

"Cities are primarily labor markets."

–Alain Bertaud

Comparative Analysis of Sectoral Employment and Industry Structure in Tulsa and Northwest Arkansas

September 18, 2023





Downtown Tulsa

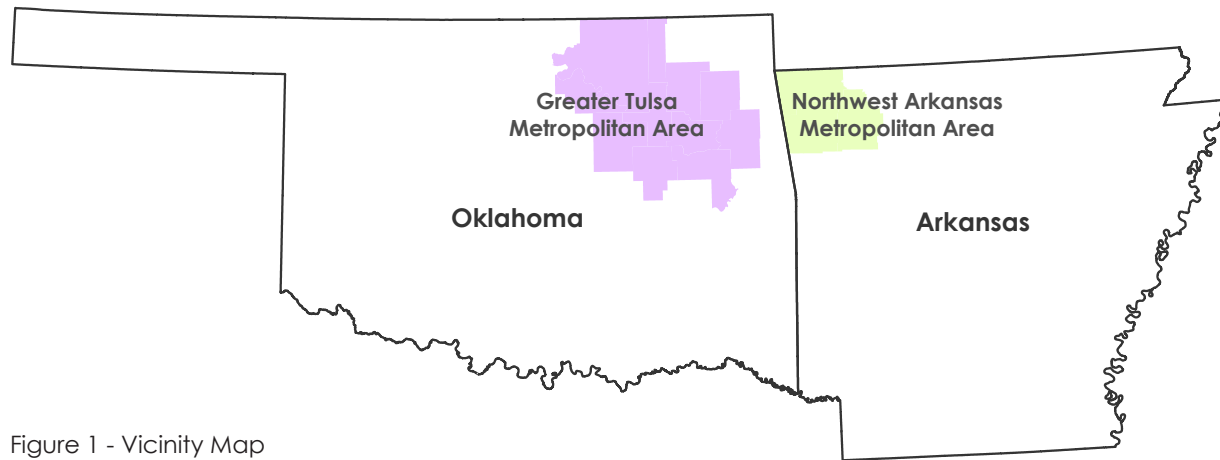


Figure 1 - Vicinity Map

PURPOSE

The purpose of this study is to describe and compare the employment characteristics and industry structure in the greater Tulsa metropolitan area and the Northwest Arkansas metropolitan area. Much of the analysis uses a parallel structure with Tulsa shown and Northwest Arkansas data shown side-by-side. The comparison begins with community employment profiles and employment trends by industry sectors, before calculating location quotients, and conducting a shift-share analysis. Findings are presented for each job market, and lastly, contrasted with each other.

GEOGRAPHY

The two job markets, approximately 110 miles apart, have been selected due to their proximity and the fact they are increasingly interacting economically. With a 2020 population of 1,229,643 the greater

Tulsa market is older and larger. Northwest Arkansas has emerged in the last few decades as a fast-growing market seeing its population grow to 558,507.

For this study, the greater Tulsa market area is defined as the consolidated metropolitan statistical area as defined by the United States Census Bureau, plus Mayes County and Cherokee County. The Tulsa metropolitan statistical area (TMA) encompasses Creek, Okmulgee, Osage, Pawnee, Rogers, Tulsa, and Wagoner counties in Oklahoma. The largest cities in the area are Tulsa and Broken Arrow. Washington county and Muskogee county are added to these seven counties to form the Tulsa consolidated metropolitan statistical area (TCSA). Mayes county and Cherokee county were added to form a greater Tulsa metropolitan area due to their position located between Tulsa

and Northwest Arkansas, and recent job growth connected with the Mid-American Industrial Park located in Pryor Creek and the Cherokee Nation headquartered in Tahlequah. These counties are increasingly integrated into the Tulsa job and housing markets.

The Northwest Arkansas job market coincides with the Fayetteville-Springdale-Rogers (FSR) metropolitan area. Fayetteville, Springdale, and Rogers, along with Bentonville, are the largest cities in a linear cluster of cities merging into one urban region. The Fayetteville-Springdale-Rogers metropolitan statistical area consists of Benton, Madison, and Washington counties in Arkansas.

DATA SOURCES

The data for this study comes from the Longitudinal Household and Employment Data, Origin-Destination Employment Statistics provided by the U.S. Census Bureau at their On the Map Application. The first full year of data is from 2003, and the last year of data is 2020. However, Arkansas data from 2019 and 2020 is missing, so the analysis for Northwest Arkansas only goes to 2018. All the analysis includes all primary jobs, including farm employment and government employment. Industry sectors are defined using the two-digit level of the North American Industry Classification System (NAICS).

Additional data for the Tulsa regional largest employer list comes from the Tulsa's Future Regional Economic Development

INTRODUCTION

report prepared by the Tulsa Regional Chamber of Commerce. Data for the largest employers in Benton, Madison, and Washington counties in Arkansas comes from the Arkansas Economic Development Commission's Strategic Planning and Research Division.

METHODS

CURRENT EMPLOYMENT PROFILES

Worker demographics for both regions are compared using tables and charts. Demographic categories in the profile include total employment, jobs by worker age, jobs by earnings, jobs by worker race and ethnicity, jobs by worker educational attainment, and jobs by worker sex. Job distribution by industry sector is also examined. A list of major employers consisting of firms with 500 to 999 employees and firms with over 1,000 employees is included, as are maps showing the clustering of all employers in the market areas.

EMPLOYMENT INDICES

After looking at the current employment situation, the analysis moves on to looking at employment trends from 2003 to 2018 (for Northwest Arkansas) or 2003 to 2020 (for Tulsa.) The accompanying charts show the change in employment during those periods for the twenty industry sectors. To normalize for differing amounts of jobs in each sector, the data has been indexed to the year 2003. This means that all sector indices start at a value of 100 in 2003 and

increase or decline proportionally, allowing for comparison.

LOCATION QUOTIENTS

Location quotients use a ratio to compare the local concentration of jobs with the national concentration of jobs in each employment sector.

The formula used for location quotients is:

$$LQ_{im} = (E_{im}/E_m) / (E_{in}/E_n)$$

Where:

E_{im} = employment of sector i in metro area m

E_m = total employment in metro area m

E_{in} = employment of sector i in the nation

E_n = employment in the nation

Industries with location quotients less than or equal to one are considered local or non-basic industries, and industries with location quotients greater than one are considered export or basic industries. According to Mourouzi-Sivitanidou, because local consumption patterns may differ across markets, it is best to interpret location quotients as a measure of relative concentration or importance. Location quotients were calculated for 2003, 2010, and 2018 or 2020 to look at changes in industry concentrations over the study period.

SHIFT-SHARE ANALYSIS

The greater Tulsa and Northwest Arkansas economies are not static and tend to have concentrations and specializations of industries and jobs. Shift-Share Analysis (SSA) explains which industries in a region are growing or shrinking faster than the national economy, and which industries in the region are more competitive than the nation. Shift-share analysis splits actual job growth over a given period into three factors: share of national growth, shift effect of industry mix, and shift of competitive advantage of the region. The share due to national growth indicates how much an industry would have grown if it grew at the same rate as the national economy. The shift due to the industry mix shows any additional growth in a region due to the nature or mix of its industries. Regional growth rates should be higher if industries are over-represented in the location quotient analysis. The differential shift due to the competitive effect is additional growth in a region's industries due to metropolitan location factors and competitive advantages. There are several variations on the calculations of shift-share analysis. The analysis in this study uses formulae adapted from the IMPLAN software originally developed for the United States Forest Service at the University of Minnesota. The formulae are as follows:

Share Component - National Growth Effect:

$$S_n = E_{it1} * [(N_{i2} / N_{i1}) - 1]$$

Shift Effect of Industry Mix:

$$S_m = E_{it1} * [(E_{nit2} / E_{nit1}) - (N_{i2} / N_{i1})]$$

Competitive Share Effect:

$$S_c = E_{it1} * [(E_{it2} / E_{it1}) - (E_{nit2} / E_{nit1})]$$

Actual Growth:

$$\Delta E_i = S_n + S_m + S_c$$

Where:

ΔE_i = change in the metro economy in industry i

E_{it1} = metro employment in industry i at time 1

E_{it2} = metro employment in industry i at time 2

N_{t1} = national employment at time 1

N_{t2} = national employment at time 2

E_{nit1} = national employment in industry i at time 1

E_{nit2} = national employment in industry i at time 2

CURRENT EMPLOYMENT PROFILES

The first part of the analysis summarizes the current employment situation in greater Tulsa and Northwest Arkansas. Tulsa's total employment of 513,073 makes it the 58th largest employment market in the country, which is more than twice as large as the 242,819 workers in Northwest Arkansas, the 110th largest employment market in the country. Combining the two markets make them comparable in size to Jacksonville, FL with 782,311 workers, Raleigh, NC with 741,600 workers or Oklahoma City, OK with 710,252 workers, the 43rd, 44th, and 45th largest employment markets in the country, respectively.

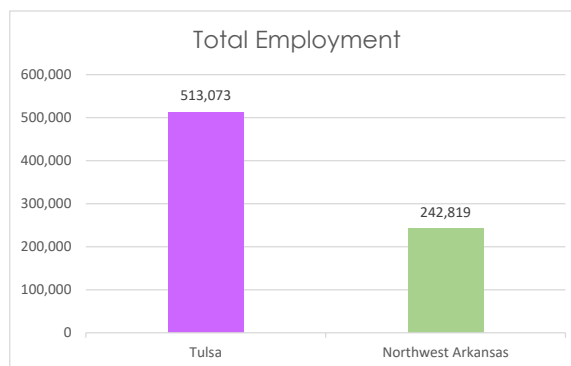


Figure 2 - Total Employment Comparison

WORKERS BY AGE

Overall, workers in Northwest Arkansas are younger than in Tulsa. Twenty-three percent of the workers in Tulsa are aged 29 or younger, while twenty-seven percent of workers in Northwest Arkansas are aged 29 or younger. By contrast, twenty-four percent of the workers in Tulsa are aged 55 or older, while only nineteen percent of workers in Northwest Arkansas are aged 55 or older. The percentages of workers aged 30 to 54 are similar for both regions. Tulsa's age distribution is close to the national average.

WORKERS BY EARNINGS

Tulsa and Northwest Arkansas both have higher percentages of middle-income workers than the national average of twenty-eight percent. In Tulsa, thirty-four percent of workers earn between \$1,251 and \$3,333 per month. In Northwest Arkansas, thirty-eight percent of workers are

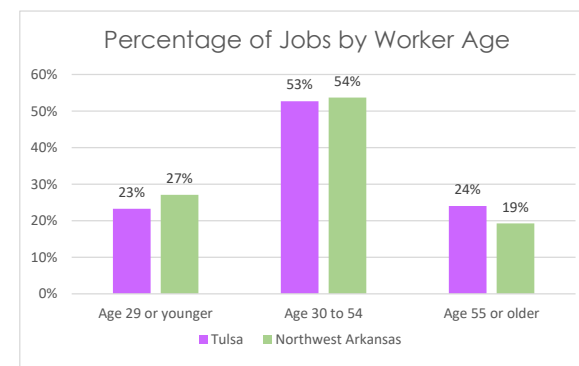


Figure 3 - Percent of Jobs by Worker Age

in that bracket. Both markets have lower percentages of workers earning less than \$1,251 per month or more than \$3,333 per month, than the national averages. The forty-four percent of higher-income workers in Tulsa, and forty-one percent of higher-income workers in Northwest Arkansas earning more than \$3,333 per month rank below the forty-eight percent national average.

