

Strengthening the Regional Workforce



Workforce Analysis and Education Alignment Strategy
August 2014



Table of Contents

Executive Summary..... 3

Project Background..... 4

 Data Summary.....5

 Key Findings6

 Overview of Recommendations7

Project Overview 15

Part 1 – Economic and Demographic Landscape 19

Labor Market Supply & Demand Analysis 20

 Economic Trends21

 Demographic Trends.....23

 Occupational Cluster Trends27

 Neighborhood AreaTrends30

Target Industry Brief 45

 Overall Target Industry Trends45

 Advanced Manufacturing.....47

 Aviation & Aerospace50

 Energy53

 Healthcare.....57

 Information Security.....60

 Professional Services62

 Transportation & Logistics65

Strengths, Weaknesses, Opportunities, & Threats (SWOT)..... 67

Part 2 – Education and Training Landscape 72

High School Level Program Alignment and Overview 73

 High School Career and Technical Education Programming.....73

 Tulsa High School Career and Technical Education Programs by
 School District.....77

Post-Secondary Education Assets Review 81

 Sector/Competency and Institutional Overview: Post-Secondary
 Institutions81

Sector Program Analysis.....85

 Advanced Manufacturing Programs.....87

 Aerospace and Aviation Programs91

 Energy Programs.....95

 Healthcare Programs.....99

 Information Systems Programs.....103

 Professional Services Programs107

 Transportation and Logistics Programs111

Part 3 – Workforce Analysis Strategy and Recommendations.. 117

**Workforce and Education Alignment Strategy and
Recommendations 118**

 Content Recommendations119

 Communication Recommendations125

 Collaboration Recommendations.....128

 Capacity Recommendations131

 Strategy Session Workshop134

Executive Summary

Project Background

In January of 2014 the Tulsa Regional Chamber engaged with the consulting team of the Council for Adult and Experiential Learning (CAEL) and Avalanche Consulting to conduct a 24 week Workforce Analysis and Workforce Alignment Strategy for the greater Tulsa region. This study and workforce alignment strategy was funded through a partnership of stakeholders including the Tulsa Regional Chamber, Community Service Council, AEP Public Service Company of Oklahoma, George Kaiser Family Foundation, Indian Nations Council of Governments and support through the Economic Development Administration of the US Department of Commerce. This project was conducted in three parts:

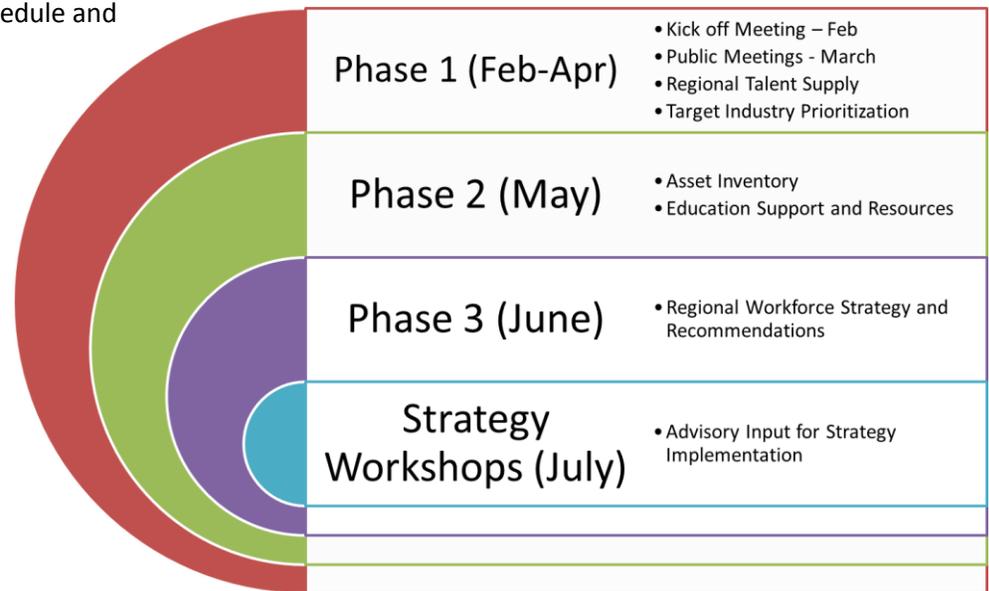
Part One: Economic and Demographic Landscape: Tulsa Region and Neighborhood Area Labor Market Information and Demographic Analysis;

Part Two: Education and Training Landscape: Tulsa Regional Education and Training System Inventory and Analysis;

Part Three: Regional Strategy and Recommendations for Workforce Alignment.

The focus of this project was at the regional level, however, the consulting team conducted deeper analysis within three target areas - East, North and West neighborhood area in Tulsa. The project was conducted within the following schedule and activities.

The main project objectives were to understand the demographic and economic landscape of Tulsa at the regional and neighborhood area level, analyze performance of target economic sectors (Advanced Manufacturing, Aviation and Aerospace, Energy, Healthcare, Information Security, Professional Services and Transportation and Logistics), understand the degree to which the regional education and training system (including High School districts, Technical Training, Higher Education and other Workforce Training Programs) are meeting the needs of local industry and provide a set of regional strategic recommendations to aide in the alignment of education, training, career awareness and regional collaboration in a way that supports the continued development of a talented workforce pipeline for growth industries in the Tulsa region. The Workforce Alignment strategy sets forth action steps through which



regional stakeholders can strengthen the region's capacity to develop skills and capacities within the current and future workforce in Tulsa and help to grow and strengthen the local economy.

