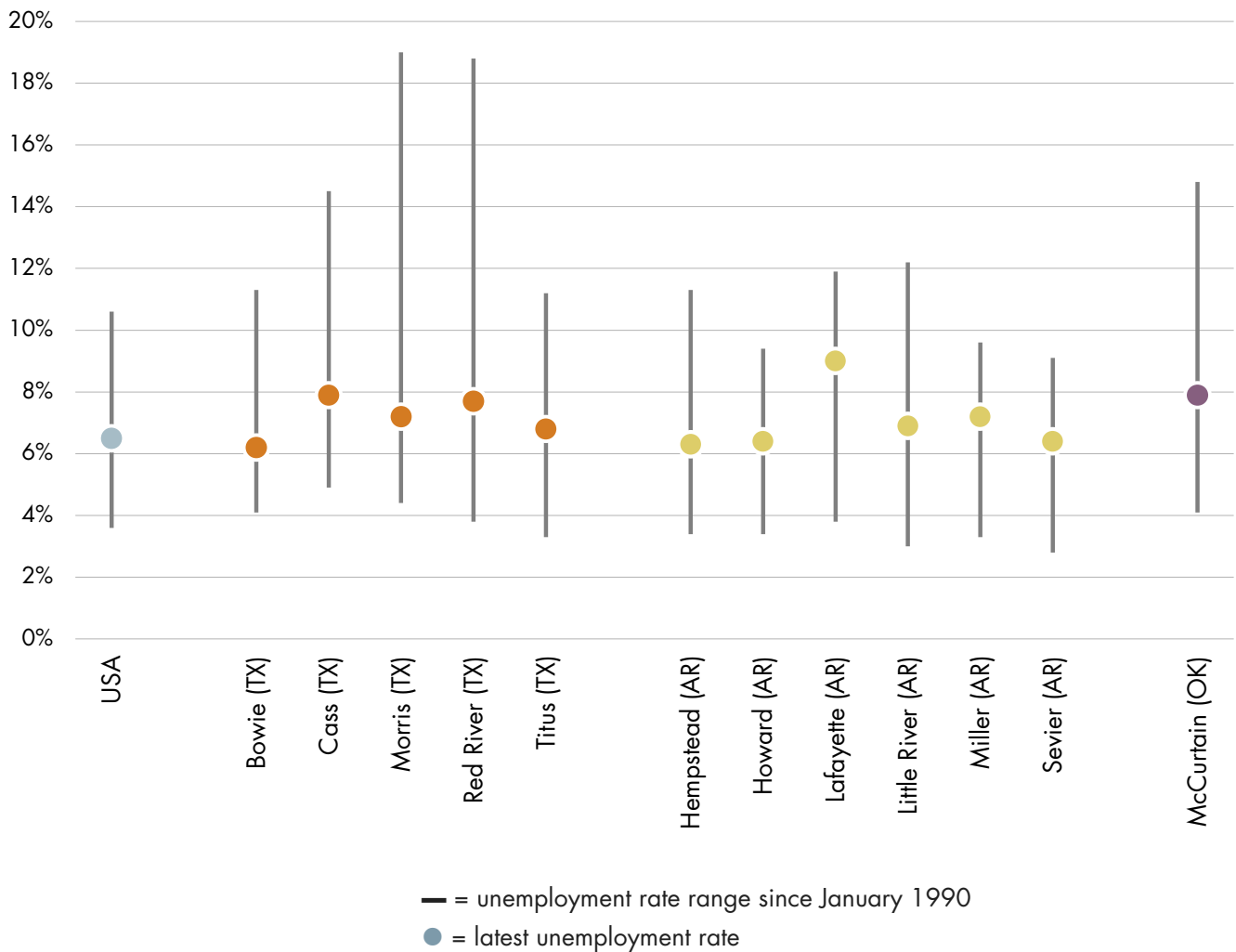
Unemployment rates nationwide rose to record highs during the recent recession and have improved gradually. The national jobless rate has stayed at or below 7 percent for the past 12 months, dipping below 6 percent in mid-2014 for the first time since the start of the downturn.

Within the 12-county region, unemployment rates in Bowie, Hempstead, Howard, and Sevier Counties are very close to the national average. Other counties in the region are slightly above the US average. Some counties like Morris and Red River have jobless rates that are now well below their historic highs.

By contrast, recent unemployment rates for a handful of Arkansas counties—Lafayette, Miller, and Sevier—remain near their historic peak.

FIGURE 12. AVERAGE ANNUAL UNEMPLOYMENT RATE, 1990–2014 (%)

LATEST 2014 UNEMPLOYMENT RATE RELATIVE TO THE HISTORICAL 24-YEAR RANGE



Note: Because seasonal adjustment is not available for all jurisdictions, none of the rates shown (including comparables) are seasonally adjusted.

Source: U.S. Bureau of Labor Statistics, CPS (US rate) and LAUS (state & county rates)

Local unemployment rates in 2006–2008 converged very close to the national average just ahead of the recession. This pattern of convergence appears to be occurring again as of 2014.

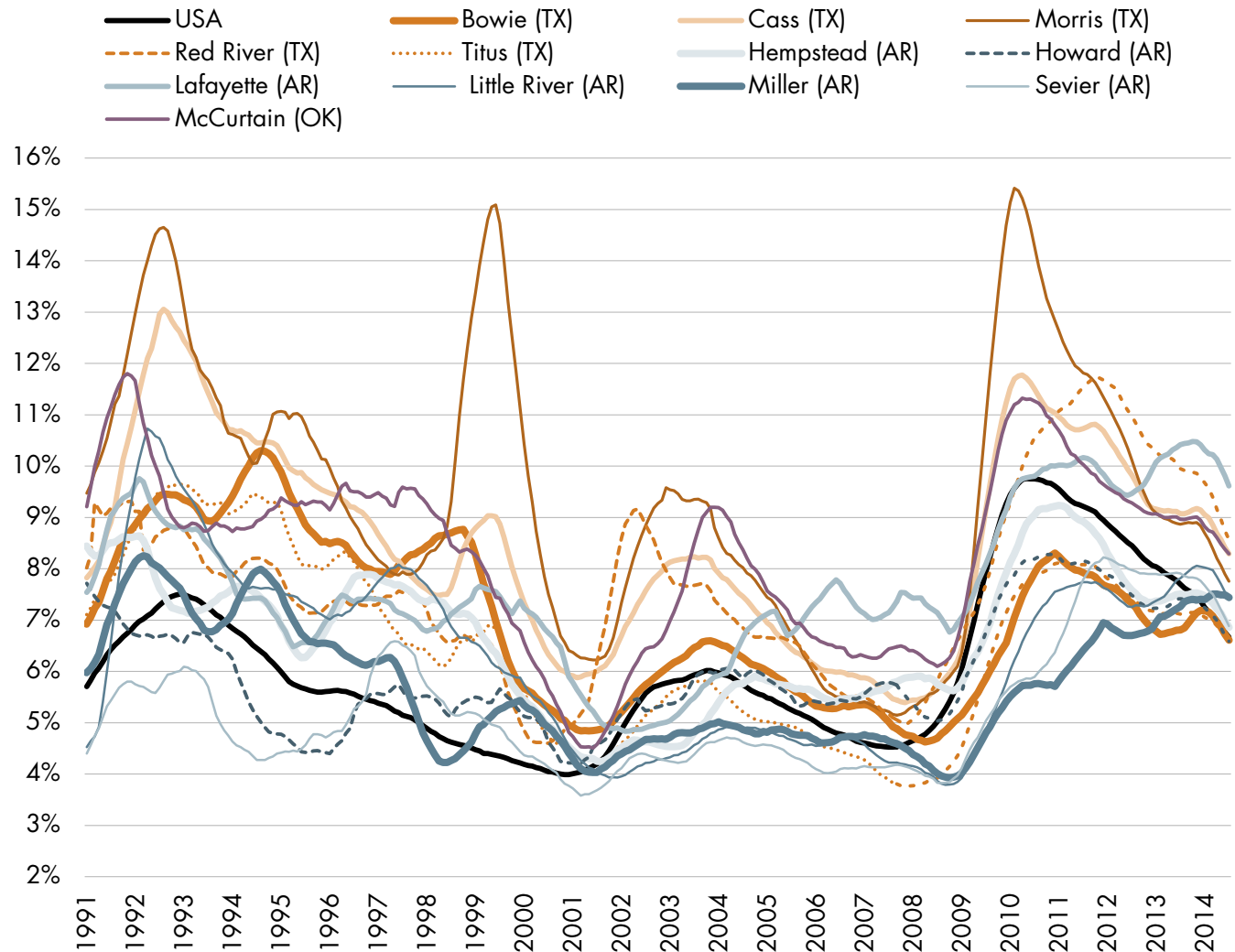
When viewed over the long term, the jobless rates in individual counties have behaved very differently. Morris, Cass, Red River, and McCurtain each shot way above the US average during the recession. These rates, while still well above the nation, have dropped significantly from their recent highs.

By contrast, other counties—including Bowie, Miller, and Little River—didn't experience jobless rates as high as the US average during the height of the recession. These three counties, however, have not done as well in the recovery. Jobless rates have crept up in all three counties over the past year or two, enough to move them at or above the US average for the first time in years.

FIGURE 13. UNEMPLOYMENT RATES COMPARED

REGIONAL UNEMPLOYMENT RATES ARE CONVERGING WITH THE US AVERAGE ONCE AGAIN

12-month moving average of the seasonally unadjusted jobless rates



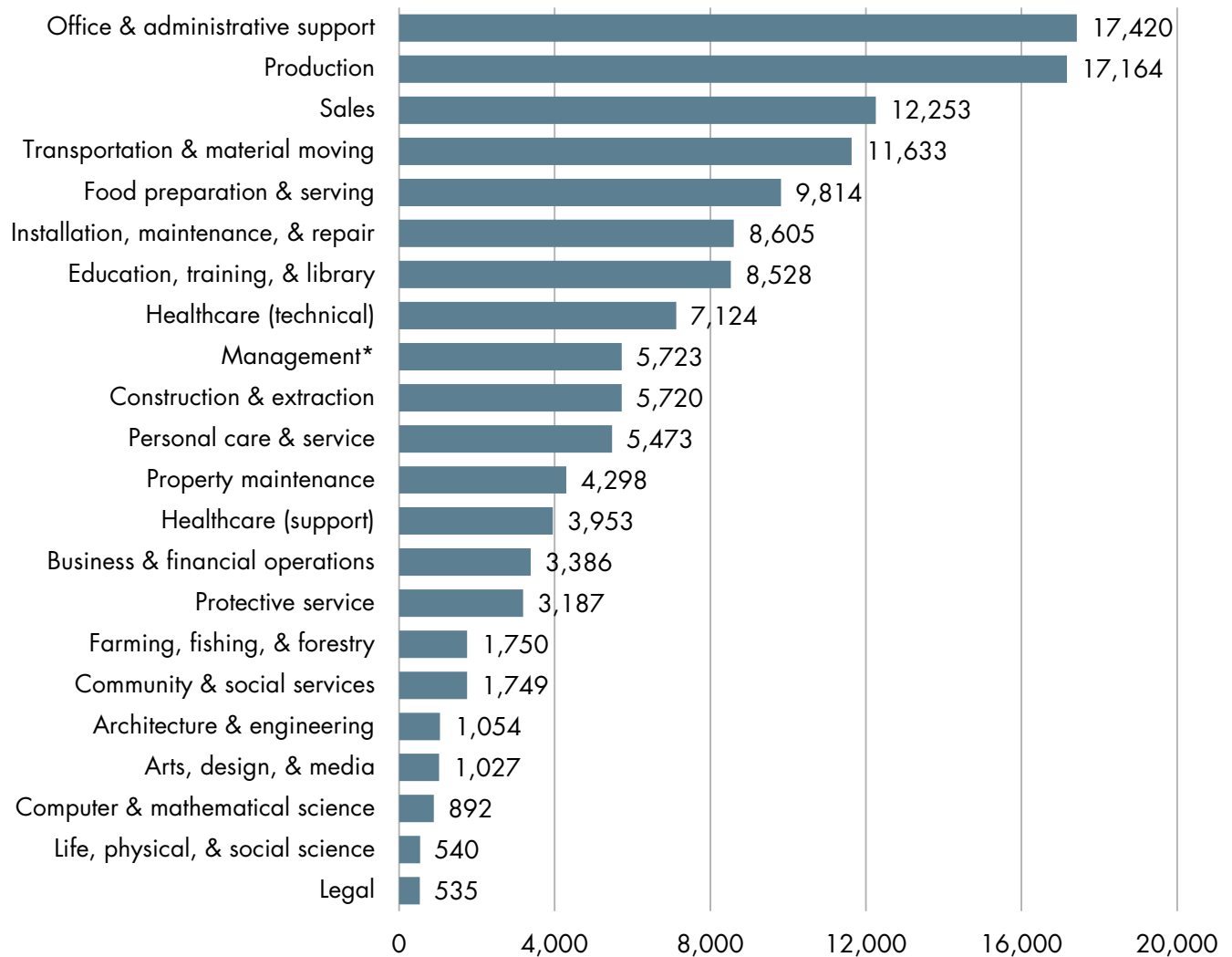
Source: U.S. Bureau of Labor Statistics, CPS (US) and LAUS (state & county)

Just over one-quarter of the 12-county region's entire workforce (26 percent) falls into two occupational groups: office administration and production. The prevalence of production workers is correlated to the region's large manufacturing base.

Further down the list, the large number of transportation & material-moving workers points to the region's strengths in logistics and distribution. This group also includes a range of workers typically employed within manufacturing operations, including warehouse workers, forklift operators, and truck drivers.

FIGURE 14. 2013 JOB BASE BY OCCUPATIONAL GROUP IN THE 12-COUNTY REGION

AS OF 2013



*Note: Management occupations include self-employed real estate agents, farmers & ranchers, construction managers and general managers.

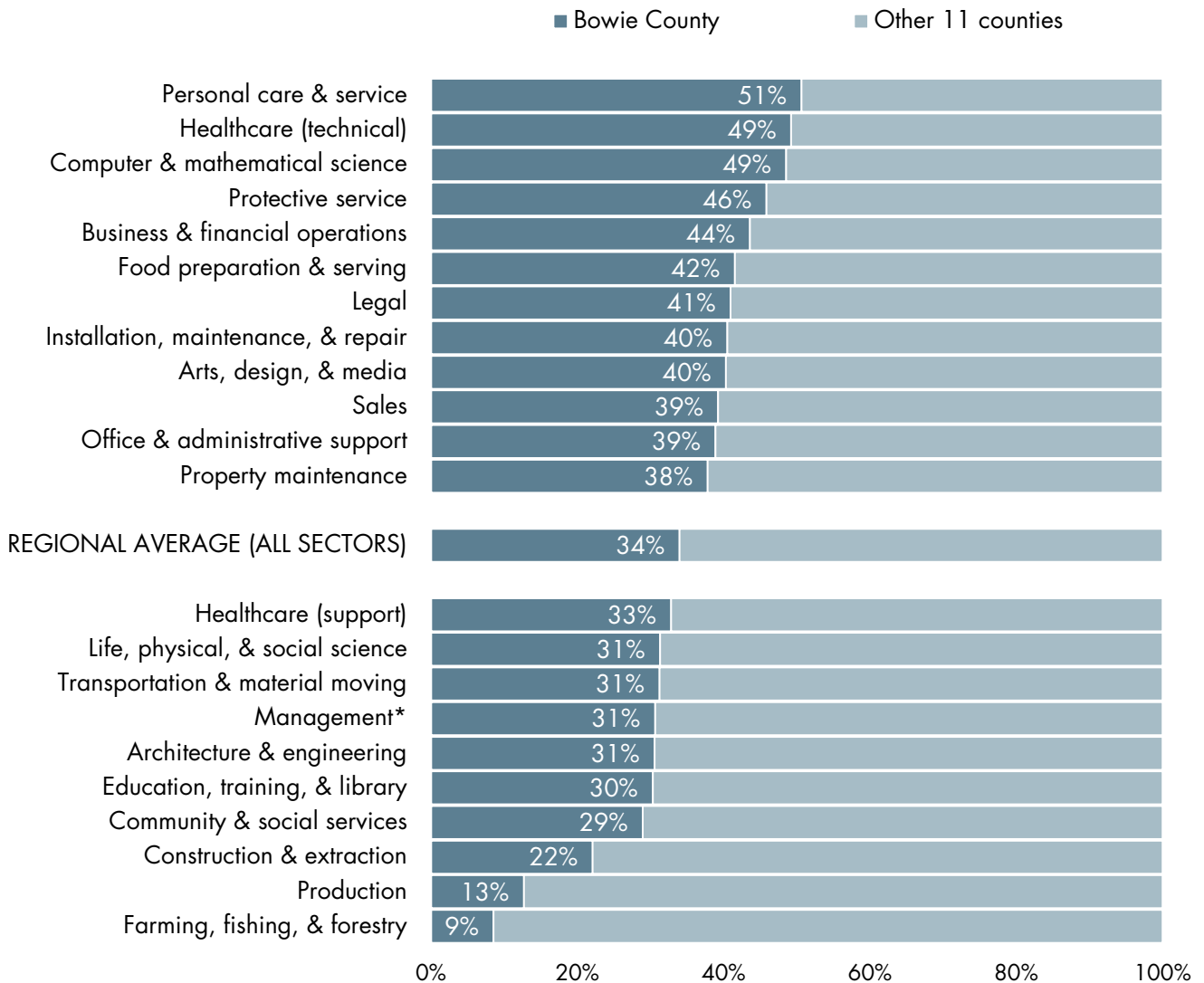
Source: EMSI Complete Employment 2014.2

Just over a third (34%) of the jobs in the 12-county region are located in Bowie County. This parallels the commuting data which tends to show a strong net inflow of workers into the county.

For some occupational groups, the concentration of jobs in Bowie County is even stronger. This is true for healthcare (technical) workers as well as for computer-related positions. Civilian occupations that are likely to be employed at RRAD, including security workers (included in protective services) and repair and maintenance professions, are also more concentrated in Bowie County than in the r

FIGURE 15. GEOGRAPHIC DISTRIBUTION OF JOBS BY OCCUPATIONAL GROUP IN THE 12-COUNTY REGION

AS OF 2013



*Note: Management occupations include self-employed real estate agents, farmers & ranchers, construction managers and general managers.

Source: EMSI Complete Employment 2014.2

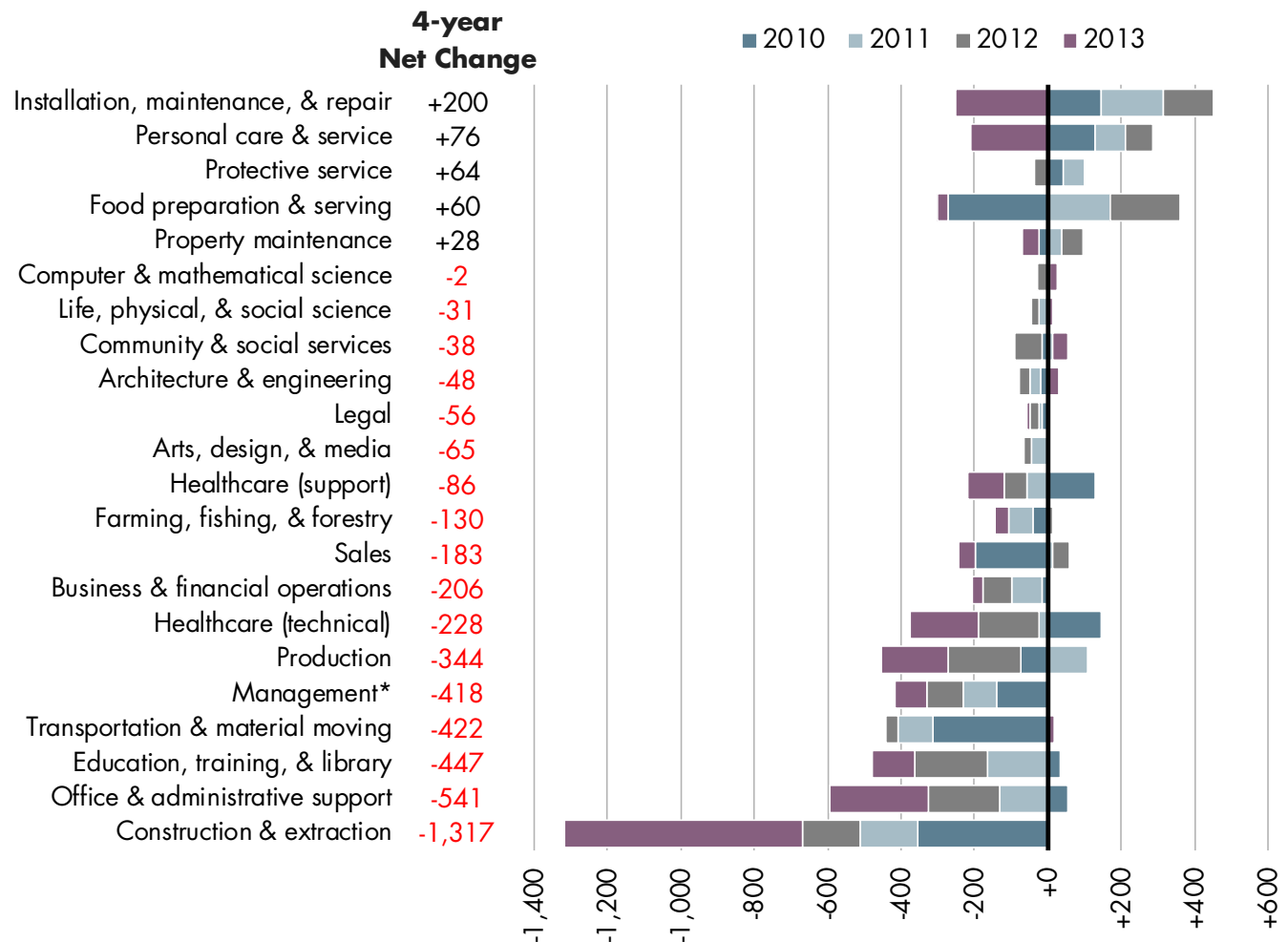
Recovery from the most recent US recession has been uneven across the region's occupations, with some groups still struggling to recover. Despite the recession's official end in mid-2009, construction, office, education, and transportation-related occupations continued to experience steady losses in most of the years analyzed.

On a net basis, only a handful of occupational groups in the region have seen gains. The largest overall increases in the past four years have been among maintenance and repair workers, a category that represents many of the jobs at RRAD. Personal services occupations have also experienced modest net gains since 2010.

However, a sharp decline in employment in the region in 2013 offset job gains made in both groups. Construction occupations, office jobs, and production workers also experienced substantial losses in the region in 2013.

FIGURE 16. OCCUPATIONAL JOB TRENDS IN THE 12-COUNTY REGION, 2010-2013

WIDE DIFFERENCES IN OCCUPATIONAL VOLATILITY OVER THE PAST FOUR YEARS



*Note: Management occupations include self-employed real estate agents, farmers & ranchers, construction managers and general managers.

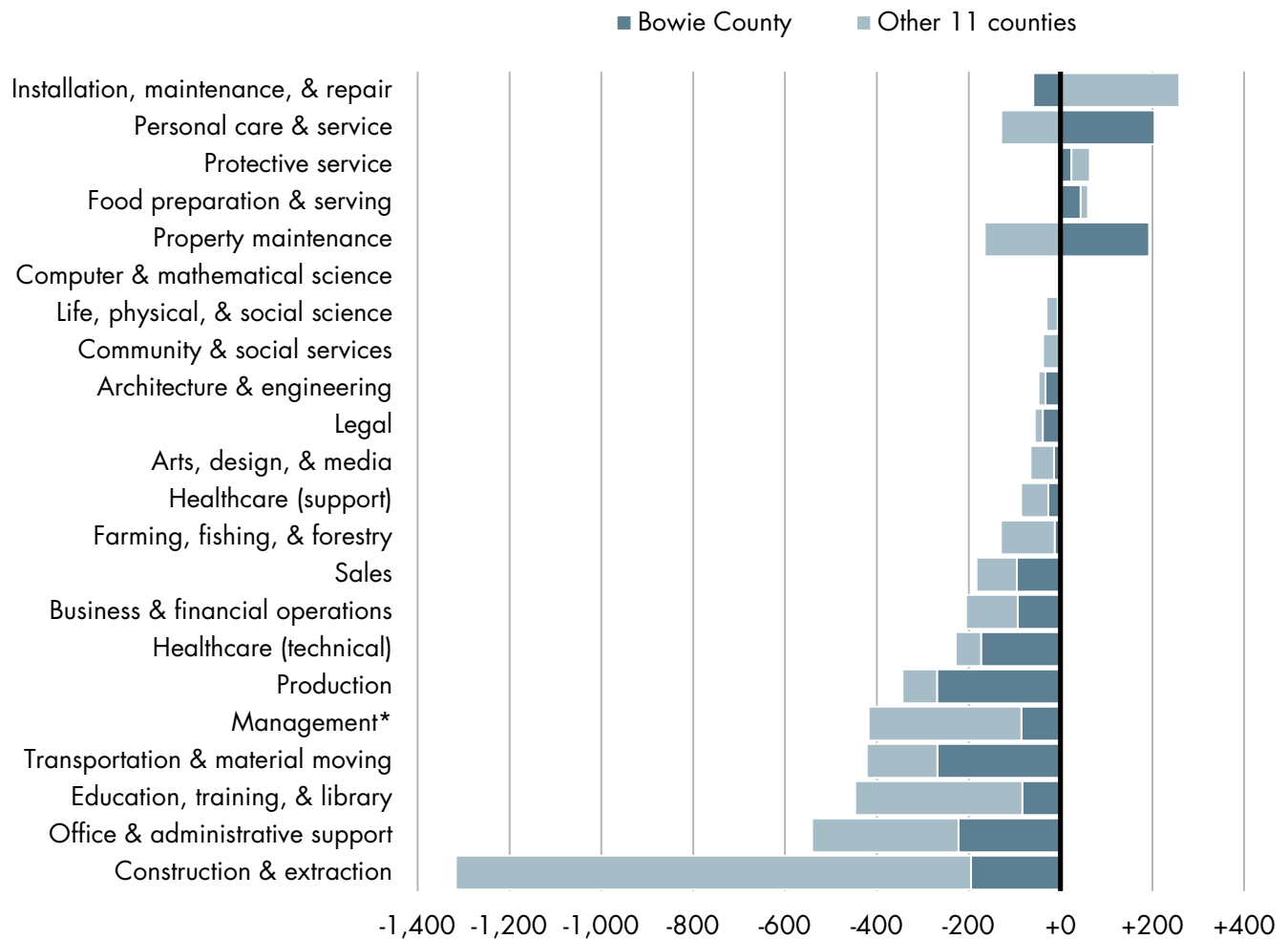
Source: EMSI Complete Employment 2014.2

Over the past four years, Bowie County's occupational job gains have been concentrated mostly in personal services and property maintenance. Net gains in the other eleven counties as a whole have been limited to a handful of occupational categories, primarily maintenance and repair occupations.

Over the same four-year period, Bowie County absorbed the bulk of the region's job losses in several areas, such as healthcare (technical), production, and transportation. Some of the occupational categories affected in Bowie County can be tied to cutbacks at RRAD, especially the losses associated with repair and maintenance occupations.

The largest losses by far were in construction & extraction occupations, which shed more than 1,200 jobs during the period analyzed. Unlike losses in some other categories, these were not concentrated in Bowie County.

FIGURE 17. NET JOB CHANGE BY OCCUPATION WITHIN THE 12-COUNTY REGION, 2010–2013
BOWIE COUNTY VS. THE OTHER 11 COUNTIES



*Note: Management occupations include self-employed real estate agents, farmers & ranchers, construction managers and general managers.

Source: EMSI Complete Employment 2014.2

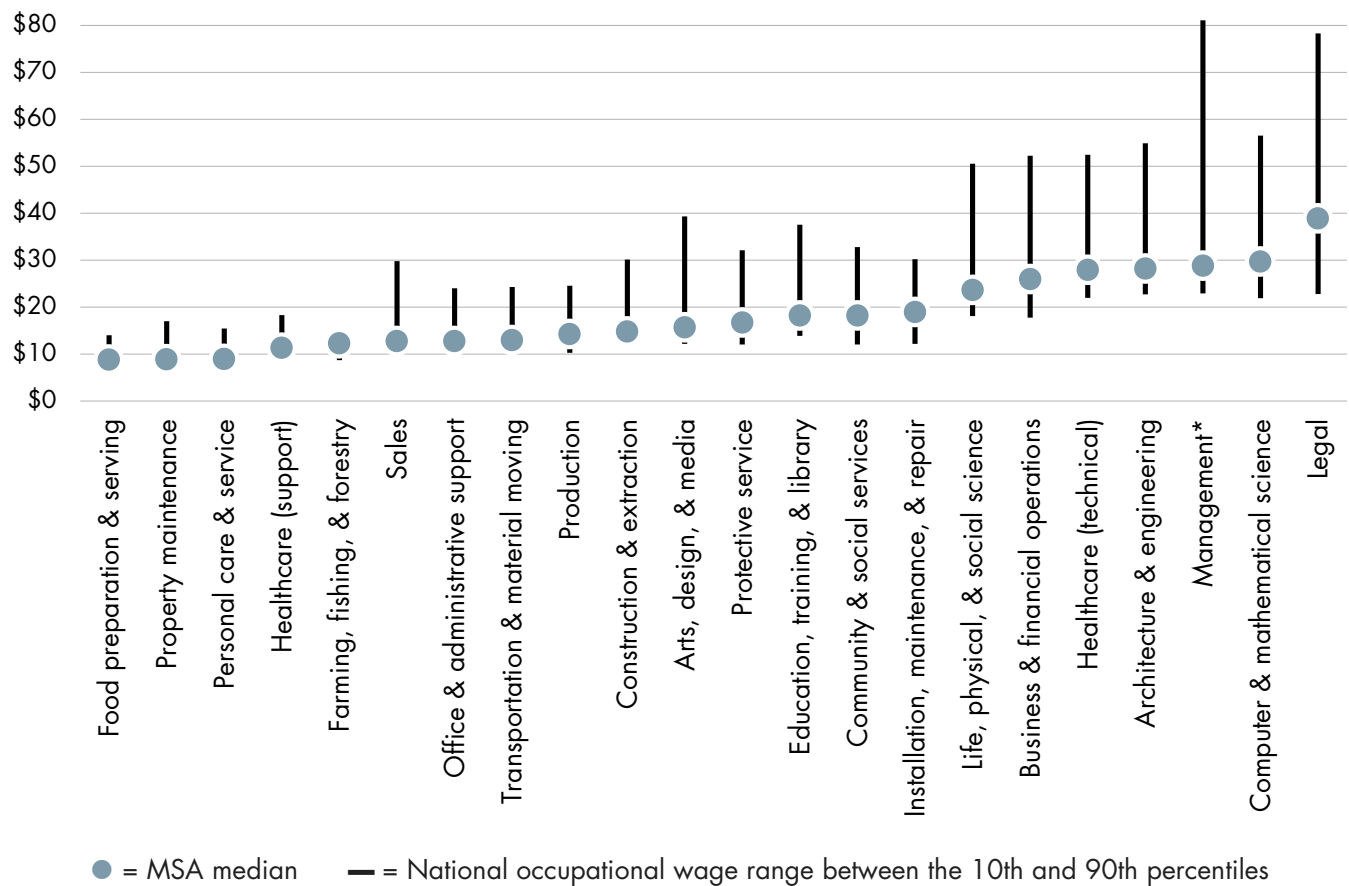
In most occupational categories, the median wage in the 12-county region falls in the middle to lower half of the national wage range. The wage pattern is very typical for a region of this population size in the South Central US.

A few deviations from the general pattern are notable, however. First, the local median wage is higher than average in the occupational category of farming, fishing, & forestry. This is likely due to the presence of higher-paying forestry jobs. The national wage range, however, is quite narrow, so the net pay differential is marginal.

A second deviation from the pattern is among management occupations. Nationwide, this category includes large numbers of well-paid business managers who tend to be concentrated in larger urban areas. In the 12-county region surrounding Texarkana and RRAD, this management group includes mostly self-employed farmers and ranchers whose income (when converted to an hourly wage scale) tends to be much lower. This is not uncommon. Rather, it is just a reflection of the way the data are tabulated. In fact, relatively lower paying management occupations are typical in most areas of the US with farming or ranching activities.

FIGURE 18. MEDIAN HOURLY WAGE RATE BY OCCUPATIONAL GROUP

12-COUNTY MEDIAN WAGE LEVELS PRESENTED IN THE CONTEXT OF THE NATIONAL OCCUPATIONAL WAGE RANGE



*Note: Management occupations include self-employed real estate agents, farmers & ranchers, construction managers and general managers.

Source: EMSI Complete Employment 2014.2

Occupational groups with high location quotients underscore the 12-county region's core economic strengths, including its notable manufacturing base, as evidenced by the region's strong concentration of production workers.

Large numbers of maintenance & repair occupations are a reflection of civilian activities at RRAD. Relative concentrations of occupations in farming, fishing, & forestry are a reflection of the region's agricultural heritage and its forestry resources.

Below-average location quotients mostly reflect the types of jobs that often concentrate more strongly in large urban areas, including financial services, science, engineering, arts, and IT.

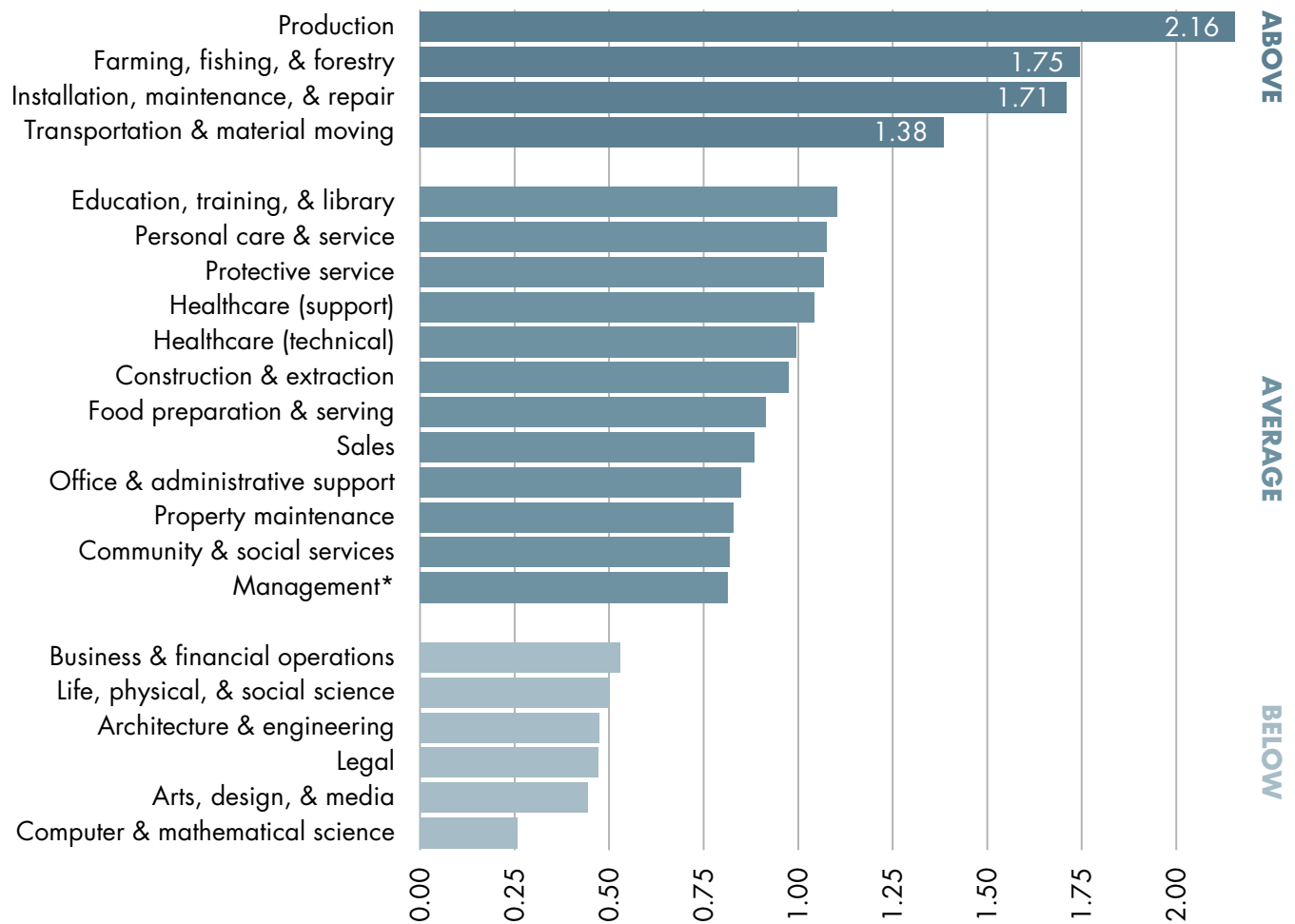
FIGURE 19. OCCUPATIONAL GROUP CONCENTRATIONS IN THE 12-COUNTY REGION

LOCATION QUOTIENT ANALYSIS

US average for each industry = 1.00

Regional strength > 1.25

Regional weakness < 0.75

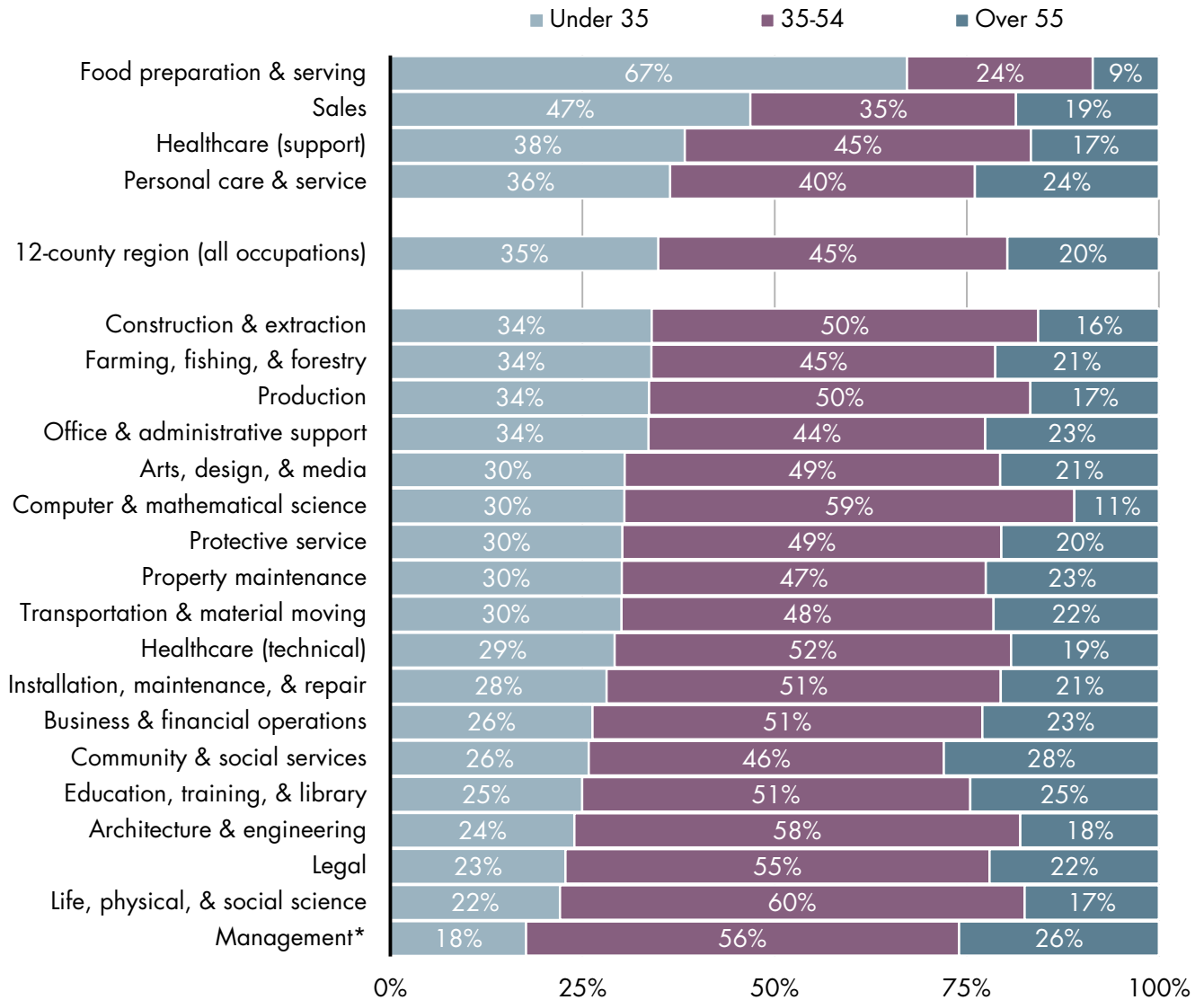


*Note: Management occupations include self-employed real estate agents, farmers & ranchers, construction managers and general managers.

Source: EMSI Complete Employment 2014.2

Differences exist in the age of workers across occupational groups. Some of this is to be expected. Food preparation and serving, for example, is an entryway into the workforce for many younger workers. It makes sense that as workers age they move into other occupations. Conversely, there's a small share of managerial workers under the age of 35. This makes sense as well, as these posts tend to be filled by more experienced candidates. The managerial category also includes self-employed farmers and ranchers who also tend to be a relatively more mature and seasoned group.