WORKER RACE AND ETHNICITY

Tulsa has a more diverse work force than the national average with seventy-three percent of workers identifying as White alone, compared to the national average of seventy-seven percent. Tulsa's Black or African American workers represent eight percent of workers compared to the national average of thirteen percent. Ten percent of Tulsa's workers identify as American Indian or Native American, compared to two percent nationally. By contrast, Northwest Arkansas has a

PROFILES

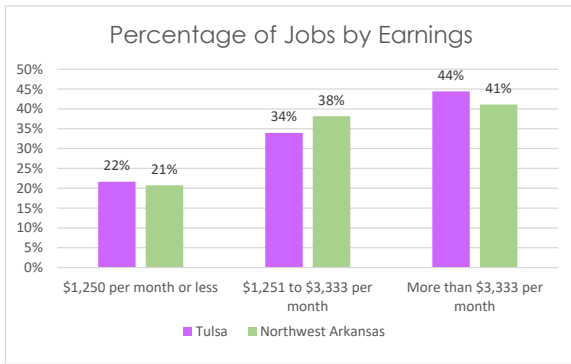


Figure 4 - Percentage of Jobs by Earnings

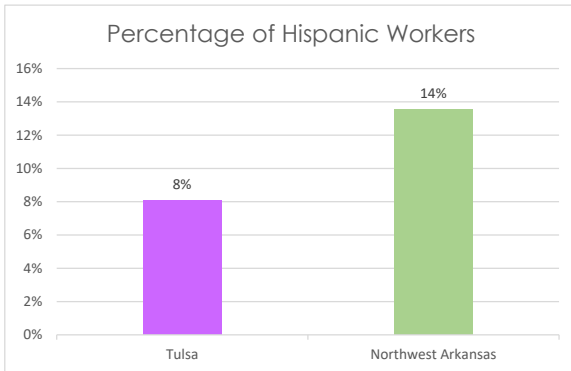


Figure 5 - Percentage of Hispanic Workers

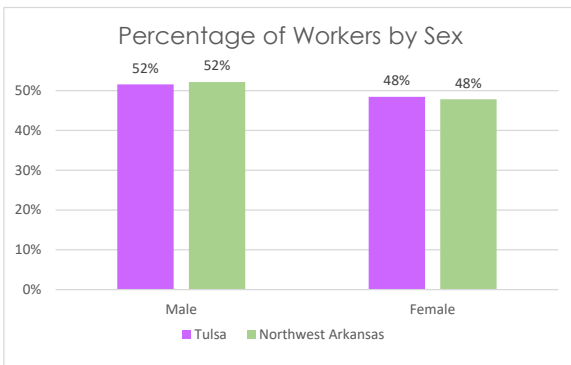


Figure 6 - Percentage of Jobs by Sex

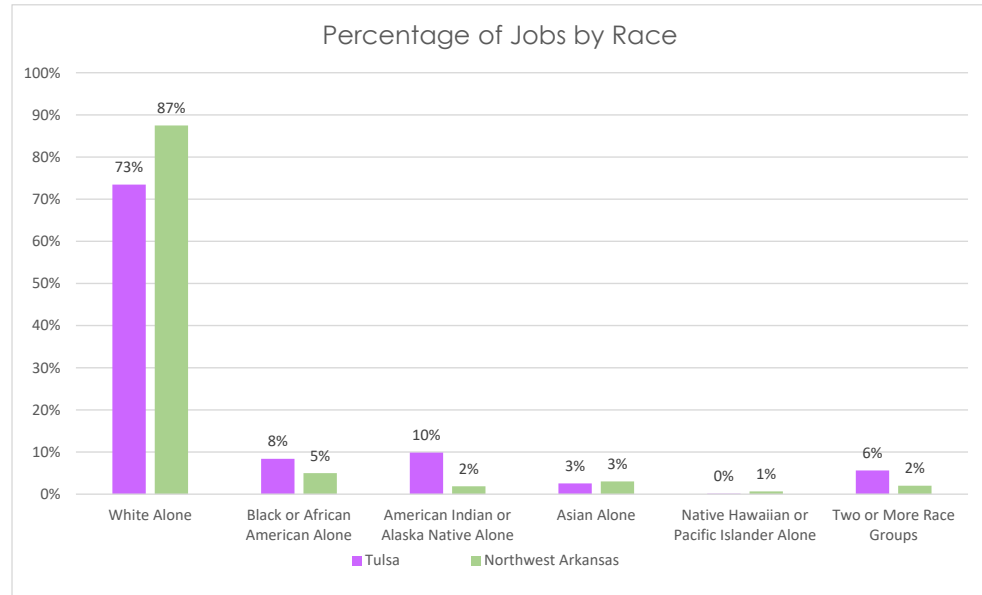


Figure 7 - Percentage of Jobs by Race

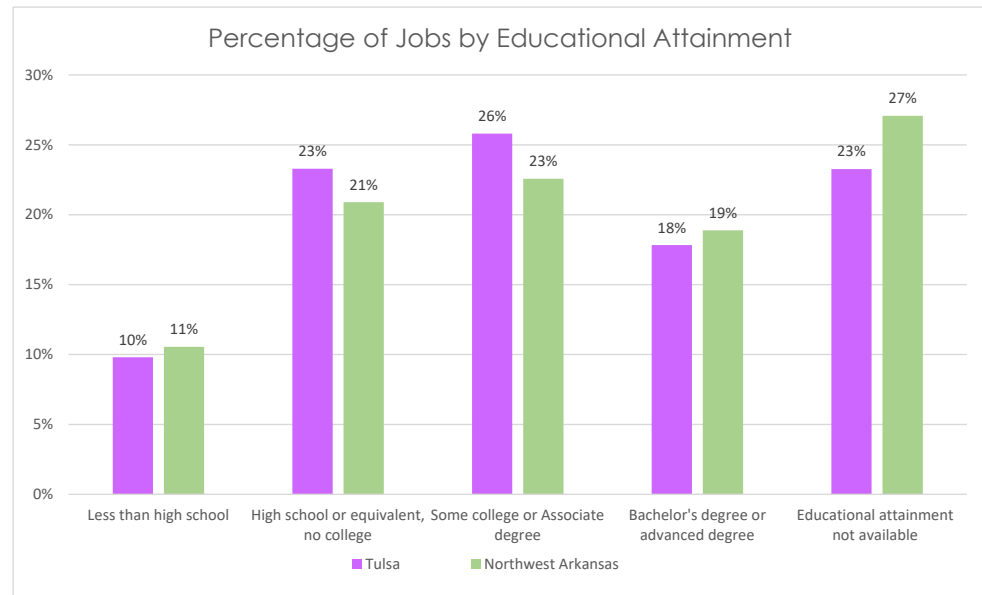


Figure 8 - Percentage of Jobs by Educational Attainment

less diverse work force than the national average with 87% of workers identifying as White alone. Only five percent of Northwest Arkansas workers identify as Black or African American, while two percent identify as American Indian or Native American. The three percent of workers identifying as Asian alone in both regions is less than half the national average.

Only eight percent of workers in Tulsa are Hispanic or Latino: about half the national average of sixteen percent. Northwest Arkansas is closer to the national average with fourteen percent of all workers identifying as Hispanic or Latino. Northwest Arkansas has a concentration of food processing industries, which may employ more Hispanic or Latino workers.

WORKER EDUCATIONAL ATTAINMENT

Workers in Tulsa and Northwest Arkansas are less likely to have earned a bachelor's degree or advanced degree than the national average of twenty-two and one-half percent. In Tulsa, eighteen percent of workers have a bachelor's degree or higher. Northwest Arkansas is slightly better at nineteen percent, perhaps because of the presence of the University of Arkansas in Fayetteville. Note that educational attainment is not reported for workers less than 25 years old.W

WORKER SEX

In both Tulsa and Northwest Arkansas, male workers still out number female workers, fifty-two percent to forty-eight percent. This

	Count	% Share
Total Jobs	513,073	100%
Jobs by Worker Age		
Age 29 or younger	119,388	23%
Age 30 to 54	270,329	53%
Age 55 or older	123,356	24%
Jobs by Earnings		
\$1,250 per month or less	111,079	22%
\$1,251 to \$3,333 per month	174,132	34%
More than \$3,333 per month	227,862	44%
Jobs by Worker Race		
White Alone	376,880	73%
Black or African American Alone	43,014	8%
American Indian or Alaska Native Alone	50,667	10%
Asian Alone	13,132	3%
Native Hawaiian or Pacific Islander Alone	534	0%
Two or More Race Groups	28,846	6%
Jobs by Worker Ethnicity		
Not Hispanic or Latino	471,746	92%
Hispanic or Latino	41,327	8%
Jobs by Worker Educational Attainment		
Less than high school	50,325	10%
High school or equivalent, no college	119,481	23%
Some college or Associate degree	132,401	26%
Bachelor's degree or advanced degree	91,478	18%
Educational attainment not available (workers aged 29 or younger)	119,388	23%
Jobs by Worker Sex		
Male	264,564	52%
Female	248,509	48%

Figure 9 - Greater Tulsa Employment Profile

differs from the national average of fifty percent to fifty percent but does reflect the secular trend of women closing the gap and surpassing the percentage of men in the work force.

	Count	% Share
Total All Jobs	242,819	100%
Jobs by Worker Age		
Age 29 or younger	65,740	27%
Age 30 to 54	130,325	54%
Age 55 or older	46,754	19%
Jobs by Earnings		
\$1,250 per month or less	50,372	21%
\$1,251 to \$3,333 per month	92,649	38%
More than \$3,333 per month	99,798	41%
Jobs by Worker Race		
White Alone	212,432	87%
Black or African American Alone	12,118	5%
American Indian or Alaska Native Alone	4,531	2%
Asian Alone	7,320	3%
Native Hawaiian or Pacific Islander Alone	1,578	1%
Two or More Race Groups	4,840	2%
Jobs by Worker Ethnicity		
Not Hispanic or Latino	209,909	86%
Hispanic or Latino	32,910	14%
Jobs by Worker Educational Attainment		
Less than high school	25,629	11%
High school or equivalent, no college	50,759	21%
Some college or Associate degree	54,825	23%
Bachelor's degree or advanced degree	45,866	19%
Educational attainment not available (workers aged 29 or younger)	65,740	27%
Jobs by Worker Sex		
Male	126,680	52%
Female	116,139	48%

Figure 10 - Northwest Arkansas Employment Profile

PROFILES

JOBS BY INDUSTRY SECTOR

The Health Care and Social Assistance sector has the greatest number of employees in Tulsa, Northwest Arkansas, and the nation. However, the percentage of workers employed in the two regions is less than the national average of almost sixteen percent. The Manufacturing sector has the second largest number of workers in Tulsa and Northwest Arkansas, outpacing the nine percent national average. Retail Trade is the third largest employment sector in Tulsa and the second largest employment sector nationally. It is ranked fourth in Northwest Arkansas, where it is edged out by Management of Companies and Enterprises. The latter, along with Transportation and Warehousing, are significant outliers in Northwest Arkansas, likely due to the presence of Walmart. Tulsa is overrepresented in the Mining, Quarrying, and Oil and Gas Extraction category, a legacy from its days as Oil Capital of the World, but the number of workers in this sector represents less than two percent of the work force. Both Tulsa and Northwest Arkansas are weak in the FIRE (Finance and Insurance, Information, and Real Estate and Rental and Leasing) cluster of industry sectors.