Data Summary

Throughout this project the consulting team reviewed Labor Market Information from a variety of sources, including data collected via the American Community Survey which provides more demographic and population information, High School Career and Technical Education programs, Technical and Higher Education programs and other community driven efforts as they pertain to development of the local workforce. In addition, the consulting team engaged in numerous interviews, focus groups and community meetings to gather qualitative input on the state of the current workforce, system challenges and perspectives on opportunities to improve talent development opportunities. The consulting team conducted four (4) in-person visits to the Tulsa area, spoke with over fifty (50) organizations, businesses and institutions, received input from over one hundred (100) individuals and visited each neighborhood area (East, North and West Tulsa) twice. Analysis of both the quantitative and qualitative data provided the basis of the Workforce Alignment Strategy.

The Labor Market Information included in the report looks at sector and occupation forecasted growth in the Tulsa region and the East, North and West neighborhood area. Additionally the American Community Survey data examined population data for the same area. Throughout this report detailed data is provided for the Tulsa region and each neighborhood area separately so specific challenges within the localized workforce can begin to come into focus. The topics examined in this report for the Economic and Demographic Landscape includes:

- Employment Growth
- Population Growth
- Commute Patterns
- Occupational Clusters
- Industry Clusters
- Education Levels
- Age Distribution
- Income Levels
- Racial/Ethnic Diversity

After reviewing the Economic and Demographic Landscape the consulting team reviewed and analyzed how the Education and Training system is currently set up to meet the needs of the target sectors reviewed during this project, and where Education and Training opportunities may become better aligned with the regional economy. The consulting team reviewed quantitative data (including program descriptions, program offerings and institutional policies) along with qualitative data (obtained via interviews and focus groups with education and training providers) to inform the final strategy and recommendations. The consulting team reviewed all Career and Technical Education programs within the fifty-five (55) High School Districts located in the Tulsa Metropolitan Statistical Area and forty-three (43) Higher Education and Workforce focused institutions.

Key Findings

Overall, Tulsa's economy is performing well relative to the state and nation, but there is significant variation within the examined neighborhood area. There is higher unemployment in the East, West and North Tulsa neighborhood area as compared to the Metro Tulsa Region. As well, in each target neighborhood area relatively few residents are connecting to opportunities within those areas. With the higher unemployment rates within the neighborhood area, it will be important to provide area residents with more information on proximal employment opportunities, and guidance on how to access education and training that will prepare them for those opportunities. Essentially, neighborhood area residents are simply not aware of the opportunities in their backyard.

All target industries except Information Security are highly concentrated in the Tulsa Metro, particularly Aviation & Aerospace, Energy, and Advanced Manufacturing. Furthermore four out of seven targets are currently forecast to create jobs over the next five years (Advanced Manufacturing, Aviation and Aerospace, Healthcare and Professional Services). This is a very promising outlook for the health, sustainability and growth of key economic sectors across the Tulsa region. Nearly all target industries are highly concentrated and creating jobs in the Tulsa Metro. The target neighborhood area is very much a part of this concentration – 35% of all jobs in the Tulsa Metro are in the East, North, and West Tulsa neighborhood area. These neighborhood areas have above average job concentrations in many industries, particularly in Aviation & Aerospace, Advanced Manufacturing, Energy, and Transportation & Logistics.

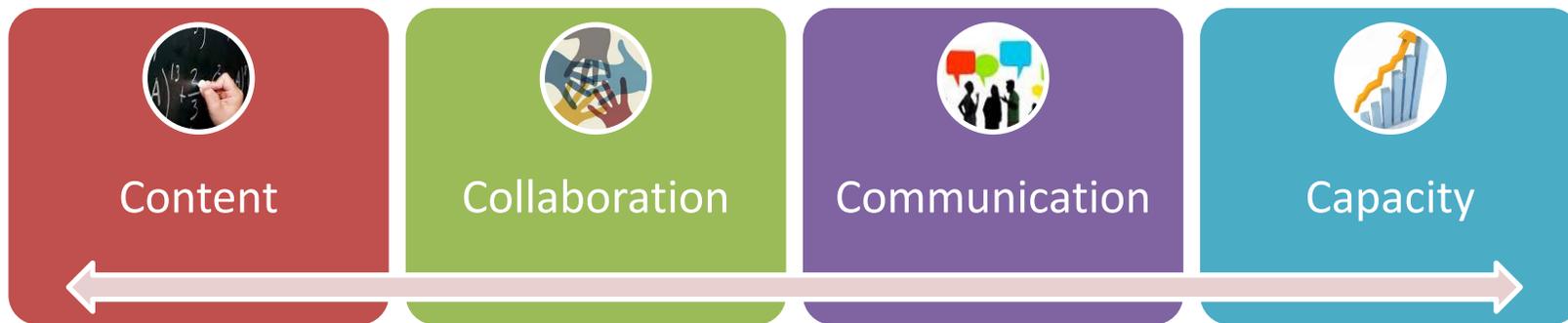
One of the biggest strengths of the Tulsa Education and Training system is the variety of programs both from a subject matter and sector supported perspective but also in terms of the type of institutions. There are a number of Career and Technical Education focused programs offered at the High School level and with the Tulsa Tech and Tulsa Community College locations, in addition to the number of 4 year Higher Education Institutions, there are plenty of options for learners in the region.