FIGURE 20. THE 12-COUNTY REGION'S OCCUPATIONAL MIX BY AGE



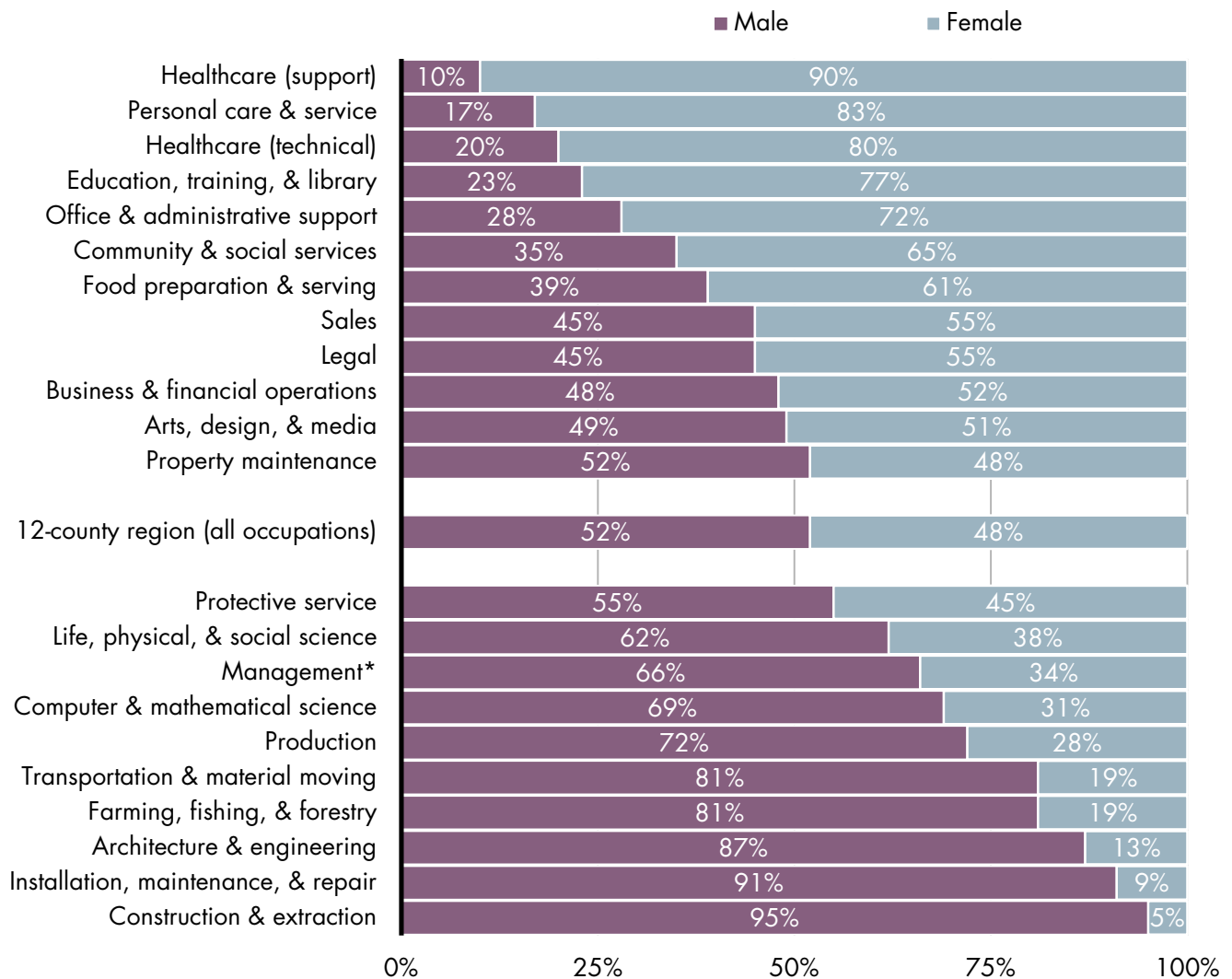
*Note: Management occupations include self-employed real estate agents, farmers & ranchers, construction managers and general managers.

Source: EMSI Complete Employment 2014.2

The occupational divide by gender is starker. Female workers are much more likely to be employed in the region's healthcare, education, and social and personal service industries. Male workers cluster heavily in construction, maintenance, repair, engineering, and transportation fields.

These patterns matter at the household level. Economic recessions can hit certain types of occupations disproportionately. Local policymakers must consider these issues carefully when structuring economic development strategies and workforce training programs to best match local needs.

FIGURE 21. THE 12-COUNTY REGION'S OCCUPATIONAL MIX BY GENDER



*Note: Management occupations include self-employed real estate agents, farmers & ranchers, construction managers and general managers.

Source: EMSI Complete Employment 2014.2

ECONOMIC ASSESSMENT: ECONOMY AND INFRASTRUCTURE

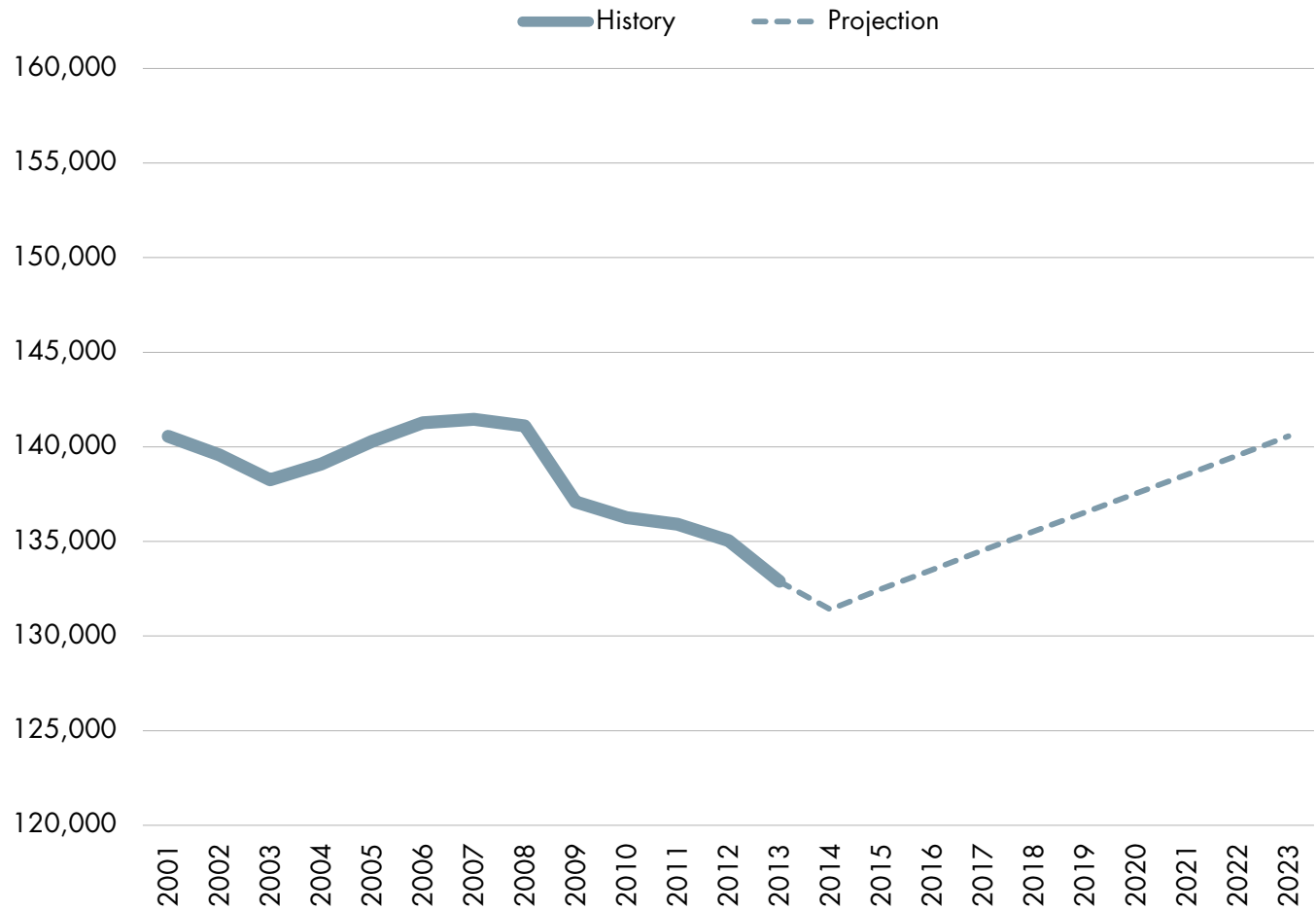


According to EMSI's expanded data series—which includes an estimate of self-employed workers, along with the traditional wage and salary employment data produced by state and federal agencies—employment in the 12-county region peaked at roughly 141,500 in 2007.

The pace of job growth in the years ahead is expected to increase. The recovery from recession has been slower so far than in previous recessions, but this sluggishness is not expected to last much longer. EMSI projects roughly 7,600 new jobs for the 12-county region between 2013 and 2023.

FIGURE 22. THE JOB BASE IN THE 12-COUNTY AREA

JOB GROWTH LIKELY TO RETURN IN 2014



Note: The base includes the "complete" job count of public and private sector, covered employment and self-employment, F/T and P/T employment

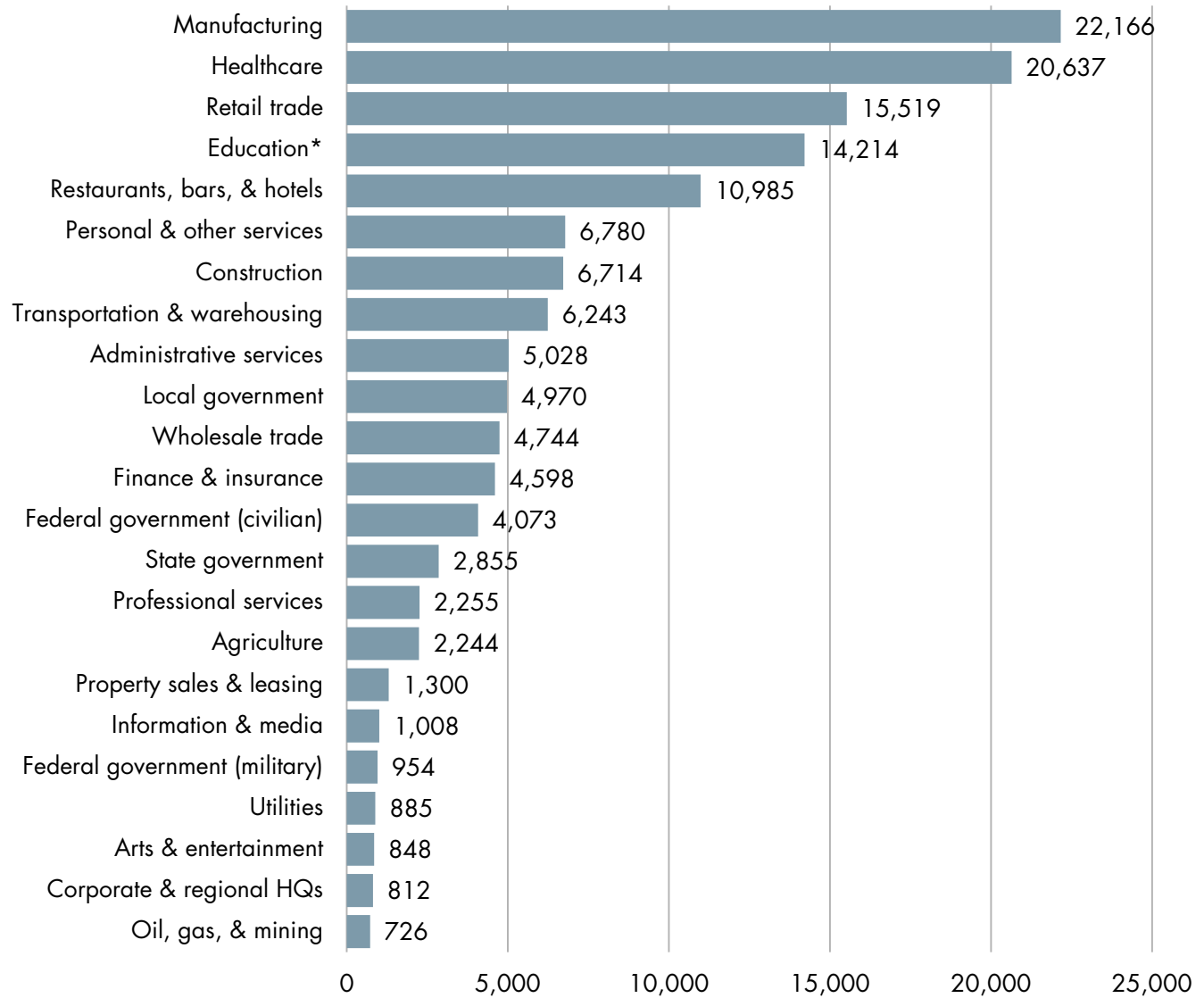
Source: EMSI Complete Employment 2014.2

Healthcare and manufacturing together employ more than 42,000 workers in the region. Almost a third of all jobs in the region fall into these two groups.

The sales-tax-generating industries (i.e., retail trade plus restaurants, bars, and hotels) together account for nearly 27,000 jobs in the 12-county region.

FIGURE 23. JOB BASE BY INDUSTRY SECTOR IN THE 12-COUNTY AREA

AS OF 2013



*Note: Education includes all public schools, colleges, & universities (i.e., these jobs are not included with local or state government).

Source: EMSI Complete Employment 2014.2

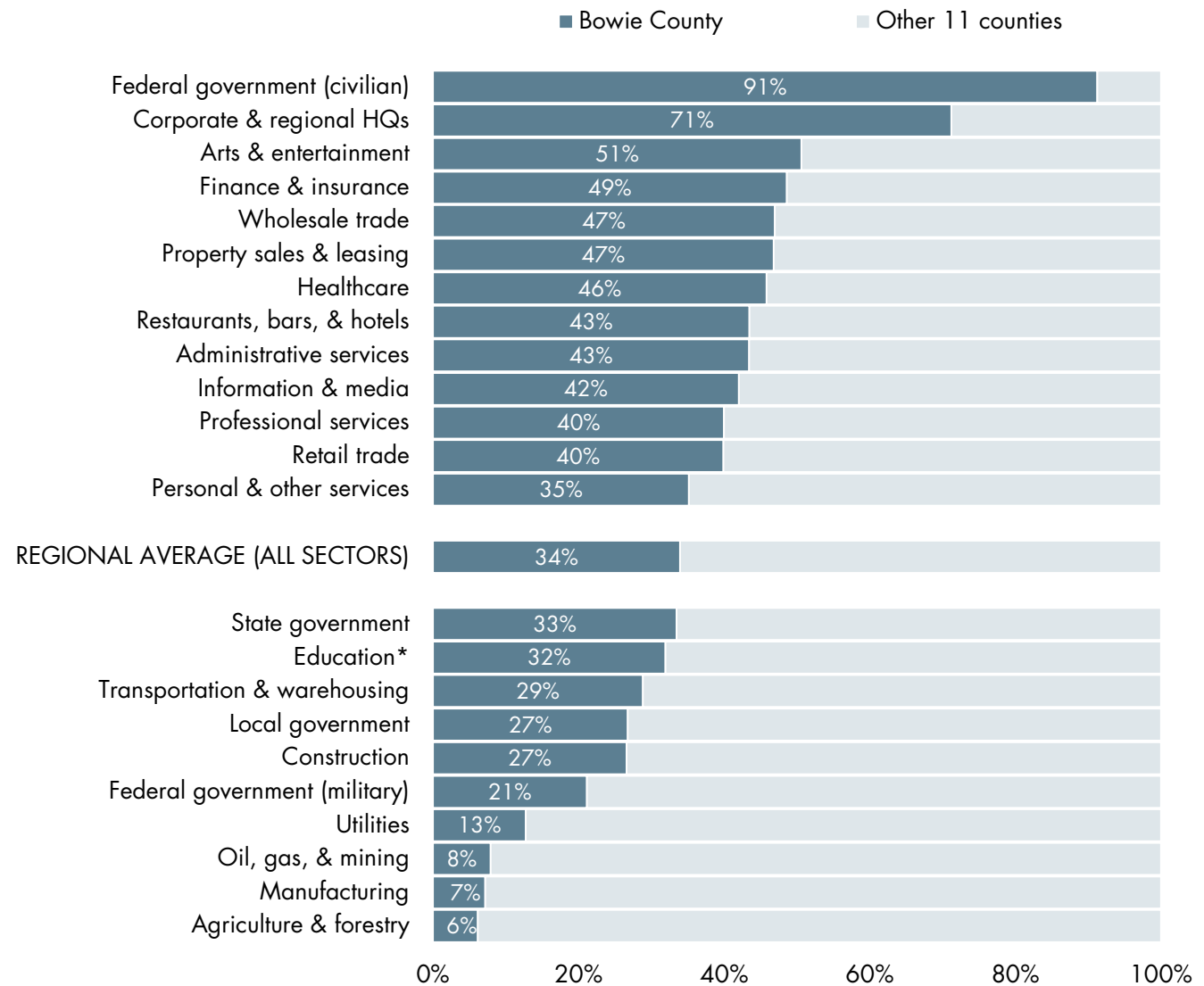
Virtually all of the region's civilian federal government employment is in Bowie County where RRAD is located.

Bowie County also provides a disproportionate share of employment in healthcare and in sales-tax-generating activities such as retail stores and restaurants.

Not surprisingly, the other 11 counties in the region pick up more employment in activities such as oil & gas, agriculture, and forestry. These counties are also home to more than 90% of the region's manufacturing jobs.

FIGURE 24. GEOGRAPHIC DISTRIBUTION OF JOBS BY INDUSTRY IN THE 12-COUNTY AREA

AS OF 2013



*Note: Education includes all public schools, colleges, & universities (i.e., these jobs are not included with local or state government)

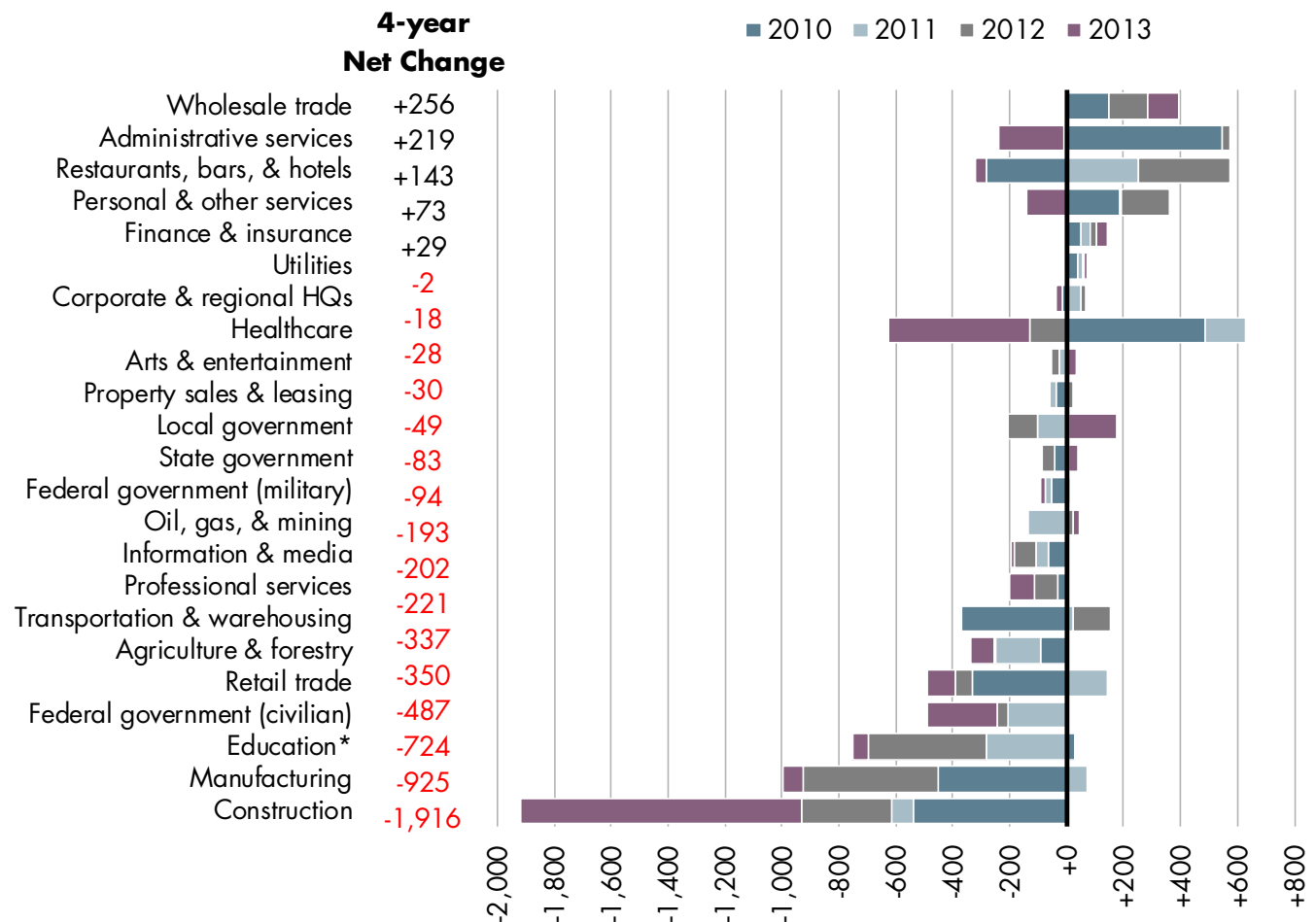
Source: EMSI Complete Employment 2014.2

Figure 16 (page 19) showing occupational job changes over the past four years highlighted the region’s relatively heavy net losses in 2013 in maintenance and repair occupations. Comparing those occupational losses with this industry-oriented exhibit, we can infer that many of these occupational job losses were associated with civilian employees of the federal government along with a mix of other occupations that may have been more masked in net figures for the year.

The 2013 losses for logging occupations (part of the farming, fishing, and forestry occupational group) also align with industry declines shown here for agriculture & forestry.

Some of the industries with the greatest losses over the past four years, including construction and manufacturing, had not yet regained these jobs as of year-end 2013.

FIGURE 25. JOB TRENDS BY ECONOMIC SECTOR IN THE 12-COUNTY AREA, 2010–2013
A WIDE GAP IN THE TYPES OF JOBS GAINED AND LOST SINCE THE RECESSION



*Note: Education includes all public schools, colleges, & universities (i.e., these jobs are not included with local or state government)

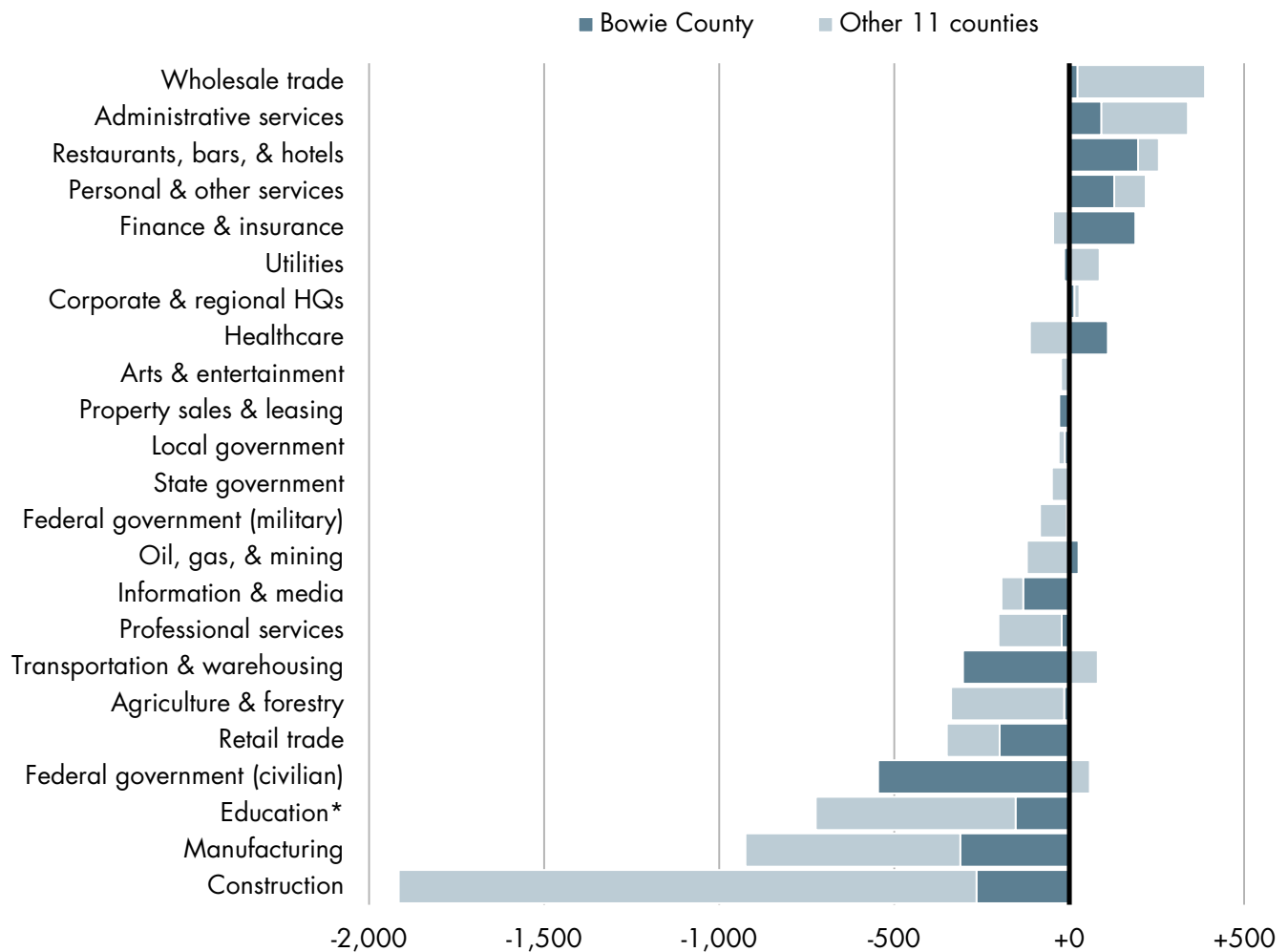
Source: EMSI Complete Employment 2014.2

The past four years of job growth in the region on an industry-by-industry basis have been mixed across counties. Bowie County has experienced steep losses in federal civilian employment, as well as the bulk of the region's losses in the transportation & warehousing and information sectors.

The construction industry was hardest hit, shedding nearly 2,000 jobs across the 12-county region, with the majority of those losses occurring outside Bowie County. Manufacturing also experienced sharp declines, with a net loss of nearly 1,000 jobs across the region.

A handful of sectors netted gains during the period analyzed. The largest gains were seen in wholesale trade and administrative services, a sector that includes a broad range of activities including temporary agencies, building maintenance, and waste management services.

FIGURE 26. NET JOB CHANGE BY INDUSTRY WITHIN THE 12-COUNTY AREA, 2010–2013
 BOWIE COUNTY VS. THE OTHER 11 COUNTIES



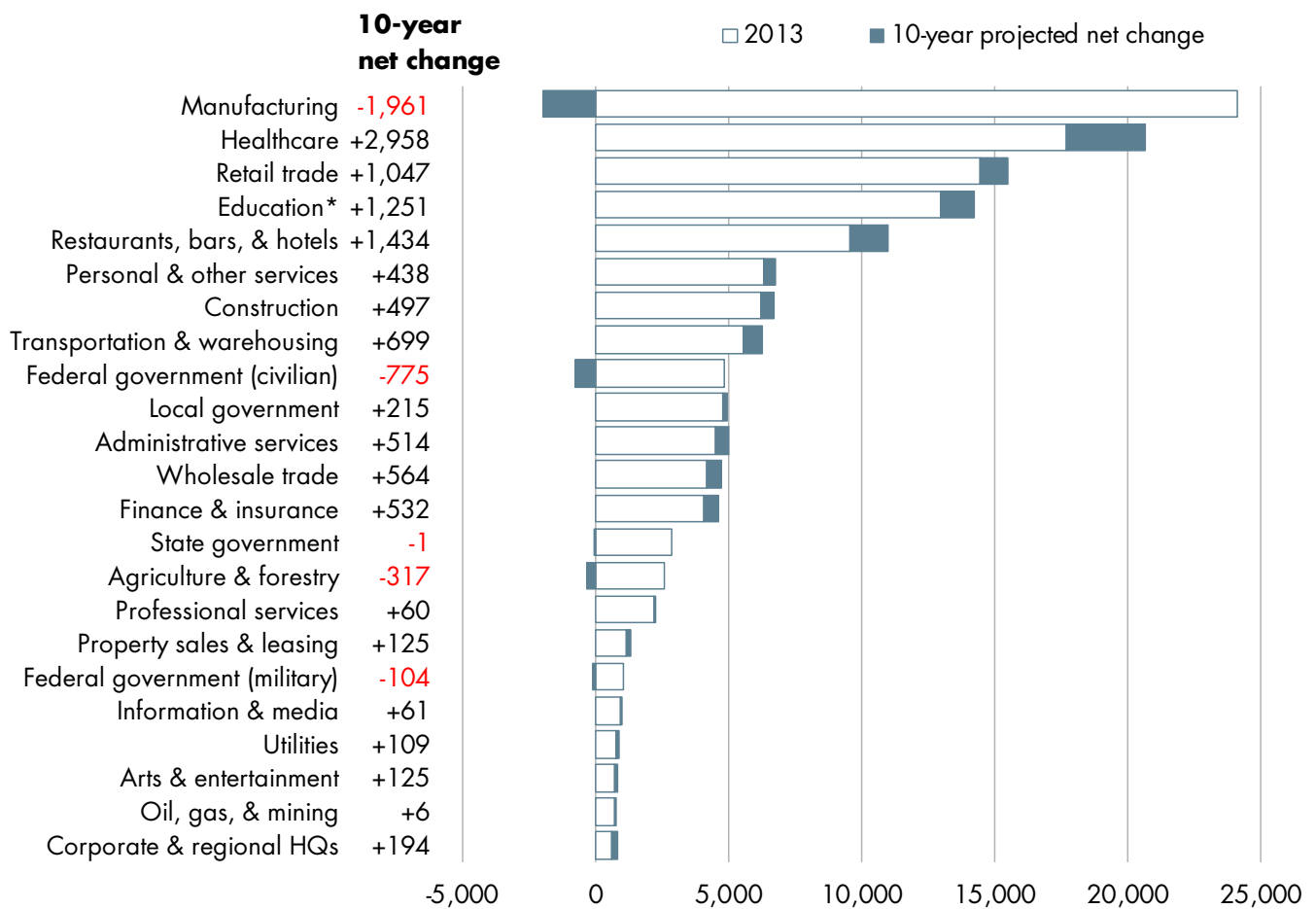
*Note: Education includes all public schools, colleges, & universities (i.e., these jobs are not included with local or state government)

Source: EMSI Complete Employment 2014.2

As US demographics change over the coming decade, healthcare will inevitably be a major job gainer in all areas of the country, both rural and urban. But other sectors, including education, finance & insurance, and transportation and warehousing will also be among the larger job gainers in the 12-county region, according to recent projections by EMSI.

Technological innovations will continue to create productivity gains in manufacturing and business-to-consumer sales (retail trade) which means fewer jobs are likely to be added in these sectors in percentage terms than might have been otherwise expected.

FIGURE 27. 12-COUNTY REGIONAL JOB BASE IN 2013 + PROJECTED 10-YEAR CHANGE



*Note: Education includes all public schools, colleges, & universities (i.e., these jobs are not included with local or state government)

Source: EMSI Complete Employment 2014.2

Along with a high concentration of federal civilian employment, the 12-county area can point to a large manufacturing sector relative to national employment patterns. Other regional employment strengths include utilities and agriculture & forestry related employment.

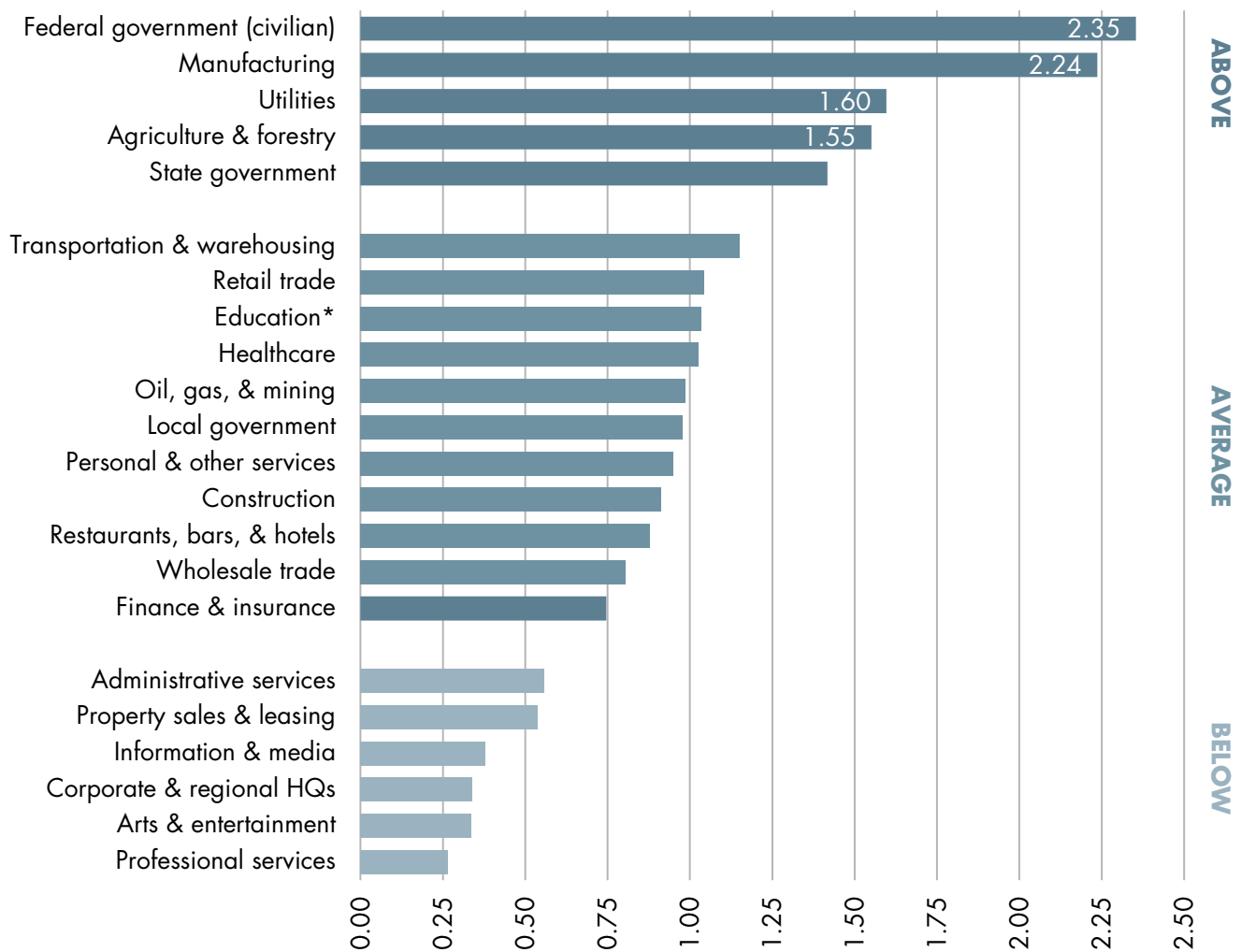
Industries with LQs falling between 1.25 and 0.75 are typically considered to be in the average range.

US average for each industry = 1.00

Regional strength > 1.25

Regional weakness < 0.75

FIGURE 28. 12-COUNTY REGIONAL INDUSTRY SECTOR STRENGTHS RELATIVE TO THE US
LOCATION QUOTIENT ANALYSIS



*Note: Education includes all public schools, colleges, & universities (i.e., these jobs are not included with local or state government)

Source: EMSI Complete Employment 2014.2

OCCUPATIONAL ANALYSIS



This section builds on the workforce data compiled as part of the economic assessment. The analysis presented below provides an understanding of occupational trends and identifies workforce strengths within the 12-county region. A central focus of the analysis was exploring the capabilities of occupations affected by proposed reductions in workload at the Red River Army Depot.

RED RIVER ARMY DEPOT

Established in 1941, the Red River Army Depot (RRAD) plays a pivotal role in the Northeast Texas economy. Operations at RRAD encompass federal civilian employment at the Depot itself, as well as the operations of both public and private sector tenants. An overview RRAD employment is provided in Figure 29.

Faced with federal budget cuts and the continued winding down of operations in both Iraq and Afghanistan, employment at the Depot has declined steadily over the past 24 months. After ramping up to nearly 4,800 workers in FY 2008, Depot employment dropped to just under 3,200 workers by the start of FY 2014, with continued reductions in workload predicted.

Data on workforce capabilities of the majority of RRAD’s civilian labor force was supplied by the Depot leadership according to the applicable federal classification system: the General Schedule (GS) for salaried, white-collar workers and the Federal Wage System (FWS) for hourly, craft and trade workers. These federal classifications were translated to the more commonly used Standard Occupational Classification (SOC) system using a January 2013 crosswalk published by the US Equal Employment Opportunity Commission. A summary of this analysis is provided in Figure 30.

Of the roughly 2,300 workers for which data were provided, nearly one-half (45 percent) are classified as installation, maintenance, and repair occupations. These positions include workers that maintain a range of systems, including electronics, motor vehicles, industrial equipment, and mechanical systems (such as boilers and HVAC systems). Several white-collar occupations are also among the largest occupational groups, including business and financial occupations, administrative and support workers, and management positions. Because of the nature of operations at the Depot, protective service workers comprise approximately 5 percent of the workforce. These jobs fall into two general categories: 1) law enforcement and criminal investigation personnel and 2) positions focused on fire prevention and the control of hazardous materials.

FIGURE 29: RRAD OPERATIONS
EMPLOYMENT BY TYPE (AS OF 1/30/2014)

Red River Army Depot	3,804
Civilian employees*	2,266
Contractors	1,530
Military personnel	8
Tenant operations	1,217
Civilian employees**	969
Military personnel	248
TOTAL	5,021

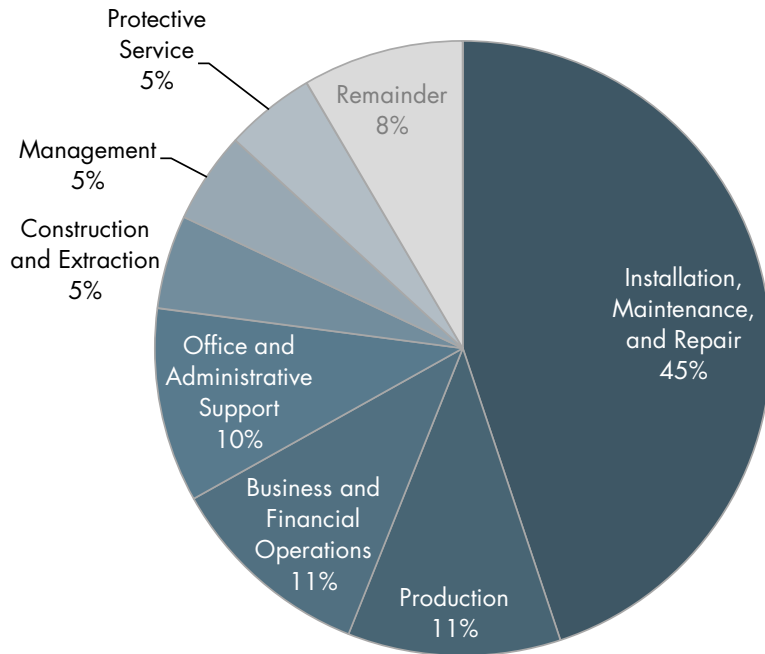
Source: RRAD Strength Report (April 30, 2014)

*Figure includes salaried (General Schedule) and hourly (Federal Wage System) employees.

**Figure includes federal civilian and NAF (non-appropriated funds) positions.

FIGURE 30: DISTRIBUTION OF RRAD CIVILIAN EMPLOYMENT

SHARE OF TOTAL EMPLOYMENT BY MAJOR OCCUPATIONAL GROUP



Installation, maintenance, and repair workers comprise nearly one-half (45 percent) of the Depot’s federal civilian workforce.

This occupational group also makes up the largest share of the positions that are expected to be impacted by workload reductions.

Source: RRAD (data on positions by federal job series), US Equal Employment Opportunity Commission (Federal Sector Occupation Cross-Classification Table, January 2013), TIP Strategies. Excludes 7 military positions.

AFFECTED OCCUPATIONS

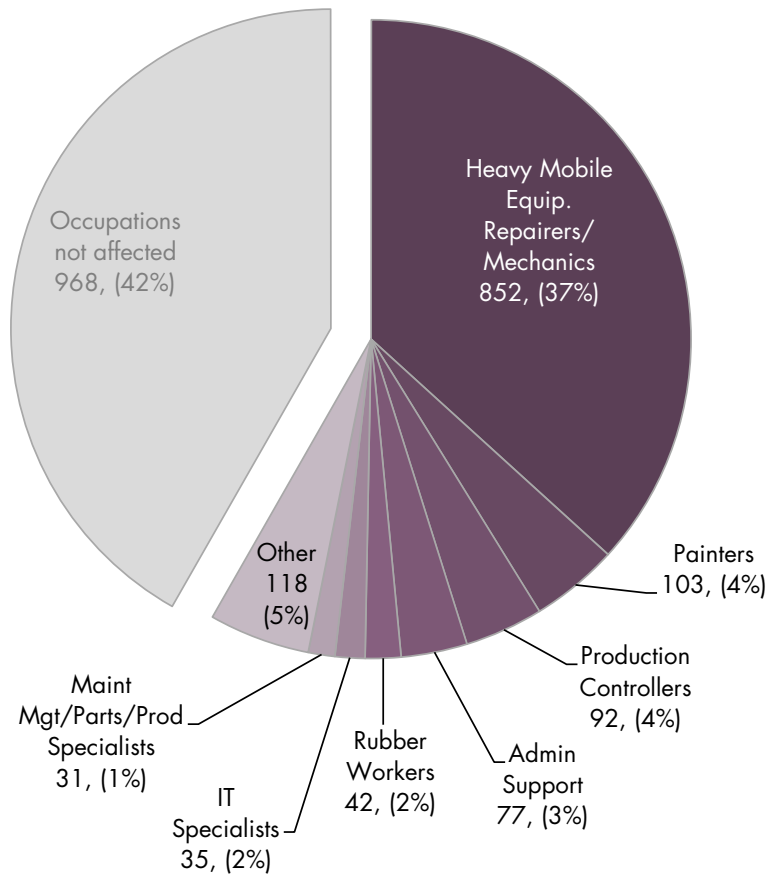
Within the employment figures provided, more than one-half of the workforce (58 percent) falls within the 15 occupations expected to be impacted by reductions in workload, according to figures supplied by RRAD.