MAJOR EMPLOYERS

Tulsa has at least thirty major employers with more than 1,000 employees, and between forty and fifty employers with 500 to 999 employees. The Health Care and Social Assistance sector is strongly represented by six health systems. Manufacturers are



Figure 11 - Number of Jobs by Industry Sector

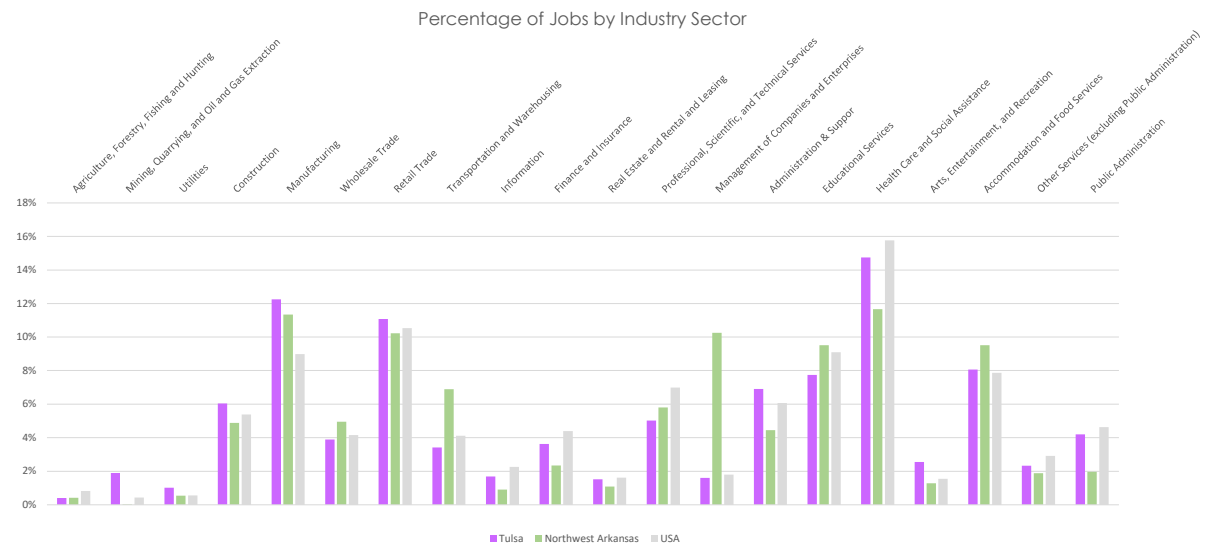


Figure 12 - Percentage of Jobs by Industry Sector

Companies with more than 1,000 Employees	Industry Sector
Saint Francis Health System	Health Care and Social Assistance
Hillcrest Healthcare System	Health Care and Social Assistance
Tulsa Public Schools	Educational Services
American Airlines Maintenance Base	Educational Services
Ascension St. John	Health Care and Social Assistance
City of Tulsa	Public Administration
Amazon Fulfillment Center	Transportation and Warehousing
QuikTrip Corporation	Retail Trade
AAON, Inc.	Manufacturing
Broken Arrow Public Schools	Educational Services
Bank Of Oklahoma	Finance and Insurance
Union Public School District	Educational Services
Tulsa Community College	Educational Services
Jack C. Montgomery VA Medical Center	Health Care and Social Assistance
Tulsa County	Public Administration
Jenks Public Schools	Educational Services
Whirlpool Corporation	Manufacturing
AT&T & DirecTV	Utilities
Macy's Fulfillment Center	Transportation and Warehousing
Public Service Company of Oklahoma	Utilities
River Spirit Casino	Arts, Entertainment, and Recreation
Owasso Public Schools	Educational Services
IC Bus of Oklahoma LLC	Manufacturing
ONEOK, Inc.	Mining, Quarrying, and Oil and Gas Extraction
Family & Children's Services	Health Care and Social Assistance
Integrated Service Company LLC	Mining, Quarrying, and Oil and Gas Extraction
The Williams Companies	Mining, Quarrying, and Oil and Gas Extraction
NORDAM Group	Manufacturing
Blue Cross Blue Shield Of Oklahoma	Finance and Insurance
Webco Industries Inc.	Manufacturing
Bios Corporation	Health Care and Social Assistance
University of Tulsa	Educational Services

Figure 13 - Greater Tulsa Companies with more than 1,000 Workers

also prominent on the list with clusters in aerospace, fin tube heat exchangers, durable goods, and oil field equipment. Several oil and gas companies, particularly midstream enterprises, also appear on the list. Public schools are most prominent in the Educational Services sector with eight school districts listed. Tulsa only has two Fortune 500 headquarters: ONEOK at #224 and Williams at #347.

Northwest Arkansas has almost twenty major employers with more than 1,000 employees, and between ten and fifteen employers with 500 to 999 employees. As previously noted, Walmart, the largest company in the country, has its world headquarters in

Companies with more than 500 to 999 Employees	Industry Sector
Spirit Aerosystems	Manufacturing
OSU-Tulsa and OSU Center for Health Sciences	Educational Services
ONE Gas	Mining, Quarrying, and Oil and Gas Extraction
Muscogee (Creek) Nation	Public Administration
Bixby Public Schools	Educational Services
Oral Roberts University	Educational Services
Osage Casinos	Arts, Entertainment, and Recreation
Bama Companies Inc.	Manufacturing
City of Broken Arrow	Public Administration
Lumen	Information
Melfon Truck Lines	Transportation and Warehousing
Google Data Center	Information
Magellan Midstream Partners LP	Mining, Quarrying, and Oil and Gas Extraction
Sand Springs Public Schools	Educational Services
Zeeco Inc.	Manufacturing
Baker Hughes	Mining, Quarrying, and Oil and Gas Extraction
FlightSafety International	Manufacturing
Georgia-Pacific	Manufacturing
Arvest Bank	Finance and Insurance
Ameristar Perimeter Security	Manufacturing
AXH Air-Coolers	Manufacturing
YMCA of Greater Tulsa	Health Care and Social Assistance
United Parcel Service Inc	Transportation and Warehousing
Muskogee Public Schools	Educational Services
Muscogee Nation Health System	Health Care and Social Assistance
Hilti North America	Manufacturing
Tulsa Technology Center	Educational Services
Grand River Dam Authority	Utilities
Kimberly-Clark	Manufacturing
Helmerich & Payne, Inc.	Mining, Quarrying, and Oil and Gas Extraction
RCB Bank	Finance and Insurance
cxLoyalty	Professional, Scientific, and Technical Services
Cox Communications	Information
Mill Creek Lumber & Supply Co.	Wholesale Trade
A G Equipment Company	Manufacturing
Verizon Business	Information
Cap Tulsa	Health Care and Social Assistance
Sapulpa Public Schools	Educational Services
T.D. Williamson, Inc	Mining, Quarrying, and Oil and Gas Extraction
Claremore Public Schools	Educational Services
Enovation Controls	Manufacturing
LufthansaTechnik Component Service/Bizjet	Transportation and Warehousing
Greenheck Group	Manufacturing
Avantive Solutions	Information
ITCU Federal Credit Union	Finance and Insurance

Figure 14 - Greater Tulsa Companies with 500 to 999 Workers

PROFILES

Bentonville. It skews the employment picture in the region, especially in the Management of Companies and Enterprises sector. Health Care and Social Assistance, as well as Education have multiple employers on the list with the University of Arkansas particularly notable. The Manufacturing sector is dominated by seven major poultry food processors producing packaged consumer goods. Transportation and Warehousing concerns are also represented on the list. The two other Fortune 500 companies headquartered in Northwest Arkansas are Tyson Foods at #81 and J.B. Hunt Transportation Services at #240.

EMPLOYMENT CLUSTERS

The nine counties of the Tulsa consolidated metropolitan area cover 7,494 square miles. Adding Mayes County and Cherokee County to the total sums to 8,898 square miles for the greater Tulsa employment area. The region has a density of 57 workers per square mile. However, Osage County, coincident with the Osage Indian Reservation, is largely rural and covers 2,246 square miles. Subtracting this area from the density calculation changes the result to 77 workers per square mile.

Employment in the greater Tulsa region is largely centralized in Tulsa County and the City of Tulsa. This concentric geometry holds true despite the Arkansas River bisecting the area. Within Tulsa County there are several important employment clusters: Downtown Tulsa, the City of Broken Arrow, the Tulsa International Airport, and the Cherokee Industrial Park. Outside of the urban core,

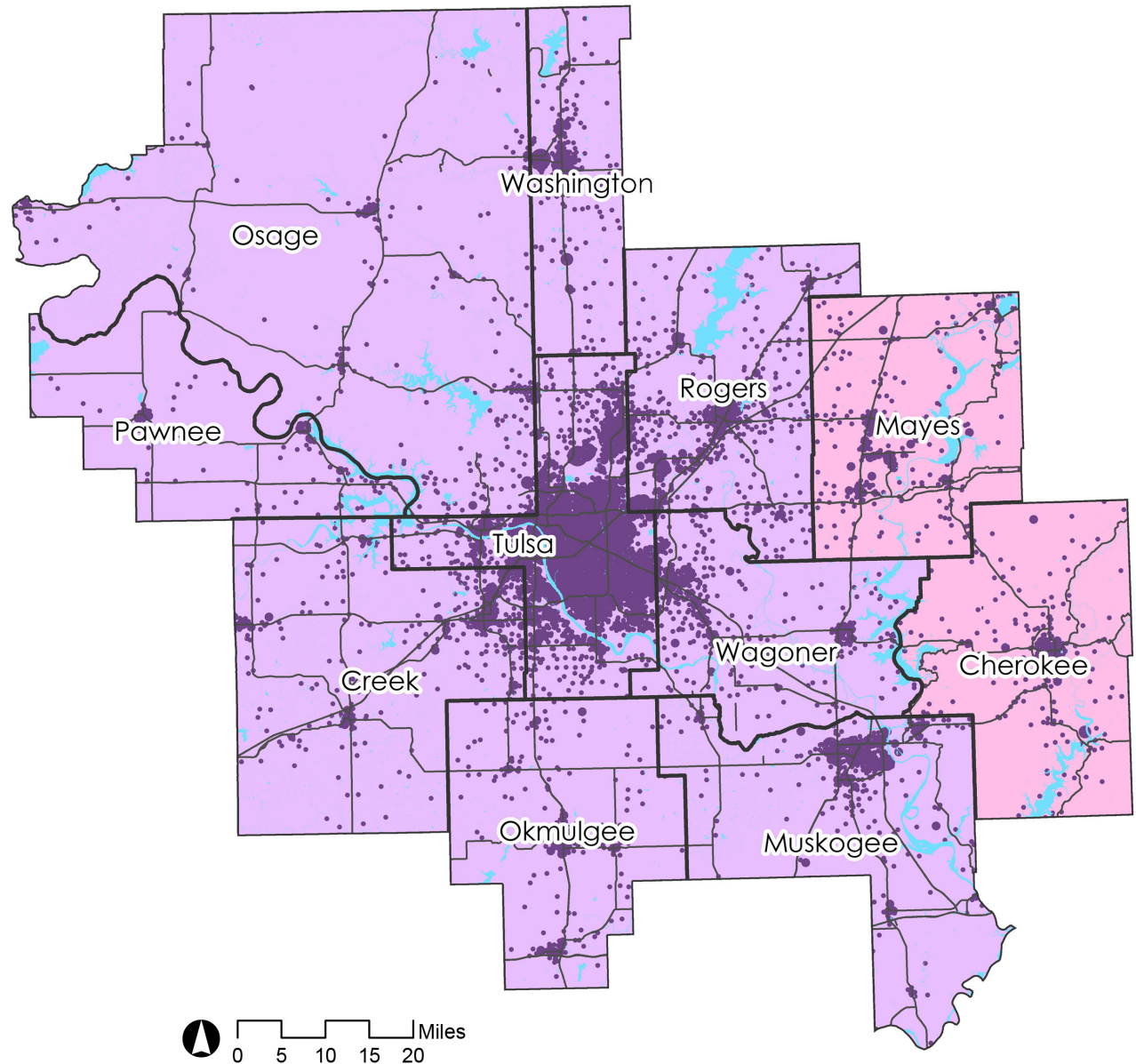


Figure 15 - Greater Tulsa Metropolitan Tulsa Employment Clusters

Companies with more than 1,000 Employees	Industry Sector
Walmart	Management of Companies and Enterprises
J.B. Hunt Transport	Transportation and Warehousing
Tyson Foods	Manufacturing
University of Arkansas	Educational Services
Springdale School District	Educational Services
PAM Transport	Transportation and Warehousing
Rogers School District	Educational Services
Mercy Health System	Health Care and Social Assistance
Bentonville School District	Educational Services
Simmons Foods	Manufacturing
McKee Foods	Manufacturing
Arvest Bank	Finance and Insurance
Walmart	Retail Trade
George's	Manufacturing
Washington Regional Medical Center	Health Care and Social Assistance
Fayetteville School District	Educational Services
Cargill	Manufacturing
Veterans Medical Center	Health Care and Social Assistance
Northwest Health System	Health Care and Social Assistance

Figure 16 - Northwest Arkansas Companies with more than 1,000 Workers

there are several important clusters on the east side of the region in the City of Bartlesville, the City of Muskogee, the Ports of Catoosa, Inola, and Muskogee, Mid-American Industrial Park in Mayes County, the Muskogee Creek Nation Capitol in Okmulgee, and the Cherokee Nation Capitol in Tahlequah. There are fewer clusters on the west side of the region in Osage, Pawnee, and Creek Counties.