Many programs starting at the High School level focus on Information Technology and Information Security skill development. This network of early-stage skills development providers is a very strong asset for the region. Many regions lack this ability to promote interest in and training for information technology, which is critical to every industry sector. Additionally there is a strong connection between High School programs and the Technical School System in the Tulsa Region. The high numbers of students that participate in either dual or concurrent enrollment allow students to take advantage of higher learning while they are also earning a High School Diploma. These dual and concurrent enrollment programs give students the opportunity to get hands-on experience and in many cases graduate from High School with a not only a High School Diploma but also some college credit and an Industry recognized certificate.

Not all of Tulsa's target sectors enjoy strong alignment with the regional education and training system. There are very limited program offerings that support Aviation and Aerospace (a sector that is forecasted for significant growth across the region) as well as in Energy and Transportation and Logistics. There are only two High School programs supporting skill development for Aviation and Aerospace and Energy sectors; four programs at the High School level support Transportation and Logistics. In these three areas, however, there is a high number of a technical certificate and Associate Degree programs but limited options within Bachelor Degree and above pathways.

Overview of Recommendations

Based on the information gathered via the Economic and Demographic Landscape Assessment, the Education and Training Inventory and Analysis, the consulting team created the Workforce Analysis and Education Alignment Strategy and Recommendations for the Tulsa Region. These recommendations provide a roadmap through which the Tulsa region and its stakeholders can collectively impact greater education alignment, career and education awareness, increased regional capacity and collaboration across the Tulsa region. The strategy is broken into four separate parts with specific recommendations that address Content, Collaboration, Communication and Capacity within the education and talent development system in Tulsa Region. The strategy was developed as a framework for achieving collective impact across the economy regardless of which industry sector or collections of stakeholders are prominent across Tulsa.



The following list includes the twelve recommendations developed by the consulting team:

- Expand high school career and technical offerings in aerospace and energy.
- Increase technical certificate and associate level options.
- Increase bachelors and above level programs.
- Implement career awareness plan.
- Creation of Sector One Stop Workforce Centers.
- Increase industry and education communication effectiveness.
- Create clearinghouse (inventory) for education and workforce focused initiatives.
- Convene industry and education roundtables.
- Unify philanthropic requests.
- Localize services to address barriers in neighborhood areas.
- Increase education access for non-traditional students and working learners.
- Supportive Services and outreach efforts.

A strategy session was held to validate the direction and feasibility of implementing the recommendations that were put forth. This session was well received and allowed many leaders in the community to provide direct feedback and input on how the recommendations (included below) would be translated into an action plan for the region. Within this activity the stakeholders were asked to begin to scope out each action step to achieve success on the recommendation, document some metrics of success, identify critical partners to lead the recommendation, brainstorm on some barriers to success, discuss potential funding sources to support the recommendation and assign priority and a general timeline for completion. A high level overview of the outcomes from the strategy session are included below and the full overview is detailed in the Strategy Session section of this report. Following the strategy implementation is a full overview of each strategy and the associated recommendations.

CONTENT STRATEGY

Goal: Expand Technical Training/Program Offerings

⇒ **Create High School Programming in Aerospace, Energy and Manufacturing**

- Increase student awareness of career pathways
- Revise curriculum to align with industry needs
- Convene sector/education stakeholders to develop new programs

⇒ **Develop certificate and associate programming in biomedical/biotechnology, energy and supply chain**

- Revise curriculum to align with industry needs
- Convene sector/education stakeholders to develop new programs
- Assign career pathway advisors beyond current set of counselors

⇒ **Develop bachelor and above programming in engineering, industrial technology, biomedical/biotechnology, health IT, process technology and quality assurance**

- Improve credit transfer
- Identify benchmark programs from similar regions
- Create regional plan for development, marketing, enrollment and faculty

COMMUNICATION STRATEGY

Goal: Implement a Career Awareness Campaign

- ⇒ **Develop student marketing strategy on growing industries and education pathways**
 - Include online resources and messaging highlighting value of technical pathways
- ⇒ **Develop teacher and counselor marketing and education campaign**
- ⇒ **Expand “Dream It, Do It” program to other growing industries**
- ⇒ **Create asset inventory of workforce and service learning programs with industry exposure**

Goal: Create Sector-focused One Stop Centers

- ⇒ **Build on Transportation WorkAdvance Model**
- ⇒ **Target growing industry sectors**
 - Determine which sectors have greatest need and are growing in Tulsa economy
- ⇒ **Create both online and “brick and mortar” presence for centers**

Goal: Increase Industry and Education Communication Effectiveness

- ⇒ **Expand Road Trip for Teachers experience**
 - Develop a multi-day professional development experience between education and industry
- ⇒ **Create regional guidebook/manual for implementing student internships and teacher externships with industry**
- ⇒ **Build on Parent and Career Guidance Program at McClain High School**
 - Expand to other High Schools across the Tulsa region