- Heavy Mobile Equip Repairer/Mechanic
- Painter
- Production Controller
- Admin Support
- Rubber Worker
- IT Specialist
- Maint Mgt/Parts/Prod Specialist
- Welder
- Machinist/Mach Tool Opr
- Sandblaster
- Materials Examiner & Identifier
- Electroplater
- Forklift Operator
- Tractor Operator
- Pneudraulic Systems Mech

Figure 31 shows the distribution of the 1,350 workers in the affected occupations within the roughly 2,300 occupations for which information was provided. For this chart, data are shown at the individual occupation level and include the approximate number of positions as well as the share they comprise of the workforce. Below the figure, a table shows the job series number and the associated detailed occupation under the SOC system. Two of the job series titles—5704 Forklift Operator and 5705 Tractor Operator—are matched to the same occupation under the SOC system: Industrial Truck and Tractor Operators (SOC 53-7051). This reduces the number of occupations from 15 to 14.

FIGURE 31: DISTRIBUTION OF AFFECTED POSITIONS BY DETAILED OCCUPATION

WITH TRANSLATION OF FEDERAL CIVILIAN JOB SERIES TO SOC SYSTEM FOR AFFECTED POSITIONS



The 1,350 positions affected by workload reductions represent more than one-half (58 percent) of the total workforce for which data were provided.

Within this group, one occupation—heavy mobile equipment repairers and mechanics—accounts for nearly two-thirds (63 percent) of the affected workforce.

AS PROVIDED			TRANSLATION TO SOC SYSTEM	
Series	# of Jobs	Job Title	SOC Code	Description
5803	852	Heavy Mobile Equip Repairer/Mechanic	49-3042	Mobile Heavy Equip. Mechanics, Except Engines
4102	103	Painter	51-9122	Painters, Transportation Equipment
1152	92	Production Controller	11-3051	Industrial Production Managers
303	77	Admin Support	43-9199	Office/Admin. Support Workers, All Other
4301	42	Rubber Worker	51-9195	Molders, Shapers, and Casters, Except Metal/Plastic
2210	35	IT Specialist	15-1152	Computer Network Support Specialists
1101	31	Maint Mgt/Parts/Prod Specialist	13-1199	Business Operations Specialists, All Others
3703	23	Welder	51-4121	Welders, Cutters, Solderers, and Brazers
3414	20	Machinist/Mach Tool Opr	51-4041	Machinists
5423	20	Sandblaster	51-4199	Metal Workers and Plastic Workers, All Other
6912	19	Materials Examiner & Identifier	43-5081	Stock Clerks and Order Fillers
3711	13	Electroplater	51-4193	Plating/Coating Machine Wrks., Metal and Plastic
5704/05	13	Forklift/Tractor Operator	53-7051	Industrial Truck and Tractor Operators
8255	10	Pneudraulic Systems Mech	49-9012	Control and Valve Installers/Repairers

Source: RRAD (data on positions by federal job series), US Equal Employment Opportunity Commission (Federal Sector Occupation Cross-Classification Table, January 2013), TIP Strategies. Excludes 7 military positions.

Throughout the remainder of the document, the affected occupations are presented using the Standard Occupational Classification (SOC) system. The crosswalk provided in Figure 31 (page 39) can be used to refer back to the original job series number.

Figure 32 provides an overview of current employment in the 14 occupations within the region, along with an estimate of annual openings anticipated over the next five years due to net job growth and the replacement of existing workers. Stock Clerks and Order Fillers (SOC 43-5081) is the largest of the occupations in terms of employment across the 12 counties, representing nearly 1,500 jobs in 2013. Stock Clerks and Order Fillers are also anticipated to see the largest demand in the coming years based on estimated annual openings within the region. At slightly more than 50 openings projected annually, this position accounts for roughly one-quarter of annual openings anticipated among the affected occupations region-wide. However, it is also the lowest paying of the group, with a median hourly rate of \$9.76. The highest median wages—\$38.23 per hour—are paid to Industrial Production Managers (SOC 11-3051), although demand for this occupation is projected to be quite low, with just five openings per year projected annually in the region through 2018.

Of the 1,350 workers in affected positions, the majority (852 workers) were classified under a single occupation: Heavy Mobile Equipment Repairer/Mechanic (Job Series 5803). Under the SOC system, this occupation aligns most closely with **Mobile Heavy Equipment Mechanics (SOC 49-3042)**. Workers in this occupation diagnose, adjust, repair, or overhaul mobile mechanical, hydraulic, and pneumatic equipment—such as cranes, bulldozers, graders, and conveyors—used in construction, logging, and surface mining operations.

FIGURE 32: ESTIMATED EMPLOYMENT OF AFFECTED OCCUPATIONS IN THE REGION

RANKED BY ESTIMATED ANNUAL OPENINGS (2013-2018)

SOC CODE	DESCRIPTION	2013 JOBS	EST. ANNUAL OPENINGS 2013-2018	# AFFECTED RRAD WORKERS	RATIO WORKERS/ OPENINGS	MEDIAN HOURLY WAGE
43-5081	Stock Clerks and Order Fillers	1,476	53	19	0.4	\$9.76
51-4121	Welders, Cutters, Solderers, and Brazers	1,377	43	23	0.5	\$15.50
49-3042	Mobile Heavy Equipment Mechanics	1,268	40	852	21.3	\$22.01
53-7051	Industrial Truck and Tractor Operators	795	21	13	0.6	\$12.95
13-1199	Business Operations Specialists, All Other	572	13	31	2.4	\$27.18
51-4041	Machinists	301	13	20	1.5	\$18.14
11-3051	Industrial Production Managers	191	5	92	18.4	\$38.23
51-9122	Painters, Transportation Equipment	157	5	103	20.6	\$15.92
49-9012	Control and Valve Installers/Repairers	91	4	10	2.5	\$14.56
43-9199	Office and Admin. Support Workers, All Other	75	3	77	25.7	\$13.47
51-4193	Plating/Coating Machine Workers, Metal/Plastic	70	2	13	6.5	\$15.72
15-1152	Computer Network Support Specialists	62	2	35	17.5	\$19.22
51-9195	Molders, Shapers, and Casters, Exc. Metal/Plastic	48	2	42	21.0	\$13.08
51-4199	Metal Workers and Plastic Workers, All Other	31	1	20	20.0	\$15.75
Total (occupations shown)		6,514	207	1,350	6.5	

Source: EMSI Complete Employment 2014.2. Annual openings figures are EMSI’s estimates of anticipated demand created by net job growth and the replacement of existing workers over a five-year period (2013-2018). Ratio shows the number of workers per projected openings annually. **Gold shading** indicates affected occupations with more than 10 workers for each projected opening. **Blue-shaded** figures indicate hourly wage rates above the regional median of \$15.62.

The impacted heavy equipment workers represented roughly two-thirds (67 percent) of the more than 1,200 workers employed in SOC 49-3042 within the 12-county region in 2013. According to EMSI’s estimates, there are an average of 40 openings annually for this position in the region (including new hires and the replacement of existing workers). At that pace, it would take **more than 20 years** to re-employ the existing workers in the same occupation locally. This calculation suggests that retaining this skilled workforce will require the introduction of a new employer to the region or a targeted effort to help these workers transition to other occupations. Other occupations where the number of affected workers far exceeds the number of annual openings include office and administrative workers, painters, and molding and casting workers.

Education and training levels of RRAD workers were not available. In the absence of this information, a review of education and training requirements prepared by the U.S. Bureau of Labor Statistics is used to illustrate the types of preparation typically needed for entry into each occupation (Figure 33). Only two of the 14 positions typically require more than a high school diploma or GED, although several require an extended period of on-the-job training (OJT). In general, wage rates correspond to the level of education and training required. One exception to this pattern is Business Operation Specialists, All Other (SOC 13-1199) with a median hourly wage rate of \$27.18 despite having minimal education and training requirements. However, this broad category encompasses a variety of occupations which could skew the wage range.

FIGURE 33: EDUCATION AND TRAINING REQUIREMENTS FOR AFFECTED OCCUPATIONS

RANKED BY TYPICAL EDUCATION REQUIREMENTS FOR ENTRY INTO THE POSITION

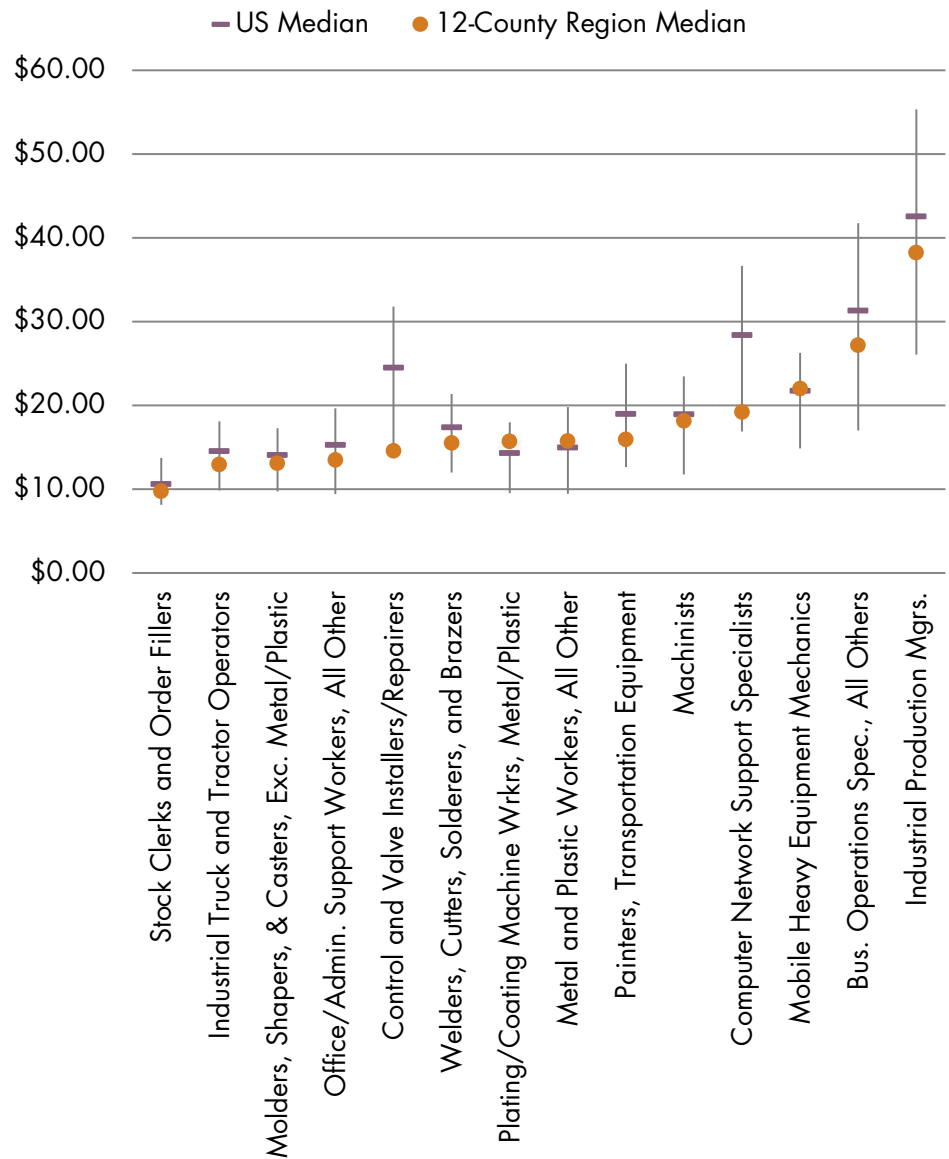
SOC CODE	DESCRIPTION	MEDIAN HOURLY WAGE	EDUCATION	EXPERIENCE	TRAINING
11-3051	Industrial Production Managers	\$38.23	Bachelor's degree	5+ years	None
15-1152	Computer Network Support Specialists	\$19.22	Associate's degree	None	None
49-3042	Mobile Heavy Equipment Mechanics	\$22.01	High school/GED	None	Long-term OJT
51-4041	Machinists	\$18.14	High school/GED	None	Long-term OJT
51-9195	Molders, Shapers and Casters, Exc. Metal/Plastic	\$13.08	High school/GED	None	Long-term OJT
51-4121	Welders, Cutters, Solderers, and Brazers	\$15.50	High school/GED	None	Moderate-term OJT
51-9122	Painters, Transportation Equipment	\$15.92	High school/GED	None	Moderate-term OJT
49-9012	Control and Valve Installers/Repairers	\$14.56	High school/GED	None	Moderate-term OJT
51-4193	Plating/Coating Machine Wrks., Metal/Plastic	\$15.72	High school/GED	None	Moderate-term OJT
51-4199	Metal Workers and Plastic Workers, All Other	\$15.75	High school/GED	None	Moderate-term OJT
43-9199	Office and Admin. Support Workers, All Other	\$13.47	High school/GED	None	Short-term OJT
13-1199	Business Operations Specialists, All Other	\$27.18	High school/GED	None	None
43-5081	Stock Clerks and Order Fillers	\$9.76	Less than HS	None	Short-term OJT
53-7051	Industrial Truck and Tractor Operators	\$12.95	Less than HS	None	Short-term OJT

Source: EMSI Complete Employment 2014.2. Annual openings figures are EMSI’s estimates of anticipated demand created by net job growth and the replacement of existing workers over a five-year period (2013-2018). **Shaded** figures indicate hourly wage rates above the regional median of \$15.62.

Median hourly wage rates for the affected occupations within the 12-county region are shown in Figure 34. To understand how regional rates compare with national rates, the local median (dot) and the US median (dash) are shown in the context of the national wage range (vertical line). Most of the 14 occupations have median hourly wage rates comparable to the national median. However, for some occupations, including Computer Network Support Specialists, regional rates are well below that of the US. The median hourly wage paid to Control and Valve Installers/Repairers in the region also diverges significantly from the US figure. But the wide pay range nationally for this occupation (from just under \$14/hour to nearly \$32/hour) suggests a diversity of roles and settings.

FIGURE 34: MEDIAN HOURLY WAGE RATE OF AFFECTED OCCUPATIONS RELATIVE TO US RANGE

MARKERS SHOW MEDIAN FOR US AND 12-COUNTY REGION; BAR SHOWS US RANGE*



Most of the 14 occupations have median wage rates comparable to the national median. However, for some occupations, including Computer Support Specialists, regional wage rates are well below that of the US.

The median hourly rate paid to Control and Valve Installers/Repairers in the region also diverges significantly from the US figure. But the wide range nationally for this occupation (from just under \$14/hour to nearly \$32/hour) suggests a diversity of roles and settings.

Source: EMSI Complete Employment 2014.2. *Bar shows national wage range from 10th to 90th percentile.

Interviews conducted in connection with this project point to the significantly higher wages paid at the Depot as a potentially serious obstacle in placing these workers with private-sector employers in the region. This issue, coupled with the sheer number of workers that would need to be re-employed quickly and the relatively small number of openings projected in the region each year, points to the need to investigate other compatible occupations for which the affected workers might be suited.

Data from the O*NET database was used to understand the skills and general work activities of the affected occupations. The database provides information on the broad skills required, as well as a rating of their importance based on employer surveys and input from knowledgeable analysts. Critical thinking topped the list of shared skills for the affected positions with an average importance of 3.27 on a five-point scale. Other skills that received an above-average importance rating (3.0 or greater) include judgment and decision-making, time management, and communication (speaking and listening). General work activities that are common to the affected positions align with these traits, with the ability to gather and communicate information deemed most important, followed by decision making and problem solving. Detailed information on work activities of the affected occupations are provided as part of the occupational profiles presented in Section 5.

ABOUT O*NET

The Occupational Information Network (O*NET) is a database of occupational requirements and worker attributes for more than 900 occupations. It describes occupations in terms of the skills and knowledge required, how the work is performed, and the typical work settings. O*NET information helps support the creation of industry competency models and is used by a range of workforce and education professionals to provide career guidance. The online database replaces the *Dictionary of Occupational Titles*, a printed handbook produced by the US Department of Labor Education and Training Administration, which was first published in 1938.

Information on tools and technologies used by various types of workers was recently incorporated the O*NET database for many occupations nationwide. An analysis of this information reveals that computers are typically used by all of the affected occupations for which data were available (Figure 35). Other commonly used tools include forklifts, welding equipment, and common power and hand tools (such as saws, screwdrivers, hammers, and wrenches). A variety of software packages comprised the list of the most common technologies required among these occupations. Widely used applications (such as database, spreadsheet, and word processing software) topped the list. A number of more specialized types of software were also common to several of the affected occupations, including those related to inventory management, project management, computer-aided design, and process control. A matrix of tools and technologies used by the affected occupations is provided in Appendix C.

FIGURE 35: TOP 20 TOOLS & TECHNOLOGIES FOR AFFECTED OCCUPATIONS

RANKED BY SHARE OF OCCUPATIONS THAT USE THEM (AMONG THOSE FOR WHICH DATA WERE AVAILABLE)

TOOLS		TECHNOLOGY	
1	Personal computers (incl. laptops/tablets)	1	Data base user interface and query software
2	Forklifts	2	Spreadsheet software
3	Adjustable wrenches	3	Word processing software
4	Blow torch	4	Electronic mail software
5	Calipers	5	Facilities management software
6	Screwdrivers	6	Inventory management software
7	Hammers	7	Office suite software
8	Micrometers	8	Project management software
9	Power drills	9	Analytical or scientific software
10	Power saws	10	Calendar and scheduling software
11	Squares	11	Computer aided design (CAD) software
12	Gas welding, brazing, or cutting apparatus	12	Document management software
13	Hoists	13	Industrial control software
14	Jacks	14	Backup or archival software
15	Ladders	15	Data base management system software
16	Metal inert gas welding machine	16	Development environment software
17	Mill saw file	17	Enterprise resource planning (ERP) software
18	Plasma arc welding machine	18	Operating system software
19	Pneumatic sanding machines	19	Presentation software
20	Power grinders	20	On-demand/remote access software

Source: O*NET database, version 18.1 (Commodity titles); TIP Strategies

Notes: Data unavailable for SOC 43-5081, SOC 43-9199, SOC 51-4193, and SOC 51-4199. Personal computers includes desktop computers, laptop computers, notebook computers, and tablet computers.

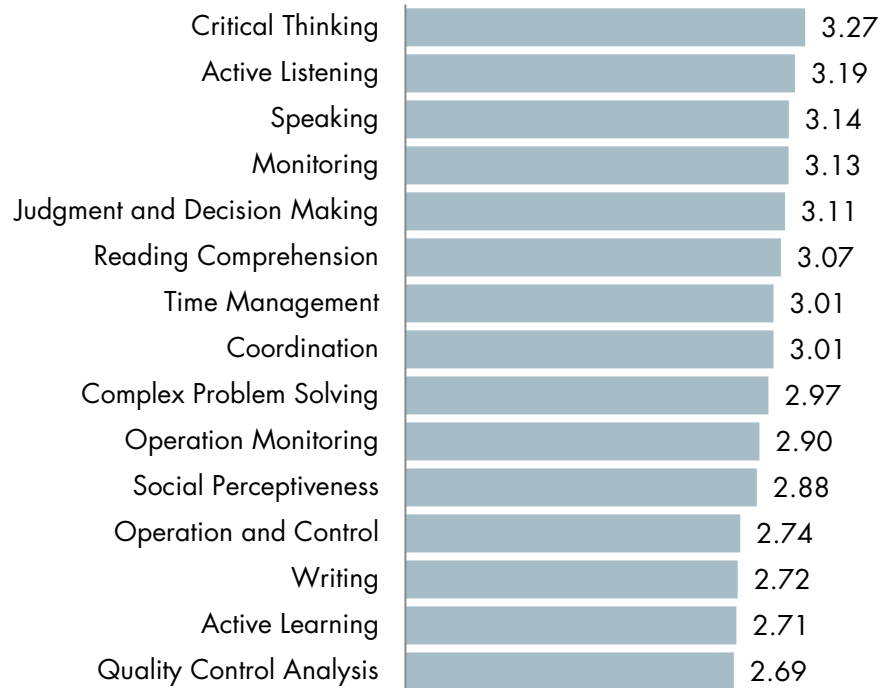
In addition to looking at skillsets and tools, we analyzed staffing patterns data to identify the types of industries that could employ the affected workers. This data is compiled by the U.S. Bureau of Labor Statistics as part of the preparation of the National Industry-Occupation Employment Matrix. The matrix is prepared by the BLS every other year as part of its ongoing Employment Projections program. The most recent matrix shows US employment levels for 2012 and projected employment for 2022 for approximately 300 detailed industries and 750 occupations. The data can be used to understand the employment opportunities for a particular **occupation** (for example, identifying all industries in which welders are employed). Alternately, it can be used to illustrate the staffing needs of a given **industry** (such as identifying the detailed occupations employed in the construction industry).

Results of the analysis for the largest affected occupation, Mobile Heavy Equipment Mechanics (SOC 49-3042), are presented in Figure 37 (page 47). As might be expected, establishments that rely on large-scale industrial and commercial equipment —including mining operations and equipment leasing establishments—were the most likely to have heavy equipment mechanics as a significant share of their workforce. When viewed as a source of employment, industrial machinery and equipment wholesaling was the largest single industry, employing roughly one in eight workers in the occupation nationwide (12.4 percent).

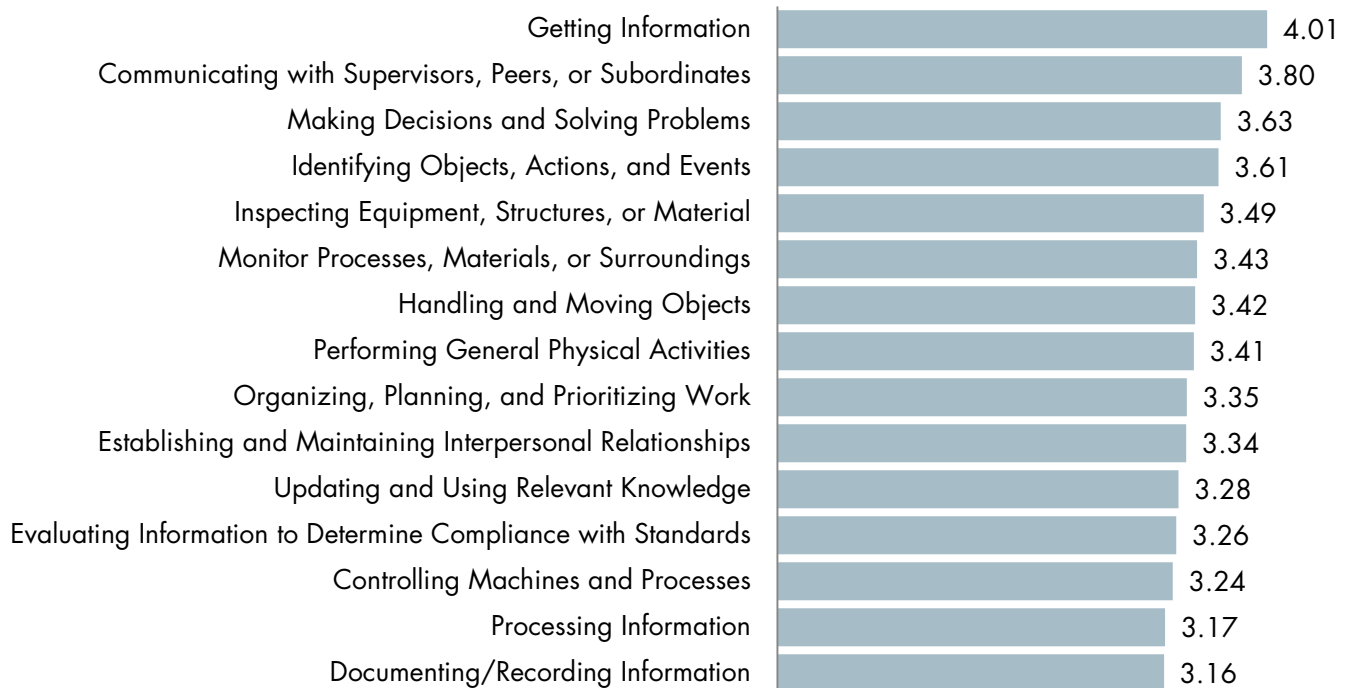
FIGURE 36: TOP SKILLS & WORK ACTIVITIES FOR AFFECTED OCCUPATIONS

RANKED BY AVERAGE LEVEL OF IMPORTANCE ON 5-POINT SCALE

TOP 15 SKILLS



TOP 15 WORK ACTIVITIES



Source: O*NET database, version 18.1; TIP Strategies

Appendix B contains the full results of the staffing patterns analysis. Industries that were common to multiple occupations include:

- **Transportation equipment** [including All Other Motor Vehicle Parts Mfg., NAICS 336399; Aircraft Mfg., NAICS 336411; Ship Building and Repairing, NAICS 336611; and Motor Vehicle Metal Stamping, NAICS 336370]
- **Metalworking** [including Machine Shops, NAICS 332710; Fabricated Structural Metal Mfg., NAICS 332312 Sheet Metal Work Mfg., NAICS 332322; and Metal Tank (Heavy Gauge) Mfg., NAICS 332420]
- **Machinery and equipment** [including Oil and Gas Field Machinery and Equipment Mfg., NAICS 333132; Construction Machinery Mfg., NAICS 333120; HVAC and Commercial/Industrial Refrigeration Equipment Mfg., NAICS 333415; and Farm Machinery and Equipment Mfg., NAICS 333111]
- **Wholesale distribution** [including Industrial Machinery and Equipment Merchant Wholesalers, NAICS 423830; Construction and Mining (except Oil Well) Machinery and Equip. Wholesalers, NAICS 423810; and Metal Service Centers and Other Metal Merchant Wholesalers, NAICS 423510]

The staffing patterns analysis also informed the target industry analysis outlined in Volume 1, Appendix B. The top industries for each of the affected occupations are presented as part of the profiles presented in Section 5.

A large pool of workers with similar skill sets can be an asset when recruiting a new industry to the region. When trying to place workers with existing employers, however, the sheer number of people looking for similar jobs can be a challenge. As workers transition out of employment at RRAD, an understanding of the transferability of their skillsets can highlight opportunities for future employment that may not be immediately apparent.

For this analysis, compatible occupations were identified using EMSI's Analyst tool. This tool identifies potential occupations for transitioning workers based on a Compatibility Index that assesses the degree of shared skills, knowledge, and abilities. TIP used data for the 12-county impact region to explore potential transition occupations for some of the largest groups that will be affected by workload reductions at RRAD. In an ideal scenario, the compatible occupations will have good earnings and strong job growth.

Compatible occupations were identified for 11 of the 14 occupations. Data were not available for SOC 13-1199 (Business Operations Specialists, All Others), SOC 43-9199 (Office and Administrative Support Workers, All Other), and SOC 51-4199 (Metal Workers and Plastic Workers, All Other). These "All Other" titles represent occupations with a wide range of characteristics. As a result, these positions do not meet the detailed definitions required to compile skills-related data.

Figure 38 (page 48) provides an example for Mobile Heavy Equipment Mechanics (SOC 49-3042), the occupation with the largest number of affected workers. The table shows the number of regional jobs in each of the compatible occupations, along with median hourly earnings, and the projected number of annual openings from 2013 to 2018. The occupations are ranked according to the number of projected openings. Occupations with median hourly wage rates above the affected occupation are highlighted. The top compatible occupations for each occupation are provided (where available) as part of the profiles presented in Section 5.

FIGURE 37: STAFFING PATTERNS FOR LARGEST AFFECTED OCCUPATION

MOBILE HEAVY EQUIPMENT MECHANICS (SOC 49-3042)

NAICS CODE	INDUSTRY	% OF OCCUP. WORKING IN INDUSTRY	OCCUP. SHARE OF TOTAL JOBS IN INDUSTRY
212210	Iron Ore Mining	0.4%	9.9%
212221	Gold Ore Mining	1.0%	8.1%
212234	Copper Ore & Nickel Ore Mining	0.8%	6.9%
532412	Construction, Mining, & Forestry Machinery & Equip. Rental/Leasing	3.7%	6.6%
532490	Other Commercial & Industrial Machinery & Equip. Rental/Leasing	3.0%	6.1%
423810	Constr. & Mining (except Oil Well) Machinery/Equip. Wholesalers	3.9%	5.8%
423840	Industrial Supplies Wholesalers	3.5%	4.9%
423830	Industrial Machinery & Equip. Wholesalers	12.4%	4.8%
423850	Service Establishment Equip. & Supplies Wholesalers	2.1%	4.8%
423860	Transportation Equip. & Supplies (except Motor Vehicle) Wholesalers	1.2%	4.4%
212111	Bituminous Coal & Lignite Surface Mining	1.1%	3.9%
212112	Bituminous Coal Underground Mining	1.3%	3.7%
811310	Commercial/Ind. Machinery & Equip. (except Auto/Electronic) Repair & Maint.	5.8%	3.1%
212321	Construction Sand & Gravel Mining	0.6%	2.8%
532310	General Rental Centers	0.8%	2.6%
212312	Crushed & Broken Limestone Mining/Quarrying	0.4%	2.5%
237310	Highway, Street, & Bridge Construction	4.5%	1.8%
113310	Logging	0.8%	1.3%
237110	Water & Sewer Line & Related Structures Construction	1.5%	1.2%
237120	Oil & Gas Pipeline & Related Structures Construction	1.3%	1.2%
237990	Other Heavy & Civil Engineering Construction	1.1%	1.2%
238990	All Other Specialty Trade Contractors	3.1%	0.8%
238910	Site Preparation Contractors	3.0%	0.8%
423820	Farm & Garden Machinery & Equip. Wholesalers	0.7%	0.8%
237130	Power & Communication Line & Related Structures Construction	0.9%	0.7%
213112	Support Activities for Oil & Gas Operations	1.3%	0.5%
561210	Facilities Support Services	0.4%	0.4%
901199	Federal Govt., Civilian, Excluding Postal Service	6.4%	0.3%
111000	Crop Production	2.0%	0.3%
238110	Poured Concrete Foundation & Structure Contractors	0.5%	0.3%
236220	Commercial & Institutional Building Construction	1.0%	0.2%
112000	Animal Production	0.8%	0.2%
903999	Local Govt., Excluding Education & Hospitals	6.4%	0.1%
902999	State Govt., Excluding Education & Hospitals	1.6%	0.1%
551114	Corporate, Subsidiary, & Regional Managing Offices	1.2%	0.1%
541330	Engineering Services	0.7%	0.1%
236118	Residential Remodelers	0.4%	0.1%

Source: National Industry-Occupation Employment Matrix (accessed via EMSI Complete Employment, 2014.2)

Among the most compatible occupations for Mobile Heavy Equipment Mechanics, only a handful have wage rates above the \$22.01 median hourly wages paid to workers in the occupation region-wide. However, the expected number of annual openings for these higher-paying positions is relatively small. Of the four higher-paying occupations, First-Line Supervisors of Production and Operating Workers (SOC 51-1011) are projected to have the highest levels of demand, with an average of 17 openings projected annually from 2013-2018. Projected demand is much higher for Automotive Mechanics/Technicians (SOC 49-3023) and Industrial Machinery Mechanics (SOC 49-9041), with each occupation expected to have an average of more than 40 openings annually in the region through 2018. Median wages for Industrial Machinery Mechanics are in line with the median wage rate for Mobile Heavy Equipment Mechanics. At \$15.85 per hour, however, the median wage rate paid to Automotive Mechanics/Technicians would represent a significant drop. Furthermore, the prevailing wage of Mobile Heavy Equipment Mechanics in the 12-county region may not compare with wage rates of RRAD workers performing similar functions. This discrepancy could make the prospect of transitioning to an area employer even more problematic.

FIGURE 38: COMPATIBLE OCCUPATIONS FOR MOBILE HEAVY EQUIPMENT MECHANICS

RANKED BY ESTIMATED ANNUAL OPENINGS, 2013-2018

SOC CODE	COMPATIBLE OCCUPATIONS	MEDIAN HOURLY EARNINGS	2013 JOBS	EST. ANNUAL OPENINGS (2013-2018)	COMPATIBILITY INDEX
49-3023	Automotive Service Technicians and Mechanics	\$15.85	992	43	96
49-9041	Industrial Machinery Mechanics	\$21.31	811	42	96
49-1011	First-Line Sprvrs., Mechanics, Installers, and Repairers	\$29.51	693	27	85
47-2111	Electricians	\$18.63	552	21	94
49-3031	Bus/Truck Mechanics and Diesel Engine Specialists	\$17.45	416	18	96
51-1011	First-Line Sprvrs., Production & Operating Workers	\$23.46	1,008	17	86
47-1011	First-Line Sprvrs., Construction & Extraction Workers	\$20.57	568	17	86
51-4041	Machinists	\$18.14	301	13	93
49-9051	Electrical Power-Line Installers and Repairers	\$25.49	158	12	94
49-3021	Automotive Body and Related Repairers	\$17.02	185	8	91
33-2011	Municipal Firefighters	\$18.82	234	8	89
51-8013	Power Plant Operators	\$29.44	125	7	92
49-3011	Aircraft Mechanics and Service Technicians	\$29.80	112	6	96
51-4011	CNC Machine Tool Operators, Metal and Plastic	\$20.44	152	6	95
47-2152	Plumbers, Pipefitters, and Steamfitters	\$17.75	236	6	93
51-9023	Mixing and Blending Machine Workers	\$21.01	188	6	91
51-8031	W/WW Treatment Plant and System Operators	\$15.64	146	6	89
51-4023	Rolling Machine Workers, Metal and Plastic	\$21.53	181	5	92
51-9041	Extruding, Forming, Compacting Machine Workers	\$17.05	181	5	88
51-9032	Cutting and Slicing Machine Workers	\$16.59	199	5	87

Source: EMSI Complete Employment, 2014.2

Note: Figure excludes occupations with (1) fewer than 25 jobs in 2013, (2) median hourly earnings below the regional median of \$15.62, and (3) fewer than 5 projected openings annually, 2013-2018. **Blue shading** shows occupations with median wage rates above the median wage rate of the affected occupation.

Figure 39 (page 50) summarizes the compatible occupations analysis for the affected workers in matrix form. The matrix crosswalks the affected occupations (columns) against occupations with compatible skills (rows). Data are shown for occupations that met the following criteria:

- Compatibility index above 85 with one or more affected positions
- Qualifying compatibility index with four or more of the affected occupations
- Median hourly wage rates exceeding the regional median (\$15.62 per hour)
- Employed 25 or more workers in the 12-county region in 2013
- Projected to have a minimum of five openings annually

Using the matrix format, one can easily see that some of the affected positions have the potential to transition to a broad range of occupations. Welders, for example, are compatible with all but one of the positions shown (with the blue marker indicating capability indices greater than 85) and would not experience a reduction in wages, based on reported median hourly wage rates in the region. (Blue shading indicates the compatible occupation has a median wage rate that is above that of the affected occupation.) Other occupations, in contrast, were compatible with a number of the same occupations, but would not be a likely candidate for transitioning due to a negative wage differential.

A number of production occupations (those with SOC Codes in the 51-0000 range) were compatible across several of the affected positions. However, these tended to have lower numbers of projected openings, making them less desirable as transition occupations. As with the prior example, Automotive Mechanics/Technicians (SOC 49-3023) and Industrial Machinery Mechanics (SOC 49-9041) have the highest demand levels, with each occupation expected to have an average of more than 40 openings annually in the region through 2018. The median wage rates for these occupations would be comparable for some positions, but would represent a step down for others. As mentioned previously, the higher wages paid to RRAD workers generally would also make transitioning to these compatible occupations more challenging. Furthermore, projected demand for some of these occupations may have been influenced historically by the operations at RRAD, raising the possibility that estimated annual demand is actually lower than indicated. Additional results for each occupation (where available) are shown as part the occupational profiles featured as Section 5.

FIGURE 39: MATRIX OF COMPATIBLE OCCUPATIONS

LEGEND					AFFECTED OCCUPATIONS										
■ Compatibility index of 85 or above															
■ Median hourly earnings for compatible occupation is greater than affected occupation															
— Compatible occupation is also affected occupation															
COMPATIBLE OCCUPATIONS															
SOC Code	Description	2013 Jobs	Est. Ann. Openings (2013-2018)	Median Hourly Earnings	\$15.50	\$14.56	\$18.14	\$22.01	\$13.08	\$15.72	\$12.95	\$15.92	\$19.22	\$38.23	\$9.76
					Welders, Cutters, and Welder Fitters	Control and Valve Installers/Repairers	Machinists	Mobile Heavy Equip. Mechanics	Molders & Casters, Exc. Metal/Plastic	Plating/Coating Machine, Metal/Plastic	Industrial Truck/Tractor Operators	Painters, Transportation Equipment	Computer User Support Specialists	Industrial Production Managers	Stock Clerks and Order Fillers
49-3023	Automotive Service Techs./Mechanics	992	43	\$15.85	■	■	■	■							
49-9041	Industrial Machinery Mechanics	811	42	\$21.31	■	■	■	■							
49-3042	Mobile Heavy Equip. Mechs., Exc. Engines	1268	40	\$22.01	■	■	■	—							
47-2111	Electricians	552	21	\$18.63	■	■	■	■							
49-3031	Bus/Truck Mechanics & Diesel Engine Spec.	416	18	\$17.45	■	■	■	■	■	■					
47-1011	1st-Line Sprvrs., Constr. & Extraction Wrkrs.	568	17	\$20.57	■	■	■	■					■	■	
51-1011	1st-Line Sprvrs., Prod. & Operating Wrkrs.	1008	17	\$23.46			■	■					■	■	
51-4041	Machinists	301	13	\$18.14	■	■	—	■	■	■	■	■			
49-9051	Electrical Power-Line Installers and Repairers	158	12	\$25.49	■	■	■	■	■						
43-5052	Postal Service Mail Carriers	340	11	\$23.43	■	■			■	■	■	■			■
49-3021	Automotive Body and Related Repairers	185	8	\$17.02	■	■	■	■	■	■	■	■			
51-8013	Power Plant Operators	125	7	\$29.44	■	■	■	■	■	■	■	■	■		
51-9197	Tire Builders	280	7	\$27.78	■	■	■		■	■	■	■			
51-2041	Structural Metal Fabricators and Fitters	157	7	\$18.35	■	■	■		■	■	■	■			
51-9023	Mixing and Blending Machine Workers	188	6	\$21.01	■	■	■	■	■	■	■	■			
47-2152	Plumbers, Pipefitters, and Steamfitters	236	6	\$17.75	■	■	■	■	■						
51-4011	CNC Machine Tool, Metal/Plastic	152	6	\$20.44	■	■	■	■	■						
51-8031	W/WW Treatment Plant and System Ops.	146	6	\$15.64	■	■	■	■							
49-3011	Aircraft Mechanics and Service Technicians	112	6	\$29.80		■	■	■							
53-1021	1st-Line Sprvrs., Helpers/Laborers	154	6	\$20.66		■							■	■	
51-9041	Extruding/Forming Machine Workers	181	5	\$17.05	■	■	■	■	■	■	■	■			
51-9032	Cutting and Slicing Machine Workers	199	5	\$16.59	■	■	■	■	■	■	■	■			
51-4023	Rolling Machine Workers, Metal/Plastic	181	5	\$21.53	■	■	■	■	■	■	■	■			
51-9122	Painters, Transportation Equipment	157	5	\$15.92	■	■	■		■	■	■	—			

Source: EMSI Complete Employment 2014.2

Notes: Detailed O*NET data, including information on compatible occupations, is not available for some job titles. Matrix is limited to occupations that have a compatibility index of 85 or above with at least three of the 11 occupations for which data were available. Matrix excludes occupations with (1) fewer than 25 jobs in 2013, (2) median hourly earnings below the regional median of \$15.62, and (3) fewer than 5 projected openings annually, 2013-2018.

REGIONAL WORKFORCE

To document the structure of the region's job base, individual occupations were ranked based on **size** (number of jobs in 2013), anticipated **growth rate** (in both numeric and percentage terms), and **wages**. While data for the assessment was presented at the occupational group level, the following analysis was conducted at the individual occupation level. Figure 40 (page 52) and Figure 41 (page 53) show the top 15 occupations as ranked by each indicator (among occupations employing 100 or more workers in the region 2013).

- **Largest.** Typically, the largest occupations in a region tend to be population-driven. Examples include retail salespersons, food service positions, and cashiers, as well as healthcare workers and teachers. This pattern generally holds true within the 12-county study area. Beyond these population-driven occupations, four industrial job titles—truck drivers, freight handlers, meat cutters, and maintenance workers—are among the region's top 15 largest occupations. Like most regions, the vast majority of the study area's largest occupations have relatively low wage rates, with only two occupations offering hourly wage rates in excess of the regional median of \$15.62 per hour.
- **Highest earning.** Medical professionals typically top the list of highest-earning occupations and the study area is no exception. Among occupations with 100 or more jobs in the region, doctors had the highest median hourly wage rate at more than \$100 per hour. Chief executives and other upper-level management positions dominated the region's top earning list, accounting for seven of the top 15. High-earning occupations outside the healthcare industry or management field (with median hourly earnings in parentheses) include Lawyers (\$46.18), Industrial Engineers (\$35.10), and Purchasing Agents (\$34.61). *[Note: Wage rates for some high-paying positions may be lower than typically shown in state and federal data sources, such as those produced by the Texas Workforce Commission and the U.S. Bureau of Labor Statistics. This discrepancy stems from the use of EMSI's complete data set, which includes estimates of self-employment. The addition of self-employed and independent workers can skew earnings in individual occupations where self-employment is common (such as lawyers and real estate brokers), as well as in occupational categories that include large numbers of independent workers. Management occupations are one example of the former point. Along with high-paying upper-level management jobs, this broad category includes farmers and ranchers—independent workers that typically have lower overall earnings.]*
- **Fastest growing.** The region's projected job gainers (in numeric terms) roughly mirror the largest occupations, with low-wage retail, food services, and healthcare workers topping the list (Figure 41, page 53). Elementary school teachers and supervisors of administrative support workers are the only positions among the 15 with wage rates above the regional median. When growth is defined in percentage terms, the number of positions paying above the median wage rate increases from two to six. These fast-growing, high-wage occupations include utility line workers, sales representatives, dental hygienists, and financial services workers.

FIGURE 40: TOP 15 OCCUPATIONS BASED ON SIZE AND EARNINGS

COMPARISON OF NUMBER OF JOBS AND MEDIAN HOURLY WAGES, 2013

LARGEST		
◀ Ranked by employment in 2013		
3,726	Retail Salespersons	\$9.60
3,435	Heavy and Tractor-Trailer Truck Drivers	\$15.14
3,280	Cashiers	\$8.81
3,257	Combined Food Prep./Serving Workers, Incl. Fast Food	\$8.35
2,766	Personal Care Aides	\$8.32
2,606	Laborers and Freight, Stock, and Material Movers, Hand	\$9.90
2,594	Office Clerks, General	\$10.52
2,484	Registered Nurses	\$26.07
2,129	Meat, Poultry, and Fish Cutters and Trimmers	\$10.14
2,113	Secretaries/Admin. Assistants, Exc. Legal, Medical, & Exec.	\$12.29
1,828	Nursing Assistants	\$10.29
1,824	Janitors and Cleaners, Except Maids and Housekeepers	\$8.74
1,715	Maintenance and Repair Workers, General	\$14.08
1,676	Elementary School Teachers, Except Special Education	\$19.49
1,603	Waiters and Waitresses	\$8.41

Like many regions across the US the largest occupations in the 12-county region (based on employment in 2013) include a number of low-wage population-driven positions, including retail, food service, and healthcare support workers.