The three counties of the Northwest Arkansas metropolitan area cover 3,213 square miles, roughly one third the size of the greater Tulsa employment area. Its employment density of 75 workers per square mile is similar to greater Tulsa's density when Osage County is subtracted. Unlike Tulsa, the Northwest Arkansas area has grown in a linear fashion from a cluster of smaller towns running from north to south in Benton and Washington Counties, namely Bentonville, Rogers, Springdale, and Fayetteville. A secondary cluster of linear nodes may be emerging on the western side of Benton County running from Northwest Arkansas National Airport on the north to Siloam Springs in the south.

Companies with more than 500 to 999 Employees	Industry Sector
Ozark Mountain Poultry	Manufacturing
Northwest Arkansas Community College	Educational Services
John Brown University	Educational Services
McDonald's	Retail Trade
Siloam Springs School District	Educational Services
Glad Products	Manufacturing
Gates Corporation	Manufacturing
Rockline Industries	Manufacturing
Harp's Food Stores	Retail Trade
Arkansas Support Network	Health Care and Social Assistance
Superior Industries International	Manufacturing
Medical Associates of Northwest Arkansas	Health Care and Social Assistance

Figure 17 - Northwest Arkansas Companies with 500 to 999 Workers

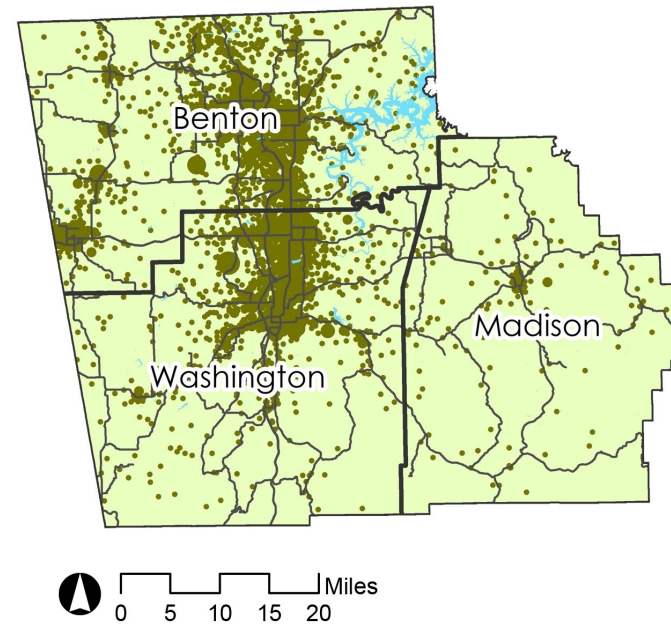


Figure 18 - Northwest Arkansas Employment Clusters

TRENDS

EMPLOYMENT TRENDS

When looking at long-term employment trends, it is important to look at both absolute and relative distributions of jobs in each industry sector. The absolute employment distribution is represented as a simple percentage of jobs in an industry compared to the region. These percentages are converted into indices when plotted on a growth chart to allow them to be compared. Location quotients are used to compare the distribution of jobs in the region compared to the nation to develop a relative employment picture. For example, an industry sector that is overrepresented in the region compared to the nation may still not be of much significance if it is a small percentage of overall employment.

EMPLOYMENT TRENDS IN GREATER TULSA

Starting with the absolute employment data in greater Tulsa, we can see the largest employment sectors in 2020 were in Health Care and Social Assistance at fifteen percent, Manufacturing at twelve percent, and Retail Trade at eleven percent of total employment. The smallest employment sectors were Agriculture, Forestry, Fishing, and Hunting at less than one percent, Utilities at one percent, and Mining, Quarrying, and Oil and Gas extraction, Information, Real Estate and Rental and Leasing, and Other Services, all at two percent.

Turning to the location quotients for greater Tulsa, we see the Oil and Gas,

Utilities, and Arts sectors with much greater concentrations of employment than seen nationally. Oil and Gas is particularly strong with a location quotient of 4.4. However, these three sectors are all small, each is less than three percent of the region's total employment. More significant is the Manufacturing sector with a modest but slowly increasing location quotient of 1.4. With twelve percent of the region's employment, the potential of this sector as an export industry may be the most impressive finding, worthy of further study to determine its growth factors. Less encouraging but not surprisingly, Health Care and Education, two of the largest sectors representing almost a quarter of the region's employment, have a location quotient below 1.0. Small but important

Employment Sector	2003 USA Employment	2003 USA %	2010 USA Employment	2010 USA %	2020 USA Employment	2020 USA %
Agriculture, Forestry, Fishing and Hunting	989,377	1%	1,049,962	1%	1,126,683	1%
Mining, Quarrying, and Oil and Gas Extraction	481,477	0%	637,833	1%	584,538	0%
Utilities	735,505	1%	802,323	1%	771,607	1%
Construction	5,922,844	5%	5,263,544	4%	7,341,328	5%
Manufacturing	13,833,394	12%	11,432,798	9%	12,226,475	9%
Wholesale Trade	5,340,430	5%	5,409,504	4%	5,655,189	4%
Retail Trade	13,772,420	12%	13,932,219	11%	14,337,773	11%
Transportation and Warehousing	4,021,479	3%	4,191,515	3%	5,607,468	4%
Information	3,034,968	3%	2,867,457	2%	3,087,336	2%
Finance and Insurance	5,285,785	5%	5,382,850	4%	5,992,716	4%
Real Estate and Rental and Leasing	1,943,130	2%	1,933,892	2%	2,210,682	2%
Professional, Scientific, and Technical Services	6,235,978	5%	7,405,939	6%	9,522,729	7%
Management of Companies and Enterprises	1,695,293	1%	1,917,779	2%	2,466,196	2%
Administration & Support	6,695,201	6%	7,064,590	6%	8,275,037	6%
Educational Services	10,801,376	9%	12,578,311	10%	12,388,999	9%
Health Care and Social Assistance	13,954,604	12%	17,629,976	14%	21,461,506	16%
Arts, Entertainment, and Recreation	1,910,955	2%	2,119,102	2%	2,111,351	2%
Accommodation and Food Services	9,416,340	8%	10,773,907	9%	10,717,739	8%
Other Services (excluding Public Administration)	4,014,986	3%	4,338,798	4%	3,981,646	3%
Public Administration	4,925,686	4%	6,612,696	5%	6,311,545	5%
Total	115,011,228		123,344,995		136,178,543	

Figure 19 - National Employment by Industry Sector

Employment Sector	2003 Tulsa MSA Employment	2003 Tulsa MSA %	2010 Tulsa MSA Employment	2010 Tulsa MSA %	2020 Tulsa MSA Employment	2020 Tulsa MSA %
Agriculture, Forestry, Fishing and Hunting	2,152	0%	1,706	0%	2,048	0%
Mining, Quarrying, and Oil and Gas Extraction	6,604	1%	7,748	2%	9,720	2%
Utilities	4,905	1%	6,464	1%	5,233	1%
Construction	23,721	5%	23,711	5%	30,974	6%
Manufacturing	53,391	12%	51,537	11%	62,867	12%
Wholesale Trade	19,612	4%	19,015	4%	19,983	4%
Retail Trade	53,473	12%	55,605	12%	56,804	11%
Transportation and Warehousing	18,185	4%	17,889	4%	17,570	3%
Information	11,302	3%	9,098	2%	8,645	2%
Finance and Insurance	16,623	4%	19,117	4%	18,602	4%
Real Estate and Rental and Leasing	8,286	2%	7,540	2%	7,829	2%
Professional, Scientific, and Technical Services	20,551	5%	21,953	5%	25,772	5%
Management of Companies and Enterprises	6,494	1%	6,420	1%	8,247	2%
Administration & Support	29,741	7%	37,146	8%	35,422	7%
Educational Services	40,463	9%	44,536	9%	39,705	8%
Health Care and Social Assistance	61,765	14%	69,567	14%	75,640	15%
Arts, Entertainment, and Recreation	6,297	1%	7,947	2%	13,073	3%
Accommodation and Food Services	34,462	8%	38,185	8%	41,400	8%
Other Services (excluding Public Administration)	12,416	3%	12,797	3%	12,001	2%
Public Administration	16,142	4%	24,220	5%	21,538	4%
Total	446,585		482,201		513,073	

Figure 20 - Greater Tulsa Employment by Industry Sector

Employment Sector	2003 LQ	2010 LQ	2020 LQ	2020 Classification
Agriculture, Forestry, Fishing and Hunting	0.6	0.4	0.5	Local Industry
Mining, Quarrying, and Oil and Gas Extraction	3.5	3.1	4.4	Export Industry
Utilities	1.7	2.1	1.8	Export Industry
Construction	1.0	1.2	1.1	Export Industry
Manufacturing	1.0	1.2	1.4	Export Industry
Wholesale Trade	0.9	0.9	0.9	Local Industry
Retail Trade	1.0	1.0	1.1	Export Industry
Transportation and Warehousing	1.2	1.1	0.8	Local Industry
Information	1.0	0.8	0.7	Local Industry
Finance and Insurance	0.8	0.9	0.8	Local Industry
Real Estate and Rental and Leasing	1.1	1.0	0.9	Local Industry
Professional, Scientific, and Technical Services	0.8	0.8	0.7	Local Industry
Management of Companies and Enterprises	1.0	0.9	0.9	Local Industry
Administration & Support	1.1	1.3	1.1	Export Industry
Educational Services	1.0	0.9	0.9	Local Industry
Health Care and Social Assistance	1.1	1.0	0.9	Local Industry
Arts, Entertainment, and Recreation	0.8	1.0	1.6	Export Industry
Accommodation and Food Services	0.9	0.9	1.0	Local Industry
Other Services (excluding Public Administration)	0.8	0.8	0.8	Local Industry
Public Administration	0.8	0.9	0.9	Local Industry

Figure 21 - Greater Tulsa Location Quotients

sectors in Information and Professional, Scientific, and Technical Services are underrepresented with location quotients of 0.7.

When looking at employment trends using the growth index chart it is important to first look at significant economic events. Several events are of note. First, the Great Recession of 2008-2009 is clearly visible as an employment dip in most sectors. Second, Oil and Gas Extraction and Utilities are closely linked to oil prices. A boom in these sectors is evident from 2011 to 2016. Lastly, since this data extends to 2020, the onset of the COVID-19 pandemic shows a steep decline in many sectors, and a rise in some others like Management of Companies and Enterprises, and Transportation and Warehousing.

TRENDS

- Agriculture, Forestry, Fishing and Hunting
- Mining, Quarrying, and Oil and Gas Extraction
- Utilities
- Construction
- Manufacturing
- Wholesale Trade
- Retail Trade
- Transportation and Warehousing
- Information
- Finance and Insurance
- Real Estate and Rental and Leasing
- Professional, Scientific, and Technical Services
- Management of Companies and Enterprises
- Administration & Support
- Educational Services
- Health Care and Social Assistance
- Arts, Entertainment, and Recreation
- Accommodation and Food Services
- Other Services (excluding Public Administration)
- Public Administration

Several industry sectors are worth noting in the growth chart. First, Arts, Entertainment, and Recreation is a significant outlier with sustained growth across the period and explosive growth after 2014. Several developments may be contributing to this sector's growth including the opening of the BOK Center arena, the construction of ONEOK field for baseball and soccer, the revitalization of the downtown Arts District, and perhaps most important of all: the expansion of Indian Gaming at multiple casinos and resorts. Two traditionally strong sectors in Tulsa, Mining, Quarrying, and Oil and Gas Extraction, and Utilities, have also performed well. On the other hand, the Real Estate, the Transportation and Warehousing, and the Information sectors saw considerable declines.