COLLABORATION STRATEGY

Goal: Create Clearinghouse (Inventory) for Education and Workforce Focused Initiatives

- ⇒ **Identify an individual or organization to lead data gathering effort**
- ⇒ **Survey known workforce and talent development initiatives in the Tulsa region**
 - Determine areas of focus, current partners, initiative or organizational goals, funding model
- ⇒ **Create a database or website holding the information**
 - Ensure that the data is refreshed on a regular basis (quarterly, semi-annually or annually)

Goal: Convene Industry and Education Roundtables

- ⇒ **Leverage learning from various sector Advisory Committees at each education institution**
- ⇒ **Identify existing groups and measure engagement/participation**
- ⇒ **Create regional MOU**
- ⇒ **Designate teams of stakeholders for specific initiatives/sector focused program development**
- ⇒ **Create response teams for workforce emergencies and immediate skill gap needs**

Goal: Unify Philanthropic Requests and Efforts Related to Education, Skill Development and Workforce Needs

- ⇒ **Create inventory of all local, regional, statewide and national Foundation funding coming into Tulsa**
- ⇒ **Leverage inventory of local workforce and education initiatives to analyze what funds are being requested and for what type of programming**
- ⇒ **Convene meetings, potentially quarterly, to determine the region can consolidate Foundation prospecting and fund raising efforts**

Goal: Localize Services to Address Specific Barriers in Tulsa Neighborhood Areas

- ⇒ **Centralize existing information from the public on barriers to careers/education**
- ⇒ **Determine regional capacity to leverage work currently underway in each neighborhood area**
- ⇒ **Formulate a regional plan to target specific activities to impact common barriers across Tulsa**

CAPACITY STRATEGY

Goal: Increase Education Access for Non-Traditional Students and Working Learners

⇒ **Expand Prior Learning Assessment offerings**

- Review, adjust and implement policy on campuses across Tulsa region
- Conduct marketing focused on opportunity for students to potentially receive college credit for prior learning

⇒ **Increase availability of online programs and distance learning**

- Determine areas of focus, current partners, initiative or organizational goals, funding model

⇒ **Create a database or website holding the information**

⇒ **Enhance career advising and other career services for non-traditional students**

- Define available career pathways with training and education programs
- Aim to tell the story of jobs in Tulsa effectively

⇒ **Improve articulation agreements between High Schools, Technical Schools and other Higher Education Institutions**

⇒ **Focus on lifelong learning in TYPro's**

- Utilize this network to highlight the value of a degree and post-secondary credentials
- Leverage this group to help with messaging and marketing for degree attainment and continued learning in Tulsa region

Goal: Leverage Regional Supportive Services and Other Outreach Efforts to Tulsa Workforce

⇒ **Invest in work and education based transportation program**

- Create a scalability plan for pilot transportation programs going on current in Tulsa
- Track utilization and return on investment for pilot programs

⇒ **Highlight increased employer investment in ex-offender workforce pipeline**

- Support "Ban the Box" legislation
- Tailor transition training programs to specifically serve this portion of the population

Content Recommendations

Advanced Manufacturing

- Bachelor and Above Engineering Technology and Mechatronics
- Incentivize Tech Center Programs

Aerospace and Aviation

- Increase High School Programs
- Expand Aviation Maintenance, Production and Aerospace Management Offerings

Energy

- Increase High School Programs
- Bachelor level Industry Technology Programs

Healthcare

- Diversify Biomedical and Biotechnology Programs

Information Security

- Expand Electronics Technology and Tech Management Programs
- Master level Health Information Technology Programs

Professional Services

- Focus on Business Management
- Incentivize Career Progressions beyond entry level Administration and Support Services

Transportation and Logistics

- Increase Certificate/Associate Supply Chain Management
- Bachelor and above Process Technology and Quality Assurance

Communication Recommendations



Implement a Career Awareness Campaign

- Targeted Marketing Plan
- Creation of Online Resources
- Highlight Technical Skill Pathways

Sector One Stop Workforce Centers

- Focus on needs of one sector
- Increase Job Matching, Skill Development and Career Connections

Increase Industry and Education Communication Effectiveness

- Expand Road trip for Teachers
- Create Regional Structure for Inter/Externships

Collaboration Recommendations



Inventory for Education and Workforce Initiatives

- Flag areas that are over supported
- Identify ways to increase collaboration and leverage capacity

Industry and Education Roundtables

- Leverage Advisory CMTE Learning
- Identify Opportunities for Sector Focused Career Academies

Unify Philanthropic Requests / Efforts

- Coordinate requests as related to skill development, workforce support and other education needs
- Funding/Grant Making efforts

Localize Services to Address Neighborhood Area Barriers

- Impact at micro-level particular needs of residents (childcare, English courses, GED, Ex-Offender)

Capacity Recommendations



Non-Traditional and Working Student Access

- Expand Prior Learning Assessment (PLA)
- Increase Online Options
- Enhance Career Services
- Improve Articulation between Higher Ed
- Focus on Lifelong Learning in TYPro's



Supportive Services and Outreach Efforts

- Invest in Regional Work and Education Based Transportation
- Highlight investment in Ex-Offender Workforce Pipeline