HIGHEST-PAYING		
Ranked by median hourly wage ▶		
128	Physicians and Surgeons, All Other	\$108.46
220	Pharmacists	\$58.78
195	Chief Executives	\$47.49
273	Lawyers	\$46.18
117	Physical Therapists	\$41.07
191	Industrial Production Managers	\$38.23
117	Transportation, Storage, and Distribution Managers	\$36.59
251	Financial Managers	\$36.27
154	Industrial Engineers	\$35.10
247	Medical and Health Services Managers	\$34.62
187	Purchasing Agents, Exc. Wholesale, Retail, & Farm Products	\$34.61
1,537	General and Operations Managers	\$34.12
306	Education Administrators, Elementary/Secondary School	\$33.37
134	Mechanical Engineers	\$32.68
104	Logisticians	\$32.26

Management positions dominate the region's highest-paying list (among occupations with 100 or more jobs in 2013), accounting for seven of the top 15 slots. Healthcare professionals are also among the region's highest earners

Source: EMSI Complete Employment 2014.2

Note: Figures exclude occupations with fewer than 100 jobs in the 12-county region in 2013. Median hourly wage rates above the regional median of \$15.62 are bolded. Wage rates for some high-paying positions may be lower than typically shown in state and federal data sources, such as those produced by the Texas Workforce Commission and the U.S. Bureau of Labor Statistics. This discrepancy stems from the use of EMSI's complete data set, which includes estimates of self-employment. The addition of these workers can skew earnings in occupations where self-employment is common, such as lawyers, and among management positions, as this broad category includes independent workers, such as farmers and ranchers, which typically have lower overall earnings.

FIGURE 41: TOP 15 OCCUPATIONS BASED ON PROJECTED GROWTH (2013-2018)

COMPARISON OF CHANGE IN NUMERIC AND PERCENTAGE TERMS AND MEDIAN HOURLY WAGE RATES

FASTEST GROWING (#)		
◀ Ranked by projected net change, 2013-2018		
384	Personal Care Aides (2,766)	\$8.32
362	Combined Food Prep./Servers, Incl. Fast Food (3,257)	\$8.35
308	Retail Salespersons (3,726)	\$9.60
250	Heavy and Tractor-Trailer Truck Drivers (3,435)	\$15.14
165	Home Health Aides (798)	\$9.22
137	Waiters and Waitresses (1,603)	\$8.41
117	Construction Laborers (1,198)	\$11.01
115	Elementary School Teachers, Except Special Ed. (1,676)	\$19.49
94	Cooks, Restaurant (742)	\$8.76
88	Customer Service Representatives (1,019)	\$11.07
82	First-Line Supervisors of Food Prep./Serving Workers (852)	\$12.44
79	Janitors/Cleaners, Except Maids and Housekeepers (1,824)	\$8.74
69	Secr./Admin. Assts., Exc. Legal, Med., & Exec. (2,113)	\$12.29
67	First-Line Sprvsrs., Office/Admin. Support Workers (1,190)	\$18.77
64	Teacher Assistants (1,209)	\$8.55

With few exceptions, the fastest-growing jobs in the region in numeric terms are relatively low-paying jobs, with only two of the top 15 having a median hourly wage rate above the overall median of \$15.62.

FASTEST GROWING (%)		
◀ Ranked by projected percent change, 2013-2018		
20.7%	Home Health Aides (798)	\$9.22
14.3%	Phlebotomists (119)	\$11.34
13.9%	Electrical Power-Line Installers and Repairers (158)	\$25.49
13.9%	Personal Care Aides (2,766)	\$8.32
13.9%	Social and Human Service Assistants (209)	\$12.91
13.8%	Sales Representatives, Services, All Other (261)	\$19.23
13.3%	Securities, Commodities, & Fin. Svcs. Sales Agents (195)	\$22.68
12.7%	Cooks, Restaurant (742)	\$8.76
12.6%	Preschool Teachers, Except Special Education (348)	\$13.79
11.5%	Healthcare Social Workers (104)	\$22.88
11.5%	Dental Hygienists (157)	\$29.81
11.2%	Bill and Account Collectors (178)	\$12.29
11.1%	Food Prep./Serving Wrkrs., Incl. Fast Food (3,257)	\$8.35
11.1%	Loan Officers (217)	\$23.36
11.0%	Loan Interviewers and Clerks (173)	\$12.94

When viewed in percentage terms, the number of fast-growing occupations paying above the median wage improves. However, the largest of these fast-growing occupations (home health, personal care, cooks, and food service workers) offer wages well below the regional median.

Source: EMSI Complete Employment 2014.2

Note: Figures exclude occupations with fewer than 100 jobs in the 12-county region in 2013. Median hourly wage rates above the regional median of \$15.62 are bolded. Employment figures for the fastest growing occupations are shown in parenthesis.

An analysis of location quotients (LQs) reveals areas of specialization within the 12-county region. Occupational strengths include a wide range of manufacturing and material moving occupations. The presence of Cooper Tire's manufacturing facility in Miller County, Arkansas, is reflected by the exceptionally strong concentration of Tire Builders (SOC 51-9197) in the region, an occupation that accounts for roughly 15 percent of employment in the tire manufacturing industry. Extruding, Forming, Pressing, and Compacting Machine Workers (SOC 51-9041) is also a common position in the manufacture of tires, representing 7 percent of the industry workforce, which could help account for this occupation's higher-than-expected concentration and wage rates in the region.

The region's food processing strengths are also evident from the LQ analysis. Four of the top ten occupations with above-average employment levels in the region are related to this sector:

- Meat, Poultry, & Fish Cutters & Trimmers (SOC 51-3022)
- Food Processing Workers, All Other (SOC 51-3099)
- Slaughterers & Meat Packers (SOC 51-3023)
- Food/Tobacco Roasting & Drying Machine Workers (SOC 51-3091)

Combined employment in these four occupations alone within the 12-county region is in excess of 3,000. Wages are similar among the four job titles, with median hourly wages around \$10.00. When compared to the national median for the occupation, all are below the US level. While this can be a draw for industrial recruitment, it can be a detriment from the perspective of potential workers in the industry.

A number of the region's most specialized occupations are projected to have little or no demand in the coming years. Of the 40 positions shown in Figure 42 (page 55), 15 are expected to have fewer than five openings annually through 2018. Occupations with the largest number of projected openings among the highly concentrated occupations include:

- Meat, Poultry, & Fish Cutters & Trimmers (SOC 51-3022)
- Correctional Officers & Jailers (SOC 33-3012)
- Welders, Cutters, Solderers, & Brazers (SOC 51-4121)
- Industrial Machinery Mechanics (SOC 49-9041)
- Mobile Heavy Equip. Mechanics, Except Engines (SOC 49-3042)

Several of the affected occupations are also among those with high LQs. Along with the two listed above—welders and heavy equipment mechanics—other affected occupations with higher than expected concentration of employment include: Painters, Transportation Equipment (51-9122) and Control & Valve Installers/Repairers (SOC 49-9012). Given the sheer number of workers at RRAD, it is not surprising that employment levels in some of the facility's largest occupations would result in above-average concentration of those workers relative to the nation.

FIGURE 42: TOP EMPLOYMENT CONCENTRATIONS IN 12-COUNTY REGION

CHARACTERISTICS OF 40 OCCUPATIONS WITH HIGHEST LOCATION QUOTIENTS (LQS)

SOC CODE	DESCRIPTION	2013 LQ (US = 1.00)	2013 JOBS	EST. ANNUAL OPENINGS (2013-2018)	MEDIAN HRLY. WAGE RATE	
					12-COUNTY REGION	REL. TO US US=1.00
51-9197	Tire Builders	17.89	280	7	\$27.78	1.40
51-3022	Meat, Poultry, & Fish Cutters & Trimmers	14.75	2,129	68	\$10.14	0.92
45-4021	Fallers	13.05	100	4	\$20.27	1.25
49-3042	Mobile Heavy Equip. Mechanics, Except Engines	11.69	1,268	40	\$22.01	1.01
45-4022	Logging Equip. Operators	11.21	396	17	\$14.88	1.01
51-3099	Food Processing Workers, All Other	9.83	343	10	\$10.24	0.92
51-9051	Furnace, Kiln, Oven, Drier, & Kettle Operators & Tenders	8.04	146	4	\$20.64	1.21
51-3023	Slaughterers & Meat Packers	7.87	552	24	\$9.57	0.82
51-3091	Food/Tobacco Roasting & Drying Machine Workers	7.64	141	4	\$10.42	0.76
51-7041	Sawing Machine Workers, Wood	7.41	280	9	\$11.88	0.94
51-4023	Rolling Machine Workers, Metal & Plastic	5.65	181	5	\$21.53	1.20
51-9191	Adhesive Bonding Machine Operators & Tenders	4.65	69	3	\$17.94	1.25
51-9196	Paper Goods Machine Workers	4.47	376	14	\$14.46	0.87
51-4121	Welders, Cutters, Solderers, & Brazers	4.24	1,377	43	\$15.50	0.89
53-7063	Machine Feeders & Offbearers	4.17	399	9	\$11.03	0.85
51-9192	Cleaning, Washing, & Metal Pickling Equip. Workers	3.92	57	2	\$10.37	0.82
51-9032	Cutting & Slicing Machine Workers	3.89	199	5	\$16.59	1.10
49-3043	Rail Car Repairers	3.79	71	3	\$17.68	0.76
51-9198	Helpers--Production Workers	3.64	1,384	27	\$11.13	1.02
49-9044	Millwrights	3.55	125	4	\$18.86	0.79
51-8013	Power Plant Operators	3.49	125	7	\$29.44	0.93
51-9122	Painters, Transportation Equip.	3.38	157	5	\$15.92	0.84
33-1011	First-Line Supervisors of Correctional Officers	3.28	133	6	\$20.36	0.73
45-2041	Graders & Sorters, Agricultural Products	3.20	175	3	\$9.86	1.07
33-3012	Correctional Officers & Jailers	3.18	1,248	51	\$15.26	0.81
51-8021	Stationary Engineers & Boiler Operators	3.18	103	4	\$16.31	0.63
45-2093	Farmworkers, Farm, Ranch, & Aquacultural Animals	3.11	215	9	\$9.95	0.94
19-4011	Agricultural & Food Science Technicians	3.09	56	2	\$12.83	0.78
51-9021	Crushing, Grinding, & Polishing Machine Workers	3.01	79	2	\$14.38	0.94
51-9041	Extruding, Forming, & Compacting Machine Workers	2.96	181	5	\$17.05	1.13
49-9041	Industrial Machinery Mechanics	2.83	811	42	\$21.31	0.95
51-3092	Food Batchmakers	2.82	255	8	\$11.50	0.90
49-9043	Maintenance Workers, Machinery	2.80	232	5	\$14.76	0.76
11-9131	Postmasters & Mail Superintendents	2.67	54	1	\$26.98	0.90
31-1013	Psychiatric Aides	2.67	190	6	\$10.17	0.86
51-4022	Forging Machine Workers, Metal & Plastic	2.64	53	1	\$14.19	0.87
25-2032	Career/Tech. Ed. Teachers, Secondary School	2.59	190	7	\$23.49	0.89
51-7042	Woodworking Machine Workers, Except Sawing	2.55	142	3	\$14.40	1.11
49-9012	Control & Valve Installers/Repairers, Exc. Mechanical Door	2.52	91	4	\$14.56	0.59
51-3021	Butchers & Meat Cutters	2.50	308	9	\$11.43	0.83

Source: EMSI Complete Employment 2014.2. Excludes occupations with fewer than 50 jobs in the 12-county region in 2013.

Note: Blue shading shows occupations with median wage rates greater than the regional median of \$15.62.

Other occupations with high LQs and relatively high levels of demand not shown in Figure 42 include:

- Personal Care Aides (101 annual openings)
- Heavy & Tractor-Trailer Truck Drivers (139 annual openings)
- Tellers (55 annual openings)
- Elementary School Teachers, Except Special Education (63 annual openings)
- Nursing Assistants (54 annual openings)
- Laborers & Freight, Stock, & Material Movers, Hand (94 annual openings)

Within this list, only elementary school teachers had median hourly wage rates above that of the region. This occupation also tops the list in Figure 43, which presents specialized occupations that are both in demand and offer wages above the regional median. Education-related positions accounted for five of the 17 occupations, along with a range of mechanics and supervisory positions. Nurses, utility workers, expediting clerks, and postal carriers round out the list.

FIGURE 43: HIGH-DEMAND, HIGH-WAGE OCCUPATIONS IN THE 12-COUNTY REGION

RANKED BY ESTIMATED ANNUAL OPENINGS, 2013-2018

Specialized occupations (LQ>1.20) with at least 10 openings & hourly wage rates above the regional median

SOC CODE	DESCRIPTION	2013 LQ (US = 1.00)	2013 JOBS	EST. ANNUAL OPENINGS (2013-2018)	MEDIAN HRLY. WAGE RATE	
					12-COUNTY REGION	REL. TO US US=1.00
25-2021	Elementary School Teachers, Except Special Education	1.40	1,676	63	\$19.49	0.76
41-1011	First-Line Supervisors of Retail Sales Workers	1.22	1,587	52	\$16.17	0.97
25-2031	Secondary School Teachers, Exc. Special & Career/Tech. Ed.	1.63	1,361	50	\$21.25	0.80
29-2061	Licensed Practical & Licensed Vocational Nurses	1.83	1,214	45	\$16.42	0.82
49-3023	Automotive Service Technicians & Mechanics	1.52	992	43	\$15.85	0.97
49-9041	Industrial Machinery Mechanics	2.83	811	42	\$21.31	0.95
49-3042	Mobile Heavy Equip. Mechanics, Except Engines	11.69	1,268	40	\$22.01	1.01
25-2022	Middle School Teachers, Except Special & Career/Tech. Ed.	1.76	949	36	\$20.51	0.80
49-1011	First-Line Supervisors of Mechanics, Installers, & Repairers	1.78	693	27	\$29.51	1.02
49-3031	Bus & Truck Mechanics & Diesel Engine Specialists	1.90	416	18	\$17.45	0.88
51-1011	First-Line Supervisors of Production & Operating Workers	1.93	1,008	17	\$23.46	0.91
49-9051	Electrical Power-Line Installers & Repairers	1.55	158	12	\$25.49	0.84
43-5061	Production, Planning, & Expediting Clerks	1.52	392	12	\$19.55	0.93
11-9051	Food Service Managers	1.31	327	12	\$16.41	0.87
11-9032	Education Administrators, Elementary & Secondary School	1.54	306	11	\$33.37	0.79
43-5052	Postal Service Mail Carriers	1.34	340	11	\$23.43	0.86
25-2012	Kindergarten Teachers, Except Special Education	1.53	212	10	\$19.51	0.81

Source: EMSI Complete Employment 2014.2. Excludes occupations with fewer than 50 jobs in the 12-county region in 2013.

Note: Blue shading shows occupations with median wage rates greater than the regional median of \$15.62.

OCCUPATIONAL PROFILES



As part of the occupational analysis, we prepared detail profiles for each of the affected occupations—i.e., those positions identified by RRAD as skills that are “impacted by workload.” These 15 federal civilian job categories were matched to 14 occupational classifications within the more commonly used Standard Occupational Classification (SOC) system.

For each occupation, the profiles provide an overview of the position, along with sample of job titles commonly associated with the occupation, detailed tasks, skills, and general education and training requirements. This information is produced as part of an ongoing data collection effort undertaken by O*NET, the Occupational Information Network.

Detailed information was not available for a handful of occupations. In some cases, these occupations were part of an “All Other” classification. These occupational groups include a wide range of characteristics which do not fit into one of the O*NET definitions that are the basis for creating detailed information. Other occupations are in the process of being broken out into more specific occupations. For example, Welders, Cutters, Solderers, and Brazers (SOC 51-4121) is being divided into two separate occupations: 1) Welders, Cutters, and Welder Fitters, and 2) Solderers and Brazers. Detailed data, such as reported job titles, skills, and compatible occupations are not available for this type of title.

FIGURE 44: AFFECTED POSITIONS BY DETAILED OCCUPATION

WITH TRANSLATION OF FEDERAL CIVILIAN JOB SERIES TO SOC SYSTEM

AS PROVIDED			TRANSLATION TO SOC SYSTEM	
Series	# of Jobs	Job Title	SOC Code	Description
5803	852	Heavy Mobile Equip Repairer/Mechanic	49-3042	Mobile Heavy Equip. Mechanics, Except Engines
4102	103	Painter	51-9122	Painters, Transportation Equipment
1152	92	Production Controller	11-3051	Industrial Production Managers
303	77	Admin Support	43-9199	Office/Admin. Support Workers, All Other
4301	42	Rubber Worker	51-9195	Molders, Shapers, and Casters, Except Metal/Plastic
2210	35	IT Specialist	15-1152	Computer Network Support Specialists
1101	31	Maint Mgt/Parts/Prod Specialist	13-1199	Business Operations Specialists, All Others
3703	23	Welder	51-4121	Welders, Cutters, Solderers, and Brazers
3414	20	Machinist/Mach Tool Opr	51-4041	Machinists
5423	20	Sandblaster	51-4199	Metal Workers and Plastic Workers, All Other
6912	19	Materials Examiner & Identifier	43-5081	Stock Clerks and Order Fillers
3711	13	Electroplater	51-4193	Plating/Coating Machine Wrks., Metal and Plastic
5704/05	13	Forklift/Tractor Operator	53-7051	Industrial Truck and Tractor Operators
8255	10	Pneudraulic Systems Mech	49-9012	Control and Valve Installers/Repairers

Source: RRAD (data on positions by federal job series), US Equal Employment Opportunity Commission (Federal Sector Occupation Cross-Classification Table, January 2013), TIP Strategies. Excludes 7 military positions.

11-3051 INDUSTRIAL PRODUCTION MANAGERS *(Job Series 1152 Production Controller)*

Plan, direct, or coordinate the work activities and resources necessary for manufacturing products in accordance with cost, quality, and quantity specifications.

Sample of reported job titles: Area Plant Manager, General Production Manager, Manufacturing Coordinator, Manufacturing Manager, Plant Manager, Plant Senior Manager, Product Line Manager, Production Control Manager, Production Manager, Sub Plant Manager

Detailed tasks:

- Analyze data to inform operational decisions or activities.
- Approve expenditures.
- Conduct employee-training programs.
- Confer with organizational members to accomplish work activities.
- Coordinate special events or programs.
- Develop operating strategies, plans, or procedures.
- Develop organizational methods or procedures.
- Develop specifications for new products or processes.
- Direct facility maintenance or repair activities.
- Direct organizational operations, projects, or services.
- Direct sales, marketing, or customer service activities.
- Evaluate employee performance.
- Evaluate quality of materials or products.
- Hire personnel.
- Implement organizational process or policy changes.
- Maintain knowledge of current developments in area of expertise.
- Maintain personnel records.
- Manage control system activities in organizations.
- Monitor organizational procedures to ensure proper functioning.
- Negotiate sales or lease agreements for products or services.
- Prepare operational budgets.
- Prepare operational progress or status reports.
- Recommend organizational process or policy changes.

EMPLOYMENT OVERVIEW

(12-County Region)

2013 Employment	191
Change in employment from 2008	-36 ▼
Estimated annual openings, 2013-2018	5
Median hourly earning	\$38.23
Relative to US (US = 1.00)	0.90
Share of the occupation age 55+ years	22%

SKILLS

(Ranked by importance on 5-point scale)

1	Critical thinking	4.00
2	Monitoring	4.00
3	Speaking	4.00
4	Coordination	3.88
5	Time management	3.88
6	Active listening	3.75
7	Judgment and decision making	3.75
8	Reading comprehension	3.75
9	Management of personnel resources	3.62
10	Active learning	3.50

WORK ACTIVITIES

(Ranked by importance on 5-point scale)

1	Making decisions and solving problems	4.47
2	Communicating with supervisors, peers, or subordinates	4.38
3	Getting information	4.21
4	Guiding, directing, and motivating subordinates	4.18
5	Resolving conflicts and negotiating with others	4.17
6	Establishing/maintaining interpersonal relationships	4.15
7	Organizing, planning, and prioritizing work	4.12
8	Coordinating the work and activities of others	4.03
9	Scheduling work and activities	4.01
10	Identifying objects, actions, and events	4.00

Sources: O*NET Online and O*NET database, version 18.1, EMSI Complete Employment 2014.2 (employment overview)

11-3051 INDUSTRIAL PRODUCTION MANAGERS (Job Series 1152 Production Controller) **Cont.**

EDUCATION/PREPARATION

Typical requirements for entry

Education Bachelor's degree

Experience 5 or more years

Additional training None
required for competency

Job Zone A system for grouping occupations based on similar education, experience, and on-the-job training requirements needed to do the work.

Job Zone ●●●●○

Level of preparation Considerable
needed

Specific Vocational Preparation (SVP) Range: 7 to <8

The time required by a typical worker to learn the techniques, acquire the information, and develop the facility needed for average job performance

- 1. Short demonstration only
- 2. Anything beyond short demonstration up to and incl. 1 month
- 3. Over 1 month up to and including 3 months
- 4. Over 3 months up to and including 6 months
- 5. Over 6 months up to and including 1 year
- 6. Over 1 year up to and including 2 years
- 7. Over 2 years up to and including 4 years
- 8. Over 4 years up to and including 10 years
- 9. Over 10 years

COMPATIBLE OCCUPATIONS

(Ranked by estimated annual openings in region, 2013-2018)

SOC CODE	COMPATIBLE OCCUPATIONS	MEDIAN HOURLY EARNINGS	2013 JOBS	EST. ANNUAL OPENINGS (2013-2018)	COMPATIBILITY INDEX
11-1021	General and Operations Managers	\$34.12	1,537	47	92
49-1011	First-Line Sprvrs., Mechanics, Installers, and Repairers	\$29.51	693	27	89
51-1011	First-Line Sprvrs., Production and Operating Workers	\$23.46	1,008	17	92
47-1011	First-Line Sprvrs., Construction Trades/Extraction Workers	\$20.57	568	17	88
13-1199	Business Operations Specialists, All Other	\$27.18	572	13	86
11-9199	Managers, All Other	\$26.05	390	12	88
11-9111	Medical and Health Services Managers	\$34.62	247	11	87
11-3031	Financial Managers	\$36.27	251	9	87
53-1031	First-Line Sprvrs., Transp./Material-Moving Workers	\$27.64	190	9	89
11-9021	Construction Managers	\$22.25	342	9	89
11-2022	Sales Managers	\$30.98	175	7	89
11-3011	Administrative Services Managers	\$28.96	227	7	87
13-1111	Management Analysts	\$27.53	183	7	86
25-2032	Career/Technical Education Teachers, Secondary School	\$23.49	190	7	90
11-1011	Chief Executives	\$47.49	195	6	86
17-2112	Industrial Engineers	\$35.10	154	6	90
41-1012	First-Line Supervisors of Non-Retail Sales Workers	\$27.69	227	6	89
13-1051	Cost Estimators	\$23.73	117	6	89
53-1021	First-Line Sprvrs., Laborers, & Material Movers, Hand	\$20.66	154	6	89
13-1023	Purchasing Agents, Except Whsl./Retail/Farm Products	\$34.61	187	5	89

Sources: O*NET Online (Job Zone/SVP Range); EMSI Complete Employment 2014.2 (employment data, typical requirements for entry, and compatibility index). Blue shading shows occupations with median wage rates equal to or greater than the median wage rate of the affected occupation. For a description of the compatible occupation analysis, see pages 46 to 50.

11-3051 INDUSTRIAL PRODUCTION MANAGERS (Job Series 1152 Production Controller) **Cont.**

STAFFING PATTERNS

(Ranked by share the occupation represents of industry's total employment)

NAICS CODE	INDUSTRY	% WORKING IN THE INDUSTRY	% OF TOTAL INDUSTRY EMPLOYMENT
325211	Plastics Material and Resin Manufacturing	0.7%	2.1%
325199	All Other Basic Organic Chemical Manufacturing	0.4%	1.8%
325412	Pharmaceutical Preparation Manufacturing	2.1%	1.7%
325510	Paint and Coating Manufacturing	0.4%	1.7%
325998	All Other Miscellaneous Chemical Product and Preparation Manufacturing	0.4%	1.7%
332813	Electroplating, Plating, Polishing, Anodizing, and Coloring	0.6%	1.6%
332812	Metal Coating, Engraving (except Jewelry/Silverware), and Allied Svcs. to Mfg.	0.5%	1.5%
332722	Bolt, Nut, Screw, Rivet, and Washer Manufacturing	0.3%	1.5%
332721	Precision Turned Product Manufacturing	0.4%	1.5%
332116	Metal Stamping	0.5%	1.5%
322121	Paper (except Newsprint) Mills	0.5%	1.4%
333514	Special Die and Tool, Die Set, Jig, and Fixture Manufacturing	0.6%	1.4%
331111	Iron and Steel Mills	0.7%	1.4%
333511	Industrial Mold Manufacturing	0.3%	1.4%
326199	All Other Plastics Product Manufacturing	2.2%	1.3%
336350	Motor Vehicle Transmission and Power Train Parts Manufacturing	0.6%	1.3%
336312	Gasoline Engine and Engine Parts Manufacturing	0.4%	1.3%
327215	Glass Product Manufacturing Made of Purchased Glass	0.3%	1.3%
336370	Motor Vehicle Metal Stamping	0.6%	1.3%
333999	All Other Miscellaneous General Purpose Machinery Manufacturing	0.3%	1.3%
334220	Radio/TV Broadcasting and Wireless Communications Equipment Mfg.	0.4%	1.3%
324110	Petroleum Refineries	0.5%	1.2%
336322	Other Motor Vehicle Electrical and Electronic Equipment Manufacturing	0.3%	1.2%
336399	All Other Motor Vehicle Parts Manufacturing	1.0%	1.2%
332322	Sheet Metal Work Manufacturing	0.7%	1.2%
322211	Corrugated and Solid Fiber Box Manufacturing	0.7%	1.2%
332710	Machine Shops	2.1%	1.2%
333618	Other Engine Equipment Manufacturing	0.3%	1.2%
311511	Fluid Milk Manufacturing	0.4%	1.2%
334513	Instruments/Related Products Mfg. for Industrial Process Control	0.4%	1.2%
325620	Toilet Preparation Manufacturing	0.4%	1.2%
336360	Motor Vehicle Seating and Interior Trim Manufacturing	0.5%	1.2%
332999	All Other Miscellaneous Fabricated Metal Product Manufacturing	0.5%	1.2%
336412	Aircraft Engine and Engine Parts Manufacturing	0.6%	1.2%
312130	Wineries	0.3%	1.1%
336211	Motor Vehicle Body Manufacturing	0.4%	1.1%
332312	Fabricated Structural Metal Manufacturing	0.6%	1.1%
332313	Plate Work Manufacturing	0.3%	1.1%
311412	Frozen Specialty Food Manufacturing	0.4%	1.1%
334511	Aeronautical/Nautical Instrument Mfg. (Guidance, Navigation, etc.)	0.8%	1.1%

Source: EMSI Complete Employment 2014.2

13-1199 BUS. OPERATIONS SPECIALISTS, ALL OTHERS *(Job Series 1101 Maint Mgt/Parts/Prod Spec)*

All business operations specialists not listed separately.

“All Other” titles represent occupations with a wide range of characteristics which do not fit into one of the detailed O*NET-SOC occupations. O*NET data is not available for this type of title.

EMPLOYMENT OVERVIEW

(12-County Region)

2013 Employment	572
Change in employment from 2008	-56 ▼
Estimated annual openings, 2013-2018	13
Median hourly earning	\$27.18
Relative to US (US = 1.00)	0.87
Share of the occupation age 55+ years	21%

SKILLS

(Ranked by importance on 5-point scale)

1
2
3
4
5
6
7
8
9
10

WORK ACTIVITIES

(Ranked by importance on 5-point scale)

1
2
3
4
5
6
7
8
9
10

Sources: O*NET Online and O*NET database, version 18.1, EMSI Complete Employment 2014.2 (employment overview)

13-1199 BUS. OPERATIONS SPECIALISTS... (Job Series 1101 Maint Mgt/Parts/Prod Spec) *Cont.*

EDUCATION/PREPARATION

Typical requirements for entry

Education High school/GED

Experience None

Additional training required for competency None

Job Zone *A system for grouping occupations based on similar education, experience, and on-the-job training requirements needed to do the work.*

Job Zone

Level of preparation needed

Specific Vocational Preparation (SVP) Range

The time required by a typical worker to learn the techniques, acquire the information, and develop the facility needed for average job performance

- 1. Short demonstration only
- 2. Anything beyond short demonstration up to and incl. 1 month
- 3. Over 1 month up to and including 3 months
- 4. Over 3 months up to and including 6 months
- 5. Over 6 months up to and including 1 year
- 6. Over 1 year up to and including 2 years
- 7. Over 2 years up to and including 4 years
- 8. Over 4 years up to and including 10 years
- 9. Over 10 years

COMPATIBLE OCCUPATIONS
(Ranked by estimated annual openings in region, 2013-2018)

*“All Other” titles represent occupations with a wide range of characteristics which do not fit into one of the detailed O*NET-SOC occupations. O*NET data is not available for this type of title.*

Sources: O*NET Online (Job Zone/SVP Range); EMSI Complete Employment 2014.2 (employment data, typical requirements for entry, and compatibility index). Blue shading shows occupations with median wage rates equal to or greater than the median wage rate of the affected occupation. For a description of the compatible occupation analysis, see pages 46 to 50.

13-1199 BUS. OPERATIONS SPECIALISTS... (Job Series 1101 Maint Mgt/Parts/Prod Spec) Cont.

STAFFING PATTERNS

(Ranked by share the occupation represents of industry's total employment)

NAICS CODE	INDUSTRY	% WORKING IN THE INDUSTRY	% OF TOTAL INDUSTRY EMPLOYMENT
813930	Labor Unions and Similar Labor Organizations	1.4%	11.9%
901199	Federal Government, Civilian, Excluding Postal Service	18.1%	7.9%
813211	Grantmaking Foundations	0.5%	7.8%
813219	Other Grantmaking and Giving Services	0.3%	7.6%
813212	Voluntary Health Organizations	0.3%	7.5%
486110	Pipeline Transportation of Crude Oil	0.1%	6.5%
533110	Lessors of Nonfinancial Intangible Assets (except Copyrighted Works)	0.1%	5.5%
813920	Professional Organizations	0.4%	5.0%
813990	Other Similar Orgs. (except Business, Professional, Labor, and Political Org.)	0.5%	4.6%
813910	Business Associations	0.5%	4.5%
517210	Wireless Telecommunications Carriers (except Satellite)	0.7%	4.3%
541618	Other Management Consulting Services	0.4%	3.6%
813311	Human Rights Organizations	0.2%	3.5%
813319	Other Social Advocacy Organizations	0.3%	3.4%
541614	Process, Physical Distribution, and Logistics Consulting Services	0.4%	3.4%
541612	Human Resources Consulting Services	0.3%	3.4%
541620	Environmental Consulting Services	0.3%	3.3%
813312	Environment, Conservation and Wildlife Organizations	0.2%	3.2%
541690	Other Scientific and Technical Consulting Services	0.9%	3.2%
541613	Marketing Consulting Services	0.8%	3.1%
541611	Administrative Management and General Management Consulting Services	1.8%	3.1%
517919	All Other Telecommunications	0.1%	3.0%
517911	Telecommunications Resellers	0.2%	2.9%
517110	Wired Telecommunications Carriers	1.7%	2.8%
541910	Marketing Research and Public Opinion Polling	0.3%	2.8%
551114	Corporate, Subsidiary, and Regional Managing Offices	5.6%	2.7%
551112	Offices of Other Holding Companies	0.2%	2.7%
524130	Reinsurance Carriers	0.1%	2.7%
211111	Crude Petroleum and Natural Gas Extraction	0.5%	2.7%
519130	Internet Publishing and Broadcasting and Web Search Portals	0.4%	2.4%
561110	Office Administrative Services	1.2%	2.4%
524114	Direct Health and Medical Insurance Carriers	0.9%	2.3%
524113	Direct Life Insurance Carriers	0.7%	2.3%
541930	Translation and Interpretation Services	0.1%	2.3%
902999	State Government, Excluding Education and Hospitals	5.1%	2.2%
541712	Research and Dev. in the Physical, Engineering, and Life Sci. (except Biotechnology)	0.9%	2.1%
611430	Professional and Management Development Training (Private)	0.1%	2.1%
325412	Pharmaceutical Preparation Manufacturing	0.4%	2.0%
511210	Software Publishers	0.6%	2.0%
611710	Educational Support Services (Private)	0.3%	2.0%

Source: EMSI Complete Employment 2014.2

15-1152 COMPUTER NETWORK SUPPORT SPECIALISTS *(Job Series 2210 IT Specialist)*

Analyze, test, troubleshoot, and evaluate existing network systems, such as local area network (LAN), wide area network (WAN), and Internet systems or a segment of a network system. Perform network maintenance to ensure networks operate correctly with minimal interruption.

Sample of reported job titles: *This job title represents an occupation for which data collection is currently underway as part of the ongoing maintenance of the O*NET database. As a result, some detailed data points are not available for this occupation.*

Detailed tasks:

- Analyze network data to determine network usage, disk space availability, or server function.
- Configure and define parameters for installation or testing of local area network (LAN), wide area network (WAN), hubs, routers, switches, controllers, multiplexers, or related networking equipment.
- Configure security settings or access permissions for groups or individuals.
- Configure wide area network (WAN) or local area network (LAN) routers or related equipment.
- Document network support activities.
- Evaluate local area network (LAN) or wide area network (WAN) performance data to ensure sufficient availability or speed, to identify network problems, or for disaster recovery purposes.
- Identify the causes of networking problems, using diagnostic testing software and equipment.
- Install and configure wireless networking equipment.
- Install network software, including security or firewall software.
- Install new hardware or software systems or components, ensuring integration with existing network systems.

EMPLOYMENT OVERVIEW

(12-County Region)

2013 Employment	62
Change in employment from 2008	-4 ▼
Estimated annual openings, 2013-2018	2
Median hourly earning	\$19.22
Relative to US (US = 1.00)	0.68
Share of the occupation age 55+ years	8%

SKILLS

(Ranked by importance on 5-point scale)

1	Speaking	4.00
2	Active listening	4.00
3	Reading comprehension	3.88
4	Critical thinking	3.75
5	Writing	3.62
6	Complex problem solving	3.50
7	Time management	3.38
8	Judgment and decision making	3.25
9	Monitoring	3.25
10	Active learning	3.25

WORK ACTIVITIES

(Ranked by importance on 5-point scale)

1	Interacting with computers	4.95
2	Getting information	4.47
3	Making decisions and solving problems	4.42
4	Updating and using relevant knowledge	4.37
5	Communicating with supervisors, peers, or subordinates	4.29
6	Identifying objects, actions, and events	4.26
7	Processing information	3.87
8	Analyzing data or information	3.83
9	Establishing and maintaining interpersonal relationships	3.72
10	Organizing, planning, and prioritizing work	3.69

Sources: O*NET Online and O*NET database, version 18.1, EMSI Complete Employment 2014.2 (employment overview). This job title represents an occupation for which data collection is currently underway. Where applicable, data for a related occupation (SOC 15-1151 Computer User Support Specialist) was used.

15-1152 COMPUTER NETWORK SUPPORT SPECIALISTS *(Job Series 2210 IT Specialist)* **Cont.**

EDUCATION/PREPARATION

Typical requirements for entry

Education Associate’s degree

Experience None

Additional training required for competency None

Job Zone *A system for grouping occupations based on similar education, experience, and on-the-job training requirements needed to do the work.*

Job Zone

Level of preparation needed

Specific Vocational Preparation (SVP) Range

The time required by a typical worker to learn the techniques, acquire the information, and develop the facility needed for average job performance

- 1. Short demonstration only
- 2. Anything beyond short demonstration up to and incl. 1 month
- 3. Over 1 month up to and including 3 months
- 4. Over 3 months up to and including 6 months
- 5. Over 6 months up to and including 1 year
- 6. Over 1 year up to and including 2 years
- 7. Over 2 years up to and including 4 years
- 8. Over 4 years up to and including 10 years
- 9. Over 10 years

COMPATIBLE OCCUPATIONS
(Ranked by estimated annual openings in region, 2013-2018)

*“All Other” titles represent occupations with a wide range of characteristics which do not fit into one of the detailed O*NET-SOC occupations. O*NET data is not available for this type of title.*

Sources: O*NET Online (Job Zone/SVP Range); EMSI Complete Employment 2014.2 (employment data, typical requirements for entry, and compatibility index). Blue shading shows occupations with median wage rates equal to or greater than the median wage rate of the affected occupation. For a description of the compatible occupation analysis, see pages 46 to 50.

15-1152 COMPUTER NETWORK SUPPORT SPECIALISTS (Job Series 2210 IT Specialist) Cont.

STAFFING PATTERNS

(Ranked by share the occupation represents of industry's total employment)

NAICS CODE	INDUSTRY	% WORKING IN THE INDUSTRY	% OF TOTAL INDUSTRY EMPLOYMENT
517919	All Other Telecommunications	0.3%	2.4%
517911	Telecommunications Resellers	0.7%	2.3%
518210	Data Processing, Hosting, and Related Services	3.2%	2.2%
541513	Computer Facilities Management Services	0.7%	2.1%
541512	Computer Systems Design Services	10.0%	2.1%
541519	Other Computer Related Services	1.3%	2.1%
517110	Wired Telecommunications Carriers	6.6%	2.0%
541511	Custom Computer Programming Services	9.1%	2.0%
334119	Other Computer Peripheral Equipment Manufacturing	0.3%	1.9%
334111	Electronic Computer Manufacturing	0.9%	1.8%
511210	Software Publishers	2.7%	1.7%
517210	Wireless Telecommunications Carriers (except Satellite)	1.0%	1.2%
423430	Computer and Computer Peripheral Equip. and Software Merchant Wholesalers	1.3%	1.0%
423420	Office Equipment Merchant Wholesalers	0.5%	0.9%
423450	Medical, Dental, and Hospital Equipment and Supplies Merchant Wholesalers	1.0%	0.9%
551114	Corporate, Subsidiary, and Regional Managing Offices	5.1%	0.5%
519130	Internet Publishing and Broadcasting and Web Search Portals	0.4%	0.5%
522320	Financial Transactions Processing, Reserve, and Clearinghouse Activities	0.3%	0.5%
903612	Colleges, Universities, and Professional Schools (Local Government)	1.5%	0.4%
902612	Colleges, Universities, and Professional Schools (State Government)	5.0%	0.4%
561110	Office Administrative Services	1.2%	0.4%
524114	Direct Health and Medical Insurance Carriers	0.8%	0.4%
524113	Direct Life Insurance Carriers	0.5%	0.4%
541214	Payroll Services	0.4%	0.4%
541211	Offices of Certified Public Accountants	1.0%	0.4%
443112	Radio, Television, and Other Electronics Stores	0.5%	0.3%
211111	Crude Petroleum and Natural Gas Extraction	0.3%	0.3%
221122	Electric Power Distribution	0.3%	0.3%
541219	Other Accounting Services	0.6%	0.3%
541330	Engineering Services	1.4%	0.3%
611310	Colleges, Universities, and Professional Schools (Private)	2.5%	0.3%
561320	Temporary Help Services	2.3%	0.2%
522110	Commercial Banking	1.5%	0.2%
425120	Wholesale Trade Agents and Brokers	0.7%	0.2%
561422	Telemarketing Bureaus and Other Contact Centers	0.5%	0.2%
522130	Credit Unions	0.3%	0.2%
902999	State Government, Excluding Education and Hospitals	2.6%	0.2%
561330	Professional Employer Organizations	0.4%	0.2%
541690	Other Scientific and Technical Consulting Services	0.3%	0.2%
541712	Research and Dev. in the Physical, Engineering, and Life Sci. (except Biotechnology)	0.6%	0.2%

Source: EMSI Complete Employment 2014.2

43-5081 STOCK CLERKS & ORDER FILLERS *(Job Series 6912 Materials Examiner & Identifier)*

Receive, store, and issue materials, equipment, and other items from stockroom, warehouse, or storage yard. Keep records and compile stock reports.

Sample of reported job titles: Stock Clerk, Stocker, Bay Stocker, Material Handler, Order Selector, Shipper/Receiver, Stockroom Clerk, Warehouse Representative, Warehouse Worker, Warehouseman

Detailed tasks:

- Receive and count stock items, and record data manually or using computer.
- Pack and unpack items to be stocked on shelves in stockrooms, warehouses, or storage yards.
- Verify inventory computations by comparing them to physical counts of stock, and investigate discrepancies or adjust errors.
- Store items in an orderly and accessible manner in warehouses, tool rooms, supply rooms, or other areas.
- Mark stock items using identification tags, stamps, electric marking tools, or other labeling equipment.
- Clean and maintain supplies, tools, equipment, and storage areas to ensure compliance with safety regulations.
- Determine proper storage methods, identification, and stock location based on turnover, environmental factors, and physical capabilities of facilities.
- Keep records on the use or damage of stock or stock-handling equipment.
- Examine and inspect stock items for wear or defects, reporting any damage to supervisors.
- Provide assistance or direction to other stockroom, warehouse, or storage yard workers.