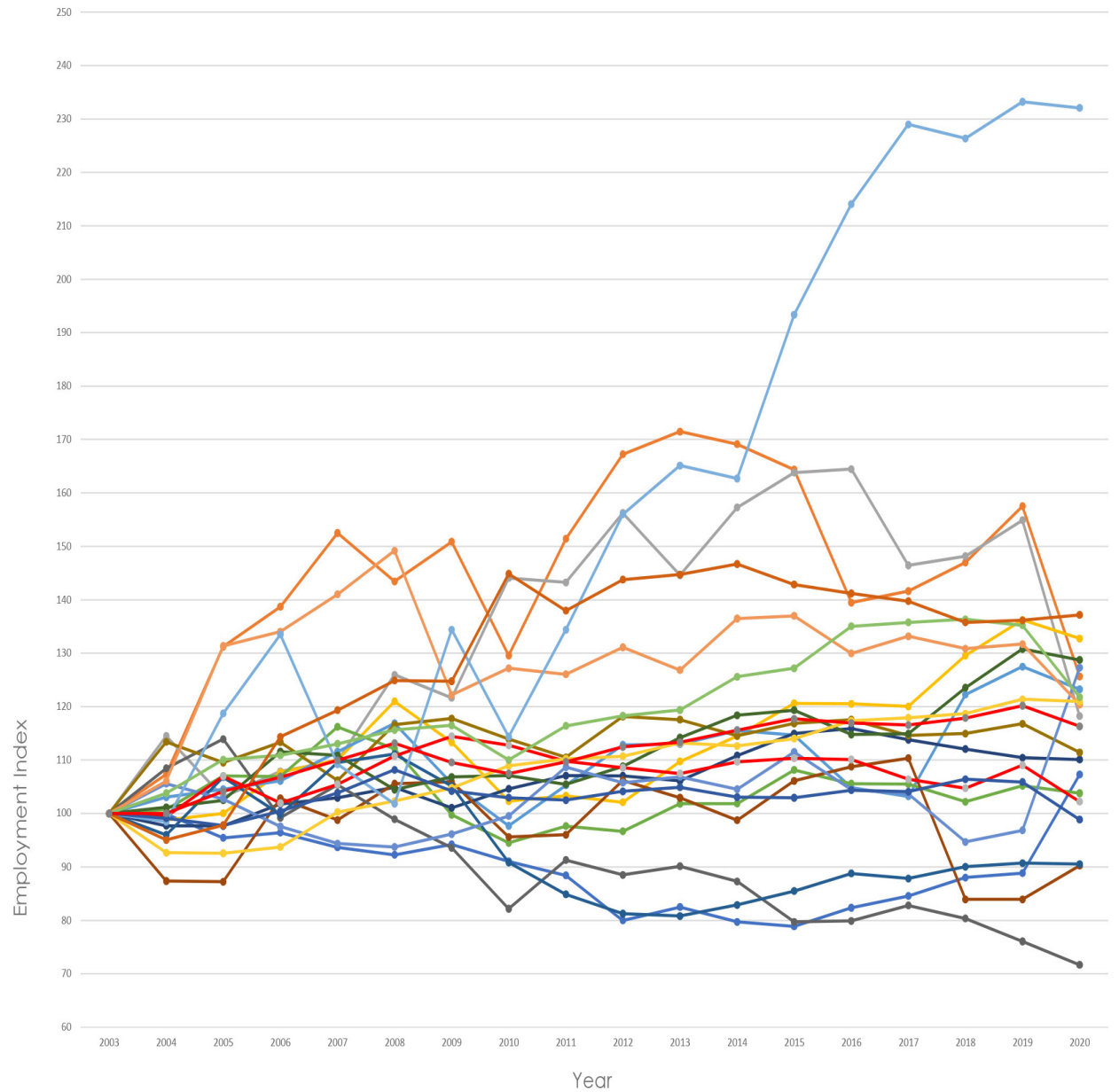


Figure 22 - Greater Tulsa Growth Trends

Employment Sector	2003 FSR MSA Employment	2003 FSR MSA %	2010 FSR MSA Employment	2010 FSR MSA %	2018 FSR MSA Employment	2018 FSR MSA %
Agriculture, Forestry, Fishing and Hunting	1,210	1%	1,068	1%	1,009	0%
Mining, Quarrying, and Oil and Gas Extraction	56	0%	140	0%	64	0%
Utilities	1,291	1%	1,579	1%	1,337	1%
Construction	7,705	5%	7,668	4%	11,856	5%
Manufacturing	31,454	19%	26,704	15%	27,561	11%
Wholesale Trade	7,044	4%	8,697	5%	12,024	5%
Retail Trade	16,862	10%	18,305	10%	24,836	10%
Transportation and Warehousing	16,126	10%	13,286	7%	16,722	7%
Information	2,493	2%	2,222	1%	2,195	1%
Finance and Insurance	4,223	3%	4,809	3%	5,700	2%
Real Estate and Rental and Leasing	1,903	1%	2,177	1%	2,642	1%
Professional, Scientific, and Technical Services	6,473	4%	8,556	5%	14,087	6%
Management of Companies and Enterprises	13,850	8%	16,165	9%	24,908	10%
Administration & Support	6,901	4%	6,988	4%	10,834	4%
Educational Services	15,458	9%	19,760	11%	23,095	10%
Health Care and Social Assistance	14,034	8%	20,753	11%	28,333	12%
Arts, Entertainment, and Recreation	1,477	1%	2,124	1%	3,124	1%
Accommodation and Food Services	11,249	7%	15,036	8%	23,095	10%
Other Services (excluding Public Administration)	3,366	2%	3,502	2%	4,599	2%
Public Administration	2,448	1%	4,402	2%	4,798	2%
Total	165,623		183,941		242,819	

Figure 23 - Northwest Arkansas Employment by Sector

Employment Sector	2003 LQ	2010 LQ	2018 LQ	2018 Classification
Agriculture, Forestry, Fishing and Hunting	0.8	0.7	0.5	Local Industry
Mining, Quarrying, and Oil and Gas Extraction	0.1	0.1	0.1	Local Industry
Utilities	1.2	1.3	1.0	Local Industry
Construction	0.9	1.0	1.0	Local Industry
Manufacturing	1.6	1.6	1.3	Export Industry
Wholesale Trade	0.9	1.1	1.2	Export Industry
Retail Trade	0.9	0.9	0.9	Local Industry
Transportation and Warehousing	2.8	2.1	1.8	Export Industry
Information	0.6	0.5	0.4	Local Industry
Finance and Insurance	0.6	0.6	0.6	Local Industry
Real Estate and Rental and Leasing	0.7	0.8	0.7	Local Industry
Professional, Scientific, and Technical Services	0.7	0.8	0.9	Local Industry
Management of Companies and Enterprises	5.7	5.7	6.0	Export Industry
Administration & Support	0.7	0.7	0.7	Local Industry
Educational Services	1.0	1.1	1.0	Local Industry
Health Care and Social Assistance	0.7	0.8	0.8	Local Industry
Arts, Entertainment, and Recreation	0.5	0.7	0.7	Local Industry
Accommodation and Food Services	0.8	0.9	1.0	Local Industry
Other Services (excluding Public Administration)	0.6	0.5	0.6	Local Industry
Public Administration	0.3	0.4	0.4	Local Industry

Figure 24 - Northwest Arkansas Location Quotients

EMPLOYMENT TRENDS
IN NORTHWEST ARKANSAS

While smaller than the Tulsa region, the Northwest Arkansas employment market appears to be more diverse and more dynamic with many more growing sectors than stagnant or declining ones. The largest employment sectors in 2018 were Health Care and Social Assistance at twelve percent, Manufacturing at eleven percent, and the four sectors of Management of Companies and Enterprises, Educational Services, Accommodation and Food Services, and Retail Trade all at ten percent of total employment. The smallest employment sectors were Agriculture, Forestry, Fishing, and Hunting, and Mining, Quarrying, and Oil and Gas at less than one percent. Seven others, including the FIRE cluster, are less than two percent.

TRENDS

- Agriculture, Forestry, Fishing and Hunting
- Mining, Quarrying, and Oil and Gas Extraction
- Utilities
- Construction
- Manufacturing
- Wholesale Trade
- Retail Trade
- Transportation and Warehousing
- Information
- Finance and Insurance
- Real Estate and Rental and Leasing
- Professional, Scientific, and Technical Services
- Management of Companies and Enterprises
- Administration & Support
- Educational Services
- Health Care and Social Assistance
- Arts, Entertainment, and Recreation
- Accommodation and Food Services
- Other Services (excluding Public Administration)
- Public Administration
- Total All Jobs

Management of Companies and Enterprises is an outlier when it comes to location quotients with a high value of 6.0. This is undoubtedly due to the inclusion of Walmart, the nation's largest company to manage, and its many vendors and suppliers that are co-located in the region. Manufacturing, Transportation and Warehousing, and Wholesale Trade also have greater employment concentrations than national averages, but the first two seem to be declining with time. The other large sectors of Health Care and Social Assistance, and Educational Services have location quotients near 1.0. The remaining industry sectors are all local industries that collectively amount to less than eleven percent of total employment. Notably, Information, Public Administration, and Mining, Quarrying, and Oil and Gas Extraction, are extremely underrepresented.