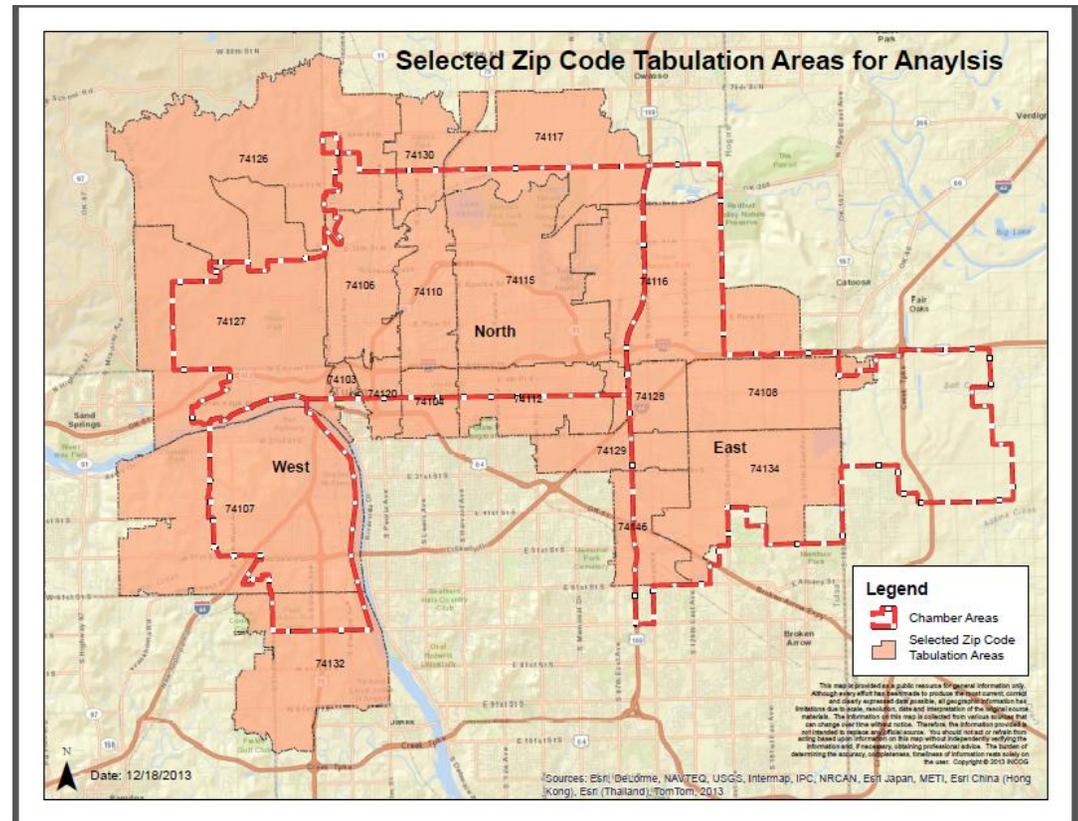
Project Overview

The main project objectives were to understand the demographic and economic landscape of Tulsa at the regional and neighborhood area level, analyze performance of target economic sectors and assess the degree to which the regional Education and Training system was under or over supporting the skills and workforce needs of these economic targets. As a starting point for the review the target sectors were identified as key local industries that are strong and growing in the Tulsa region and will continue to have significant workforce needs in the future. These sectors include:

- Advanced Manufacturing
- Aviation and Aerospace
- Energy
- Healthcare
- Information Security
- Professional Services
- Transportation and Logistics

Data on past and future trends in these economic sectors was reviewed and analyzed across the Tulsa region and specifically in the target neighborhood area of East, North and West Tulsa. Additionally demographic data was reviewed and analyzed in the same geographic area. For the purposes of this study the Tulsa region was defined as the Tulsa Metropolitan Statistical Area, as defined by the Federal Office of Management and Budget and used by the Census Bureau. Furthermore the neighborhood area was defined by the following boundaries and zip codes:

74108 EAST	74112 NORTH
74116 EAST	74115 NORTH
74128 EAST	74117 NORTH
74129 EAST	74120 NORTH
74134 EAST	74126 NORTH
74146 EAST	74127 NORTH
74103 NORTH	74130 NORTH
74104 NORTH	74107 WEST
74106 NORTH	74132 WEST
74110 NORTH	



To assess the Education and Training landscape across the Tulsa region the same geography was reviewed and High School Career and Technical Education programs, Technical Colleges, Higher Education and Workforce programs were inventoried that supported the target economic sectors listed above. For this review the following Districts, Institutions and Organizations were inventoried.