EMPLOYMENT OVERVIEW

(12-County Region)

2013 Employment	1,476
Change in employment from 2008	-140 ▼
Estimated annual openings, 2013-2018	53
Median hourly earning	\$9.76
Relative to US (US = 1.00)	0.92
Share of the occupation age 55+ years	15%

SKILLS

(Ranked by importance on 5-point scale)

1	Speaking	3.25
2	Active listening	3.25
3	Judgment and decision making	3.25
4	Monitoring	3.12
5	Critical thinking	3.00
6	Time management	3.00
7	Service orientation	3.00
8	Complex problem solving	2.88
9	Coordination	2.88
10	Social perceptiveness	2.75

WORK ACTIVITIES

(Ranked by importance on 5-point scale)

1	Handling and Moving Objects	4.37
2	Performing General Physical Activities	4.10
3	Getting Information	3.61
4	Establishing and Maintaining Interpersonal Relationships	3.47
5	Communicating with Supervisors, Peers, or Subordinates	3.21
6	Performing for or Working Directly with the Public	3.07
7	Controlling Machines and Processes	3.01
8	Organizing, Planning, and Prioritizing Work	2.94
9	Identifying Objects, Actions, and Events	2.85
10	Processing Information	2.84

Sources: O*NET Online and O*NET database, version 18.1, EMSI Complete Employment 2014.2 (employment overview). Note: This job title represents a group of more specific emerging occupations. Detailed data are for emerging O*NET occupation: 53-4081.03 Stock Clerks-Stockroom, Warehouse, or Storage Yard

43-5081 STOCK CLERKS & ORDER FILLERS *(Job Series 6912 Materials Examiner & Identifier)* **Cont.**

EDUCATION/PREPARATION

Typical requirements for entry

Education Less than HS

Experience None

Additional training required for competency Short-term on-the-job training

Job Zone *A system for grouping occupations based on similar education, experience, and on-the-job training requirements needed to do the work.*

Job Zone ●○○○○

Level of preparation needed Little to none

Specific Vocational Preparation (SVP) Range: Below 4

The time required by a typical worker to learn the techniques, acquire the information, and develop the facility needed for average job performance

- 1. Short demonstration only
- 2. Anything beyond short demonstration up to and incl. 1 month
- 3. Over 1 month up to and including 3 months
- 4. Over 3 months up to and including 6 months
- 5. Over 6 months up to and including 1 year
- 6. Over 1 year up to and including 2 years
- 7. Over 2 years up to and including 4 years
- 8. Over 4 years up to and including 10 years
- 9. Over 10 years

COMPATIBLE OCCUPATIONS

(Ranked by estimated annual openings in region, 2013-2018)

SOC CODE	COMPATIBLE OCCUPATIONS	MEDIAN HOURLY EARNINGS	2013 JOBS	EST. ANNUAL OPENINGS (2013-2018)	COMPATIBILITY INDEX
43-9061	Office Clerks, General	\$10.52	2,594	71	84
51-3022	Meat, Poultry, and Fish Cutters and Trimmers	\$10.14	2,129	68	93
31-1014	Nursing Assistants	\$10.29	1,828	54	91
51-9198	Helpers-Production Workers	\$11.13	1,384	27	91
51-9061	Inspectors, Testers, Sorters, Samplers, and Weighers	\$13.83	901	23	93
51-2092	Team Assemblers	\$11.28	1,150	22	94
43-5071	Shipping, Receiving, and Traffic Clerks	\$14.23	626	21	92
43-3021	Billing and Posting Clerks	\$12.37	405	14	93
33-9032	Security Guards	\$10.06	446	13	95
53-3031	Driver/Sales Workers	\$10.50	363	12	94
47-2141	Painters, Construction and Maintenance	\$15.41	420	12	93
43-5052	Postal Service Mail Carriers	\$23.43	340	11	91
51-3021	Butchers and Meat Cutters	\$11.43	308	9	91
51-7041	Sawing Machine Workers, Wood	\$11.88	280	9	84
29-2071	Medical Records and Health Information Technicians	\$14.14	192	8	93
51-3092	Food Batchmakers	\$11.50	255	8	92
51-3011	Bakers	\$10.07	159	7	90
43-3051	Payroll and Timekeeping Clerks	\$14.11	169	6	83
51-9122	Painters, Transportation Equipment	\$15.92	157	5	84
43-3061	Procurement Clerks	\$16.78	124	5	83

Sources: O*NET Online (Job Zone/SVP Range); EMSI Complete Employment 2014.2 (employment data, typical requirements for entry, and compatibility index). Blue shading shows occupations with median wage rates equal to or greater than the median wage rate of the affected occupation. For a description of the compatible occupation analysis, see pages 46 to 50.

43-5081 STOCK CLERKS & ORDER FILLERS (Job Series 6912 Materials Examiner & Identifier) **Cont.**

STAFFING PATTERNS

(Ranked by share the occupation represents of industry's total employment)

NAICS CODE	INDUSTRY	% WORKING IN THE INDUSTRY	% OF TOTAL INDUSTRY EMPLOYMENT
452111	Department Stores (except Discount Department Stores)	5.4%	18.2%
452112	Discount Department Stores	8.1%	18.2%
445110	Supermarkets and Other Grocery (except Convenience) Stores	22.2%	16.5%
452910	Warehouse Clubs and Supercenters	11.6%	15.3%
445120	Convenience Stores	1.5%	15.1%
452990	All Other General Merchandise Stores	3.3%	14.9%
493190	Other Warehousing and Storage	0.2%	8.3%
493110	General Warehousing and Storage	2.8%	8.2%
493120	Refrigerated Warehousing and Storage	0.2%	7.9%
445310	Beer, Wine, and Liquor Stores	0.7%	7.7%
424130	Industrial and Personal Service Paper Merchant Wholesalers	0.2%	7.5%
424120	Stationery and Office Supplies Merchant Wholesalers	0.2%	7.5%
493130	Farm Product Warehousing and Storage	0.0%	7.5%
424110	Printing and Writing Paper Merchant Wholesalers	0.0%	7.4%
453310	Used Merchandise Stores	0.8%	6.9%
446110	Pharmacies and Drug Stores	2.1%	5.4%
424410	General Line Grocery Merchant Wholesalers	0.7%	5.3%
448140	Family Clothing Stores	1.3%	5.3%
424470	Meat and Meat Product Merchant Wholesalers	0.1%	5.3%
448110	Men's Clothing Stores	0.1%	5.3%
448120	Women's Clothing Stores	0.9%	5.3%
448130	Children's and Infants' Clothing Stores	0.2%	5.2%
424440	Poultry and Poultry Product Merchant Wholesalers	0.0%	5.2%
424490	Other Grocery and Related Products Merchant Wholesalers	0.6%	5.2%
424460	Fish and Seafood Merchant Wholesalers	0.1%	5.1%
424450	Confectionery Merchant Wholesalers	0.2%	5.1%
424420	Packaged Frozen Food Merchant Wholesalers	0.1%	5.1%
424480	Fresh Fruit and Vegetable Merchant Wholesalers	0.3%	5.1%
424920	Book, Periodical, and Newspaper Merchant Wholesalers	0.1%	5.1%
424940	Tobacco and Tobacco Product Merchant Wholesalers	0.1%	5.0%
448190	Other Clothing Stores	0.3%	5.0%
424430	Dairy Product (except Dried or Canned) Merchant Wholesalers	0.1%	5.0%
424950	Paint, Varnish, and Supplies Merchant Wholesalers	0.1%	5.0%
442299	All Other Home Furnishings Stores	0.4%	4.8%
424930	Flower, Nursery Stock, and Florists' Supplies Merchant Wholesalers	0.1%	4.8%
448150	Clothing Accessories Stores	0.2%	4.8%
423710	Hardware Merchant Wholesalers	0.2%	4.8%
423720	Plumbing and Heating Equipment and Supplies (Hydronics) Merchant Wholesalers	0.2%	4.8%
424990	Other Miscellaneous Nondurable Goods Merchant Wholesalers	0.2%	4.7%
423730	Warm Air Heating and Air-Conditioning Equipment and Supplies Merchant Wholesalers	0.2%	4.7%

Source: EMSI Complete Employment 2014.2

43-9199 OFFICE/ADMINISTRATIVE SUPPORT WORKERS, ALL OTHER *(Job Series 303 Admin Support)*

All office and administrative support workers not listed separately.

*“All Other” titles represent occupations with a wide range of characteristics which do not fit into one of the detailed O*NET-SOC occupations. O*NET data is not available for this type of title.*

EMPLOYMENT OVERVIEW

(12-County Region)

2013 Employment	75
Change in employment from 2008	-6 ▼
Estimated annual openings, 2013-2018	3
Median hourly earning	\$13.47
Relative to US (US = 1.00)	0.88
Share of the occupation age 55+ years	21%

SKILLS

(Ranked by importance on 5-point scale)

1
2
3
4
5
6
7
8
9
10

WORK ACTIVITIES

(Ranked by importance on 5-point scale)

1
2
3
4
5
6
7
8
9
10

Sources: O*NET Online and O*NET database, version 18.1, EMSI Complete Employment 2014.2 (employment overview).

43-9199 OFFICE/ADMINISTRATIVE SUPPORT WORKERS... *(Job Series 303 Admin Support)* **Cont.**

EDUCATION/PREPARATION

Typical requirements for entry

Education High school/GED
Experience None
Additional training required for competency Short-term on-the-job training

Job Zone *A system for grouping occupations based on similar education, experience, and on-the-job training requirements needed to do the work.*

Job Zone

Level of preparation needed

Specific Vocational Preparation (SVP) Range

The time required by a typical worker to learn the techniques, acquire the information, and develop the facility needed for average job performance

- 1. Short demonstration only
- 2. Anything beyond short demonstration up to and incl. 1 month
- 3. Over 1 month up to and including 3 months
- 4. Over 3 months up to and including 6 months
- 5. Over 6 months up to and including 1 year
- 6. Over 1 year up to and including 2 years
- 7. Over 2 years up to and including 4 years
- 8. Over 4 years up to and including 10 years
- 9. Over 10 years

COMPATIBLE OCCUPATIONS
(Ranked by estimated annual openings in region, 2013-2018)

*“All Other” titles represent occupations with a wide range of characteristics which do not fit into one of the detailed O*NET-SOC occupations. O*NET data is not available for this type of title.*

Sources: O*NET Online (Job Zone/SVP Range); EMSI Complete Employment 2014.2 (employment data, typical requirements for entry, and compatibility index). Blue shading shows occupations with median wage rates equal to or greater than the median wage rate of the affected occupation. For a description of the compatible occupation analysis, see pages 46 to 50.

43-9199 OFFICE/ADMINISTRATIVE SUPPORT WORKERS... (Job Series 303 Admin Support) **Cont.**

STAFFING PATTERNS

(Ranked by share the occupation represents of industry's total employment)

NAICS CODE	INDUSTRY	% WORKING IN THE INDUSTRY	% OF TOTAL INDUSTRY EMPLOYMENT
903612	Colleges, Universities, and Professional Schools (Local Government)	8.2%	3.6%
611210	Junior Colleges (Private)	0.7%	3.1%
611310	Colleges, Universities, and Professional Schools (Private)	13.9%	2.4%
902612	Colleges, Universities, and Professional Schools (State Government)	12.5%	1.6%
561110	Office Administrative Services	2.0%	1.3%
561410	Document Preparation Services	0.3%	1.2%
611710	Educational Support Services (Private)	0.5%	0.9%
511110	Newspaper Publishers	0.6%	0.9%
511120	Periodical Publishers	0.3%	0.7%
511130	Book Publishers	0.2%	0.7%
515120	Television Broadcasting	0.2%	0.6%
561499	All Other Business Support Services	0.2%	0.6%
561311	Employment Placement Agencies	0.5%	0.6%
541910	Marketing Research and Public Opinion Polling	0.2%	0.6%
903999	Local Government, Excluding Education and Hospitals	9.1%	0.5%
901199	Federal Government, Civilian, Excluding Postal Service	3.8%	0.5%
721120	Casino Hotels	0.4%	0.5%
524114	Direct Health and Medical Insurance Carriers	0.6%	0.5%
561320	Temporary Help Services	4.5%	0.5%
561330	Professional Employer Organizations	0.6%	0.5%
621511	Medical Laboratories	0.2%	0.4%
561990	All Other Support Services	0.3%	0.4%
902999	State Government, Excluding Education and Hospitals	2.8%	0.4%
541380	Testing Laboratories	0.2%	0.4%
541110	Offices of Lawyers	1.7%	0.4%
541990	All Other Professional, Scientific, and Technical Services	0.2%	0.4%
624310	Vocational Rehabilitation Services	0.4%	0.4%
524113	Direct Life Insurance Carriers	0.4%	0.4%
519130	Internet Publishing and Broadcasting and Web Search Portals	0.2%	0.4%
512110	Motion Picture and Video Production	0.3%	0.4%
524292	Third Party Administration of Insurance and Pension Funds	0.2%	0.3%
551114	Corporate, Subsidiary, and Regional Managing Offices	2.0%	0.3%
903611	Elementary and Secondary Schools (Local Government)	6.9%	0.3%
541690	Other Scientific and Technical Consulting Services	0.3%	0.3%
541712	Research and Dev. in the Physical, Engineering, and Life Sci. (except Biotechnology)	0.3%	0.2%
518210	Data Processing, Hosting, and Related Services	0.2%	0.2%
813110	Religious Organizations	0.8%	0.2%
517110	Wired Telecommunications Carriers	0.3%	0.2%
492110	Couriers and Express Delivery Services	0.3%	0.2%
541611	Administrative Management and General Management Consulting Services	0.4%	0.2%

Source: EMSI Complete Employment 2014.2

49-3042 MOBILE HEAVY EQUIPMENT MECHANICS, EXCEPT ENGINES *(Job Series 5803 Heavy Mobile Equip. Repairer Mechanic)*

Diagnose, adjust, repair, or overhaul mobile mechanical, hydraulic, and pneumatic equipment, such as cranes, bulldozers, graders, and conveyors, used in construction, logging, and surface mining.

Sample of reported job titles: Mechanic, Heavy Equipment Mechanic, Field Service Technician, Field Mechanic, Equipment Technician, Field Technician, Mobile Heavy Equipment Mechanic, Construction Equipment Mechanic, Heavy Equipment Technician, Diesel Mechanic

Detailed tasks:

- Repair and replace damaged or worn parts.
- Dismantle and reassemble heavy equipment using hoists and hand tools.
- Operate and inspect machines or heavy equipment to diagnose defects.
- Test mechanical products and equipment after repair or assembly to ensure proper performance and compliance with manufacturers' specifications.
- Clean, lubricate, and perform other routine maintenance work on equipment and vehicles.
- Read and understand operating manuals, blueprints, and technical drawings.
- Overhaul and test machines or equipment to ensure operating efficiency.
- Fit bearings to adjust, repair, or overhaul mobile mechanical, hydraulic, and pneumatic equipment.
- Diagnose faults or malfunctions to determine required repairs, using engine diagnostic equipment such as computerized test equipment and calibration devices.
- Examine parts for damage or excessive wear, using micrometers and gauges.

EMPLOYMENT OVERVIEW

(12-County Region)

2013 Employment	1,268
Change in employment from 2008	-87 ▼
Estimated annual openings, 2013-2018	40
Median hourly earning	\$22.01
Relative to US (US = 1.00)	1.01
Share of the occupation age 55+ years	18%

SKILLS

(Ranked by importance on 5-point scale)

1	Troubleshooting	4.00
2	Equipment maintenance	3.88
3	Repairing	3.88
4	Operation monitoring	3.75
5	Operation and control	3.50
6	Quality control analysis	3.50
7	Critical thinking	3.38
8	Equipment selection	3.25
9	Monitoring	3.12
10	Complex problem solving	3.12

WORK ACTIVITIES

(Ranked by importance on 5-point scale)

1	Repairing and maintaining mechanical equip.	4.45
2	Inspecting equipment, structures, or material	4.37
3	Operating vehicles, mechanized devices, or equipment	4.01
4	Getting information	3.95
5	Performing general physical activities	3.94
6	Controlling machines and processes	3.75
7	Identifying objects, actions, and events	3.71
8	Handling and moving objects	3.68
9	Updating and using relevant knowledge	3.62
10	Repairing and maintaining electronic equipment	3.56

Sources: O*NET Online and O*NET database, version 18.1, EMSI Complete Employment 2014.2 (employment overview).

49-3042 MOBILE HEAVY EQUIPMENT MECHANICS, EXCEPT ENGINES (Job Series 5803
Heavy Mobile Equip. Repairer Mechanic) **Cont.**

EDUCATION/PREPARATION

Typical requirements for entry

Education High school/GED

Experience None

Additional training Long-term on-the-job
required for competency training

Job Zone A system for grouping occupations based on similar education, experience, and on-the-job training requirements needed to do the work.

Job Zone ●●●○○

Level of preparation Medium
needed

Specific Vocational Preparation (SVP) Range: 6 to <7

The time required by a typical worker to learn the techniques, acquire the information, and develop the facility needed for average job performance

- 1. Short demonstration only
- 2. Anything beyond short demonstration up to and incl. 1 month
- 3. Over 1 month up to and including 3 months
- 4. Over 3 months up to and including 6 months
- 5. Over 6 months up to and including 1 year
- 6. Over 1 year up to and including 2 years
- 7. Over 2 years up to and including 4 years
- 8. Over 4 years up to and including 10 years
- 9. Over 10 years

COMPATIBLE OCCUPATIONS

(Ranked by estimated annual openings in region, 2013-2018)

SOC CODE	COMPATIBLE OCCUPATIONS	MEDIAN HOURLY EARNINGS	2013 JOBS	EST. ANNUAL OPENINGS (2013-2018)	COMPATIBILITY INDEX
49-3023	Automotive Service Technicians and Mechanics	\$15.85	992	43	96
49-9041	Industrial Machinery Mechanics	\$21.31	811	42	96
49-1011	First-Line Sprvrs., Mechanics, Installers, and Repairers	\$29.51	693	27	85
47-2111	Electricians	\$18.63	552	21	94
49-3031	Bus/Truck Mechanics and Diesel Engine Specialists	\$17.45	416	18	96
51-1011	First-Line Sprvrs., Production & Operating Workers	\$23.46	1,008	17	86
47-1011	First-Line Sprvrs., Construction & Extraction Workers	\$20.57	568	17	86
51-4041	Machinists	\$18.14	301	13	93
49-9051	Electrical Power-Line Installers and Repairers	\$25.49	158	12	94
49-3021	Automotive Body and Related Repairers	\$17.02	185	8	91
33-2011	Municipal Firefighters	\$18.82	234	8	89
51-8013	Power Plant Operators	\$29.44	125	7	92
49-3011	Aircraft Mechanics and Service Technicians	\$29.80	112	6	96
51-4011	CNC Machine Tool Operators, Metal and Plastic	\$20.44	152	6	95
47-2152	Plumbers, Pipefitters, and Steamfitters	\$17.75	236	6	93
51-9023	Mixing and Blending Machine Workers	\$21.01	188	6	91
51-8031	W/WW Treatment Plant and System Operators	\$15.64	146	6	89
51-4023	Rolling Machine Workers, Metal and Plastic	\$21.53	181	5	92
51-9041	Extruding, Forming, Compacting Machine Workers	\$17.05	181	5	88
51-9032	Cutting and Slicing Machine Workers	\$16.59	199	5	87

Sources: O*NET Online (Job Zone/SVP Range); EMSI Complete Employment 2014.2 (employment data, typical requirements for entry, and compatibility index). Blue shading shows occupations with median wage rates equal to or greater than the median wage rate of the affected occupation. For a description of the compatible occupation analysis, see pages 46 to 50.

49-3042 MOBILE HEAVY EQUIPMENT MECHANICS, EXCEPT ENGINES (Job Series 5803
Heavy Mobile Equip. Repairer Mechanic) **Cont.**

STAFFING PATTERNS

(Ranked by share the occupation represents of industry's total employment)

NAICS CODE	INDUSTRY	% WORKING IN THE INDUSTRY	% OF TOTAL INDUSTRY EMPLOYMENT
212210	Iron Ore Mining	0.4%	9.9%
212221	Gold Ore Mining	1.0%	8.1%
212234	Copper Ore and Nickel Ore Mining	0.8%	6.9%
532412	Construction, Mining, and Forestry Machinery and Equipment Rental and Leasing	3.7%	6.6%
532490	Other Commercial and Industrial Machinery and Equipment Rental and Leasing	3.0%	6.1%
423810	Constr. and Mining (except Oil Well) Machinery and Equip. Merchant Wholesalers	3.9%	5.8%
423840	Industrial Supplies Merchant Wholesalers	3.5%	4.9%
423850	Service Establishment Equipment and Supplies Merchant Wholesalers	2.1%	4.8%
423830	Industrial Machinery and Equipment Merchant Wholesalers	12.4%	4.8%
423860	Transportation Equipment and Supplies (except Motor Vehicle) Merchant Wholesalers	1.2%	4.4%
212111	Bituminous Coal and Lignite Surface Mining	1.1%	3.9%
212112	Bituminous Coal Underground Mining	1.3%	3.7%
811310	Commercial and Ind. Machinery and Equip. (except Auto. and Elect.) Repair and Maint.	5.8%	3.1%
212321	Construction Sand and Gravel Mining	0.6%	2.8%
532310	General Rental Centers	0.8%	2.6%
212312	Crushed and Broken Limestone Mining and Quarrying	0.4%	2.5%
237310	Highway, Street, and Bridge Construction	4.5%	1.8%
113310	Logging	0.8%	1.3%
237120	Oil and Gas Pipeline and Related Structures Construction	1.3%	1.2%
237110	Water and Sewer Line and Related Structures Construction	1.5%	1.2%
237990	Other Heavy and Civil Engineering Construction	1.1%	1.2%
238910	Site Preparation Contractors	3.0%	0.8%
423820	Farm and Garden Machinery and Equipment Merchant Wholesalers	0.7%	0.8%
238990	All Other Specialty Trade Contractors	3.1%	0.8%
237130	Power and Communication Line and Related Structures Construction	0.9%	0.7%
213112	Support Activities for Oil and Gas Operations	1.3%	0.5%
561210	Facilities Support Services	0.4%	0.4%
901199	Federal Government, Civilian, Excluding Postal Service	6.4%	0.3%
111000	Crop Production	2.0%	0.3%
238110	Poured Concrete Foundation and Structure Contractors	0.5%	0.3%
236220	Commercial and Institutional Building Construction	1.0%	0.2%
112000	Animal Production	0.8%	0.2%
902999	State Government, Excluding Education and Hospitals	1.6%	0.1%
551114	Corporate, Subsidiary, and Regional Managing Offices	1.2%	0.1%
903999	Local Government, Excluding Education and Hospitals	6.4%	0.1%
541330	Engineering Services	0.7%	0.1%
236118	Residential Remodelers	0.4%	0.1%

Source: EMSI Complete Employment 2014.2

49-9012 CONTROL AND VALVE INSTALLERS AND REPAIRERS, EXCEPT MECHANICAL DOOR *(Job Series 8255 Pneudraulic Systems Mech)*

Install, repair, and maintain mechanical regulating and controlling devices, such as electric meters, gas regulators, thermostats, safety and flow valves, and other mechanical governors.

Sample of reported job titles: Valve Technician; Measurement Technician; Meter Technician; Electric Meter Technician; Instrument and Electrical Technician (I & E Technician); Instrument Technician; Control Valve Technician; Instrument and Controls Technician; Instrument, Control and Electrical Technician (ICE Technician); Maintenance Technician

Detailed tasks:

- Turn meters on or off to establish or close service.
- Turn valves to allow measured amounts of air or gas to pass through meters at specified flow rates.
- Report hazardous field situations and damaged or missing meters.
- Record meter readings and installation data on meter cards, work orders, or field service orders, or enter data into hand-held computers.
- Connect regulators to test stands, and turn screw adjustments until gauges indicate that inlet and outlet pressures meet specifications.
- Disassemble and repair mechanical control devices or valves, such as regulators, thermostats, or hydrants, using power tools, hand tools, and cutting torches.
- Record maintenance information, including test results, material usage, and repairs made.
- Disconnect or remove defective or unauthorized meters, using hand tools.
- Lubricate wearing surfaces of mechanical parts, using oils or other lubricants.
- Test valves and regulators for leaks and accurate temperature and pressure settings, using precision testing equipment.

EMPLOYMENT OVERVIEW

(12-County Region)

2013 Employment	91
Change in employment from 2008	9 ▲
Estimated annual openings, 2013-2018	4
Median hourly earning	\$14.56
Relative to US (US = 1.00)	0.59
Share of the occupation age 55+ years	29%

SKILLS

(Ranked by importance on 5-point scale)

1	Operation monitoring	3.25
2	Critical thinking	3.25
3	Operation and control	3.12
4	Equipment maintenance	3.00
5	Monitoring	3.00
6	Complex problem solving	3.00
7	Active listening	3.00
8	Judgment and decision making	3.00
9	Troubleshooting	2.88
10	Repairing	2.88

WORK ACTIVITIES

(Ranked by importance on 5-point scale)

1	Making decisions and solving problems	4.02
2	Inspecting equipment, structures, or material	3.95
3	Getting information	3.74
4	Operating vehicles, mechanized devices, or equipment	3.72
5	Performing general physical activities	3.64
6	Performing for or working directly with the public	3.58
7	Repairing and maintaining mechanical equipment	3.47
8	Communicating with supervisors, peers, or subordinates	3.47
9	Documenting/recording information	3.46
10	Identifying objects, actions, and events	3.42

Sources: O*NET Online and O*NET database, version 18.1, EMSI Complete Employment 2014.2 (employment overview).

49-9012 CONTROL AND VALVE INSTALLERS AND REPAIRERS, EXCEPT MECHANICAL DOOR (Job Series 8255 Pneudraulic Systems Mech) **Cont.**

EDUCATION/PREPARATION

Typical requirements for entry

Education High school/GED

Experience None

Additional training Moderate-term on-the-job required for competency training

Job Zone A system for grouping occupations based on similar education, experience, and on-the-job training requirements needed to do the work.

Job Zone ●●●○○

Level of preparation Medium needed

Specific Vocational Preparation (SVP) Range: 6 to <7

The time required by a typical worker to learn the techniques, acquire the information, and develop the facility needed for average job performance

- 1. Short demonstration only
- 2. Anything beyond short demonstration up to and incl. 1 month
- 3. Over 1 month up to and including 3 months
- 4. Over 3 months up to and including 6 months
- 5. Over 6 months up to and including 1 year
- 6. Over 1 year up to and including 2 years
- 7. Over 2 years up to and including 4 years
- 8. Over 4 years up to and including 10 years
- 9. Over 10 years

COMPATIBLE OCCUPATIONS

(Ranked by estimated annual openings in region, 2013-2018)

SOC CODE	COMPATIBLE OCCUPATIONS	MEDIAN HOURLY EARNINGS	2013 JOBS	EST. ANNUAL OPENINGS (2013-2018)	COMPATIBILITY INDEX
49-3023	Automotive Service Technicians and Mechanics	\$15.85	992	43	91
49-9041	Industrial Machinery Mechanics	\$21.31	811	42	90
49-3042	Mobile Heavy Equipment Mechanics, Except Engines	\$22.01	1,268	40	89
47-2111	Electricians	\$18.63	552	21	87
49-3031	Bus and Truck Mechanics and Diesel Engine Specialists	\$17.45	416	18	96
47-1011	First-Line Sprvrs., Construction and Extraction Workers	\$20.57	568	17	89
51-1011	First-Line Sprvrs., Production and Operating Workers	\$23.46	1,008	17	85
51-4041	Machinists	\$18.14	301	13	93
49-9051	Electrical Power-Line Installers and Repairers	\$25.49	158	12	94
43-5052	Postal Service Mail Carriers	\$23.43	340	11	89
49-3021	Automotive Body and Related Repairers	\$17.02	185	8	95
15-1151	Computer User Support Specialists	\$18.38	228	8	86
29-2021	Dental Hygienists	\$29.81	157	8	85
51-8013	Power Plant Operators	\$29.44	125	7	96
51-2041	Structural Metal Fabricators and Fitters	\$18.35	157	7	92
51-9197	Tire Builders	\$27.78	280	7	90
51-9023	Mixing and Blending Machine Workers	\$21.01	188	6	95
51-8031	W/WW Treatment Plant and System Operators	\$15.64	146	6	94
47-2152	Plumbers, Pipefitters, and Steamfitters	\$17.75	236	6	93
51-4011	CNC Machine Tool Operators, Metal and Plastic	\$20.44	152	6	89

Sources: O*NET Online (Job Zone/SVP Range); EMSI Complete Employment 2014.2 (employment data, typical requirements for entry, and compatibility index). Blue shading shows occupations with median wage rates equal to or greater than the median wage rate of the affected occupation. For a description of the compatible occupation analysis, see pages 46 to 50.

49-9012 CONTROL AND VALVE INSTALLERS AND REPAIRERS, EXCEPT MECHANICAL DOOR (Job Series 8255 Pneudraulic Systems Mech) **Cont.**

STAFFING PATTERNS

(Ranked by share the occupation represents of industry's total employment)

NAICS CODE	INDUSTRY	% WORKING IN THE INDUSTRY	% OF TOTAL INDUSTRY EMPLOYMENT
221210	Natural Gas Distribution	19.3%	7.2%
486210	Pipeline Transportation of Natural Gas	2.6%	3.8%
221310	Water Supply and Irrigation Systems	2.9%	2.9%
221122	Electric Power Distribution	10.7%	2.2%
221112	Fossil Fuel Electric Power Generation	4.7%	2.0%
221121	Electric Bulk Power Transmission and Control	1.2%	1.9%
221113	Nuclear Electric Power Generation	2.4%	1.9%
454312	Liquefied Petroleum Gas (Bottled Gas) Dealers	0.5%	0.6%
454311	Heating Oil Dealers	0.5%	0.6%
237120	Oil and Gas Pipeline and Related Structures Construction	1.8%	0.5%
237110	Water and Sewer Line and Related Structures Construction	2.1%	0.5%
811310	Commercial and Ind. Machinery and Equip. (except Auto. and Elect.) Repair and Maint.	2.1%	0.4%
423720	Plumbing and Heating Equipment and Supplies (Hydronics) Merchant Wholesalers	0.6%	0.3%
454390	Other Direct Selling Establishments	0.8%	0.3%
423990	Other Miscellaneous Durable Goods Merchant Wholesalers	0.5%	0.3%
324110	Petroleum Refineries	0.5%	0.3%
423710	Hardware Merchant Wholesalers	0.5%	0.3%
423810	Construction and Mining (except Oil Well) Machinery and Equip. Merchant Wholesalers	0.5%	0.2%
211111	Crude Petroleum and Natural Gas Extraction	1.2%	0.2%
561990	All Other Support Services	1.2%	0.2%
423840	Industrial Supplies Merchant Wholesalers	0.5%	0.2%
423930	Recyclable Material Merchant Wholesalers	0.8%	0.2%
423830	Industrial Machinery and Equipment Merchant Wholesalers	1.8%	0.2%
238220	Plumbing, Heating, and Air-Conditioning Contractors	2.7%	0.1%
903999	Local Government, Excluding Education and Hospitals	16.9%	0.1%
425120	Wholesale Trade Agents and Brokers	1.7%	0.1%
901199	Federal Government, Civilian, Excluding Postal Service	2.8%	0.1%
541380	Testing Laboratories	0.6%	0.1%
541330	Engineering Services	1.0%	0.0%
238210	Electrical Contractors and Other Wiring Installation Contractors	0.7%	0.0%
551114	Corporate, Subsidiary, and Regional Managing Offices	0.7%	0.0%

Source: EMSI Complete Employment 2014.2

51-4041 MACHINISTS *(Job Series 3414 Machinist/Mach Tool Opr)*

Set up and operate a variety of machine tools to produce precision parts and instruments. Includes precision instrument makers who fabricate, modify, or repair mechanical instruments. May also fabricate and modify parts to make or repair machine tools or maintain industrial machines, applying knowledge of mechanics, mathematics, metal properties, layout, and machining procedures.

Sample of reported job titles: Gear Machinist, Journeyman Machinist, Machine Operator, Machine Repair Person, Machinist, Maintenance Machinist, Maintenance Specialist, Production Machinist, Set-Up Machinist, Tool Room Machinist

Detailed tasks:

- Calculate dimensions or tolerances, using instruments such as micrometers or vernier calipers.
- Machine parts to specifications, using machine tools, such as lathes, milling machines, shapers, or grinders.
- Set up, adjust, or operate basic or specialized machine tools used to perform precision machining operations.
- Align and secure holding fixtures, cutting tools, attachments, accessories, or materials onto machines.
- Measure, examine, or test completed units to check for defects and ensure conformance to specifications, using precision instruments, such as micrometers.
- Monitor the feed and speed of machines during the machining process.
- Maintain machine tools in proper operational condition.
- Study sample parts, blueprints, drawings, or engineering information to determine methods or sequences of operations needed to fabricate products.
- Operate equipment to verify operational efficiency.
- Check work pieces to ensure that they are properly lubricated or cooled.

EMPLOYMENT OVERVIEW

(12-County Region)

2013 Employment	301
Change in employment from 2008	-41 ▼
Estimated annual openings, 2013-2018	13
Median hourly earning	\$18.14
Relative to US (US = 1.00)	0.96
Share of the occupation age 55+ years	24%

SKILLS

(Ranked by importance on 5-point scale)

1	Operation monitoring	3.25
2	Critical thinking	3.12
3	Operation and control	3.12
4	Monitoring	3.00
5	Active listening	3.00
6	Reading comprehension	3.00
7	Coordination	3.00
8	Complex problem solving	2.88
9	Judgment and decision making	2.88
10	Speaking	2.88

WORK ACTIVITIES

(Ranked by importance on 5-point scale)

1	Getting information	4.07
2	Controlling machines and processes	3.96
3	Making decisions and solving problems	3.64
4	Communicating with supervisors, peers, or subordinates	3.56
5	Handling and moving objects	3.50
6	Inspecting equipment, structures, or material	3.41
7	Updating and using relevant knowledge	3.36
8	Processing information	3.35
9	Performing general physical activities	3.31
10	Identifying objects, actions, and events	3.29

Sources: O*NET Online and O*NET database, version 18.1, EMSI Complete Employment 2014.2 (employment overview).

51-4041 MACHINISTS (Job Series 3414 Machinist/Mach Tool Opr) **Cont.**

EDUCATION/PREPARATION

Typical requirements for entry

Education High school/GED

Experience None

Additional training Long-term on-the-job
required for competency training

Job Zone A system for grouping occupations based on similar education, experience, and on-the-job training requirements needed to do the work.

Job Zone ●●●○○

Level of preparation Medium
needed

Specific Vocational Preparation (SVP) Range: 6 to <7

The time required by a typical worker to learn the techniques, acquire the information, and develop the facility needed for average job performance

- 1. Short demonstration only
- 2. Anything beyond short demonstration up to and incl. 1 month
- 3. Over 1 month up to and including 3 months
- 4. Over 3 months up to and including 6 months
- 5. Over 6 months up to and including 1 year
- 6. Over 1 year up to and including 2 years
- 7. Over 2 years up to and including 4 years
- 8. Over 4 years up to and including 10 years
- 9. Over 10 years

COMPATIBLE OCCUPATIONS

(Ranked by estimated annual openings in region, 2013-2018)

SOC CODE	COMPATIBLE OCCUPATIONS	MEDIAN HOURLY EARNINGS	2013 JOBS	EST. ANNUAL OPENINGS (2013-2018)	COMPATIBILITY INDEX
49-3023	Automotive Service Technicians and Mechanics	\$15.85	992	43	90
49-9041	Industrial Machinery Mechanics	\$21.31	811	42	94
49-3042	Mobile Heavy Equipment Mechanics, Except Engines	\$22.01	1,268	40	91
47-2111	Electricians	\$18.63	552	21	90
49-3031	Bus and Truck Mechanics and Diesel Engine Specialists	\$17.45	416	18	94
51-1011	First-Line Sprvrs., Production and Operating Workers	\$23.46	1,008	17	90
49-9051	Electrical Power-Line Installers and Repairers	\$25.49	158	12	93
49-3021	Automotive Body and Related Repairers	\$17.02	185	8	96
51-8013	Power Plant Operators	\$29.44	125	7	95
51-2041	Structural Metal Fabricators and Fitters	\$18.35	157	7	90
51-9197	Tire Builders	\$27.78	280	7	90
51-9023	Mixing and Blending Machine Workers	\$21.01	188	6	95
51-4011	CNC Machine Tool Operators, Metal and Plastic	\$20.44	152	6	95
47-2152	Plumbers, Pipefitters, and Steamfitters	\$17.75	236	6	94
49-3011	Aircraft Mechanics and Service Technicians	\$29.80	112	6	90
51-8031	W/WW Treatment Plant and System Operators	\$15.64	146	6	89
51-4023	Rolling Machine Workers, Metal and Plastic	\$21.53	181	5	96
51-9032	Cutting and Slicing Machine Workers	\$16.59	199	5	95
51-9041	Extruding, Forming, and Compacting Machine Workers	\$17.05	181	5	95
51-9122	Painters, Transportation Equipment	\$15.92	157	5	91

Sources: O*NET Online (Job Zone/SVP Range); EMSI Complete Employment 2014.2 (employment data, typical requirements for entry, and compatibility index). Blue shading shows occupations with median wage rates equal to or greater than the median wage rate of the affected occupation. For a description of the compatible occupation analysis, see pages 46 to 50.

51-4041 MACHINISTS *(Job Series 3414 Machinist/Mach Tool Opr)* **Cont.**

STAFFING PATTERNS

(Ranked by share the occupation represents of industry's total employment)

NAICS CODE	INDUSTRY	% WORKING IN THE INDUSTRY	% OF TOTAL INDUSTRY EMPLOYMENT
332710	Machine Shops	23.2%	32.1%
332721	Precision Turned Product Manufacturing	1.7%	17.2%
332722	Bolt, Nut, Screw, Rivet, and Washer Manufacturing	1.5%	16.3%
333516	Rolling Mill Machinery and Equipment Manufacturing	0.2%	15.5%
333515	Cutting Tool and Machine Tool Accessory Manufacturing	1.0%	15.2%
333518	Other Metalworking Machinery Manufacturing	0.3%	15.1%
333511	Industrial Mold Manufacturing	1.3%	14.8%
333513	Machine Tool (Metal Forming Types) Manufacturing	0.5%	14.8%
333512	Machine Tool (Metal Cutting Types) Manufacturing	0.9%	14.8%
333514	Special Die and Tool, Die Set, Jig, and Fixture Manufacturing	2.3%	14.6%
333611	Turbine and Turbine Generator Set Units Manufacturing	0.5%	8.2%
333612	Speed Changer, Industrial High-Speed Drive, and Gear Manufacturing	0.3%	8.0%
333613	Mechanical Power Transmission Equipment Manufacturing	0.3%	7.9%
333291	Paper Industry Machinery Manufacturing	0.1%	6.8%
333220	Plastics and Rubber Industry Machinery Manufacturing	0.2%	6.8%
333992	Welding and Soldering Equipment Manufacturing	0.2%	6.7%
333298	All Other Industrial Machinery Manufacturing	0.5%	6.7%
333994	Industrial Process Furnace and Oven Manufacturing	0.2%	6.7%
333996	Fluid Power Pump and Motor Manufacturing	0.3%	6.7%
333912	Air and Gas Compressor Manufacturing	0.3%	6.6%
333911	Pump and Pumping Equipment Manufacturing	0.5%	6.6%
333995	Fluid Power Cylinder and Actuator Manufacturing	0.3%	6.5%
333294	Food Product Machinery Manufacturing	0.3%	6.5%
333132	Oil and Gas Field Machinery and Equipment Manufacturing	1.2%	6.4%
333999	All Other Miscellaneous General Purpose Machinery Manufacturing	0.6%	6.4%
332911	Industrial Valve Manufacturing	0.4%	6.4%
333922	Conveyor and Conveying Equipment Manufacturing	0.5%	6.3%
332991	Ball and Roller Bearing Manufacturing	0.4%	6.3%
333993	Packaging Machinery Manufacturing	0.3%	6.3%
333618	Other Engine Equipment Manufacturing	0.6%	6.1%
333924	Industrial Truck, Tractor, Trailer, and Stacker Machinery Manufacturing	0.3%	6.1%
332996	Fabricated Pipe and Pipe Fitting Manufacturing	0.6%	6.1%
332994	Small Arms Manufacturing	0.2%	6.1%
332913	Plumbing Fixture Fitting and Trim Manufacturing	0.1%	6.0%
332912	Fluid Power Valve and Hose Fitting Manufacturing	0.5%	6.0%
336415	Guided Missile and Space Vehicle Propulsion Unit and Propulsion Unit Parts Mfg.	0.1%	5.9%
332999	All Other Miscellaneous Fabricated Metal Product Manufacturing	0.9%	5.8%
332212	Hand and Edge Tool Manufacturing	0.3%	5.8%
332919	Other Metal Valve and Pipe Fitting Manufacturing	0.2%	5.7%
333923	Overhead Traveling Crane, Hoist, and Monorail System Manufacturing	0.2%	5.7%

Source: EMSI Complete Employment 2014.2

51-4121 WELDERS, CUTTERS, SOLDERERS, AND BRAZERS *(Job Series 3703 Welder)*

Use hand-welding or flame-cutting equipment to weld or join metal components or to fill holes, indentations, or seams of fabricated metal products.

Sample of reported job titles: Aluminum Welder, Fabrication Welder, Fabricator, Fitter/Welder, Maintenance Welder, Mig Welder, Sub Arc Operator, Welder, Welder-Fitter, Welder/Fabricator

Detailed tasks:

- Weld components in flat, vertical, or overhead positions.
- Operate safety equipment and use safe work habits.
- Lay out, position, align, and secure parts and assemblies prior to assembly, using straightedges, combination squares, calipers, and rulers.
- Examine workpieces for defects and measure workpieces with straightedges or templates to ensure conformance with specifications.
- Recognize, set up, and operate hand and power tools common to the welding trade, such as shielded metal arc and gas metal arc welding equipment.
- Weld separately or in combination, using aluminum, stainless steel, cast iron, and other alloys.
- Clamp, hold, tack-weld, heat-bend, grind, or bolt component parts to obtain required configurations and positions for welding.
- Select and install torches, torch tips, filler rods, and flux, according to welding chart specifications or types and thicknesses of metals.
- Ignite torches or start power supplies and strike arcs by touching electrodes to metals being welded, completing electrical circuits.
- Connect and turn regulator valves to activate and adjust gas flow and pressure so that desired flames are obtained.