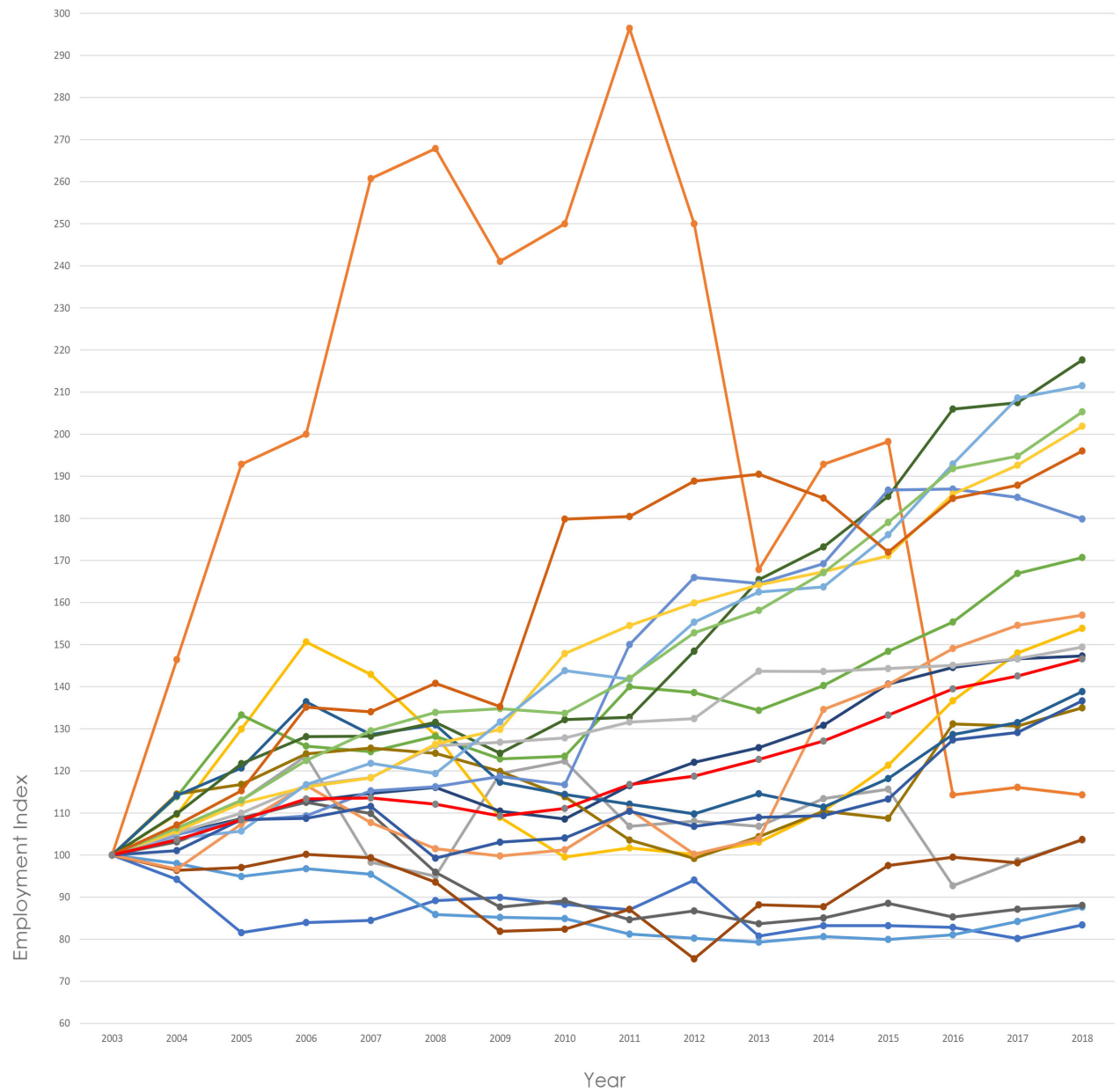


Figure 25 - Northwest Arkansas Growth Trends

Reading the growth index chart, the Mining, Quarrying, and Oil and Gas Extraction sector reveals erratic behavior. Growth climbs more rapidly in these sectors than any other until 2012 and then declines just as rapidly. This is due to this sector's extremely small size having an oversized effect on the index calculation and therefore this data should be ignored. Almost all other sectors show dramatic growth, the exceptions being Information, Utilities, Agriculture, and most importantly Manufacturing. While the others are small sectors, Manufacturing is the largest sector in the region. The highest growth sectors are Professional, Scientific, and Technical Services, Arts, Entertainment, and Recreation, Accommodation and Food Service, Health Care and Social Assistance, Public Administration, and Management of Companies and Enterprises, all with impressive indices near or above 200. These six diverse sectors together represent forty-six percent of all employment.

EMPLOYMENT SHIFTS

Shift-share analysis allows a review of historical data to examine regional and broader forces driving the economy. It is not a forecasting technique, so its results must be taken in context with the growth trend analysis and other factors to understand employment market direction. Since the greater Tulsa employment data extended into the pandemic period, the shift-share analysis for that market was run using pre-pandemic data from 2018 and with pandemic era data from 2020 for comparison. With few exceptions, the results of the 2020 analysis closely match

the 2018 analysis, but the change in Tulsa employment was of greater magnitude in 2018, reflecting losses in job growth during 2020. For the discussion that follows, the 2018 greater Tulsa analysis was used to match the 2018 data used for Northwest Arkansas.

EMPLOYMENT CHANGE AND THE SHARE COMPONENT

From 2003 to 2018, all sectors of employment in the nation grew except for Public Administration. The percent change of national employment growth was 17.1 percent. By comparison, the greater Tulsa employment growth rate was only 7.9 percent. Sixteen industries grew slower than the national rates for their sectors, with five, Utilities, Transportation and Warehousing, Management of Companies and Enterprises, Educational Services, and Public Administration, shrinking. Four industries, Agriculture, Mining, Quarrying, and Oil and Gas Extraction, Manufacturing, and Arts, Entertainment, and Recreation, grew faster than the national rates for their sectors.

By contrast, Northwest Arkansas' employment market grew at a rate of 32.0 percent, almost twice the national rate. Fourteen industries grew faster than the national rates for their sectors, sometimes by two or three times the national rate. Six industries grew at a slower rate than the rates for their national sectors, with four sectors, Agriculture, Mining, Quarrying, and Oil and Gas Extraction, Utilities, and Information declining.

The share component shows how much industries would have grown at the rate of

growth of the entire national economy. The greater Tulsa region would have seen an overall growth of 82,587 jobs compared to its actual growth of 38,332 jobs. The industry shift effects, and competitive shift effects, discussed below, help to explain the deficit of 44,265 jobs. The share component for Northwest Arkansas explains that 31,504 jobs of the 58,878 new jobs created during the period can be explained by the national rate of job growth. Likewise, the industry shift effects and competitive shift effects help explain the 27,374 job surplus in this case. It is noteworthy that Tulsa's actual growth did not keep up with the national economy and Northwest Arkansas's actual growth exceeded it.

INDUSTRY SHIFT EFFECT

The industry shift effect indicates the additional job growth in a region due to its industry mix. If a region is overrepresented by fast-growing industries, its job growth rates should be higher than the national rates. The industry effects for both greater Tulsa and Northwest Arkansas were small, suggesting they do not have particularly high concentrations of fast-growing industries.

Greater Tulsa had an industry effect of 948 jobs with seven industries experiencing a positive shift and thirteen experiencing a negative shift. The largest positive shifts were in Construction, Administration and Support, and Accommodation and Food Services. The largest negative shifts were in Educational Services, Public Administration, and Manufacturing.

SHIFTS

Employment Sector	2010-2018 Tulsa MSA Employment Change	2010-2018 Tulsa MSA % Change	2010-2018 USA Employment Change	2010-2018 USA % Change
Agriculture, Forestry, Fishing and Hunting	436	25.6%	150,800	14.4%
Mining, Quarrying, and Oil and Gas Extraction	3,185	41.1%	11,390	1.8%
Utilities	-46	-0.7%	8,471	1.1%
Construction	6,220	26.2%	2,100,400	39.9%
Manufacturing	11,311	21.9%	1,274,059	11.1%
Wholesale Trade	685	3.6%	475,314	8.8%
Retail Trade	2,258	4.1%	1,680,101	12.1%
Transportation and Warehousing	-1,524	-8.5%	1,315,669	31.4%
Information	17	0.2%	280,544	9.8%
Finance and Insurance	25	0.1%	611,257	11.4%
Real Estate and Rental and Leasing	298	4.0%	325,633	16.8%
Professional, Scientific, and Technical Services	2,993	13.6%	2,026,856	27.4%
Management of Companies and Enterprises	-227	-3.5%	568,202	29.6%
Administration & Support	1,201	3.2%	2,120,592	30.0%
Educational Services	-3,359	-7.5%	592,122	4.7%
Health Care and Social Assistance	4,783	6.9%	3,938,065	22.3%
Arts, Entertainment, and Recreation	4,882	61.4%	519,371	24.5%
Accommodation and Food Services	8,195	21.5%	2,969,454	27.6%
Other Services (excluding Public Administration)	209	1.6%	262,399	6.0%
Public Administration	-3,210	-13.3%	-105,344	-1.6%
Total	38,332	7.9%	21,125,355	17.1%

Figure 26 - Greater Tulsa Employment Change

Employment Sector	Share Component	Industry Effect	Competitive Effect	Actual Growth
Agriculture, Forestry, Fishing and Hunting	292	-47	191	436
Mining, Quarrying, and Oil and Gas Extraction	1,327	-1,189	3,047	3,185
Utilities	1,107	-1,039	-114	-46
Construction	4,061	5,401	-3,242	6,220
Manufacturing	8,827	-3,084	5,568	11,311
Wholesale Trade	3,257	-1,586	-986	685
Retail Trade	9,523	-2,818	-4,447	2,258
Transportation and Warehousing	3,064	2,551	-7,139	-1,524
Information	1,558	-668	-873	17
Finance and Insurance	3,274	-1,103	-2,146	25
Real Estate and Rental and Leasing	1,291	-22	-972	298
Professional, Scientific, and Technical Services	3,760	2,248	-3,015	2,993
Management of Companies and Enterprises	1,100	803	-2,129	-227
Administration & Support	6,362	4,788	-9,949	1,201
Educational Services	7,628	-5,531	-5,456	-3,359
Health Care and Social Assistance	11,915	3,625	-10,756	4,783
Arts, Entertainment, and Recreation	1,361	587	2,934	4,882
Accommodation and Food Services	6,540	3,984	-2,329	8,195
Other Services (excluding Public Administration)	2,192	-1,418	-565	209
Public Administration	4,148	-4,534	-2,824	-3,210
Total	82,587	948	-45,203	38,332

Figure 27 - Greater Tulsa Shift-Share

Employment Sector	2010-2018 FSR MSA Employment Change	2010-2018 FSR MSA %Change	2010-2018 USA Employment Change	2010-2018 USA %Change
Agriculture, Forestry, Fishing and Hunting	-59	-5.5%	150,800	14.4%
Mining, Quarrying, and Oil and Gas Extraction	-76	-54.3%	11,390	1.8%
Utilities	-242	-15.3%	8,471	1.1%
Construction	4,188	54.6%	2,100,400	39.9%
Manufacturing	857	3.2%	1,274,059	11.1%
Wholesale Trade	3,327	38.3%	475,314	8.8%
Retail Trade	6,531	35.7%	1,680,101	12.1%
Transportation and Warehousing	3,436	25.9%	1,315,669	31.4%
Information	-27	-1.2%	280,544	9.8%
Finance and Insurance	891	18.5%	611,257	11.4%
Real Estate and Rental and Leasing	465	21.4%	325,633	16.8%
Professional, Scientific, and Technical Services	5,531	64.6%	2,026,856	27.4%
Management of Companies and Enterprises	8,743	54.1%	568,202	29.6%
Administration & Support	3,846	55.0%	2,120,592	30.0%
Educational Services	3,335	16.9%	592,122	4.7%
Health Care and Social Assistance	7,580	36.5%	3,938,065	22.3%
Arts, Entertainment, and Recreation	1,000	47.1%	519,371	24.5%
Accommodation and Food Services	8,059	53.6%	2,969,454	27.6%
Other Services (excluding Public Administration)	1,097	31.3%	262,399	6.0%
Public Administration	396	9.0%	-105,344	-1.6%
Total	58,878	32.0%	21,125,355	17.1%

Figure 28 - Northwest Arkansas Employment Change

Employment Sector	Share Component	Industry Effect	Competitive Effect	Actual Growth
Agriculture, Forestry, Fishing and Hunting	183	-30	-212	-59
Mining, Quarrying, and Oil and Gas Extraction	24	-21	-79	-76
Utilities	270	-254	-259	-242
Construction	1,313	1,747	1,128	4,188
Manufacturing	4,574	-1,598	-2,119	857
Wholesale Trade	1,490	-725	2,563	3,327
Retail Trade	3,135	-928	4,324	6,531
Transportation and Warehousing	2,275	1,895	-734	3,436
Information	381	-163	-244	-27
Finance and Insurance	824	-278	345	891
Real Estate and Rental and Leasing	373	-6	98	465
Professional, Scientific, and Technical Services	1,465	876	3,189	5,531
Management of Companies and Enterprises	2,769	2,021	3,954	8,743
Administration & Support	1,197	901	1,748	3,846
Educational Services	3,384	-2,454	2,405	3,335
Health Care and Social Assistance	3,554	1,081	2,944	7,580
Arts, Entertainment, and Recreation	364	157	479	1,000
Accommodation and Food Services	2,575	1,569	3,915	8,059
Other Services (excluding Public Administration)	600	-388	885	1,097
Public Administration	754	-824	466	396
Total	31,504	2,577	24,797	58,878

Figure 29 - Northwest Arkansas Shift-Share

SHIFTS

Northwest Arkansas had a slightly larger industry effect of 2,577 jobs with eight industries experiencing a positive shift and twelve experiencing a negative shift. The largest positive shifts were in Management of Companies and Enterprises, Transportation and Warehousing, and Construction. The largest negative shifts were in Educational Services, Manufacturing, and Public Administration. It is notable that Educational Services, Public Administration, and Manufacturing fared the worst in both regions.