HIGH SCHOOL DISTRICTS

Barnsdall Public Schools
Beggs Public Schools
Berryhill Public Schools
Bixby Public School
Bristow Public Schools
Broken Arrow Public School
Catoosa Public Schools
Chelsea Public Schools
Claremore Public Schools
Cleveland Public Schools
Collinsville Public School
Cowetta Public School
Depew Public School
Dewar Public Schools
Drumright Public School
Foyil Public Schools
Glenpool Public School
Henryetta Public Schools
Hominy Public Schools

Inola Public Schools
Jenks Public School
Kellyville Public Schools
Kiefer Public School
Liberty Public Schools
Maneford Public Schools
McLain High School
Morris Public Schools
Mounds Public Schools
Oilton Public Schools
Okay Public Schools
Olive Public School
Okmulgee Public School
Oologah-Talala Public School
Owasso Public Schools
Pawhusa Public Schools
Pawnee Public Schools
Porter Public Schools
Preston Public Schools

Prue Public Schools
Rogers Public Schools
Sand Springs Public School
Sapulpa Public Schools
Shilder Public School
Schulter Public Schools
Sequoyah Public Schools
Skiatook Public School
Sperry Public School
Tulsa Public Schools
Twin Hills Public Schools
Union Schools
Verdigris Public School
Wagoner Public School
Wilson Public School
Woodland Public Schools
Wynona Public Schools

TECHNICAL, HIGHER EDUCATION AND WORKFORCE TRAINING PROGRAMS

Brown Mackie College	Southern Nazarene University	New Horizon Computer Learning Center
Career Point College	St. Gregory's University	Oklahoma Health Academy
Community Care College	Spartan College of Aeronautics and Technology	Oklahoma Technical College
Langston University—Tulsa	Tulsa Community College	Tulsa Tech - Broken Arrow
National American University	University of Oklahoma-Tulsa	Tulsa Tech – Lemley
Northeastern State University-Broken Arrow	University of Phoenix-Tulsa	Tulsa Tech—Owasso
Oklahoma Baptist University	University of Tulsa	Tulsa Tech - Peoria
Oklahoma State Institute of Technology	Vatterott College	Tulsa Tech - Riverside
Oklahoma State University Center for Health Sciences	Virginia College	ITT Technical Institute
Oklahoma State University-Tulsa	Wright Career College	Central Tech
Oklahoma Wesleyan University	4M Welding	Green Country Tech
Oral Roberts University	Tulsa Welding School	Indian Capital Tech
Platt College	Roadmaster Trucking	Northeast Tech
Rogers State University	Wright Business School	Tri-County Tech
	Clary Sage	

The project process was to couple the quantitative data gathered via the Economic and Demographic review and match that against the landscape of programs available and inventoried during the Education and Training assessment. This data, supplemented by several interviews, focus groups and public forums with Industry, Education, Service Providers, Community Initiatives and Tulsa area residents, allowed for a full analysis of the current state of the workforce support system in the Tulsa region. The resulting Workforce Alignment Strategy was created and vetted through a Strategy Workshop session with over 60 community leaders in the Tulsa region.

The following pages provides, in detail, the economic data and education data reviewed, feedback from stakeholder and Tulsa leadership interviews and focus groups, and complete regional strategy to support, grow and sustain a talented workforce in the Tulsa region. This strategy and set of recommendations is meant to serve as a guide for education, industry and workforce system partners (among other leaders in the region) to implement effective alignment among and across current and future initiatives in Tulsa that aim to strengthen the workforce pipeline.

Part 1 – Economic and Demographic Landscape

Labor Market Supply & Demand Analysis

The Tulsa region is recovering jobs at a similar pace to the State of Oklahoma and US. The three target neighborhood areas are each uniquely situated in the recovery, both demographically and economically. West Tulsa is a largely manufacturing neighborhood and has experienced the highest job growth in recent years, but local unemployment remains high and fewer residents are working in the neighborhood area than in East Tulsa or North Tulsa.

East Tulsa has a large concentration of jobs related to the airport and aerospace manufacturing in general, but job growth has been relatively slow in recent years. The East Tulsa population is more Hispanic and younger than the region, with larger families. These residents have the highest labor participation rate among the target neighborhood areas, but a majority of East Tulsa residents work outside of the area.

North Tulsa is more black and Hispanic than the regional averages and has both the highest unemployment rate and the lowest labor participation. North Tulsa also has a higher share of professional services, healthcare, and other technical jobs than the other two neighborhood areas. But like the other neighborhood areas, very few of the residents actually work in the neighborhood area.

High job growth is forecast primarily in manufacturing, healthcare, and professional services occupations through the region and the three neighborhood areas. Demographic trends, commuting patterns, and conversations in the neighborhood areas during recent visits highlight a disconnect between local residents and local jobs. Many manufacturing employers expressed challenges finding skilled employees, and with 1,700 jobs forecast in Advanced Manufacturing in the Tulsa Region over the next five years, this is a serious concern. Major efforts will be required to help residents of each neighborhood (and the overall region) better participate in the opportunities being created locally.

Economic Trends

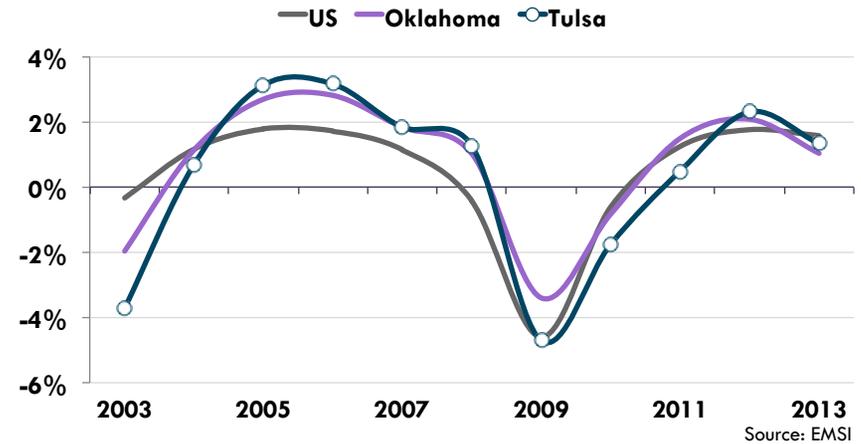
In recent years, employment patterns in the Tulsa region have generally followed US and State of Oklahoma dynamics. After several years of lagging growth, employment in Tulsa has rebounded. Between 2010 and 2013, employment in the Tulsa increased 4.2%, only slightly less than the state and US averages.