EMPLOYMENT OVERVIEW

(12-County Region)

2013 Employment	1,377
Change in employment from 2008	-130 ▼
Estimated annual openings, 2013-2018	43
Median hourly earning	\$15.50
Relative to US (US = 1.00)	0.89
Share of the occupation age 55+ years	14%

SKILLS

(Ranked by importance on 5-point scale)

1	Critical thinking	3.12
2	Operation and control	3.12
3	Monitoring	3.00
4	Reading comprehension	3.00
5	Operation monitoring	2.88
6	Active listening	2.88
7	Judgment and decision making	2.88
8	Speaking	2.88
9	Coordination	2.75
10	Time management	2.75

WORK ACTIVITIES

(Ranked by importance on 5-point scale)

1	Controlling machines and processes	4.56
2	Handling and moving objects	4.28
3	Identifying objects, actions, and events	4.04
4	Operating vehicles, mechanized devices, or equipment	3.96
5	Performing general physical activities	3.80
6	Getting information	3.79
7	Communicating with supervisors, peers, or subordinates	3.79
8	Inspecting equipment, structures, or material	3.74
9	Thinking creatively	3.71
10	Training and teaching others	3.58

Sources: O*NET Online and O*NET database, version 18.1, EMSI Complete Employment 2014.2 (employment overview). This job title represents an occupation which is currently being subdivided into a group of more specific occupations as part of the ongoing update of the O*NET database. Detailed data presented in this section are for Welders, Cutters, and Welder Fitters, which is classified under 51-4121.06 in the O*NET system.

51-4121 WELDERS, CUTTERS, SOLDERERS, AND BRAZERS (Job Series 3703 Welder) **Cont.**

EDUCATION/PREPARATION

Typical requirements for entry

Education High school/GED

Experience None

Additional training Moderate-term on-the-job training required for competency

Job Zone A system for grouping occupations based on similar education, experience, and on-the-job training requirements needed to do the work.

Job Zone ●●●○○

Level of preparation Medium needed

Specific Vocational Preparation (SVP) Range: 6 to <7

The time required by a typical worker to learn the techniques, acquire the information, and develop the facility needed for average job performance

- 1. Short demonstration only
- 2. Anything beyond short demonstration up to and incl. 1 month
- 3. Over 1 month up to and including 3 months
- 4. Over 3 months up to and including 6 months
- 5. Over 6 months up to and including 1 year
- 6. Over 1 year up to and including 2 years
- 7. Over 2 years up to and including 4 years
- 8. Over 4 years up to and including 10 years
- 9. Over 10 years

COMPATIBLE OCCUPATIONS

(Ranked by estimated annual openings in region, 2013-2018)

SOC CODE	COMPATIBLE OCCUPATIONS	MEDIAN HOURLY EARNINGS	2013 JOBS	EST. ANNUAL OPENINGS (2013-2018)	COMPATIBILITY INDEX
49-3023	Automotive Service Technicians and Mechanics	\$15.85	992	43	87
49-9041	Industrial Machinery Mechanics	\$21.31	811	42	90
49-3042	Mobile Heavy Equipment Mechanics, Except Engines	\$22.01	1,268	40	88
47-2111	Electricians	\$18.63	552	21	87
49-3031	Bus and Truck Mechanics and Diesel Engine Specialists	\$17.45	416	18	94
47-1011	First-Line Sprvrs., Construction and Extraction Workers	\$20.57	568	17	86
51-1011	First-Line Sprvrs., Production and Operating Workers	\$23.46	1,008	17	85
51-4041	Machinists	\$18.14	301	13	96
49-9051	Electrical Power-Line Installers and Repairers	\$25.49	158	12	92
43-5052	Postal Service Mail Carriers	\$23.43	340	11	89
49-3021	Automotive Body and Related Repairers	\$17.02	185	8	97
51-2041	Structural Metal Fabricators and Fitters	\$18.35	157	7	94
51-8013	Power Plant Operators	\$29.44	125	7	93
51-9197	Tire Builders	\$27.78	280	7	93
51-9023	Mixing and Blending Machine Workers	\$21.01	188	6	95
47-2152	Plumbers, Pipefitters, and Steamfitters	\$17.75	236	6	93
51-4011	CNC Machine Tool Operators, Metal and Plastic	\$20.44	152	6	91
51-8031	W/WW Treatment Plant and System Operators	\$15.64	146	6	88
51-9041	Extruding, Forming, and Compacting Machine Workers	\$17.05	181	5	96
51-4023	Rolling Machine Workers, Metal and Plastic	\$21.53	181	5	95

Sources: O*NET Online (Job Zone/SVP Range); EMSI Complete Employment 2014.2 (employment data, typical requirements for entry, and compatibility index). Blue shading shows occupations with median wage rates equal to or greater than the median wage rate of the affected occupation. For a description of the compatible occupation analysis, see pages 46 to 50.

51-4121 WELDERS, CUTTERS, SOLDERERS, AND BRAZERS (Job Series 3703 Welder) **Cont.**

STAFFING PATTERNS

(Ranked by share the occupation represents of industry's total employment)

NAICS CODE	INDUSTRY	% WORKING IN THE INDUSTRY	% OF TOTAL INDUSTRY EMPLOYMENT
336510	Railroad Rolling Stock Manufacturing	1.2%	17.0%
332420	Metal Tank (Heavy Gauge) Manufacturing	1.5%	15.6%
336212	Truck Trailer Manufacturing	1.4%	15.4%
332410	Power Boiler and Heat Exchanger Manufacturing	1.0%	14.8%
811310	Commercial and Ind. Machinery and Equip. (except Auto. and Elect.) Repair and Maint.	8.4%	13.5%
332439	Other Metal Container Manufacturing	0.5%	13.1%
336211	Motor Vehicle Body Manufacturing	1.9%	12.8%
332431	Metal Can Manufacturing	0.7%	12.7%
332312	Fabricated Structural Metal Manufacturing	3.0%	12.4%
332311	Prefabricated Metal Building and Component Manufacturing	0.9%	12.4%
332313	Plate Work Manufacturing	1.6%	12.0%
336214	Travel Trailer and Camper Manufacturing	1.0%	11.5%
332323	Ornamental and Architectural Metal Work Manufacturing	1.0%	11.0%
336611	Ship Building and Repairing	3.1%	10.8%
332321	Metal Window and Door Manufacturing	1.6%	10.8%
332322	Sheet Metal Work Manufacturing	2.9%	10.7%
333132	Oil and Gas Field Machinery and Equipment Manufacturing	2.3%	10.6%
336612	Boat Building	0.9%	10.2%
336213	Motor Home Manufacturing	0.4%	9.5%
333111	Farm Machinery and Equipment Manufacturing	1.6%	9.3%
333131	Mining Machinery and Equipment Manufacturing	0.3%	9.1%
333112	Lawn and Garden Tractor and Home Lawn and Garden Equipment Manufacturing	0.4%	7.9%
333120	Construction Machinery Manufacturing	1.5%	7.8%
333923	Overhead Traveling Crane, Hoist, and Monorail System Manufacturing	0.3%	6.7%
336992	Military Armored Vehicle, Tank, and Tank Component Manufacturing	0.1%	6.6%
333924	Industrial Truck, Tractor, Trailer, and Stacker Machinery Manufacturing	0.4%	6.3%
336999	All Other Transportation Equipment Manufacturing	0.2%	6.2%
333922	Conveyor and Conveying Equipment Manufacturing	0.5%	6.1%
333912	Air and Gas Compressor Manufacturing	0.3%	6.0%
333911	Pump and Pumping Equipment Manufacturing	0.5%	6.0%
333995	Fluid Power Cylinder and Actuator Manufacturing	0.3%	5.9%
333412	Industrial and Commercial Fan and Blower Manufacturing	0.2%	5.7%
336991	Motorcycle, Bicycle, and Parts Manufacturing	0.2%	5.5%
333999	All Other Miscellaneous General Purpose Machinery Manufacturing	0.6%	5.5%
333994	Industrial Process Furnace and Oven Manufacturing	0.1%	5.4%
333996	Fluid Power Pump and Motor Manufacturing	0.3%	5.3%
333992	Welding and Soldering Equipment Manufacturing	0.2%	5.3%
333993	Packaging Machinery Manufacturing	0.3%	5.2%
333415	Air-Cond. and Warm Air Heating Equip. and Commercial and Industrial Refrig. Equip. Mfg.	1.2%	5.2%
332996	Fabricated Pipe and Pipe Fitting Manufacturing	0.5%	5.1%

Source: EMSI Complete Employment 2014.2

51-4193 PLATING/COATING MACHINE WORKERS, METAL & PLASTIC *(Job Series 3711 Electroplater)*

Set up, operate, or tend plating or coating machines to coat metal or plastic products with chromium, zinc, copper, cadmium, nickel, or other metal to protect or decorate surfaces. Includes electrolytic processes.

Sample of reported job titles: Plater, Line Operator, Coater Operator, Machine Operator, Anodizer, Anodizing Line Operator, Chrome Plater, Coater Associate, Electroplater, Hard Chrome Plater

Detailed tasks:

- Inspect coated or plated areas for defects such as air bubbles or uneven coverage.
- Immerse objects to be coated or plated into cleaning solutions, or spray objects with conductive solutions to prepare them for plating.
- Immerse workpieces in coating solutions or liquid metal or plastic for specified times.
- Set up, operate, or tend plating or coating machines to coat metal or plastic products with chromium, zinc, copper, cadmium, nickel, or other metal to protect or decorate surfaces.
- Position and feed materials into processing machines, by hand or by using automated equipment.
- Test machinery to ensure that it is operating properly.
- Operate hoists to place workpieces onto machine feed carriages or spindles.
- Maintain production records.
- Adjust controls to set temperatures of coating substances and speeds of machines and equipment.
- Remove objects from solutions at periodic intervals and observe objects to verify conformance to specifications.

EMPLOYMENT OVERVIEW

(12-County Region)

2013 Employment	70
Change in employment from 2008	-10 ▼
Estimated annual openings, 2013-2018	2
Median hourly earning	\$15.72
Relative to US (US = 1.00)	1.10
Share of the occupation age 55+ years	29%

SKILLS

(Ranked by importance on 5-point scale)

1	Operation monitoring	3.25
2	Monitoring	3.00
3	Critical thinking	2.88
4	Judgment and decision making	2.88
5	Speaking	2.88
6	Operation and control	2.75
7	Active listening	2.75
8	Coordination	2.75
9	Time management	2.75
10	Quality control analysis	2.75

WORK ACTIVITIES

(Ranked by importance on 5-point scale)

1	Performing general physical activities	3.96
2	Handling and moving objects	3.89
3	Communicating with supervisors, peers, or subordinates	3.77
4	Documenting/recording information	3.67
5	Getting information	3.66
6	Monitor processes, materials, or surroundings	3.55
7	Identifying objects, actions, and events	3.46
8	Evaluating information to determine compliance with standards	3.31
9	Controlling machines and processes	3.25
10	Inspecting equipment, structures, or material	3.12

Sources: O*NET Online and O*NET database, version 18.1, EMSI Complete Employment 2014.2 (employment overview)

51-4193 PLATING/COATING MACHINE WORKERS... (Job Series 3711 Electroplater) Cont.

EDUCATION/PREPARATION

Typical requirements for entry

Education High school/GED

Experience None

Additional training Moderate-term on-the-job required for competency training

Job Zone A system for grouping occupations based on similar education, experience, and on-the-job training requirements needed to do the work.

Job Zone ●●○○○

Level of preparation Some needed

Specific Vocational Preparation (SVP) Range: 4 to <5

The time required by a typical worker to learn the techniques, acquire the information, and develop the facility needed for average job performance

- 1. Short demonstration only
- 2. Anything beyond short demonstration up to and incl. 1 month
- 3. Over 1 month up to and including 3 months
- 4. Over 3 months up to and including 6 months
- 5. Over 6 months up to and including 1 year
- 6. Over 1 year up to and including 2 years
- 7. Over 2 years up to and including 4 years
- 8. Over 4 years up to and including 10 years
- 9. Over 10 years

COMPATIBLE OCCUPATIONS

(Ranked by estimated annual openings in region, 2013-2018)

SOC CODE	COMPATIBLE OCCUPATIONS	MEDIAN HOURLY EARNINGS	2013 JOBS	EST. ANNUAL OPENINGS (2013-2018)	COMPATIBILITY INDEX
49-3031	Bus and Truck Mechanics and Diesel Engine Specialists	\$17.45	416	18	86
51-1011	First-Line Sprvrs., Production and Operating Workers	\$23.46	1,008	17	81
51-4041	Machinists	\$18.14	301	13	89
49-9051	Electrical Power-Line Installers and Repairers	\$25.49	158	12	84
43-5061	Production, Planning, and Expediting Clerks	\$19.55	392	12	83
43-5052	Postal Service Mail Carriers	\$23.43	340	11	91
49-3021	Automotive Body and Related Repairers	\$17.02	185	8	92
29-2021	Dental Hygienists	\$29.81	157	8	80
51-9197	Tire Builders	\$27.78	280	7	95
51-2041	Structural Metal Fabricators and Fitters	\$18.35	157	7	92
51-8013	Power Plant Operators	\$29.44	125	7	91
51-9023	Mixing and Blending Machine Workers	\$21.01	188	6	94
47-2152	Plumbers, Pipefitters, and Steamfitters	\$17.75	236	6	81
53-1021	First-Line Sprvrs., Laborers and Material Movers, Hand	\$20.66	154	6	81
51-8031	W/WW Treatment Plant and System Operators	\$15.64	146	6	80
51-9032	Cutting and Slicing Machine Workers	\$16.59	199	5	94
51-9041	Extruding, Forming, and Compacting Machine Workers	\$17.05	181	5	94
51-9122	Painters, Transportation Equipment	\$15.92	157	5	94
51-4023	Rolling Machine Workers, Metal and Plastic	\$21.53	181	5	89
27-2042	Musicians and Singers	\$18.75	109	5	80

Sources: O*NET Online (Job Zone/SVP Range); EMSI Complete Employment 2014.2 (employment data, typical requirements for entry, and compatibility index). Blue shading shows occupations with median wage rates equal to or greater than the median wage rate of the affected occupation. For a description of the compatible occupation analysis, see pages 46 to 50.

51-4193 PLATING/COATING MACHINE WORKERS... (Job Series 3711 Electroplater) Cont.

STAFFING PATTERNS

(Ranked by share the occupation represents of industry's total employment)

NAICS CODE	INDUSTRY	% WORKING IN THE INDUSTRY	% OF TOTAL INDUSTRY EMPLOYMENT
332813	Electroplating, Plating, Polishing, Anodizing, and Coloring	27.5%	14.9%
332812	Metal Coating, Engraving (except Jewelry and Silverware), and Allied Services to	22.8%	14.5%
332811	Metal Heat Treating	7.8%	14.1%
332510	Hardware Manufacturing	0.9%	1.3%
334417	Electronic Connector Manufacturing	0.6%	1.1%
332618	Other Fabricated Wire Product Manufacturing	0.7%	0.9%
334412	Bare Printed Circuit Board Manufacturing	0.7%	0.7%
334418	Printed Circuit Assembly (Electronic Assembly) Manufacturing	1.1%	0.7%
334419	Other Electronic Component Manufacturing	1.2%	0.7%
335931	Current-Carrying Wiring Device Manufacturing	0.6%	0.6%
334413	Semiconductor and Related Device Manufacturing	3.2%	0.6%
332420	Metal Tank (Heavy Gauge) Manufacturing	0.6%	0.6%
332212	Hand and Edge Tool Manufacturing	0.5%	0.6%
335999	All Other Miscellaneous Electrical Equipment and Component Manufacturing	0.5%	0.6%
332721	Precision Turned Product Manufacturing	0.6%	0.5%
332722	Bolt, Nut, Screw, Rivet, and Washer Manufacturing	0.6%	0.5%
332999	All Other Miscellaneous Fabricated Metal Product Manufacturing	0.7%	0.4%
336611	Ship Building and Repairing	0.7%	0.2%
332312	Fabricated Structural Metal Manufacturing	0.6%	0.2%
332322	Sheet Metal Work Manufacturing	0.6%	0.2%
326199	All Other Plastics Product Manufacturing	0.8%	0.1%
336411	Aircraft Manufacturing	0.6%	0.1%
332710	Machine Shops	0.9%	0.1%
336399	All Other Motor Vehicle Parts Manufacturing	0.6%	0.1%
901199	Federal Government, Civilian, Excluding Postal Service	1.3%	0.0%
561320	Temporary Help Services	1.5%	0.0%

Source: EMSI Complete Employment 2014.2

51-4199 METAL WORKERS AND PLASTIC WORKERS, ALL OTHER *(Job Series 5423 Sandblaster)*

All metal workers and plastic workers not listed separately.

*“All Other” titles represent occupations with a wide range of characteristics which do not fit into one of the detailed O*NET-SOC occupations. O*NET data is not available for this type of title.*

EMPLOYMENT OVERVIEW

(12-County Region)

2013 Employment	31
Change in employment from 2008	-2 ▼
Estimated annual openings, 2013-2018	1
Median hourly earning	\$15.75
Relative to US (US = 1.00)	1.05
Share of the occupation age 55+ years	16%

SKILLS

(Ranked by importance on 5-point scale)

1
2
3
4
5
6
7
8
9
10

WORK ACTIVITIES

(Ranked by importance on 5-point scale)

1
2
3
4
5
6
7
8
9
10

Sources: O*NET Online and O*NET database, version 18.1, EMSI Complete Employment 2014.2 (employment overview)

51-4199 METAL WORKERS AND PLASTIC WORKERS... (Job Series 5423 Sandblaster) Cont.

EDUCATION/PREPARATION

Typical requirements for entry

Education High school/GED

Experience None

Additional training required for competency Moderate-term on-the-job training

Job Zone *A system for grouping occupations based on similar education, experience, and on-the-job training requirements needed to do the work.*

Job Zone

Level of preparation needed

Specific Vocational Preparation (SVP) Range

The time required by a typical worker to learn the techniques, acquire the information, and develop the facility needed for average job performance

- 1. Short demonstration only
- 2. Anything beyond short demonstration up to and incl. 1 month
- 3. Over 1 month up to and including 3 months
- 4. Over 3 months up to and including 6 months
- 5. Over 6 months up to and including 1 year
- 6. Over 1 year up to and including 2 years
- 7. Over 2 years up to and including 4 years
- 8. Over 4 years up to and including 10 years
- 9. Over 10 years

COMPATIBLE OCCUPATIONS
(Ranked by estimated annual openings in region, 2013-2018)

*“All Other” titles represent occupations with a wide range of characteristics which do not fit into one of the detailed O*NET-SOC occupations. O*NET data is not available for this type of title.*

Sources: O*NET Online (Job Zone/SVP Range); EMSI Complete Employment 2014.2 (employment data, typical requirements for entry, and compatibility index). Blue shading shows occupations with median wage rates equal to or greater than the median wage rate of the affected occupation. For a description of the compatible occupation analysis, see pages 46 to 50.

51-4199 METAL WORKERS AND PLASTIC WORKERS... (Job Series 5423 Sandblaster) Cont.

STAFFING PATTERNS

(Ranked by share the occupation represents of industry's total employment)

NAICS CODE	INDUSTRY	% WORKING IN THE INDUSTRY	% OF TOTAL INDUSTRY EMPLOYMENT
332618	Other Fabricated Wire Product Manufacturing	2.2%	1.8%
331419	Primary Smelting and Refining of Nonferrous Metal (except Copper and Aluminum)	0.6%	1.8%
331492	Second. Smelting, Refining, and Alloying of Nonferrous Metal (exc. Copper and Aluminum)	0.8%	1.7%
332612	Spring (Light Gauge) Manufacturing	0.8%	1.6%
331422	Copper Wire (except Mechanical) Drawing	0.8%	1.2%
331315	Aluminum Sheet, Plate, and Foil Manufacturing	0.8%	1.1%
331316	Aluminum Extruded Product Manufacturing	0.9%	1.1%
331421	Copper Rolling, Drawing, and Extruding	0.5%	1.1%
331491	Nonferrous Metal (except Copper and Aluminum) Rolling, Drawing, and Extruding	0.6%	1.0%
331210	Iron and Steel Pipe and Tube Manufacturing from Purchased Steel	0.8%	0.7%
331221	Rolled Steel Shape Manufacturing	0.5%	0.6%
332212	Hand and Edge Tool Manufacturing	0.6%	0.5%
333415	Air-Cond. and Warm Air Heating Equip. and Commercial and Industrial Refrig. Equip. Mfg.	1.3%	0.4%
332991	Ball and Roller Bearing Manufacturing	0.5%	0.4%
332116	Metal Stamping	1.0%	0.4%
335931	Current-Carrying Wiring Device Manufacturing	0.5%	0.4%
336211	Motor Vehicle Body Manufacturing	0.7%	0.3%
332996	Fabricated Pipe and Pipe Fitting Manufacturing	0.6%	0.3%
333514	Special Die and Tool, Die Set, Jig, and Fixture Manufacturing	0.8%	0.3%
332722	Bolt, Nut, Screw, Rivet, and Washer Manufacturing	0.6%	0.3%
332999	All Other Miscellaneous Fabricated Metal Product Manufacturing	1.0%	0.3%
333618	Other Engine Equipment Manufacturing	0.5%	0.3%
333511	Industrial Mold Manufacturing	0.5%	0.3%
332420	Metal Tank (Heavy Gauge) Manufacturing	0.5%	0.3%
326199	All Other Plastics Product Manufacturing	3.6%	0.3%
423510	Metal Service Centers and Other Metal Merchant Wholesalers	1.5%	0.3%
332812	Metal Coat., Engraving (exc. Jewelry and Silverware), and Allied Serv. to Manufacturers	0.6%	0.3%
326113	Unlaminated Plastics Film and Sheet (except Packaging) Manufacturing	0.5%	0.3%
332721	Precision Turned Product Manufacturing	0.6%	0.3%
332912	Fluid Power Valve and Hose Fitting Manufacturing	0.5%	0.3%
339113	Surgical Appliance and Supplies Manufacturing	0.9%	0.2%
336611	Ship Building and Repairing	0.9%	0.2%
811310	Commercial and Industrial Machinery and Equipment (except Automotive and Electronic)	2.4%	0.2%
332312	Fabricated Structural Metal Manufacturing	0.7%	0.2%
332813	Electroplating, Plating, Polishing, Anodizing, and Coloring	0.7%	0.2%
332710	Machine Shops	2.1%	0.2%
331511	Iron Foundries	0.5%	0.2%
332322	Sheet Metal Work Manufacturing	0.8%	0.2%
331111	Iron and Steel Mills	0.7%	0.2%
339112	Surgical and Medical Instrument Manufacturing	1.0%	0.2%

Source: EMSI Complete Employment 2014.2

51-9122 PAINTERS, TRANSPORTATION EQUIPMENT *(Job Series 4102 Painter)*

Operate or tend painting machines to paint surfaces of transportation equipment, such as automobiles, buses, trucks, trains, boats, and airplanes. Includes painters in auto body repair facilities.

Sample of reported job titles: Painter, Auto Painter (Automobile Painter), Paint Prepper, Automotive Painter, Automotive Refinish Technician, Automotive Paint Technician, Finish Painter, Paint Technician, Automotive Spray Painter, Body Man

Detailed tasks:

- Dispose of hazardous waste in an appropriate manner.
- Select paint according to company requirements, and match colors of paint following specified color charts.
- Mix paints to match color specifications or vehicles' original colors, then stir and thin the paints, using spatulas or power mixing equipment.
- Remove grease, dirt, paint, or rust from vehicle surfaces in preparation for paint application, using abrasives, solvents, brushes, blowtorches, washing tanks, or sandblasters.
- Pour paint into spray guns and adjust nozzles and paint mixes for proper paint flow and coating thickness.
- Monitor painting operations to identify flaws, such as blisters or streaks, and correct their causes.
- Sand vehicle surfaces between coats of paint or primer to remove flaws and enhance adhesion for subsequent coats.
- Disassemble, clean, and reassemble sprayers and power equipment, using solvents, wire brushes, and cloths for cleaning duties.
- Spray prepared surfaces with specified amounts of primers and decorative or finish coatings.
- Remove accessories from vehicles, such as chrome or mirrors, and mask other surfaces with tape or paper in order to protect them from paint.

EMPLOYMENT OVERVIEW

(12-County Region)

2013 Employment	157
Change in employment from 2008	-4 ▼
Estimated annual openings, 2013-2018	5
Median hourly earning	\$15.92
Relative to US (US = 1.00)	0.84
Share of the occupation age 55+ years	10%

SKILLS

(Ranked by importance on 5-point scale)

1	Monitoring	3.12
2	Operation and control	3.12
3	Operation monitoring	3.00
4	Speaking	3.00
5	Active listening	3.00
6	Critical thinking	2.88
7	Judgment and decision making	2.88
8	Coordination	2.88
9	Quality control analysis	2.88
10	Time management	2.75

WORK ACTIVITIES

(Ranked by importance on 5-point scale)

1	Handling and moving objects	3.86
2	Performing general physical activities	3.77
3	Communicating with supervisors, peers, or subordinates	3.62
4	Inspecting equipment, structures, or material	3.60
5	Getting information	3.45
6	Updating and using relevant knowledge	3.36
7	Repairing and maintaining mechanical equipment	3.35
8	Controlling machines and processes	3.33
9	Establishing and maintaining interpersonal relationships	3.29
10	Operating vehicles, mechanized devices, or equipment	3.29

Sources: O*NET Online and O*NET database, version 18.1, EMSI Complete Employment 2014.2 (employment overview).

51-9122 PAINTERS, TRANSPORTATION EQUIPMENT (Job Series 4102 Painter) Cont.

EDUCATION/PREPARATION

Typical requirements for entry

Education High school/GED

Experience None

Additional training Moderate-term on-the-job training required for competency

Job Zone A system for grouping occupations based on similar education, experience, and on-the-job training requirements needed to do the work.

Job Zone ●●○○○

Level of preparation Some needed

Specific Vocational Preparation (SVP) Range: 4 to <5

The time required by a typical worker to learn the techniques, acquire the information, and develop the facility needed for average job performance

- 1. Short demonstration only
- 2. Anything beyond short demonstration up to and incl. 1 month
- 3. Over 1 month up to and including 3 months
- 4. Over 3 months up to and including 6 months
- 5. Over 6 months up to and including 1 year
- 6. Over 1 year up to and including 2 years
- 7. Over 2 years up to and including 4 years
- 8. Over 4 years up to and including 10 years
- 9. Over 10 years

COMPATIBLE OCCUPATIONS

(Ranked by estimated annual openings in region, 2013-2018)

SOC CODE	COMPATIBLE OCCUPATIONS	MEDIAN HOURLY EARNINGS	2013 JOBS	EST. ANNUAL OPENINGS (2013-2018)	COMPATIBILITY INDEX
53-3032	Heavy and Tractor-Trailer Truck Drivers	\$15.14	3,435	139	86
51-4121	Welders, Cutters, Solderers, and Brazers	\$15.50	1,377	43	94
49-3031	Bus and Truck Mechanics and Diesel Engine Specialists	\$17.45	416	18	85
45-4022	Logging Equipment Operators	\$14.88	396	17	92
47-2073	Operating Engineers/Other Constr. Equip. Operators	\$14.70	423	17	90
51-9196	Paper Goods Machine Setters, Operators, and Tenders	\$14.46	376	14	95
51-4041	Machinists	\$18.14	301	13	88
47-2141	Painters, Construction and Maintenance	\$15.41	420	12	91
49-9051	Electrical Power-Line Installers and Repairers	\$25.49	158	12	84
43-5052	Postal Service Mail Carriers	\$23.43	340	11	92
49-3021	Automotive Body and Related Repairers	\$17.02	185	8	94
51-9197	Tire Builders	\$27.78	280	7	94
51-2041	Structural Metal Fabricators and Fitters	\$18.35	157	7	89
51-8013	Power Plant Operators	\$29.44	125	7	86
51-9023	Mixing and Blending Machine Workers	\$21.01	188	6	92
51-9032	Cutting and Slicing Machine Wprlers	\$16.59	199	5	94
51-9041	Extruding, Forming, and Compacting Machine Workers	\$17.05	181	5	94
51-4023	Rolling Machine Workers, Metal and Plastic	\$21.53	181	5	90
47-2051	Cement Masons and Concrete Finishers	\$14.57	86	5	89
49-9043	Maintenance Workers, Machinery	\$14.76	232	5	86

Sources: O*NET Online (Job Zone/SVP Range); EMSI Complete Employment 2014.2 (employment data, typical requirements for entry, and compatibility index). Blue shading shows occupations with median wage rates equal to or greater than the median wage rate of the affected occupation. For a description of the compatible occupation analysis, see pages 46 to 50.

51-9122 PAINTERS, TRANSPORTATION EQUIPMENT *(Job Series 4102 Painter)* **Cont.**

STAFFING PATTERNS

(Ranked by share the occupation represents of industry's total employment)

NAICS CODE	INDUSTRY	% WORKING IN THE INDUSTRY	% OF TOTAL INDUSTRY EMPLOYMENT
811121	Automotive Body, Paint, and Interior Repair and Maintenance	38.0%	7.7%
811122	Automotive Glass Replacement Shops	4.9%	6.8%
336510	Railroad Rolling Stock Manufacturing	2.5%	5.3%
336212	Truck Trailer Manufacturing	2.0%	3.0%
336211	Motor Vehicle Body Manufacturing	2.7%	2.6%
336214	Travel Trailer and Camper Manufacturing	1.6%	2.5%
336120	Heavy Duty Truck Manufacturing	1.1%	2.3%
336213	Motor Home Manufacturing	0.6%	2.2%
336612	Boat Building	1.4%	2.2%
488210	Support Activities for Rail Transportation	1.0%	1.7%
336611	Ship Building and Repairing	3.5%	1.7%
336112	Light Truck and Utility Vehicle Manufacturing	1.1%	1.3%
336999	All Other Transportation Equipment Manufacturing	0.3%	1.3%
336111	Automobile Manufacturing	2.5%	1.1%
811198	All Other Automotive Repair and Maintenance	0.6%	0.9%
336991	Motorcycle, Bicycle, and Parts Manufacturing	0.2%	0.9%
488190	Other Support Activities for Air Transportation	1.5%	0.8%
488119	Other Airport Operations	1.0%	0.8%
811111	General Automotive Repair	5.2%	0.7%
811420	Reupholstery and Furniture Repair	0.2%	0.7%
811113	Automotive Transmission Repair	0.3%	0.7%
811112	Automotive Exhaust System Repair	0.2%	0.6%
811191	Automotive Oil Change and Lubrication Shops	0.8%	0.6%
811412	Appliance Repair and Maintenance	0.3%	0.6%
336411	Aircraft Manufacturing	2.2%	0.5%
811490	Other Personal and Household Goods Repair and Maintenance	0.9%	0.5%
336413	Other Aircraft Parts and Auxiliary Equipment Manufacturing	1.0%	0.5%
811118	Other Automotive Mechanical and Electrical Repair and Maintenance	0.3%	0.5%
336414	Guided Missile and Space Vehicle Manufacturing	0.4%	0.4%
441110	New Car Dealers	8.4%	0.4%
336412	Aircraft Engine and Engine Parts Manufacturing	0.6%	0.4%
333111	Farm Machinery and Equipment Manufacturing	0.5%	0.4%
441120	Used Car Dealers	1.2%	0.3%
333120	Construction Machinery Manufacturing	0.4%	0.3%
333132	Oil and Gas Field Machinery and Equipment Manufacturing	0.5%	0.3%
811192	Car Washes	0.5%	0.2%
336399	All Other Motor Vehicle Parts Manufacturing	0.5%	0.2%
336350	Motor Vehicle Transmission and Power Train Parts Manufacturing	0.3%	0.2%
441221	Motorcycle, ATV, and Personal Watercraft Dealers	0.2%	0.1%
811310	Commercial and Ind. Machinery and Equip. (except Auto. and Elect.) Repair and Maint.	0.5%	0.1%

Source: EMSI Complete Employment 2014.2

51-9195 MOLDERS, SHAPERS, & CASTERS, EXCEPT METAL/PLASTIC *(Job Series 4301 Rubber Worker)*

Perform a variety of duties such as mixing materials, assembling mold parts, filling molds, and stacking molds to mold and cast a wide range of products.

Sample of reported job titles: Press Operator, Mold Mechanic, Bed Laborer, Caster, Molder, Molding Line Operator, Fabricator, Injection Molding Machine Operator, Molding Line Assistant, Production Worker

Detailed tasks:

- Brush or spray mold surfaces with parting agents or insert paper into molds to ensure smoothness and prevent sticking or seepage.
- Clean, finish, and lubricate molds and mold parts.
- Separate models or patterns from molds and examine products for accuracy.
- Operate and adjust controls of heating equipment to melt material or to cure, dry, or bake filled molds.
- Read work orders or examine parts to determine parts or sections of products to be produced.
- Load or stack filled molds in ovens, dryers, or curing boxes, or on storage racks or carts.
- Set the proper operating temperature for each casting.
- Measure and cut products to specified dimensions, using measuring and cutting instruments.
- Remove excess materials and level and smooth wet mold mixtures.

EMPLOYMENT OVERVIEW

(12-County Region)

2013 Employment	48
Change in employment from 2008	-7 ▼
Estimated annual openings, 2013-2018	2
Median hourly earning	\$13.08
Relative to US (US = 1.00)	0.93
Share of the occupation age 55+ years	10%

SKILLS

(Ranked by importance on 5-point scale)

1	Operation monitoring	3.62
2	Monitoring	3.12
3	Operation and control	3.12
4	Critical thinking	3.12
5	Judgment and decision making	3.12
6	Complex problem solving	3.12
7	Reading comprehension	3.12
8	Active listening	3.00
9	Quality control analysis	3.00
10	Speaking	2.88

WORK ACTIVITIES

(Ranked by importance on 5-point scale)

1	Getting information	3.89
2	Performing general physical activities	3.82
3	Inspecting equipment, structures, or material	3.67
4	Communicating with supervisors, peers, or subordinates	3.64
5	Handling and moving objects	3.56
6	Making decisions and solving problems	3.53
7	Monitor processes, materials, or surroundings	3.49
8	Judging the qualities of things, services, or people	3.42
9	Evaluating information to determine compliance with standards	3.35
10	Training and teaching others	3.32

Sources: O*NET Online and O*NET database, version 18.1, EMSI Complete Employment 2014.2 (employment overview). This job title represents an occupation which is currently being subdivided into a group of more specific occupations as part of the ongoing update of the O*NET database. Detailed data presented in this section are for Molding and Casting Workers, which is classified under 51-9195.07 in the O*NET system.

51-9195 MOLDERS, SHAPERS, & CASTERS... (Job Series 4301 Rubber Worker) **Cont.**

EDUCATION/PREPARATION

Typical requirements for entry

Education High school/GED

Experience None

Additional training Long-term on-the-job
required for competency training

Job Zone A system for grouping occupations based on similar education, experience, and on-the-job training requirements needed to do the work.

Job Zone ●●○○○

Level of preparation Some
needed

Specific Vocational Preparation (SVP) Range: 4 to <5

The time required by a typical worker to learn the techniques, acquire the information, and develop the facility needed for average job performance

- 1. Short demonstration only
- 2. Anything beyond short demonstration up to and incl. 1 month
- 3. Over 1 month up to and including 3 months
- 4. Over 3 months up to and including 6 months
- 5. Over 6 months up to and including 1 year
- 6. Over 1 year up to and including 2 years
- 7. Over 2 years up to and including 4 years
- 8. Over 4 years up to and including 10 years
- 9. Over 10 years

COMPATIBLE OCCUPATIONS

(Ranked by estimated annual openings in region, 2013-2018)

SOC CODE	COMPATIBLE OCCUPATIONS	MEDIAN HOURLY EARNINGS	2013 JOBS	EST. ANNUAL OPENINGS (2013-2018)	COMPATIBILITY INDEX
53-3032	Heavy and Tractor-Trailer Truck Drivers	\$15.14	3,435	139	89
51-4121	Welders, Cutters, Solderers, and Brazers	\$15.50	1,377	43	96
49-3031	Bus and Truck Mechanics and Diesel Engine Specialists	\$17.45	416	18	88
45-4022	Logging Equipment Operators	\$14.88	396	17	94
47-2073	Operating Engineers/Other Constr. Equip. Operators	\$14.70	423	17	93
51-4041	Machinists	\$18.14	301	13	93
47-2141	Painters, Construction and Maintenance	\$15.41	420	12	88
49-9051	Electrical Power-Line Installers and Repairers	\$25.49	158	12	88
43-5052	Postal Service Mail Carriers	\$23.43	340	11	89
49-3021	Automotive Body and Related Repairers	\$17.02	185	8	96
51-9197	Tire Builders	\$27.78	280	7	94
51-2041	Structural Metal Fabricators and Fitters	\$18.35	157	7	90
51-8013	Power Plant Operators	\$29.44	125	7	90
51-9023	Mixing and Blending Machine Workers	\$21.01	188	6	94
47-2152	Plumbers, Pipefitters, and Steamfitters	\$17.75	236	6	87
51-4011	CNC Machine Tool Operators, Metal and Plastic	\$20.44	152	6	86
51-9041	Extruding, Forming, and Compacting Machine Workers	\$17.05	181	5	97
51-9122	Painters, Transportation Equipment	\$15.92	157	5	97
51-9032	Cutting and Slicing Machine Workers	\$16.59	199	5	96
51-4023	Rolling Machine Workers, Metal and Plastic	\$21.53	181	5	95

Sources: O*NET Online (Job Zone/SVP Range); EMSI Complete Employment 2014.2 (employment data, typical requirements for entry, and compatibility index). Blue shading shows occupations with median wage rates equal to or greater than the median wage rate of the affected occupation. For a description of the compatible occupation analysis, see pages 46 to 50.

51-9195 MOLDERS, SHAPERS, & CASTERS... (Job Series 4301 Rubber Worker) Cont.

STAFFING PATTERNS

(Ranked by share the occupation represents of industry's total employment)

NAICS CODE	INDUSTRY	% WORKING IN THE INDUSTRY	% OF TOTAL INDUSTRY EMPLOYMENT
327112	Vitreous China, Fine Earthenware, and Other Pottery Product Manufacturing	5.1%	20.7%
327113	Porcelain Electrical Supply Manufacturing	1.8%	11.7%
327111	Vitreous China Plumbing Fixture and China and Earthenware Bathroom Accessories Mfg.	1.2%	11.2%
327125	Nonclay Refractory Manufacturing	1.6%	10.3%
327122	Ceramic Wall and Floor Tile Manufacturing	1.6%	9.0%
327124	Clay Refractory Manufacturing	1.0%	7.5%
327121	Brick and Structural Clay Tile Manufacturing	1.3%	7.5%
327390	Other Concrete Product Manufacturing	8.1%	5.7%
327331	Concrete Block and Brick Manufacturing	2.7%	5.6%
327332	Concrete Pipe Manufacturing	1.1%	5.2%
327320	Ready-Mix Concrete Manufacturing	11.9%	5.2%
327310	Cement Manufacturing	2.0%	5.2%
327991	Cut Stone and Stone Product Manufacturing	3.4%	4.5%
327215	Glass Product Manufacturing Made of Purchased Glass	5.4%	4.4%
327212	Other Pressed and Blown Glass and Glassware Manufacturing	1.9%	4.3%
327992	Ground or Treated Mineral and Earth Manufacturing	0.9%	4.2%
327910	Abrasive Product Manufacturing	1.1%	4.0%
327211	Flat Glass Manufacturing	1.1%	3.9%
327999	All Other Miscellaneous Nonmetallic Mineral Product Manufacturing	1.3%	3.9%
327993	Mineral Wool Manufacturing	1.6%	3.6%
327213	Glass Container Manufacturing	1.6%	3.6%
327420	Gypsum Product Manufacturing	0.8%	2.7%
326299	All Other Rubber Product Manufacturing	1.2%	1.7%
326291	Rubber Product Manufacturing for Mechanical Use	1.2%	1.6%
326220	Rubber and Plastics Hoses and Belting Manufacturing	1.1%	1.6%
326211	Tire Manufacturing (except Retreading)	1.9%	1.5%
339950	Sign Manufacturing	1.9%	0.9%
339911	Jewelry (except Costume) Manufacturing	0.6%	0.9%
339999	All Other Miscellaneous Manufacturing	1.3%	0.8%
339991	Gasket, Packing, and Sealing Device Manufacturing	0.6%	0.7%
339920	Sporting and Athletic Goods Manufacturing	0.9%	0.7%
326199	All Other Plastics Product Manufacturing	2.7%	0.4%
238390	Other Building Finishing Contractors	0.8%	0.3%
238350	Finish Carpentry Contractors	1.3%	0.2%
238340	Tile and Terrazzo Contractors	0.5%	0.2%
453910	Pet and Pet Supplies Stores	0.6%	0.2%
453998	All Other Miscellaneous Store Retailers (except Tobacco Stores)	0.8%	0.2%
238330	Flooring Contractors	0.7%	0.2%
423310	Lumber, Plywood, Millwork, and Wood Panel Merchant Wholesalers	0.6%	0.2%
711510	Independent Artists, Writers, and Performers	0.7%	0.1%

Source: EMSI Complete Employment 2014.2

53-7051 INDUSTRIAL TRUCK & TRACTOR OPERATORS *(Job Series 5704/05 Forklift/Tractor Operator)*

Operate industrial trucks or tractors equipped to move materials around a warehouse, storage yard, factory, construction site, or similar location.

Sample of reported job titles: Checker Loader, Fork Lift Technician, Fork Truck Driver, Forklift Driver, Forklift Operator, Lift Truck Operator, Shag Truck Driver, Spotter Driver, Tow Motor Operator, Truck Driver

Detailed tasks:

- Move levers or controls that operate lifting devices, such as forklifts, lift beams with swivel-hooks, hoists, or elevating platforms, to load, unload, transport, or stack material.
- Inspect product load for accuracy and safely move it around the warehouse or facility to ensure timely and complete delivery.
- Manually or mechanically load or unload materials from pallets, skids, platforms, cars, lifting devices, or other transport vehicles.
- Position lifting devices under, over, or around loaded pallets, skids, or boxes and secure material or products for transport to designated areas.
- Weigh materials or products and record weight or other production data on tags or labels.
- Perform routine maintenance on vehicles or auxiliary equipment, such as cleaning, lubricating, recharging batteries, fueling, or replacing liquefied-gas tank.
- Move controls to drive gasoline- or electric-powered trucks, cars, or tractors and transport materials between loading, processing, and storage areas.
- Operate or tend automatic stacking, loading, packaging, or cutting machines.
- Signal workers to discharge, dump, or level materials.
- Hook tow trucks to trailer hitches and fasten attachments, such as graders, plows, rollers, or winch cables to tractors, using hitchpins.