COMPETITIVE SHIFT EFFECT

The competitive shift effect reflects the additional job growth in a region due to its location factors, also called its competitive advantage. While industry effects for the two regions were small, competitive effects were large and in opposite directions.

Greater Tulsa lost 45,203 jobs due to its regional competitive disadvantages. The overall result was backed up by the fact that all industries had negative shifts except Agriculture, Mining, Quarrying, and Oil and Gas Extraction, Manufacturing, and Arts, Entertainment, and Recreation. The strong showing in Manufacturing is important because it is a large sector. Industries with large negative shifts were Health Care and Social Assistance, Administration and Support, Transportation and Warehousing, and Educational Services.

Conversely, Northwest Arkansas gained 24,797 jobs attributable to regional competitive advantages. All industries sectors displayed positive shifts except

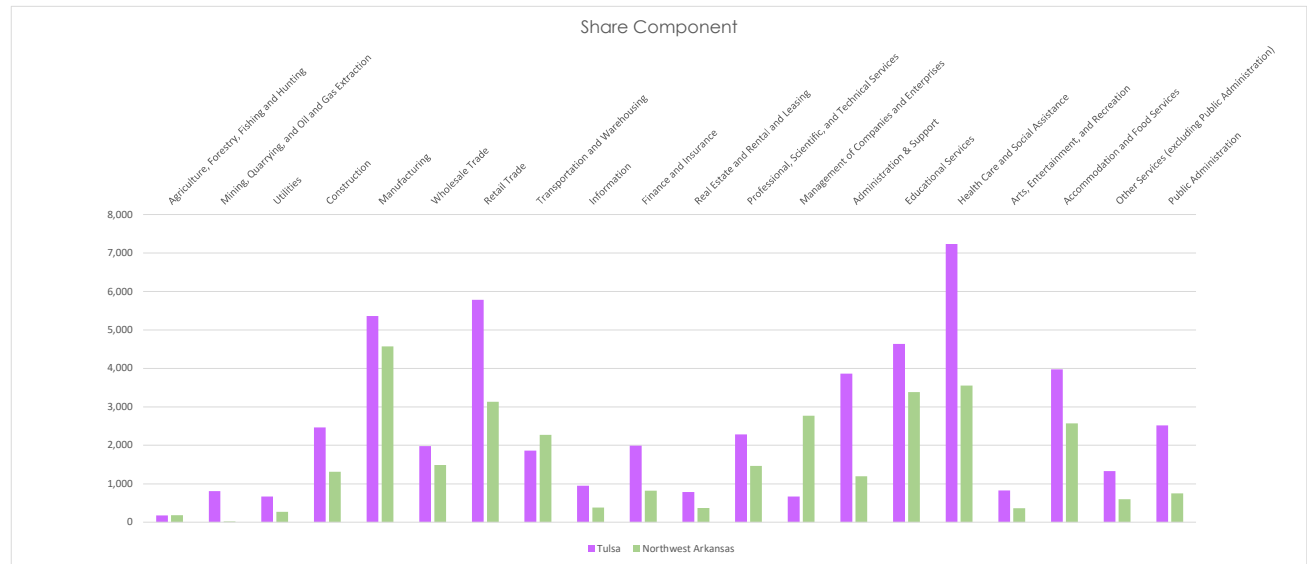


Figure 30 - Comparison of Share Components

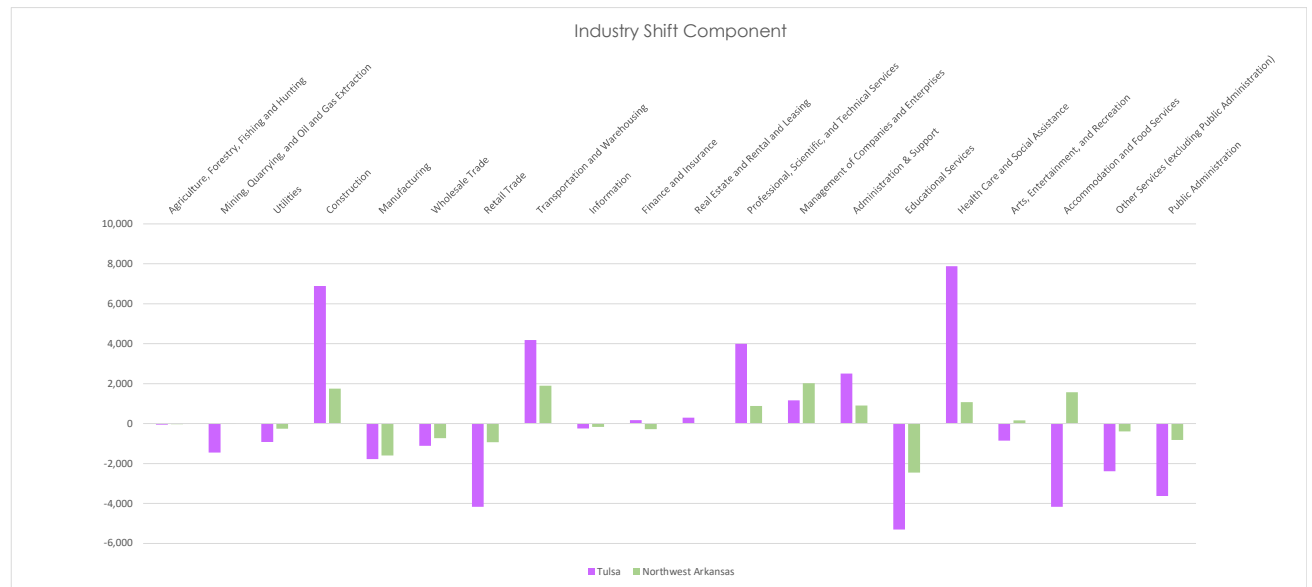


Figure 31 - Comparison of Industry Shift Components



Agriculture, Mining, Quarrying, and Oil and Gas Extraction, Utilities, Manufacturing, Transportation and Warehousing, and Information. Management of Companies and Enterprises, Retail Trade, and Accommodations and Food Service scored particularly well.

A comprehensive dissection of location factors is beyond the scope of this analysis, as many other data would need to be examined, but a synthesis of growth prospects and challenges will be attempted in the discussion section of the report to follow. The discussion should be viewed more as a guide for further research than a formal conclusion.

DISCUSSION

While Bertaud pithily contends that the growth of cities is attributable to the efficiency of their labor markets, it does not explain everything by itself. In this sense, this study is one-dimensional and should only be interpreted in context with other economic and city planning data. This study also has a small sample size of two metropolitan regions in close geographic proximity. While the labor markets have been analyzed over time and compared with national data, it is wise to compare the findings and results with other peer cities. As a final caveat, the data used comes from public sources and is three to five years old. The inclusion of 2020 data for greater Tulsa allows some evidence of the COVID-19 pandemic to be examined, It had a profound impact on the labor market. However, data for 2019 and 2020 is missing for Arkansas. The older data

Figure 32 - Comparison of Competitive Shift Components

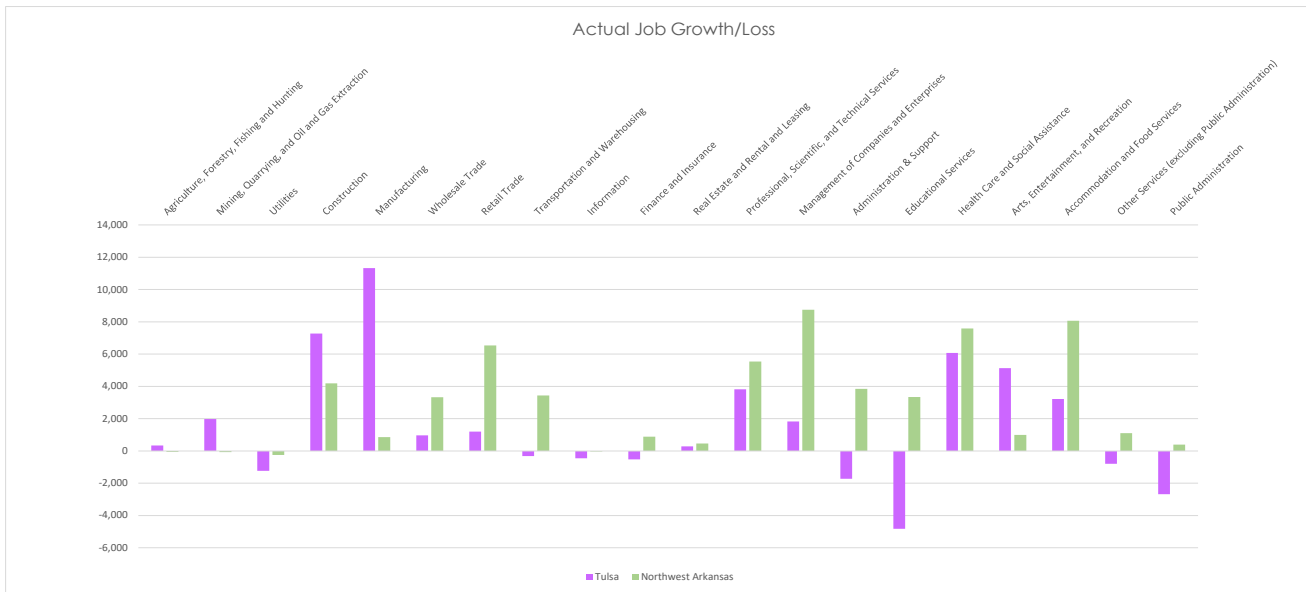


Figure 33 - Comparison of Actual Employment Growth

DISCUSSION

still gives us a good indicator of past trends and employment conditions, but confirming or supplementing it with more recent data from proprietary sources is recommended. With these limitations in mind, the discussion below covers the growth prospects and challenges for greater Tulsa and Northwest Arkansas, before concluding with a section about the opportunities for regional collaboration.

PROSPECTS FOR EMPLOYMENT GROWTH IN TULSA

The prospects for growth in Tulsa hinge on its Manufacturing sector. Continued strength in aerospace with companies like American Airlines, Spirit AeroSystems, and Flight Safety seems assured. The legacy of oil and gas energy companies presents an opportunity to partner with aerospace on alternative energy technologies like solar, wind, carbon capture, and battery storage. The ports along the Kerr-McClellan waterway are important assets for manufacturers to bring in raw materials and ship products, especially oversized equipment. Industrial land and trade zones around the Tulsa International Airport, the ports, and the Mid-American Industrial Park give the manufacturing sector room to grow. According to the Bureau of Labor Statistics the following manufacturing industries (listed by NAICS 4-digit sub-sectors,) had 2020 location quotients greater than 2.0 and sub-sector employment more than 1,000 workers, indicating significant strength and potential for growth: NAICS 3272 - Glass and glass product manufacturing, NAICS 3312 - Steel product manufacturing from