Within the Tulsa Region, the three examined neighborhood areas experienced a range of employment situations. West Tulsa has enjoyed the strongest neighborhood job growth. Between 2012 and 2013, employment jumped 9.9%. North Tulsa's job growth during this period was 3.3%, and in East Tulsa, employment increased only 0.4%.

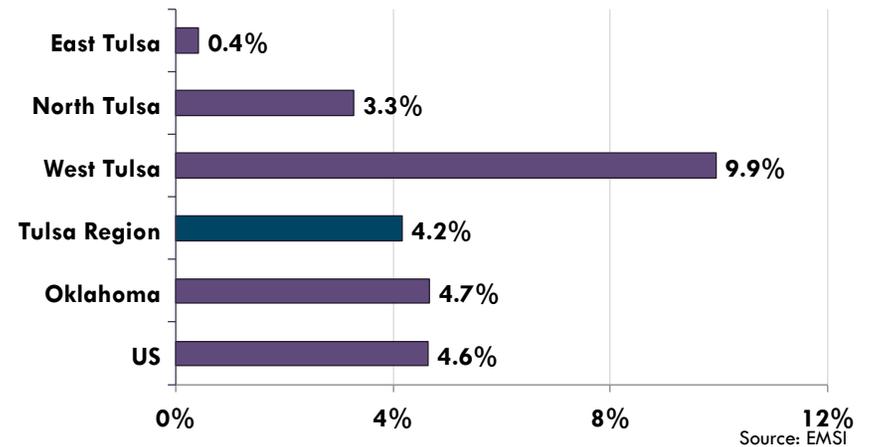
North Tulsa is a major population and employment center in the Tulsa Region. North Tulsa is home to 56% of the region's 217,400 residents and 53% of the region's 141,700 jobs.

East Tulsa has the second highest number of residents and jobs at 70,800 and 52,400 respectively. West Tulsa is home to 25,700 residents and 15,000 jobs.

**EMPLOYMENT GROWTH
2003 - 2013**



**EMPLOYMENT GROWTH
2010 - 2013**



The Tulsa Region has a relatively low unemployment rate, but each of the three neighborhood areas has varied and higher unemployment. According to the US Census, at 6.9%, the Tulsa Region's unemployment rate in 2012 was nearly identical to the state average of 6.8% and much lower than the US rate of 9.3%.

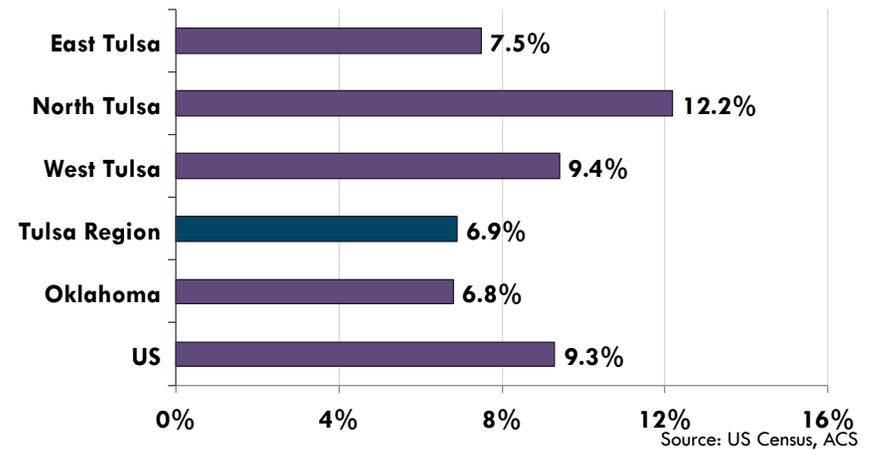
Unemployment rates for all three neighborhood areas exceeded the regional average. Unemployment in North Tulsa topped 12%. In West Tulsa and East Tulsa, the unemployment rate was 9.4% and 7.5% respectively.

A majority of Tulsa residents are either employed or actively seeking employment, resulting in the region's comparatively high rate of labor participation. In the Tulsa region, the labor participation rate is 66%. In Oklahoma and the US, labor participation rates are 63% and 65% respectively.