EMPLOYMENT OVERVIEW

(12-County Region)

2013 Employment	795
Change in employment from 2008	-134 ▼
Estimated annual openings, 2013-2018	21
Median hourly earning	\$12.95
Relative to US (US = 1.00)	0.89
Share of the occupation age 55+ years	16%

SKILLS

(Ranked by importance on 5-point scale)

1	Operation and control	3.88
2	Operation monitoring	3.25
3	Coordination	3.00
4	Time management	3.00
5	Equipment maintenance	3.00
6	Monitoring	2.88
7	Judgment and decision making	2.88
8	Active listening	2.88
9	Troubleshooting	2.88
10	Critical thinking	2.75

WORK ACTIVITIES

(Ranked by importance on 5-point scale)

1	Operating vehicles, mechanized devices, or equipment	4.59
2	Inspecting equipment, structures, or material	4.37
3	Communicating with supervisors, peers, or subordinates	4.11
4	Handling and moving objects	4.08
5	Getting information	3.95
6	Monitor processes, materials, or surroundings	3.93
7	Identifying objects, actions, and events	3.85
8	Performing general physical activities	3.75
9	Making decisions and solving problems	3.66
10	Training and teaching others	3.62

Sources: O*NET Online and O*NET database, version 18.1, EMSI Complete Employment 2014.2 (employment overview).

53-7051 INDUSTRIAL TRUCK & TRACTOR OPERATORS (Job Series 5704/05 Forklift/Tractor Operator) **Cont.**

EDUCATION/PREPARATION

Typical requirements for entry

Education Less than high school

Experience None

Additional training Short-term on-the-job required for competency training

Job Zone A system for grouping occupations based on similar education, experience, and on-the-job training requirements needed to do the work.

Job Zone ●●○○○

Level of preparation Some needed

Specific Vocational Preparation (SVP) Range: 4 to <5

The time required by a typical worker to learn the techniques, acquire the information, and develop the facility needed for average job performance

- 1. Short demonstration only
- 2. Anything beyond short demonstration up to and incl. 1 month
- 3. Over 1 month up to and including 3 months
- 4. Over 3 months up to and including 6 months
- 5. Over 6 months up to and including 1 year
- 6. Over 1 year up to and including 2 years
- 7. Over 2 years up to and including 4 years
- 8. Over 4 years up to and including 10 years
- 9. Over 10 years

COMPATIBLE OCCUPATIONS

(Ranked by estimated annual openings in region, 2013-2018)

SOC CODE	COMPATIBLE OCCUPATIONS	MEDIAN HOURLY EARNINGS	2013 JOBS	EST. ANNUAL OPENINGS (2013-2018)	COMPATIBILITY INDEX
53-3032	Heavy and Tractor-Trailer Truck Drivers	\$15.14	3,435	139	94
49-9071	Maintenance and Repair Workers, General	\$14.08	1,715	45	85
51-4121	Welders, Cutters, Solderers, and Brazers	\$15.50	1,377	43	93
43-5071	Shipping, Receiving, and Traffic Clerks	\$14.23	626	21	92
49-3031	Bus and Truck Mechanics and Diesel Engine Specialists	\$17.45	416	18	86
45-4022	Logging Equipment Operators	\$14.88	396	17	95
47-2073	Operating Engineers/Other Constr. Equip. Operators	\$14.70	423	17	95
51-4041	Machinists	\$18.14	301	13	88
47-2141	Painters, Construction and Maintenance	\$15.41	420	12	92
49-9051	Electrical Power-Line Installers and Repairers	\$25.49	158	12	85
43-5052	Postal Service Mail Carriers	\$23.43	340	11	92
49-3021	Automotive Body and Related Repairers	\$17.02	185	8	92
51-9197	Tire Builders	\$27.78	280	7	95
51-2041	Structural Metal Fabricators and Fitters	\$18.35	157	7	90
51-8013	Power Plant Operators	\$29.44	125	7	87
51-9023	Mixing and Blending Machine Workers	\$21.01	188	6	92
51-9041	Extruding, Forming, and Compacting Machine Workers	\$17.05	181	5	94
51-9032	Cutting and Slicing Machine Workers	\$16.59	199	5	94
51-9122	Painters, Transportation Equipment	\$15.92	157	5	94
51-4023	Rolling Machine Workers, Metal and Plastic	\$21.53	181	5	91

Sources: O*NET Online (Job Zone/SVP Range); EMSI Complete Employment 2014.2 (employment data, typical requirements for entry, and compatibility index). Blue shading shows occupations with median wage rates equal to or greater than the median wage rate of the affected occupation. For a description of the compatible occupation analysis, see pages 46 to 50.

53-7051 INDUSTRIAL TRUCK & TRACTOR OPERATORS (Job Series 5704/05 Forklift/Tractor Operator) **Cont.**

STAFFING PATTERNS

(Ranked by share the occupation represents of industry's total employment)

NAICS CODE	INDUSTRY	% WORKING IN THE INDUSTRY	% OF TOTAL INDUSTRY EMPLOYMENT
493130	Farm Product Warehousing and Storage	0.2%	11.4%
493120	Refrigerated Warehousing and Storage	1.1%	11.0%
493110	General Warehousing and Storage	12.7%	10.7%
493190	Other Warehousing and Storage	0.9%	10.2%
488310	Port and Harbor Operations	0.4%	9.5%
488320	Marine Cargo Handling	0.7%	8.1%
488210	Support Activities for Rail Transportation	0.5%	8.0%
335222	Household Refrigerator and Home Freezer Manufacturing	0.2%	7.4%
327420	Gypsum Product Manufacturing	0.1%	7.4%
311422	Specialty Canning	0.1%	6.5%
311421	Fruit and Vegetable Canning	0.7%	6.3%
488390	Other Support Activities for Water Transportation	0.1%	6.3%
311411	Frozen Fruit, Juice, and Vegetable Manufacturing	0.4%	6.2%
311423	Dried and Dehydrated Food Manufacturing	0.1%	6.2%
321114	Wood Preservation	0.1%	6.1%
335221	Household Cooking Appliance Manufacturing	0.1%	6.1%
488330	Navigational Services to Shipping	0.2%	6.1%
311412	Frozen Specialty Food Manufacturing	0.7%	6.1%
335228	Other Major Household Appliance Manufacturing	0.1%	6.1%
321113	Sawmills	0.9%	6.0%
335211	Electric Housewares and Household Fan Manufacturing	0.1%	5.9%
321212	Softwood Veneer and Plywood Manufacturing	0.1%	5.5%
321211	Hardwood Veneer and Plywood Manufacturing	0.1%	4.8%
321214	Truss Manufacturing	0.2%	4.7%
321219	Reconstituted Wood Product Manufacturing	0.1%	4.6%
311111	Dog and Cat Food Manufacturing	0.2%	4.5%
311119	Other Animal Food Manufacturing	0.3%	4.4%
423310	Lumber, Plywood, Millwork, and Wood Panel Merchant Wholesalers	0.8%	4.3%
423330	Roofing, Siding, and Insulation Material Merchant Wholesalers	0.3%	4.2%
314110	Carpet and Rug Mills	0.2%	4.2%
423390	Other Construction Material Merchant Wholesalers	0.2%	4.1%
311911	Roasted Nuts and Peanut Butter Manufacturing	0.1%	4.1%
423320	Brick, Stone, and Related Construction Material Merchant Wholesalers	0.4%	4.1%
311919	Other Snack Food Manufacturing	0.3%	3.9%
311941	Mayonnaise, Dressing, and Other Prepared Sauce Manufacturing	0.1%	3.8%
311920	Coffee and Tea Manufacturing	0.1%	3.8%
311999	All Other Miscellaneous Food Manufacturing	0.2%	3.8%
311942	Spice and Extract Manufacturing	0.2%	3.7%
311991	Perishable Prepared Food Manufacturing	0.3%	3.7%
311211	Flour Milling	0.1%	3.7%

Source: EMSI Complete Employment 2014.2

APPENDICES



APPENDIX A: RRAD IMPACT

As part of the planning process, TIP was asked to estimate the impact of “a singular substantial job loss” at RRAD. As a first step in the analysis, data received from the Depot on the ZIP Code of residence for their workers was used to illustrate the installation’s geographic reach. Based on the analysis, the area of impact for job losses was defined as a 12-county region centered on **Bowie** County and including four neighboring counties in Texas—**Red River, Cass, Morris,** and **Titus**—as well as **Miller, Little River, Sevier, Hempstead, Howard,** and **Lafayette** Counties in Arkansas and **McCurtain** County in Oklahoma.

This 12-county region, shown in Figure 1, was used to model the impacts of a hypothetical reduction in employment at RRAD using the input-output component of EMSI’s Analyst tool. The model estimates impacts along three dimensions: earnings, employment, and sales or output. For this task, a 2,000-person layoff was assumed, with the reduction limited to federal civilian workers. The results of the analysis are outlined below. The objective of this analysis was to provide a rough estimate of the impacts of a specific employment scenario on the surrounding region. It should not be interpreted as an analysis of RRAD’s total economic impact and it is not directly comparable to prior studies, including the 2012 analysis conducted by the Office of the Governor. In addition to variations resulting from the choice of model and the underlying assumptions and inputs, this study is not likely to align geographically with other studies because it was conducted on the installation’s laborshed rather than more commonly used economic regions, such as state planning regions or metropolitan statistical areas. While our approach satisfies the objectives of this work, it may not meet the standard for public policy decision making.

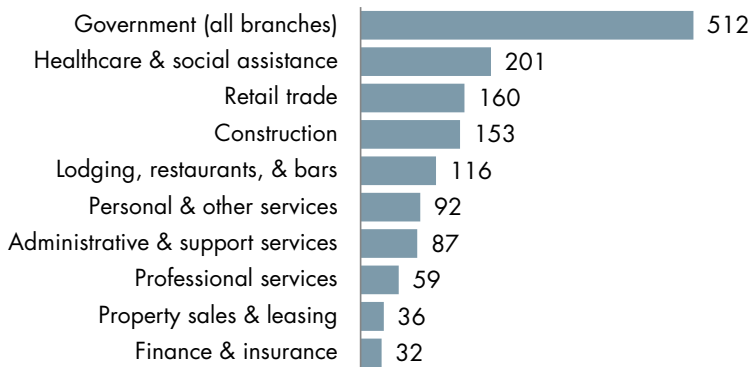
EMPLOYMENT & EARNINGS. Along with the 2,000 jobs used as the *initial* input, an estimated 1,557 additional jobs would be lost. These further job losses are due to the *direct* impact of reduced output at RRAD on the facility’s regional suppliers, the *indirect* effect on the 12-county supply chain (essentially suppliers to RRAD’s suppliers), and the *induced* effect resulting from the loss of spending by impacted employees. The majority of the employment impact beyond the initial losses results from this induced effect.

Losses would be distributed across industries and occupations. Along with the government sector’s direct job losses—the initial assumption of a 2,000-person layoff—more than 500 additional jobs would be lost in the sector as the effect of the initial layoffs reverberate through the economy affecting tax revenues and other public sector economic activities across the region.

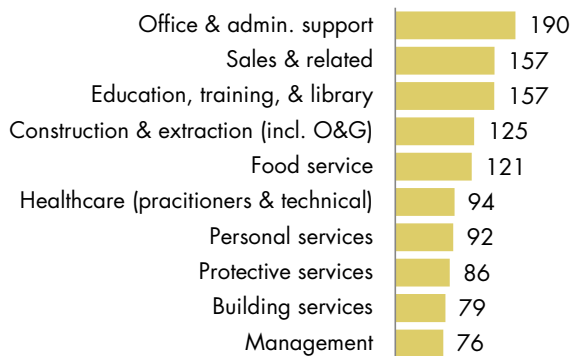
Beyond the reduction in government employment, these ripple effects would lead to the loss of more than 100 jobs region-wide in each of the following industries: healthcare, retail, construction, and food and lodging. In terms of occupations, office workers, salespersons, education-related positions, and construction and mining jobs would be most affected by RRAD losses. When the initial loss is excluded, the majority of the employment impact (85 percent) comes from induced effects resulting from a reduction in spending by affected employees throughout the supply chain.

FIGURE 46: RRAD EMPLOYMENT IMPACTS

INDUSTRY DETAIL FOR DIRECT, INDIRECT, AND INDUCED LOSSES



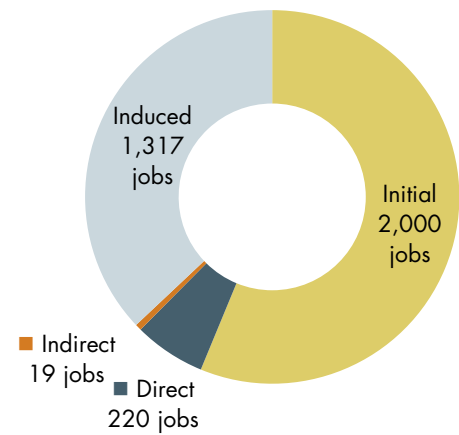
OCCUPATION DETAIL FOR DIRECT, INDIRECT, AND INDUCED LOSSES



Source: EMSI Complete Employment 2014.2; TIP Strategies

FIGURE 45: RRAD IMPACT

EMPLOYMENT IMPACTS OF 2,000-PERSON LAYOFF BY TYPE OF IMPACT



Source: EMSI Complete Emp. 2014.2; TIP Strategies

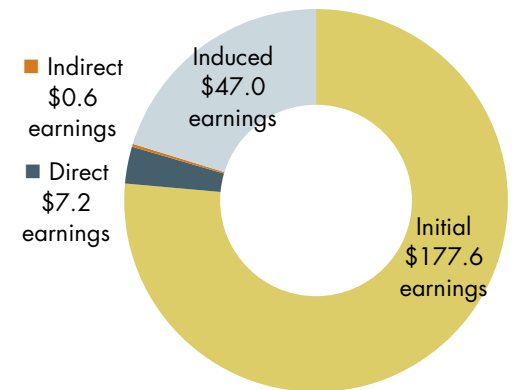
DEFINITIONS

- **Initial:** The initial change in jobs exclusive of any “ripple effects.” (In this case, the initial impact is a 2,000-person layoff at RRAD).
- **Direct:** The first round of impacts caused by changes in purchases/inputs made by the initial change (i.e., the RRAD layoffs). Direct impacts are the result of changed interactions between-industries (“inter-industry effects”).
- **Indirect:** The subsequent ripple effect that occurs when suppliers of the directly affected industries are impacted. This second round of impacts is also due to inter-industry effects.
- **Induced:** The effect on the regional economy due to changes in the earnings of employees affected by the initial, direct, and indirect impacts. These impacts reflect changes in trade among industries in the region as employee spending on food, clothing, and other goods and services is affected.
- **Sales/output.** A measure of the value of goods and services produced within a region, whether consumed locally or used for further production. It is not a measure of business profits.

Under this scenario, the loss in jobs would result in an estimated \$232.4 million loss in earnings within the region. This figure includes the change in earnings resulting from the initial job loss (2,000 workers) as well as reductions in earnings resulting from the multiplier effect created as the losses circulate through the economy. As would be expected, earnings impacts mirror the affected industries and occupations. Reductions in earnings would be largest among workers in government (all branches), healthcare, construction, professional services, and retail trade. Like employment impacts, the vast majority of the earnings impact—outside the initial losses—would result from induced effects.

FIGURE 47: RRAD IMPACT

EARNINGS IMPACTS (IN MILLIONS) OF 2,000-PERSON LAYOFF BY TYPE OF IMPACT



Source: EMSI Complete Emp. 2014.2; TIP Strategies

SALES/OUTPUT. Losses in sales/output resulting from the scenario would total \$2.4 billion region-wide. The government sector would bear the brunt of the losses, with the initial 2,000 person job loss translating to a \$2.2 billion impact—one-quarter of the estimated \$8.7 billion in economic activity generated by the sector in the 12-county region (“Original” column in Figure 48). Multiplier effects would reduce government sector output in the region by another \$89.8 million, for a total reduction of \$2.3 billion percent in the sector (26.6 percent of total output in the 12-county region). The next most heavily impacted industries, from a sales/output perspective, would be healthcare (\$15.6 million), construction (\$11.3 million), retail (\$10.2 million), lodging and restaurants (\$5.8 million) and finance and insurance (\$5.7 million). The distribution of the economic losses for selected industries is presented in Figure 48.

FIGURE 48: RRAD IMPACT

SALES/OUTPUT IMPACTS (IN MILLIONS) OF 2,000-PERSON LAYOFF BY INDUSTRY AND TYPE OF IMPACT

NAICS Code	Description	Original	Type of Impact			Total impact	Share of Original
		(prior to initial impact)	Direct	Indirect	Induced	Sales/Output	
90	Government (all branches)	\$8,680.12	\$0.04	\$0.02	\$89.77	\$2,309.44	26.6%
62	Healthcare & social assist.	\$1,267.78	\$0.83	\$0.01	\$14.78	\$15.62	1.2%
23	Construction	\$818.32	\$4.41	\$0.03	\$6.88	\$11.32	1.4%
44	Retail trade	\$1,118.93	\$0.16	\$0.10	\$9.92	\$10.18	0.9%
72	Lodging, restaurants, & bars	\$512.40	\$0.56	\$0.09	\$5.16	\$5.81	1.1%
52	Finance & insurance	\$1,079.38	\$0.45	\$0.27	\$4.96	\$5.67	0.5%
51	Information	\$290.34	\$2.44	\$0.17	\$2.06	\$4.67	1.6%
54	Professional services	\$241.26	\$2.79	\$0.18	\$1.51	\$4.48	1.9%
53	Property sales & leasing	\$516.14	\$0.70	\$0.19	\$3.57	\$4.46	0.9%
56	Admin. & support services	\$287.23	\$2.21	\$0.18	\$1.05	\$3.44	1.2%
81	Personal & other services	\$395.74	\$0.38	\$0.06	\$2.76	\$3.20	0.8%
31	Manufacturing	\$8,544.73	\$0.98	\$0.19	\$1.90	\$3.07	0.0%
42	Wholesale trade	\$689.88	\$0.69	\$0.05	\$1.80	\$2.54	0.4%
48	Transp. & warehousing	\$778.44	\$1.02	\$0.08	\$1.11	\$2.21	0.3%
22	Utilities	\$410.78	\$0.34	\$0.03	\$1.52	\$1.89	0.5%
TOTAL		\$27,605.44	\$18.14	\$1.70	\$150.04	\$2,389.48	8.7%

Source: EMSI Complete Emp. 2014.2; TIP Strategies

APPENDIX B: STAFFING PATTERNS DETAIL

Staffing patterns data prepared by the U.S. Bureau of Labor Statistics were used to identify the types of industries that could employ workers affected by workload reductions at RRAD. The analysis reveals several industries which employ more than one of the 14 affected occupations. For example, staffing patterns data for Machine Shops (NAICS 332710) show that the industry typically employs 7 of the 14 occupations, with Machinists (SOC 51-4041) usually accounting for more than 10 percent of the industry’s total employment. Additional details of the analysis are presented in Section 4, pages 44 to 46.

FIGURE 49: MATRIX OF STAFFING PATTERNS FOR AFFECTED OCCUPATIONS

INDUSTRIES (ROWS) THAT TYPICALLY EMPLOY THE AFFECTED OCCUPATIONS (COLUMNS)

NAICS Code	Industry	Occupation's share of total employment in the industry:														Total all affected occupations	# of occupations
		11-3051 Industrial Production Mgrs.	13-1199 Bus. Op. Spec., All Others	15-1152 Computer Network Support	43-5081 Stock Clerks & Order Fillers	43-9199 Office/Admin. Support, All Other	49-3042 Mobile Heavy Equip. Mechanics	49-9012 Control & Valve Install & Repair	51-4041 Machinists	51-4121 Welders, Cutters... & Brazers	51-4193 Plating/Coating Machine	51-4199 Metal/Plastic Workers, All Other	51-9122 Painters, Transp. Equip.	51-9195 Molders, Shapers & Casters	53-7051 Ind. Truck/Tractor Operators		
901199	Federal Government, Civilian, Excluding Postal Service		■		■	■	■	■	■	■	■	■	■	■	■	9.6%	9
561320	Temporary Help Services		■	■	■	■			■	■				■	5.0%	8	
561330	Professional Employer Organizations		■	■	■	■			■	■				■	4.8%	8	
541330	Engineering Services	■	■	■	■	■			■	■					2.5%	8	
332710	Machine Shops	■			■				■	■	■			■	38.4%	7	
423830	Industrial Machinery and Equipment Merchant Wholesalers		■		■		■	■	■	■				■	10.5%	7	
336399	All Other Motor Vehicle Parts Manufacturing	■			■				■	■	■	■		■	10.0%	7	
336411	Aircraft Manufacturing	■	■		■				■	■	■				6.9%	7	
326199	All Other Plastics Product Manufacturing	■			■				■		■		■	■	5.5%	7	
551114	Corporate, Subsidiary, and Regional Managing Offices	■	■	■	■	■	■							■	4.6%	7	
561311	Employment Placement Agencies		■		■	■			■	■				■	4.6%	7	
425120	Wholesale Trade Agents and Brokers	■	■	■	■	■		■						■	3.7%	7	
333132	Oil and Gas Field Machinery and Equipment Manufacturing	■	■		■				■	■				■	20.5%	6	

LEGEND

Occupation's share of total employment in the industry:

- Less than 0.5%
- 0.5% to 2.5%
- 2.5% to 9.9%
- 10.0% or more

NAICS Code	Industry	11-3051 Industrial Production Mgrs.	13-1199 Bus. Op. Spec., All Others	15-1152 Computer Network Support	43-5081 Stock Clerks & Order Fillers	43-9199 Office/Admin. Support, All Other	49-3042 Mobile Heavy Equip. Mechanics	49-9012 Control & Valve Install & Repair	51-4041 Machinists	51-4121 Welders, Cutters... & Brazers	51-4193 Plating/Coating Machine	51-4199 Metal/Plastic Workers, All Other	51-9122 Painters, Transp. Equip.	51-9195 Molders, Shapers & Casters	53-7051 Ind. Truck/Tractor Operators	Total all affected occupations	# of occupations
811310	Commercial/Industrial Machinery & Equip. (except Auto & Electronic) Repair/ Maint.															20.4%	6
332312	Fabricated Structural Metal Manufacturing															16.5%	6
333120	Construction Machinery Manufacturing															16.2%	6
336611	Ship Building and Repairing															16.0%	6
332322	Sheet Metal Work Manufacturing															14.9%	6
423810	Construction and Mining (except Oil Well) Machinery and Equip. Wholesalers															11.2%	6
333415	HVAC and Commercial/Industrial Refrigeration Equipment Manufacturing															10.4%	6
423840	Industrial Supplies Merchant Wholesalers															10.2%	6
336370	Motor Vehicle Metal Stamping															9.4%	6
336413	Other Aircraft Parts and Auxiliary Equipment Manufacturing															8.1%	6
561990	All Other Support Services															7.1%	6
221122	Electric Power Distribution															5.1%	6
334413	Semiconductor and Related Device Manufacturing															5.1%	6
902999	State Government, Excluding Education and Hospitals															3.4%	6
541712	R&D in the Physical, Engineering, and Life Sciences (except Biotechnology)															3.4%	6
903999	Local Government, Excluding Education and Hospitals															1.7%	6
332420	Metal Tank (Heavy Gauge) Manufacturing															21.0%	5
332813	Electroplating, Plating, Polishing, Anodizing, and Coloring															19.0%	5
332812	Metal Coating, Engraving (except Jewelry /Silverware), and Allied Services to Mfg.															18.6%	5
333111	Farm Machinery and Equipment Manufacturing															17.2%	5
423510	Metal Service Centers and Other Metal Merchant Wholesalers															12.6%	5

LEGEND

Occupation's share of total employment in the industry:

- Less than 0.5%
- 0.5% to 2.5%
- 2.5% to 9.9%
- 10.0% or more

NAICS Code	Industry	11-3051 Industrial Production Mgrs.	13-1199 Bus. Op. Spec., All Others	15-1152 Computer Network Support	43-5081 Stock Clerks & Order Fillers	43-9199 Office/Admin. Support, All Other	49-3042 Mobile Heavy Equip. Mechanics	49-9012 Control & Valve Install & Repair	51-4041 Machinists	51-4121 Welders, Cutters... & Brazers	51-4193 Plating/Coating Machine	51-4199 Metal/Plastic Workers, All Other	51-9122 Painters, Transp. Equip.	51-9195 Molders, Shapers & Casters	53-7051 Ind. Truck/Tractor Operators	Total all affected occupations	# of occupations
332999	All Other Miscellaneous Fabricated Metal Product Manufacturing	■							■	■	■	■				12.2%	5
336360	Motor Vehicle Seating and Interior Trim Manufacturing	■			■				■	■					■	9.7%	5
336350	Motor Vehicle Transmission and Power Train Parts Manufacturing	■			■				■	■					■	9.3%	5
332116	Metal Stamping	■							■	■		■			■	9.1%	5
331111	Iron and Steel Mills	■							■			■			■	6.5%	5
423120	Motor Vehicle Supplies and New Parts Merchant Wholesalers		■		■				■	■					■	6.3%	5
423930	Recyclable Material Merchant Wholesalers							■		■		■			■	5.8%	5
339112	Surgical and Medical Instrument Manufacturing	■	■		■				■			■				5.4%	5
339113	Surgical Appliance and Supplies Manufacturing	■	■		■							■				5.3%	5
339950	Sign Manufacturing	■			■				■	■				■		5.2%	5
324110	Petroleum Refineries	■	■					■	■						■	5.0%	5
334418	Printed Circuit Assembly (Electronic Assembly) Manufacturing	■	■						■	■	■					4.9%	5
334419	Other Electronic Component Manufacturing	■	■						■	■	■					4.8%	5
334511	Search, Detection, Navigation, Guidance, Aeronautical/Nautical Sys. & Instrument Mfg.	■	■		■				■	■						4.7%	5
211111	Crude Petroleum and Natural Gas Extraction	■	■	■				■		■						4.3%	5
541690	Other Scientific and Technical Consulting Services		■	■	■	■									■	4.3%	5
541611	Administrative Management and General Management Consulting Services		■	■	■	■									■	4.1%	5
541613	Marketing Consulting Services		■	■	■	■									■	4.1%	5
999999	Unclassified Industry		■		■				■	■					■	3.5%	5
213112	Support Activities for Oil and Gas Operations		■		■		■		■	■						3.1%	5
332721	Precision Turned Product Manufacturing	■							■		■	■				19.5%	4

LEGEND

Occupation's share of total employment in the industry:

- Less than 0.5%
- 0.5% to 2.5%
- 2.5% to 9.9%
- 10.0% or more

NAICS Code	Industry	11-3051	13-1199	15-1152	43-5081	43-9199	49-3042	49-9012	51-4041	51-4121	51-4193	51-4199	51-9122	51-9195	53-7051	Total all affected occupations	# of occupations
332722	Bolt, Nut, Screw, Rivet, and Washer Manufacturing	■							■		■	■				18.6%	4
333511	Industrial Mold Manufacturing	■							■	■		■				18.0%	4
333514	Special Die and Tool, Die Set, Jig, and Fixture Manufacturing	■							■	■		■				17.7%	4
336211	Motor Vehicle Body Manufacturing	■									■	■			■	15.3%	4
332321	Metal Window and Door Manufacturing	■							■	■					■	14.4%	4
327390	Other Concrete Product Manufacturing	■								■				■	■	10.4%	4
221210	Natural Gas Distribution	■	■					■		■						10.2%	4
327320	Ready-Mix Concrete Manufacturing	■								■				■	■	10.0%	4
332618	Other Fabricated Wire Product Manufacturing								■	■	■	■				9.8%	4
333618	Other Engine Equipment Manufacturing	■							■	■		■				9.1%	4
423850	Service Establishment Equipment and Supplies Merchant Wholesalers				■		■		■	■						9.1%	4
327215	Glass Product Manufacturing Made of Purchased Glass	■							■					■	■	8.9%	4
336312	Gasoline Engine and Engine Parts Manufacturing	■							■	■					■	8.7%	4
336322	Other Motor Vehicle Electrical and Electronic Equipment Manufacturing	■							■	■					■	8.6%	4
336412	Aircraft Engine and Engine Parts Manufacturing	■	■						■	■						8.3%	4
423310	Lumber, Plywood, Millwork, and Wood Panel Merchant Wholesalers				■					■					■	7.4%	4
423990	Other Miscellaneous Durable Goods Merchant Wholesalers				■			■		■					■	6.1%	4
423110	Automobile and Other Motor Vehicle Merchant Wholesalers				■				■	■					■	5.9%	4
482110	Rail Transportation		■		■				■	■						5.5%	4
517110	Wired Telecommunications Carriers		■	■	■	■										5.4%	4
561110	Office Administrative Services		■	■	■	■										5.1%	4

LEGEND

Occupation's share of total employment in the industry:

- Less than 0.5%
- 0.5% to 2.5%
- 2.5% to 9.9%
- 10.0% or more

NAICS Code	Industry	11-3051 Industrial Production Mgrs.	13-1199 Bus. Op. Spec., All Others	15-1152 Computer Network Support	43-5081 Stock Clerks & Order Fillers	43-9199 Office/Admin. Support, All Other	49-3042 Mobile Heavy Equip. Mechanics	49-9012 Control & Valve Install & Repair	51-4041 Machinists	51-4121 Welders, Cutters... & Brazers	51-4193 Plating/Coating Machine	51-4199 Metal/Plastic Workers, All Other	51-9122 Painters, Transp. Equip.	51-9195 Molders, Shapers & Casters	53-7051 Ind. Truck/Tractor Operators	Total all affected occupations	# of occupations
903612	Colleges, Universities, and Professional Schools (Local Government)		■	■	■	■										4.9%	4
325412	Pharmaceutical Preparation Manufacturing	■	■		■											4.6%	4
336111	Automobile Manufacturing	■						■	■							4.6%	4
423610	Electrical Apparatus/Equip., Wiring Supplies, and Related Equip. Wholesalers		■		■			■								4.6%	4
423690	Other Electronic Parts and Equipment Merchant Wholesalers		■					■								4.5%	4
339999	All Other Miscellaneous Manufacturing	■						■	■				■			4.2%	4
423430	Computer/Computer Peripheral Equipment and Software Merchant Wholesalers		■	■	■											3.9%	4
423450	Medical, Dental, and Hospital Equipment and Supplies Merchant Wholesalers		■	■	■											3.9%	4
541512	Computer Systems Design Services		■	■	■	■										3.7%	4
611310	Colleges, Universities, and Professional Schools (Private)		■	■	■	■										3.7%	4
902612	Colleges, Universities, and Professional Schools (State Government)		■	■	■	■										3.6%	4
541511	Custom Computer Programming Services		■	■	■	■										3.6%	4
561210	Facilities Support Services		■		■		■								■	3.6%	4
481111	Scheduled Passenger Air Transportation		■		■	■		■								2.7%	4
236220	Commercial and Institutional Building Construction		■				■		■							1.7%	4
622110	General Medical and Surgical Hospitals (Private)		■	■	■	■										1.3%	4
111000	Crop Production				■		■		■						■	1.2%	4
561422	Telemarketing Bureaus and Other Contact Centers		■	■	■	■										1.0%	4
238220	Plumbing, Heating, and Air-Conditioning Contractors		■		■		■		■							1.0%	4
238210	Electrical Contractors and Other Wiring Installation Contractors		■	■	■				■							0.8%	4
493110	General Warehousing and Storage		■		■										■	19.4%	3

LEGEND

Occupation's share of total employment in the industry:

- Less than 0.5%
- 0.5% to 2.5%
- 2.5% to 9.9%
- 10.0% or more

NAICS Code	Industry	11-3051 Industrial Production Mgrs.	13-1199 Bus. Op. Spec., All Others	15-1152 Computer Network Support	43-5081 Stock Clerks & Order Fillers	43-9199 Office/Admin. Support, All Other	49-3042 Mobile Heavy Equip. Mechanics	49-9012 Control & Valve Install & Repair	51-4041 Machinists	51-4121 Welders, Cutters... & Brazers	51-4193 Plating/Coating Machine	51-4199 Metal/Plastic Workers, All Other	51-9122 Painters, Transp. Equip.	51-9195 Molders, Shapers & Casters	53-7051 Ind. Truck/Tractor Operators	Total all affected occupations	# of occupations
452112	Discount Department Stores		■		■	■										18.5%	3
452910	Warehouse Clubs and Supercenters		■		■										■	15.7%	3
332313	Plate Work Manufacturing	■							■	■						14.9%	3
333999	All Other Miscellaneous General Purpose Machinery Manufacturing	■							■	■						13.2%	3
332996	Fabricated Pipe and Pipe Fitting Manufacturing								■	■		■				11.5%	3
332991	Ball and Roller Bearing Manufacturing								■	■		■				10.5%	3
332912	Fluid Power Valve and Hose Fitting Manufacturing								■	■		■				10.3%	3
424410	General Line Grocery Merchant Wholesalers		■		■											8.9%	3
424490	Other Grocery and Related Products Merchant Wholesalers		■		■											8.6%	3
331210	Iron and Steel Pipe and Tube Manufacturing from Purchased Steel									■		■				8.4%	3
336330	Motor Vehicle Steering and Suspension Components (except Spring) Manufacturing								■	■					■	7.9%	3
444110	Home Centers		■		■											7.8%	3
331221	Rolled Steel Shape Manufacturing									■		■				7.7%	3
444190	Other Building Material Dealers		■		■											7.3%	3
312111	Soft Drink Manufacturing	■														7.0%	3
332212	Hand and Edge Tool Manufacturing								■		■	■				6.9%	3
312130	Wineries	■			■											6.5%	3
423710	Hardware Merchant Wholesalers				■										■	6.2%	3
423720	Plumbing/Heating Equipment and Supplies (Hydronics) Merchant Wholesalers				■										■	6.2%	3
424210	Drugs and Druggists' Sundries Merchant Wholesalers		■		■										■	6.1%	3
336414	Guided Missile and Space Vehicle Manufacturing	■	■						■							6.0%	3
335314	Relay and Industrial Control Manufacturing	■							■	■						5.5%	3

LEGEND

Occupation's share of total employment in the industry:

- Less than 0.5%
- 0.5% to 2.5%
- 2.5% to 9.9%
- 10.0% or more

NAICS Code	Industry	11-3051 Industrial Production Mgrs.	13-1199 Bus. Op. Spec., All Others	15-1152 Computer Network Support	43-5081 Stock Clerks & Order Fillers	43-9199 Office/Admin. Support, All Other	49-3042 Mobile Heavy Equip. Mechanics	49-9012 Control & Valve Install & Repair	51-4041 Machinists	51-4121 Welders, Cutters... & Brazers	51-4193 Plating/Coating Machine	51-4199 Metal/Plastic Workers, All Other	51-9122 Painters, Transp. Equip.	51-9195 Molders, Shapers & Casters	53-7051 Ind. Truck/Tractor Operators	Total all affected occupations	# of occupations
237120	Oil and Gas Pipeline and Related Structures Construction						■	■		■						5.2%	3
454113	Mail-Order Houses		■		■										■	5.2%	3
325620	Toilet Preparation Manufacturing	■			■											5.1%	3
331511	Iron Foundries							■	■		■					5.1%	3
454111	Electronic Shopping		■		■										■	4.7%	3
237110	Water and Sewer Line and Related Structures Construction						■	■		■						4.4%	3
326211	Tire Manufacturing (except Retreading)							■					■	■		4.2%	3
488510	Freight Transportation Arrangement		■		■										■	4.1%	3
337215	Showcase, Partition, Shelving, and Locker Manufacturing	■								■					■	4.0%	3
511210	Software Publishers		■	■		■										3.9%	3
221112	Fossil Fuel Electric Power Generation		■		■			■								3.9%	3
518210	Data Processing, Hosting, and Related Services		■	■		■										3.8%	3
424690	Other Chemical and Allied Products Merchant Wholesalers		■		■										■	3.7%	3
423420	Office Equipment Merchant Wholesalers		■	■	■											3.5%	3
443112	Radio, Television, and Other Electronics Stores		■	■	■											3.5%	3
519130	Internet Publishing and Broadcasting and Web Search Portals		■	■		■										3.3%	3
524114	Direct Health and Medical Insurance Carriers		■	■		■										3.2%	3
524113	Direct Life Insurance Carriers		■	■		■										3.1%	3
453910	Pet and Pet Supplies Stores		■		■									■		3.0%	3
335931	Current-Carrying Wiring Device Manufacturing							■		■	■					2.9%	3
423820	Farm and Garden Machinery and Equipment Merchant Wholesalers				■		■		■							2.9%	3

LEGEND

Occupation's share of total employment in the industry:

- Less than 0.5%
- 0.5% to 2.5%
- 2.5% to 9.9%
- 10.0% or more

NAICS Code	Industry	11-3051 Industrial Production Mgrs.	13-1199 Bus. Op. Spec., All Others	15-1152 Computer Network Support	43-5081 Stock Clerks & Order Fillers	43-9199 Office/Admin. Support, All Other	49-3042 Mobile Heavy Equip. Mechanics	49-9012 Control & Valve Install & Repair	51-4041 Machinists	51-4121 Welders, Cutters... & Brazers	51-4193 Plating/Coating Machine	51-4199 Metal/Plastic Workers, All Other	51-9122 Painters, Transp. Equip.	51-9195 Molders, Shapers & Casters	53-7051 Ind. Truck/Tractor Operators	Total all affected occupations	# of occupations
453998	All Other Miscellaneous Store Retailers (except Tobacco Stores)		■		■											2.7%	3
311612	Meat Processed from Carcasses	■			■											2.6%	3
237310	Highway, Street, and Bridge Construction						■			■						2.5%	3
311615	Poultry Processing	■			■											2.4%	3
311611	Animal (except Poultry) Slaughtering	■			■											2.3%	3
311812	Commercial Bakeries	■			■											2.3%	3
624310	Vocational Rehabilitation Services		■		■	■										2.1%	3
323110	Commercial Lithographic Printing	■			■											2.1%	3
337110	Wood Kitchen Cabinet and Countertop Manufacturing	■			■											2.1%	3
484121	General Freight Trucking, Long-Distance, Truckload		■		■											1.9%	3
524126	Direct Property and Casualty Insurance Carriers		■	■		■										1.9%	3
511120	Periodical Publishers		■		■	■										1.9%	3
511110	Newspaper Publishers	■	■			■										1.6%	3
541810	Advertising Agencies		■		■	■										1.6%	3
238910	Site Preparation Contractors						■			■						1.5%	3
238990	All Other Specialty Trade Contractors						■			■						1.5%	3
541380	Testing Laboratories		■			■		■								1.4%	3
454390	Other Direct Selling Establishments				■			■								1.2%	3
492110	Couriers and Express Delivery Services		■			■										1.2%	3
522110	Commercial Banking		■	■		■										1.0%	3
624190	Other Individual and Family Services		■		■	■										1.0%	3
813110	Religious Organizations		■	■		■										0.9%	3
903622	Hospitals (Local Government)		■	■	■											0.8%	3
811111	General Automotive Repair				■			■	■							0.7%	3

LEGEND

Occupation's share of total employment in the industry:

- Less than 0.5%
- 0.5% to 2.5%
- 2.5% to 9.9%
- 10.0% or more

NAICS Code	Industry	11-3051 Industrial Production Mgrs.	13-1199 Bus. Op. Spec., All Others	15-1152 Computer Network Support	43-5081 Stock Clerks & Order Fillers	43-9199 Office/Admin. Support, All Other	49-3042 Mobile Heavy Equip. Mechanics	49-9012 Control & Valve Install & Repair	51-4041 Machinists	51-4121 Welders, Cutters... & Brazers	51-4193 Plating/Coating Machine	51-4199 Metal/Plastic Workers, All Other	51-9122 Painters, Transp. Equip.	51-9195 Molders, Shapers & Casters	53-7051 Ind. Truck/Tractor Operators	Total all affected occupations	# of occupations
903611	Elementary and Secondary Schools (Local Government)		■	■		■										0.6%	3
236118	Residential Remodelers		■				■			■						0.6%	3
238350	Finish Carpentry Contractors				■					■				■		0.6%	3
441110	New Car Dealers		■		■										■	0.6%	3
524210	Insurance Agencies and Brokerages		■	■		■										0.5%	3
621610	Home Health Care Services		■		■	■										0.3%	3

Source: National Industry-Occupation Employment Matrix (accessed via EMSI Complete Employment, 2014.2). Figure includes industries for which at least three of the affected occupations comprise some share of the industry's total employment.