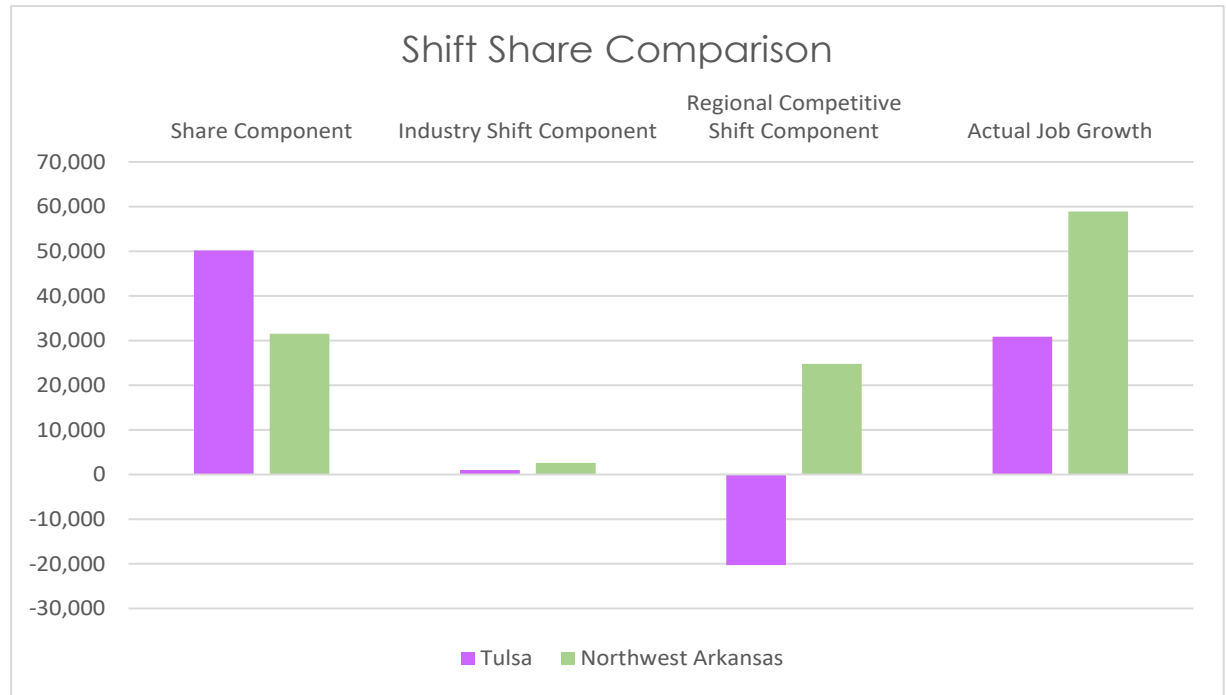


Figure 34 - Shift-Share Comparison

purchased steel, NAICS 3323 - Architectural and structural metals manufacturing, NAICS 3324 - Boiler, tank, and shipping container manufacturing, NAICS 3331 - Agriculture, construction, and mining machinery manufacturing, NAICS 3334 - Ventilation, heating, air-conditioning, and commercial refrigeration equipment manufacturing, NAICS 3345 - Navigational, measuring, electromedical, and control instruments manufacturing, and NAICS 3364 - Aerospace product and parts manufacturing.

While a considerably smaller segment than Manufacturing, the potential of the Arts,

Entertainment, and Recreation industry is another bright spot. The Indian Nations are clear leaders in this sector with their growing expertise in gaming, entertainment, and accommodations. They are also investing in film and television production by building soundstages and production studios, something sorely needed in Oklahoma to compete in this space. Other important developments include the Gathering Place and Arkansas River waterfront, the reconstruction of the Gilcrease Museum, the Pioneer Women Mercantile in Pawhuska, and the Mother Road Market District along Route 66.

PROSPECTS FOR EMPLOYMENT GROWTH IN NORTHWEST ARKANSAS

The obvious engine for growth in Northwest Arkansas continues to be Walmart and its associated constellation of vendors and suppliers. Their dominance is no doubt contributing to strong growth in the Management of Companies, Professional, Scientific, and Technical Services, Administration and Support, as well as Construction, and Transportation and Warehousing. However, it should not be ignored that the employment picture is becoming more diversified in the region and many other sectors are showing impressive growth, including service sectors like Retail Trade, Arts, Entertainment and Recreation, and Food and Accommodations. Access to the Ozark recreation area, an extensive cycling trail system, and world-class cultural attractions like the Crystal Bridges Museum are bringing in tourists and visitors to the region. As a major research university, the University of Arkansas in Fayetteville is another important asset that provides employment in the Education sector and spins off jobs in many other industries.

CHALLENGES TO EMPLOYMENT GROWTH IN TULSA

As evident in the shift-share analysis, Tulsa has several competitive disadvantages to overcome. The region has large competitive deficits in the Health Care, Education, and Public Administration sectors. Tulsa and the State of Oklahoma have not invested in these areas leading to public health issues, lower educational attainment,

and considerable inequities between racial, ethnic, and economic groups. For instance, in Tulsa there is an eleven-year life expectancy gap between zip codes on the north side and zip codes on the south side of town. Unlike Northwest Arkansas, Tulsa does not host the main campus of a major public research university. Despite the presence of branch campuses of the University of Oklahoma, Oklahoma State University, Langston University, and Northeastern State University, the Tulsa operations are miniscule in comparison with the number of employees and research expenditures at the main campuses.

Another competitive weakness is in the Transportation and Warehousing sector. Tulsa is surrounded by toll roads. Interstate 44 is the only interstate route passing through the city and it is not a main route with the last digit ending in a zero or a five. This puts the city at a competitive disadvantage for freight traffic, despite being a rail hub and having an inland port. Also in the transportation domain, Tulsa International Airport is not a hub airport, which makes it a less desirable destination for business travel.

CHALLENGES TO EMPLOYMENT GROWTH IN NORTHWEST ARKANSAS

The Manufacturing sector in Northwest Arkansas is a rare concern with a declining location quotient, and negative industry and competitive shifts. Dominated by poultry food processing with over 12,000 employees and a 2020 location quotient over 12.50, this sector is powerful but may need to pivot into plant-based and lab grown protein in the future.

Presented here mostly as a positive, the presence of Walmart is also a risk if the region is too dependent on it for growth. Management changes due to outsourcing, offshoring, or artificial intelligence could adversely affect the Management of Companies and Enterprises sector. Likewise, continuing changes in retail trade, like the maturation of e-commerce, might doom big box stores to a fate like that of enclosed shopping malls.

Fast regional growth has also brought some growing pains. In contrast to Tulsa where the older, central city is four times bigger than its largest suburb, Northwest Arkansas has four similar-sized cities that compete for development and must coordinate infrastructure and development across jurisdictions. Traffic and congestion have become a problem in a region with few expressways and a low-density, suburban development pattern.

COMPETITION OR CONVERGENCE

Unlike the rivalry that Tulsa has with Oklahoma City, Tulsa and Northwest Arkansas seem to be primed more for convergence than competition. Convergence is important for two smaller employment markets that are not in the orbit of an expanding megalopolitan region like Dallas-Fort Worth. Together they are comparable in size to Oklahoma City, and better positioned to possibly join a Kansas City megalopolitan cluster.

Possible ways to strengthen the connection between the two metropolitan areas

DISCUSSION

include infrastructure projects like the proposed Interstate 42 that would link the two, and connect Interstates 35, 44, and 49.

Opportunities also exist to market the region as a destination for visitors and job seekers. The two regions are among the most affordable places to live in the country. Tulsa has become a magnet for remote workers, partly because of the successful Tulsa Remote program incentivizing them to relocate. The Ozark Region, Beaver Lake, and Grand Lake are major recreational assets for people relocating to the region, as are the growing number of cultural attractions in both Tulsa and Northwest Arkansas. Lastly, the Cherokee, Creek, Osage, and other tribes are important partners to consider, both to promote the diverse culture and history of the area, and to provide capital investment for future growth.

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Inner Front Cover – Downtown Tulsa looking south on Boston Avenue. 2023.
Photograph by Shawn Michael Schaefer

Inner Back Cover – Crystal Bridges Museum, Bentonville, Arkansas, from Art in
Architecture: Building Crystal Bridges Museum of American Art. Scala Art Publishers,
New York: 2016. Photograph by Stephen Ironside

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CREDITS

This report was created by the University of Oklahoma Urban Design Studio. All rights reserved.

Research and analysis by:
Shawn Michael Schaefer AIA, AICP

Layout and report by:
Arq. Carmen Magaly Pate

The University of Oklahoma Urban Design Studio is founded on its three-part mission: to train urban design professionals through graduate programs in urban design and real estate, to advance understanding of the city through research and creative activity, and to engage in community design projects benefiting Tulsa and the State of Oklahoma. The Urban Design Studio is always looking for promising students and interested community partners for its programs and projects.

Please contact us for more information:

The University of Oklahoma
Christopher C. Gibbs College of Architecture
Division of Planning,
Landscape Architecture, and Design

Urban Design Studio

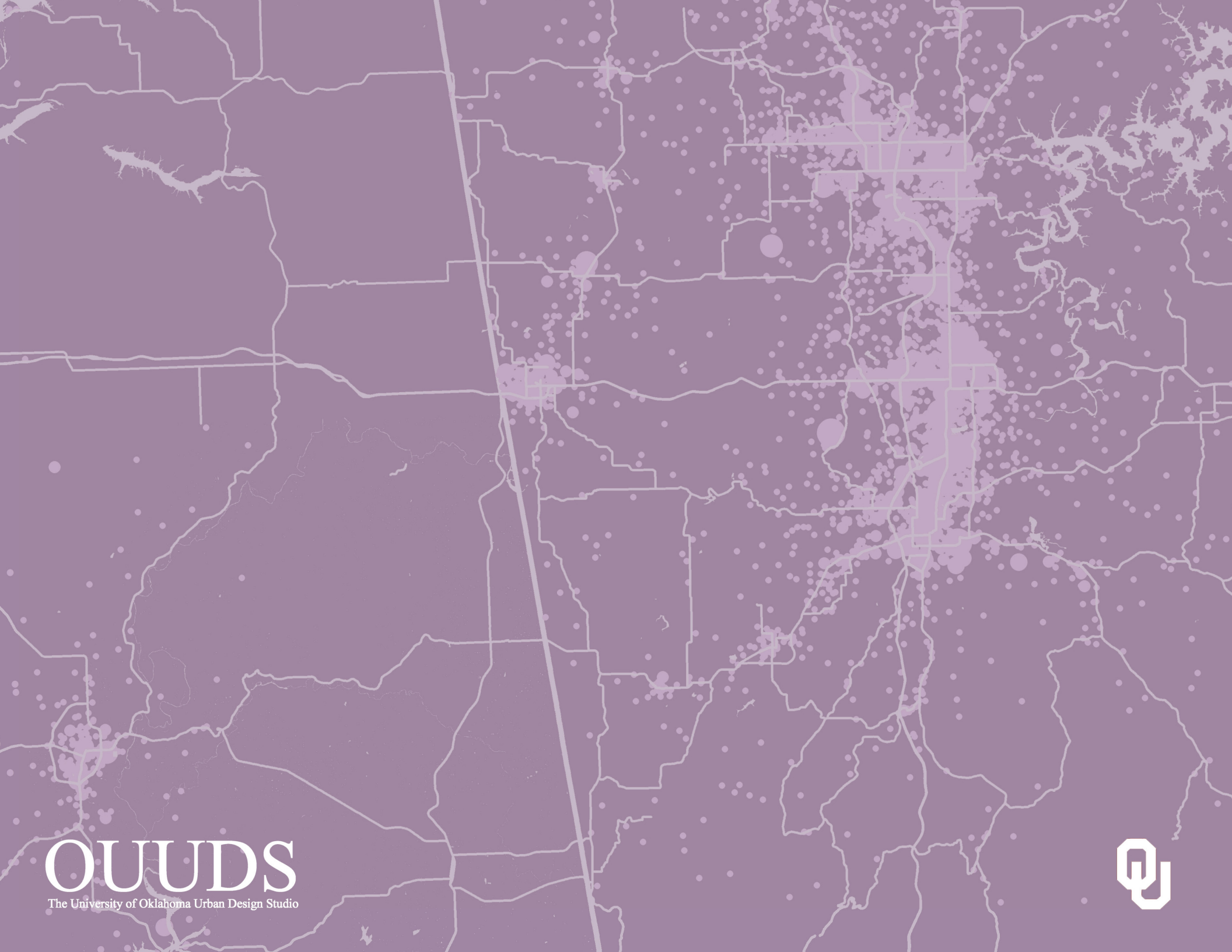
4502 East 41st Street
Tulsa, Oklahoma 74135
918.261.5935
sschaefer@ou.edu
<https://www.ou.edu/tulsa/urban-design/>

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Crystal Bridges

Bentonville, Arkansas
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