APPENDIX C: TOOLS & TECHNOLOGY DETAIL

FIGURE 50: TOOLS USED BY SELECTED OCCUPATIONS

RANKED BY SHARE OF SELECTED OCCUPATIONS THAT TYPICALLY USE THEM

TOOLS	11-3051 Industrial Production Mgrs.	13-1199 Bus. Op. Specs., All Others(1)	15-1152 Computer Network Support	49-3042 Mobile Heavy Equip. Mechs.	49-9012 Control & Valve Install/Repair	51-4041 Machinists	51-4121 Welders...Brazers(2)	51-9122 Painters, Transp. Equip.	51-9195 Molders... Casters(3)	53-7051 Ind. Truck Tractor Operators	SHARE OF OCCUPATIONS
1 Personal computers (incl. laptops/tablets)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	100%
2 Forklifts	✓				✓	✓	✓	✓	✓	✓	70%
3 Adjustable wrenches				✓	✓	✓	✓	✓		✓	60%
4 Blow torch				✓	✓	✓	✓	✓		✓	60%
5 Calipers	✓			✓	✓	✓	✓	✓			60%
6 Screwdrivers			✓	✓	✓	✓		✓		✓	60%
7 Hammers				✓	✓	✓	✓			✓	50%
8 Micrometers				✓	✓	✓	✓	✓			50%
9 Power drills				✓	✓	✓	✓			✓	50%
10 Power saws				✓	✓	✓	✓	✓			50%
11 Squares	✓				✓	✓	✓	✓			50%
12 Gas welding or brazing or cutting apparatus				✓		✓	✓			✓	40%
13 Hoists				✓			✓		✓	✓	40%
14 Jacks				✓			✓		✓	✓	40%
15 Ladders					✓	✓	✓			✓	40%
16 Metal inert gas welding machine				✓		✓	✓			✓	40%
17 Mill saw file				✓	✓	✓	✓				40%
18 Plasma arc welding machine				✓		✓	✓			✓	40%
19 Pneumatic sanding machines					✓	✓	✓			✓	40%
20 Power grinders				✓	✓	✓	✓				40%
21 Punches or nail sets or drifts				✓	✓	✓	✓				40%
22 Shielded metal arc welding/stick welding machine				✓		✓	✓			✓	40%
23 Tungsten inert gas welding machine				✓		✓	✓			✓	40%
24 Utility knives				✓	✓	✓		✓			40%
25 Voltage or current meters			✓	✓	✓		✓				40%
26 Wire brushes				✓	✓		✓			✓	40%
27 Air compressors				✓	✓					✓	30%
28 Circuit tester			✓	✓	✓						30%

TOOLS	11-3051 Industrial Production Mgrs.	13-1199 Bus. Op. Specs., All Others(1)	15-1152 Computer Network Support	49-3042 Mobile Heavy Equip. Mechs.	49-9012 Control & Valve Install/Repair	51-4041 Machinists	51-4121 Welders...Brazers(2)	51-9122 Painters, Transp. Equip.	51-9195 Molders...Casters(3)	53-7051 Ind. Truck Tractor Operators	SHARE OF OCCUPATIONS
29 Cold chisels				✓	✓	✓					30%
30 Drilling machines				✓		✓	✓				30%
31 End cut pliers				✓	✓	✓					30%
32 Goggles				✓			✓			✓	30%
33 Grease guns				✓	✓			✓			30%
34 Grinding machines						✓	✓	✓			30%
35 Hacksaw				✓	✓	✓					30%
36 Laser printers		✓				✓	✓				30%
37 Levels					✓	✓	✓				30%
38 Locking pliers				✓	✓	✓					30%
39 Manlift or personnel lift							✓		✓	✓	30%
40 Paint sprayers				✓	✓					✓	30%
41 Pipe wrenches				✓	✓	✓					30%
42 Power buffers						✓	✓			✓	30%
43 Power sanders				✓		✓				✓	30%
44 Protective gloves					✓		✓			✓	30%
45 Protractors						✓	✓	✓			30%
46 Pry bars				✓		✓	✓				30%
47 Ratchets				✓		✓	✓				30%
48 Respirators				✓			✓			✓	30%
49 Rivet tools				✓	✓					✓	30%
50 Safety glasses						✓	✓			✓	30%
51 Scaffolding					✓		✓			✓	30%
52 Socket sets				✓		✓	✓				30%
53 Spot welding machine					✓	✓	✓				30%
54 Tape measures	✓			✓	✓						30%
55 Taps					✓	✓	✓				30%
56 Tracer or duplicating or contouring lathe				✓		✓	✓				30%
57 Two way radios				✓	✓		✓				30%
58 Welder torch				✓		✓	✓				30%
59 Welding masks				✓		✓	✓				30%
60 Wire cutters				✓	✓		✓				30%

TOOLS	11-3051 Industrial Production Mgrs.	13-1199 Bus. Op. Specs., All Others(1)	15-1152 Computer Network Support	49-3042 Mobile Heavy Equip. Mechs.	49-9012 Control & Valve Install/Repair	51-4041 Machinists	51-4121 Welders...Brazers(2)	51-9122 Painters, Transp. Equip.	51-9195 Molders...Casters(3)	53-7051 Ind. Truck Tractor Operators	SHARE OF OCCUPATIONS
61 Adjustable widemouth pliers				✓	✓						20%
62 Ammeters				✓	✓						20%
63 Anvils						✓	✓				20%
64 Bandsaw wheel						✓	✓				20%
65 Belt conveyors								✓	✓		20%
66 Bench vises					✓	✓					20%
67 Boring machines				✓		✓					20%
68 C clamps				✓				✓			20%
69 Casting machines						✓		✓			20%
70 Combination wrenches				✓		✓					20%
71 Computer servers		✓	✓								20%
72 Cutting die					✓		✓				20%
73 Diagonal cut pliers				✓	✓						20%
74 Dial indicator or dial gauge				✓		✓					20%
75 Drill press or radial drill						✓	✓				20%
76 Feeler gauges				✓		✓					20%
77 Flame cutting machine				✓			✓				20%
78 Hand clamps						✓	✓				20%
79 Heat guns				✓						✓	20%
80 Hex keys				✓		✓					20%
81 Hydraulic press frames						✓	✓				20%
82 Impact wrenches					✓		✓				20%
83 Lifts				✓					✓		20%
84 Linemans pliers				✓	✓						20%
85 Longnose pliers				✓	✓						20%
86 Magnetic tools				✓		✓					20%
87 Mainframe computers		✓	✓								20%
88 Mainframe console or dumb terminals								✓		✓	20%
89 Mallets				✓		✓					20%
90 Manual press brake						✓	✓				20%
91 Microcontrollers				✓			✓				20%
92 Milling machines						✓	✓				20%

TOOLS	11-3051 Industrial Production Mgrs.	13-1199 Bus. Op. Specs., All Others(1)	15-1152 Computer Network Support	49-3042 Mobile Heavy Equip. Mechs.	49-9012 Control & Valve Install/Repair	51-4041 Machinists	51-4121 Welders...Brazers(2)	51-9122 Painters, Transp. Equip.	51-9195 Molders...Casters(3)	53-7051 Ind. Truck Tractor Operators	SHARE OF OCCUPATIONS
93 Multimeters				✓	✓						20%
94 Needlenose pliers				✓		✓					20%
95 Nut drivers				✓	✓						20%
96 Paint application system					✓					✓	20%
97 Pallet trucks									✓	✓	20%
98 Personal digital assistant PDAs or organizers	✓					✓					20%
99 Pipe or tube cutter					✓		✓				20%
100 Pitch measuring instruments				✓		✓					20%
101 Platform lift						✓			✓		20%
102 Portable data input terminals				✓	✓						20%
103 Power chippers						✓	✓				20%
104 Power screwguns				✓	✓						20%
105 Pressure indicators				✓	✓						20%
106 Putty knives				✓		✓					20%
107 Razor knives				✓	✓						20%
108 Rulers				✓		✓					20%
109 Saws					✓	✓					20%
110 Scribes						✓	✓				20%
111 Shears						✓	✓				20%
112 Slip or groove joint pliers				✓	✓						20%
113 Soldering iron					✓		✓				20%
114 Specialty wrenches				✓	✓						20%
115 Stripping tools				✓	✓						20%
116 Threading machine						✓	✓				20%
117 Threading taps							✓	✓			20%
118 Tongs					✓	✓					20%
119 Track cranes					✓		✓				20%
120 Wire lug crimping tool				✓	✓						20%

Source: O*NET database, version 18.1; TIP Strategies

Notes: (1) Data are for O*NET occupation 13-1199.04 Business Continuity Planners (2) Data are for O*NET occupation 51-4121.06 Welders, Cutters, and Welder Fitters (3) Data are for O*NET occupation 51-9195.07 Molding and Casting Workers.

FIGURE 51: TECHNOLOGIES USED BY SELECTED OCCUPATIONS

RANKED BY SHARE OF SELECTED OCCUPATIONS THAT TYPICALLY USE THEM

TECHNOLOGY	11-3051 Industrial Production Mgrs.	13-1199 Bus. Op. Specs., All Others(1)	15-1152 Computer Network Support	49-3042 Mobile Heavy Equip. Mechs.	49-9012 Control & Valve Install/Repair	51-4041 Machinists	51-4121 Welders/Cutters/... Brazers(2)	51-9122 Painters, Transp. Equip.	51-9195 Molders... Casters(3)	53-7051 Ind. Truck Tractor Operators	SHARE OF OCCUPATIONS
1 Data base user interface and query software	✓	✓	✓	✓	✓		✓			✓	70%
2 Spreadsheet software	✓	✓	✓		✓	✓		✓		✓	70%
3 Word processing software	✓	✓	✓			✓		✓		✓	60%
4 Electronic mail software	✓	✓	✓			✓				✓	50%
5 Facilities management software	✓			✓		✓				✓	40%
6 Inventory management software	✓							✓	✓	✓	40%
7 Office suite software	✓	✓	✓			✓					40%
8 Project management software		✓	✓		✓	✓					40%
9 Analytical or scientific software					✓	✓	✓				30%
10 Calendar and scheduling software	✓						✓			✓	30%
11 Computer aided design (CAD) software			✓			✓	✓				30%
12 Document management software	✓	✓	✓								30%
13 Industrial control software	✓					✓				✓	30%
14 Backup or archival software		✓	✓								20%
15 Data base management system software		✓	✓								20%
16 Development environment software	✓		✓								20%
17 Enterprise resource planning (ERP) software	✓	✓									20%
18 Operating system software		✓	✓								20%
19 Presentation software	✓	✓									20%
20 On-demand/remote access software			✓								10%
21 Accounting software	✓										10%
22 Administration software			✓								10%
23 Business intelligence and data analysis software		✓									10%
24 Charting software		✓									10%
25 Communications server software		✓									10%
26 Computer aided manufacturing CAM software						✓					10%
27 Configuration management software			✓								10%
28 Customer relationship management CRM software			✓								10%
29 Data base reporting software		✓									10%
30 Desktop communications software			✓								10%

TECHNOLOGY	11-3051 Industrial Production Mgrs.	13-1199 Bus. Op. Specs., All Others(1)	15-1152 Computer Network Support	49-3042 Mobile Heavy Equip. Mechs.	49-9012 Control & Valve Install/Repair	51-4041 Machinists	51-4121 Welders/Cutters/... Brazers(2)	51-9122 Painters, Transp. Equip.	51-9195 Molders... Casters(3)	53-7051 Ind. Truck Tractor Operators	SHARE OF OCCUPATIONS
31 Enterprise application integration software			✓								10%
32 Filesystem software			✓								10%
33 Financial analysis software	✓										10%
34 Helpdesk or call center software			✓								10%
35 Human resources software	✓										10%
36 Internet browser software		✓									10%
37 Internet directory services software			✓								10%
38 LAN software		✓									10%
39 MRP/logistics and supply chain software								✓			10%
40 Network conferencing software			✓								10%
41 Network monitoring software			✓								10%
42 Network operating system enhancement software			✓								10%
43 Network operation system software		✓									10%
44 Network security/VPN equipment software			✓								10%
45 Network security/VPN management software			✓								10%
46 Object or component oriented development software			✓								10%
47 Platform interconnectivity software			✓								10%
48 Program testing software			✓								10%
49 Storage networking software			✓								10%
50 Time accounting software							✓				10%
51 Transaction security and virus protection software			✓								10%
52 Transaction server software			✓								10%
53 Web platform development software			✓								10%

Source: O*NET database, version 18.1; TIP Strategies

Notes: (1) Data are for O*NET occupation 13-1199.04 Business Continuity Planners (2) Data are for O*NET occupation 51-4121.06 Welders, Cutters, and Welder Fitters (3) Data are for O*NET occupation 51-9195.07 Molding and Casting Workers.

APPENDIX D: EDUCATION & TRAINING INVENTORY

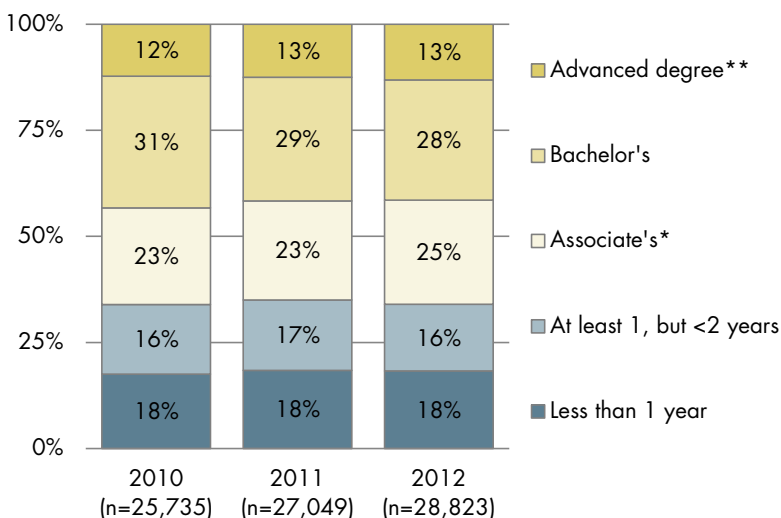
To document the region’s postsecondary offerings, we compiled published data from the US Department of Education’s Integrated Postsecondary Education Data System (IPEDS). Under the Higher Education Act of 1965, every college, university, and vocational or technical institution that participates in federal financial student aid programs (such as Pell grants or federally backed student loans) is required to report annually on a range of indicators. Data are collected through a system of interrelated surveys and are made available through IPEDS.

Each fall, institutions report on the number of awards conferred for credit by field of study, by level (associate’s, bachelor’s, master’s, doctor’s, and postsecondary certificates), and by the race or ethnicity and gender of the recipient. These data are referred to as “completions.” Completions data for the three most recent academic years available (2009-2010, 2010-2011, and 2011-2012) were downloaded from the IPEDS Data Center for colleges and universities within 125 miles of Texarkana (specifically, ZIP Code 75501). This threshold was used to capture the largest possible number of institutions, including those like Paris Junior College that are traditionally included within the Northeast Texas region, without encompassing institutions in major markets like Dallas-Fort Worth and Little Rock.

The analysis presented in this section includes data for 48 schools across four states. (A complete list of schools is provided as Figure 54 (page 126), along with total for-credit completions by year. Together, these institutions conferred nearly 29,000 degrees/awards in credit-bearing programs in 2012 (Figure 52), an increase of slightly more than 3,000 (12 percent) from 2010. Of these, bachelor’s degrees represented the largest category, accounting for more than one in four awards (28 percent of the total), down slightly from the 2011 and 2010 academic years. Two-year degrees accounted for a similar share with 25 percent of total awards granted at this level in 2012, up slightly from prior years analyzed.

FIGURE 52: COMPLETIONS BY YEAR AND AWARD LEVEL, 2010-2012

SHARE OF AWARDS/DEGREES CONFERRED FOR CREDIT BY REGIONAL INSTITUTIONS



The 48 colleges and universities included in the analysis conferred nearly 29,000 awards in credit-bearing programs in 2012, an increase of slightly more than 3,000 awards (12 percent) from 2010. Approximately 40 percent of all completions included in the analysis were awards of four-years or more.

Source: National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS) surveys.

Note: IPEDS data include only schools eligible to participate in federal financial aid programs. Figures shown include first and second majors. Cosmetology schools were excluded from this analysis.

* Associate’s-degree-level completions include awards categorized by IPEDS as "Award of at least two but less than four academic years."

** Advanced-level completions represent all awards above the bachelor’s-degree level.

Figure 53 shows the 25 largest fields of study (as defined by Classification of Instructional Programs or CIP code), in terms of the average annual number of completions over the three-year period analyzed. Within the top 25, courses related to healthcare (CIP 51) are the largest group, with five separate subject areas—nursing (RNs and LVNs), EMT/paramedics, patient aides, and medical assisting—accounting for an average of nearly 3,500 degrees/awards granted each year. The number of completions in the top liberal arts/general studies (CIP 24) and business-related (CIP 52) fields is similar, averaging roughly 2,500 degrees/awards annually in each field. While the number of awards is similar, the level at which the awards are made is not. Business-related awards and degrees conferred in the region are more likely to be made at the bachelor’s level or above. By contrast, awards in liberal arts and general studies are more likely to be granted at the associate’s level or below.

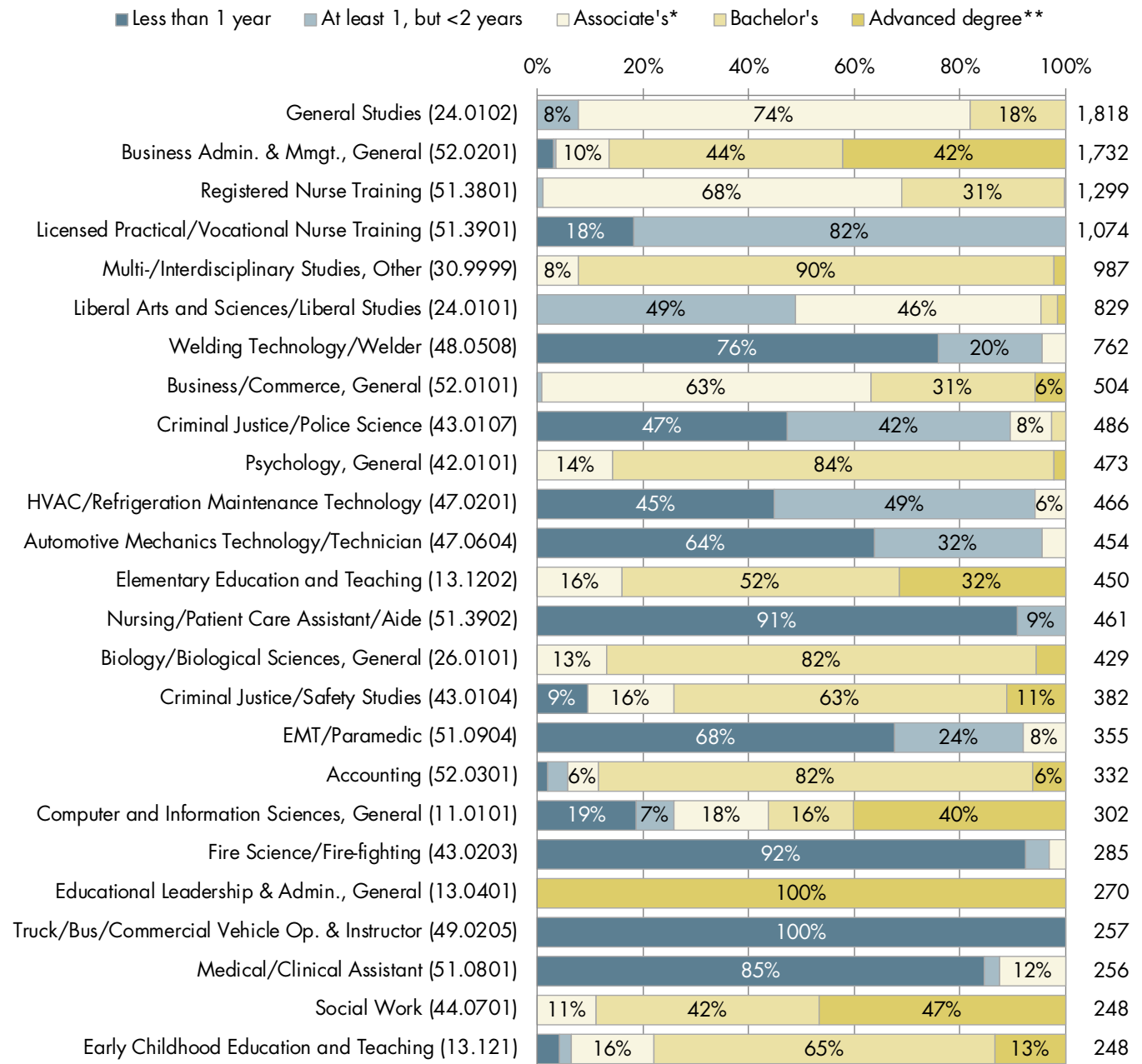
Texas A&M University-Commerce had the largest number of completions among the 48 schools, issuing an average of roughly 2,500 awards annually during the three-year period analyzed. Technical colleges in Louisiana and public institutions in Tyler rounded out the top five with an average of roughly 1,500 to 2,000 completions each: Northwest Louisiana Technical College (2,124); Louisiana Tech University (1,867); Tyler Junior College (1,827); The University of Texas at Tyler (1,570). Southern Arkansas University Tech was the largest Arkansas institution in the analysis, with an average of nearly 800 completions annually; Carl Albert State College was the largest of the Oklahoma schools at roughly 500 completions on average per year.

The majority of schools experienced an increase in the number of degrees and awards conferred between the first and last year of the analysis. The largest increases were seen at the Kiamichi Technology Centers in Idabel and Poteau, Oklahoma, where the number of completions grew by 157 percent and 126 percent, respectively over the three-year period. The Kiamichi Technology Center in Hugo was at the opposite end of the spectrum, experiencing the largest percentage decrease in completions during the period among the schools analyzed, a decline of 44 percent. Texarkana College had the second largest percentage drop in for-credit degrees and awards conferred, experiencing a 26 percent drop over the period.

Completions for selected occupations, along with a discussion of the limitations of the analysis, are provided as part of the information on target industries presented in Volume 1, Appendix B.

FIGURE 53: TOP 25 COMPLETIONS BY FIELD OF STUDY AND AWARD LEVEL

THREE-YEAR AVERAGE OF AWARDS/DEGREES CONFERRED FOR CREDIT BY REGIONAL INSTITUTIONS



Source: National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS) surveys.

Note: IPEDS data include only schools eligible to participate in federal financial aid programs. Figures shown include first and second majors.

Cosmetology schools were excluded from this analysis.

*Associate's-degree-level completions include awards categorized by IPEDS as "Award of at least two but less than four academic years."

**Advanced-level completions represent all awards above the bachelor's-degree level.

FIGURE 54: AWARDS/DEGREES CONFERRED FOR CREDIT BY INSTITUTION AND ACADEMIC YEAR
 RANKED BY THREE-YEAR AVERAGE, INCLUDING PERCENT CHANGE (2010 TO 2012 ACADEMIC YEAR)

IPEDS ID	Institution Name	2010	2011	2012	% chg. 2010-2012	Three-year average
224554	Texas A & M University-Commerce	2,210	2,515	2,988	+35%	2,571
160010	Northwest Louisiana Technical College	1,989	2,231	2,151	+8%	2,124
159647	Louisiana Tech University	1,838	1,864	1,900	+3%	1,867
229355	Tyler Junior College	1,649	1,720	2,112	+28%	1,827
228802	The University of Texas at Tyler	1,503	1,542	1,664	+11%	1,570
226019	Kilgore College	1,297	1,397	1,473	+14%	1,389
158431	Bossier Parish Community College	875	1,128	1,307	+49%	1,103
159009	Grambling State University	885	906	907	+2%	899
226231	LeTourneau University	947	854	787	-17%	863
228699	Texarkana College	943	895	695	-26%	844
227401	Paris Junior College	685	871	932	+36%	829
107992	Southern Arkansas University Tech	869	752	742	-15%	788
107071	Henderson State University	852	699	767	-10%	773
107521	College of the Ouachitas	659	644	644	-2%	649
159416	Louisiana State University-Shreveport	600	675	626	+4%	634
107983	Southern Arkansas University Main Campus	605	575	699	+16%	626
106980	National Park Community College	484	623	641	+32%	583
227386	Panola College	512	546	593	+16%	550
224545	Texas A & M University-Texarkana	586	554	498	-15%	546
107725	University of Arkansas Community College-Hope	506	534	483	-5%	508
107974	South Arkansas Community College	437	439	631	+44%	502
206923	Carl Albert State College	484	477	508	+5%	490
227225	Northeast Texas Community College	369	439	496	+34%	435
160649	Southern University at Shreveport	290	341	403	+39%	345
451866	Remington College-Shreveport Campus	334	319	323	-3%	325
107512	Ouachita Baptist University	293	258	314	+7%	288
106795	Cossatot Community College of the Univ. of Ark.	255	273	290	+14%	273
260664	Diesel Driving Academy-Shreveport	226	263	250	+11%	246
375744	Kiamichi Technology Center-Poteau	168	191	379	+126%	246
435000	Louisiana State Univ. Health Sciences Ctr.-Shreveport	237	242	252	+6%	244
207050	Eastern Oklahoma State College	220	248	220	—	229
224527	East Texas Baptist University	203	212	234	+15%	216
158477	Centenary College of Louisiana	219	195	220	<1%	211
107743	Rich Mountain Community College	168	197	254	+51%	206
408394	Texas State Technical College-Marshall	187	215	201	+7%	201
439482	Blue Cliff College-Shreveport	267	126	203	-24%	199
229887	Wiley College	159	205	177	+11%	180
158246	Ayers Career College	137	181	143	+4%	154

IPEDS ID	Institution Name	2010	2011	2012	% chg. 2010-2012	Three-year average
375735	Kiamichi Technology Center-Idabel	76	183	195	+157%	151
375717	Kiamichi Technology Center-Hugo	157	98	88	-44%	114
446880	Career Technical College-Shreveport	78	116	124	+59%	106
228884	Texas College	96	100	107	+11%	101
225885	Jarvis Christian College	76	65	58	-24%	66
225876	Jacksonville College-Main Campus	32	36	39	+22%	36
375762	Kiamichi Technology Center-Talihina	33	30	36	+9%	33
158158	American School of Business	19	46	29	+53%	31
223117	Baptist Missionary Assoc. Theological Seminary	21	29	26	+24%	25
474979	University of Phoenix-Shreveport-Bossier Campus	—	—	14	—	7
475866	Virginia College-Shreveport/Bossier City*	—	—	—	—	—
Total		25,735	27,049	28,823	+12%	27,202

Source: National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS) surveys.

Note: IPEDS data include only schools eligible to participate in federal financial aid programs. Figures shown include first and second majors. Cosmetology schools were excluded from this analysis.

*Virginia College-Shreveport/Bossier City opened in June 2012 and, as a result, did not report completions in any of the years analyzed.

FIGURE 55: AWARDS/DEGREES CONFERRED FOR CREDIT BY FIELD OF STUDY (CIP) AND AWARD LEVEL
 THREE-YEAR AVERAGE FOR CIP CODES IN WHICH AT LEAST 25 COMPLETIONS WERE REPORTED

CIP Code	Description	Award level					Total
		< 1 academic year	At least 1 but < 2 yrs.	Associate's*	Bachelor's**	Advanced	
24.0102	General Studies		140	1,351	327		1,818
52.0201	Business Administration and Management, General	51	9	176	767	729	1,732
51.3801	Registered Nursing/Registered Nurse		14	881	403	1	1,299
51.3901	Licensed Practical/Vocational Nurse Training	196	878				1,074
30.9999	Multi-/Interdisciplinary Studies, Other			77	890	20	987
24.0101	Liberal Arts and Sciences/Liberal Studies		405	385	26	13	829
48.0508	Welding Technology/Welder	578	150	34			762
52.0101	Business/Commerce, General		4	315	156	29	504
43.0107	Criminal Justice/Police Science	230	205	38	13		486
42.0101	Psychology, General			68	395	10	473
47.0201	HVAC and Refrigeration Maintenance Technology/	210	230	27			466
51.3902	Nursing Assistant/Aide and Patient Care Assistant/Aide	419	42				461
47.0604	Automobile/Automotive Mechanics Technology/Technician	289	144	20			454
13.1202	Elementary Education and Teaching			72	238	140	450
26.0101	Biology/Biological Sciences, General			56	350	23	429
43.0104	Criminal Justice/Safety Studies	36		62	241	42	382
51.0904	Emergency Medical Technology/Technician (EMT Paramedic)	241	86	28			355
52.0301	Accounting	6	13	19	274	20	332
11.0101	Computer and Information Sciences, General	57	22	54	49	121	302
43.0203	Fire Science/Fire-fighting	264	13	9			285
13.0401	Educational Leadership and Administration, General					270	270
49.0205	Truck and Bus Driver/Comm. Vehicle Operator and Instructor	257					257
51.0801	Medical/Clinical Assistant	217	7	32			256
13.121	Early Childhood Education and Teaching	10	5	39	164	29	248
44.0701	Social Work			28	105	116	248
12.0401	Cosmetology/Cosmetologist, General	57	181	2			241
51	Health Services/Allied Health/Health Sciences, General	32	62	107	3	3	208
13.1205	Secondary Education and Teaching			100	8	94	202
52.1401	Marketing/Marketing Management, General			1	182	16	199
54.0101	History, General			31	152	16	198
31.0505	Kinesiology and Exercise Science				175	13	188
10.0203	Recording Arts Technology/Technician	88	55	45			187
23.0101	English Language and Literature, General			7	138	41	186
51.2601	Health Aide	146	34				180
19.0709	Child Care Provider/Assistant	97	40	40			178

CIP Code	Description	Award level					Total
		< 1 academic year	At least 1 but < 2 yrs.	Associate's*	Bachelor's**	Advanced	
45.1101	Sociology			5	168	4	177
15.0612	Industrial Technology/Technician	24	16	49	46	41	176
52.0401	Administrative Assistant and Secretarial Science, General	62	84	30			175
13.1314	Physical Education Teaching and Coaching		9	43	103	17	171
13.1401	Teaching English as a Second or Foreign Language	3		4	152		158
52.0801	Finance, General				112	32	144
43.0103	Criminal Justice/Law Enforcement Administration	32	2	65	43		142
15.0404	Instrumentation Technology/Technician	37	58	42			137
12.0499	Cosmetology and Related Personal Grooming Arts, Other		137				137
51.0713	Medical Insurance Coding Specialist/Coder	109	25				134
51.0899	Allied Health and Medical Assisting Services, Other		115	14			129
11.0401	Information Science/Studies	14	2	54	50	7	126
27.0101	Mathematics, General			27	81	15	123
45.1001	Political Science and Government, General			11	100	2	114
51.1201	Medicine					111	111
42.2803	Counseling Psychology					110	110
13.0301	Curriculum and Instruction					107	107
14.1901	Mechanical Engineering			2	102	1	105
46.0201	Carpentry/Carpenter	71	33	1			105
9.0102	Mass Communication/Media Studies				98	5	103
12.0503	Culinary Arts/Chef Training	23	68	13			103
47.0605	Diesel Mechanics Technology/Technician	40	51	10			101
51.0909	Surgical Technology/Technologist		34	67			101
14.0101	Engineering, General			23		76	99
47.0303	Industrial Mechanics and Maintenance Technology	46	42	9			98
51.0911	Radiologic Technology/Science–Radiographer	3		94			97
52.1201	Management Information Systems, General	3	11	25	52	3	94
47.0603	Autobody/Collision and Repair Technology/Technician	27	65	2			94
51.0805	Pharmacy Technician/Assistant	54	22	18			94
15.0303	Electrical, Electronic and Communications Engineering Technology/Technician	2	22	36	33		94
49.0202	Construction/Heavy Equip./Earthmoving Equip. Operation	86	7				93
46.0504	Well Drilling/Driller	91					91
15.1301	Drafting and Design Technology/Technician, General	16	31	34	7		88
31.0501	Health and Physical Education/Fitness, General			10	54	22	86
51.0806	Physical Therapy Technician/Assistant			80			80
13.1206	Teacher Education, Multiple Levels			70	1	9	80

CIP Code	Description	Award level					Total
		< 1 academic year	At least 1 but < 2 yrs.	Associate's*	Bachelor's**	Advanced	
51.0707	Health Information/Medical Records Technology/Technician	26	14	39			80
51.0908	Respiratory Care Therapy/Therapist	10		70			79
19.0706	Child Development	15	26	37			79
11.0701	Computer Science	1	4	23	40	12	78
46.0302	Electrician	38	38	2			78
14.1001	Electrical and Electronics Engineering			3	60	14	77
52.0302	Accounting Technology/Technician and Bookkeeping	12	18	44			74
50.0901	Music, General		6	23	43		72
9.0401	Journalism			11	60		71
47.0408	Watchmaking and Jewelmaking	63	5	4			71
30.1801	Natural Sciences			70			70
13.1101	Education/School Counseling and Guidance Services					70	70
50.0409	Graphic Design	8	12	19	30		69
51.0716	Medical Admin./Executive Assistant and Medical Secretary	8	40	21			69
40.0501	Chemistry, General			11	50	7	68
50.0702	Fine/Studio Arts, General				55	12	67
19.9999	Family and Consumer Sciences/Human Sciences, Other		67				67
13.1203	Junior High/Intermediate/Middle School Educ. and Teaching		3	36	22	7	67
13.1001	Special Education and Teaching, General				21	43	63
52.0408	General Office Occupations and Clerical Services	29	28	5			62
52.0206	Non-Profit/Public/Organizational Management				61		61
31.0504	Sport and Fitness Administration/Management				13	47	60
11.0901	Computer Systems Networking and Telecommunications	11	22	27			59
50.0701	Art/Art Studies, General			22	37		58
50.0501	Drama and Dramatics/Theatre Arts, General			9	40	7	56
43.0102	Corrections			55			55
15.1001	Construction Engineering Technology/Technician	7	8	4	35		54
51.1009	Phlebotomy Technician/Phlebotomist	15	38				53
52.1005	Human Resources Development				22	28	50
14.0801	Civil Engineering, General			5	43	2	50
9.0101	Speech Communication and Rhetoric			18	24	7	49
51.071	Medical Office Assistant/Specialist	12	18	19			49
22.0302	Legal Assistant/Paralegal		11	28	9		48
1.0901	Animal Sciences, General			8	40		48
47.0105	Industrial Electronics Technology/Technician	26	21				47
49.0102	Airline/Commercial/Professional Pilot and Flight Crew				47		47
51.3101	Dietetics/Dietitian				31	15	46

CIP Code	Description	Award level					Total
		< 1 academic year	At least 1 but < 2 yrs.	Associate's*	Bachelor's**	Advanced	
40.0801	Physics, General			5	31	10	46
51.0705	Medical Office Management/Administration	9	19	17			46
51.0602	Dental Hygiene/Hygienist			44			44
11.0899	Computer Software and Media Applications, Other	24		18	1		44
45.9999	Social Sciences, Other			41	1		43
47.0608	Aircraft Powerplant Technology/Technician	23	15	4			43
13.0101	Education, General			17	8	16	41
51.3501	Massage Therapy/Therapeutic Massage	30	3	8			41
52.0402	Executive Assistant/Executive Secretary		31	10			41
11.1002	System, Networking, and LAN/WAN Mgmt./Manager	4	8	28			40
16.0905	Spanish Language and Literature				38	2	40
52.0407	Business/Office Automation/Technology/Data Entry	6	23	11			39
13.0501	Educational/Instructional Technology		1			37	38
13.1299	Teacher Education and Professional Development, Specific Levels and Methods, Other					38	38
24.0199	Liberal Arts and Sciences, General Studies/Humanities, Other	2		36			38
49.0104	Aviation/Airway Management and Operations				38		38
51.2308	Physical Therapy/Therapist					38	38
19.0701	Human Development and Family Studies, General				37		37
51.0803	Occupational Therapist Assistant			36			36
1	Agriculture, General			3	21	12	36
50.0406	Commercial Photography	17	16	3			36
15.0611	Metallurgical Technology/Technician		13	22			35
48.0501	Machine Tool Technology/Machinist	13	17	5			35
19.0708	Child Care and Support Services Management	11	10	13			34
44.0401	Public Administration				3	31	34
52.9999	Business, Mgmt., Marketing, and Related Support Svcs, Other		29	2	4		34
1.0101	Agricultural Business and Management, General			5	29		34
51.1004	Clinical/Medical Laboratory Technician			34			34
51.0912	Physician Assistant				32	1	33
51.1005	Clinical Laboratory Science/Medical Tech./Technologist			2	31		32
13.1301	Agricultural Teacher Education			14	10	8	32
31.0101	Parks, Recreation and Leisure Studies			3	29		32
23.1304	Rhetoric and Composition			1	30		31
15.0701	Occupational Safety and Health Technology/Technician	2	9	20			31
42.2804	Industrial and Organizational Psychology				1	30	31
13.0408	Elementary and Middle School Administration/Principalship				20	10	31

CIP Code	Description	Award level					Total
		< 1 academic year	At least 1 but < 2 yrs.	Associate's*	Bachelor's**	Advanced	
15.0801	Aeronautical/Aerospace Engineering Technology/Technician	19			12		31
15.1102	Surveying Technology/Surveying		19	12			30
51.1501	Substance Abuse/Addiction Counseling		5	25			30
11.0103	Information Technology	30					30
45.0401	Criminology		1	21	4	4	30
51.0714	Medical Insurance Specialist/Medical Biller	30					30
47.0606	Small Engine Mechanics and Repair Technology/Technician	21	8				30
11.1003	Computer and Information Systems Security/Info. Assurance	9	8	9	3		29
51.0204	Audiology/Audiologist and Speech-Language Pathology/Pathologist				18	11	29
39.9999	Theology and Religious Vocations, Other			2	13	13	29
15.0399	Electrical and Electronic Engineering Technologies/Technicians, Other		29				29
50.0402	Commercial and Advertising Art		6	17	6		28
50.0903	Music Performance, General				24	4	28
51.3805	Family Practice Nurse/Nursing				1	27	28
15.1302	CAD/CADD Drafting and/or Design Technology/Technician	19		8			27
51.3802	Nursing Administration			13		14	27
15.0403	Electromechanical Technology/Electromechanical Engineering Technology		18	8			26
9.01	Communication, General				21	5	26
14.0701	Chemical Engineering			3	23		26
51.3817	Nursing Education					26	26
52.0601	Business/Managerial Economics				26		26
13.1312	Music Teacher Education				23	2	25
51.0913	Athletic Training/Trainer			7	18		25
13.1315	Reading Teacher Education					25	25
15.1202	Computer Technology/Computer Systems Technology	13	4	8			25
39.0201	Bible/Biblical Studies				25		25
47.0104	Computer Installation and Repair Technology/Technician	6	18				25

Source: National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS) surveys.

Note: IPEDS data include only schools eligible to participate in federal financial aid programs. Figures shown include first and second majors. Cosmetology schools were excluded from this analysis.

APPENDIX E: CLASSIFICATION SYSTEMS

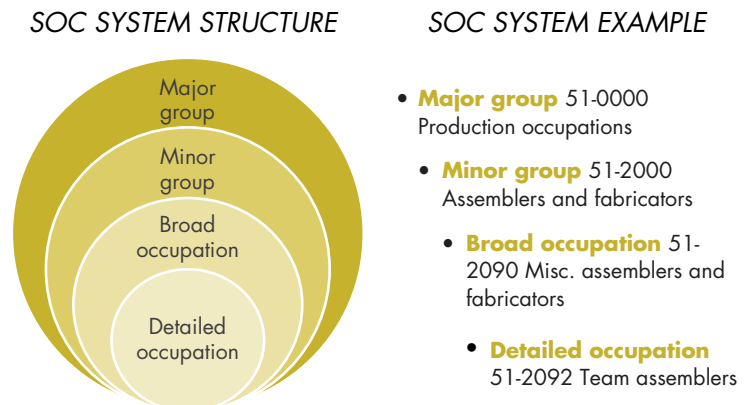
Much of the analysis presented in this report relies on three separate classification systems: A brief overview of each is presented below.

The **Standard Occupational Classification (SOC)** system is used by federal statistical agencies to classify workers into categories for the purpose of collecting, calculating, or disseminating data. This system groups all occupations, in which work is performed for pay or profit, according to the type of work performed and, in some cases, on the skills, education, or training needed to perform the work at a competent level. Under the 2010 SOC system, workers are classified into one of 840 detailed occupations, which are combined to form 461 broad occupations, 97 minor groups, and 23 major groups.

The **North American Industry Classification System (NAICS)** (NAICS, pronounced "Nakes") was developed under the direction and guidance of the Office of Management and Budget (OMB) as the standard for use by Federal statistical agencies in classifying business establishments for the collection, tabulation, presentation, and analysis of statistical data describing the US economy. The classification system was developed jointly with government agencies in Canada and Mexico to allow for a high level of comparability in business statistics among the North American countries.

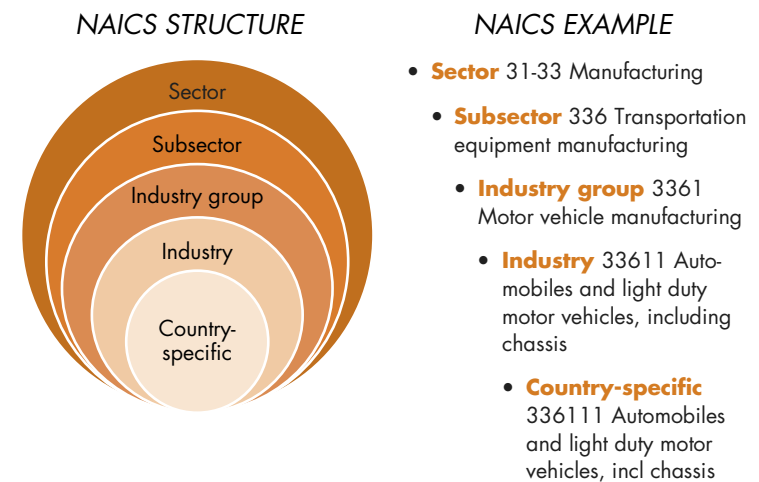
The version of NAICS currently in wide use was released in 2007 and classifies industries into 20 sectors based on production processes. These sectors are broken into subsectors, industry groups, and individual industries. An additional level of detail is provided to accommodate industry codes that are specific to the three countries. The classification system is updated every five years. The 2012 NAICS structure was finalized in August 2011. Federal statistical agencies were directed to begin using the new system for data published for reference years beginning on or after January 1, 2012.

FIGURE 56: STANDARD OCCUPATIONAL CLASSIFICATION (SOC) SYSTEM



Source: U.S. Bureau of Labor Statistics; TIP Strategies

FIGURE 57: NORTH AMERICAN INDUSTRY CLASSIFICATION SYSTEM (NAICS)

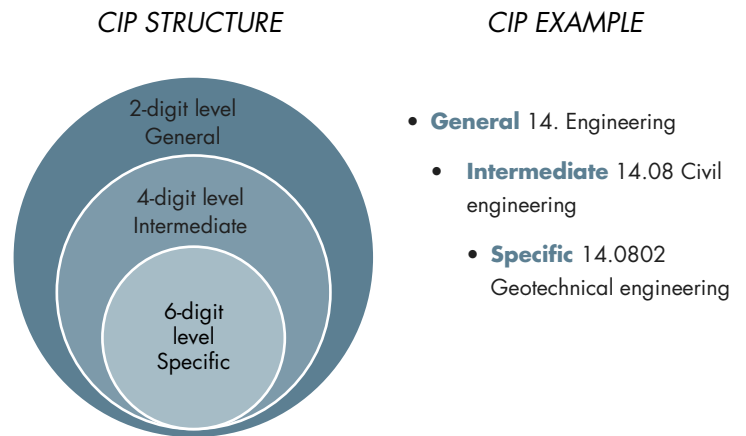


Source: US Census Bureau; TIP Strategies

The **Classification of Instructional Programs (CIP)** is the accepted federal government statistical standard on instructional program classifications. Developed in 1980 by the National Center for Education Statistics, the CIP is used by state agencies, national associations, academic institutions, and employment counseling services for collecting, reporting, and analyzing instructional program data.

The CIP titles and program descriptions are intended to be generic categories into which program completions data can be placed, and are not exact duplicates of specific major or field of study titles used by individual institutions. The vast majority of CIP titles correspond to academic and occupational instructional programs offered for credit at the postsecondary level. These programs result in recognized completion points and awards, including degrees, certificates, and other formal awards. The CIP also includes other types of instructional programs, such as residency programs in various dental, medical, podiatric, and veterinary specialties that may lead to advanced professional certification, personal improvement and leisure programs, and instructional programs that lead to diplomas and certificates at the secondary level only.

FIGURE 58: CLASSIFICATION OF INSTRUCTIONAL PROGRAMS (CIP)



Source: US Census Bureau; TIP Strategies