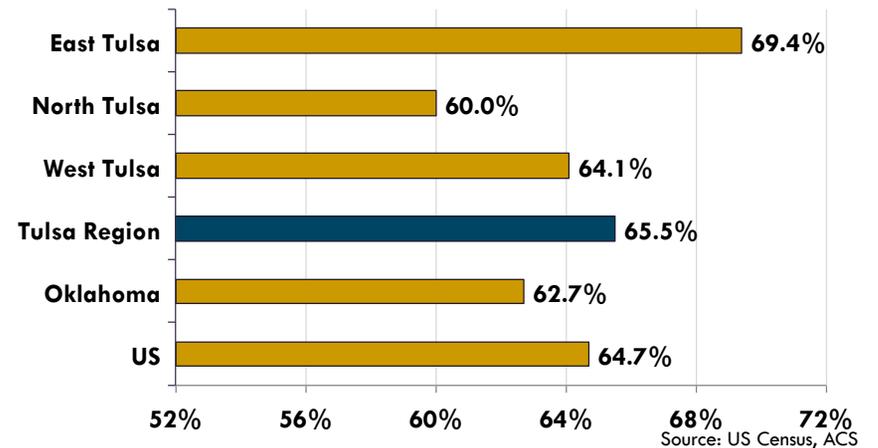
At 69%, East Tulsa is the only neighborhood area with a higher labor participation rate than the region, even though East Tulsa has higher unemployment. Labor participation rates in West Tulsa and North Tulsa are 64% and 60% respectively.

Notably, job growth exceeds population growth in all areas except East Tulsa. Comparatively high job growth suggests that unemployment rates should continue to fall.

CENSUS UNEMPLOYMENT RATE 2012



CENSUS LABOR PARTICIPATION RATE 2012



Demographic Trends

Overall, the population of the Tulsa Region shares many characteristics with the State of Oklahoma but is slightly better educated, older, and has a higher median income. Each of the three examined neighborhood areas within the city has unique demographics from each other and the region.

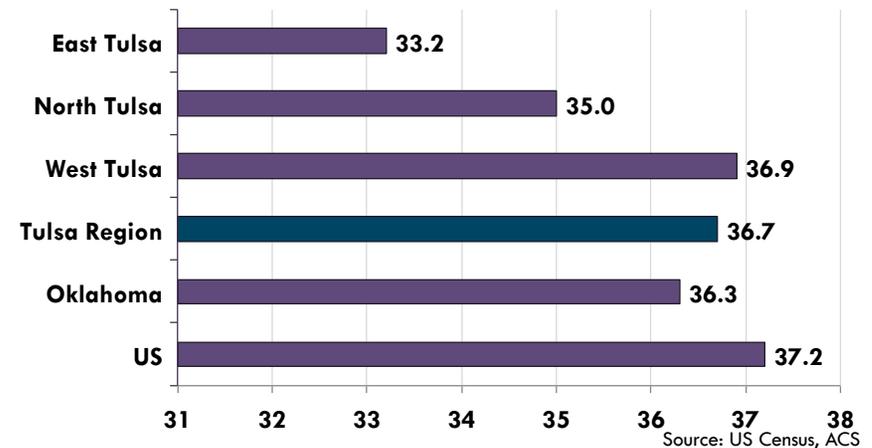
The Tulsa Region is younger than the US but slightly older than the state. The median age in the Tulsa Region is 36.7, compared to 37.2 nationally and 36.3 in the State of Oklahoma.

West Tulsa has a slightly older population than the region, with a median age of 36.9. North and East Tulsa are much younger than the region and state averages though, with median ages of 33.2 and 35.0 respectively.

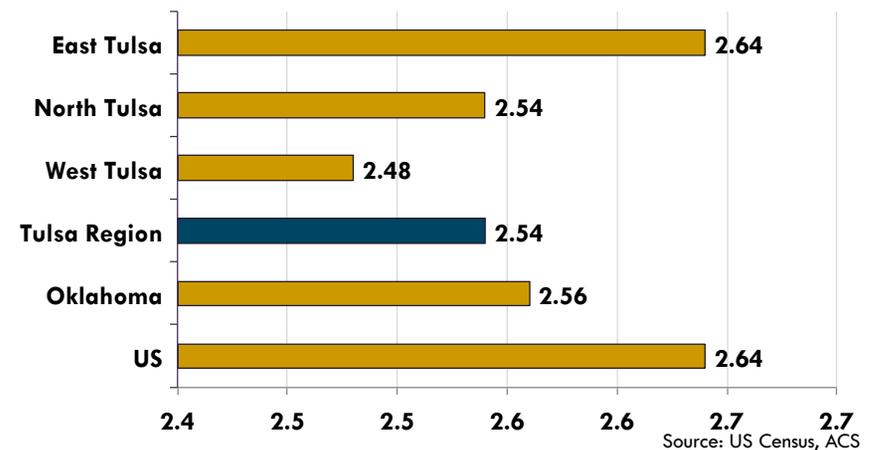
East Tulsa's relative youth is likely due to a larger share of families with young children. The average household size in East Tulsa is 2.64, compared to 2.54 in the Tulsa Region and North Tulsa and 2.48 in West Tulsa.

West Tulsa has the smallest average household size among the three neighborhood areas. This is likely due to the above average share of residents age 65 and older in the neighborhood areas, which also contributes to the slightly higher median age.

**MEDIAN AGE
2012**



**AVERAGE HOUSEHOLD SIZE
2012**



Over the past five years, annual population growth in the Tulsa Region has been uneven. Growth slowed significantly in Tulsa and Oklahoma during the early 2000s, but did not drop as significantly during the recent recession. Population growth in Tulsa only dipped to 1.1% in 2008, still well above the national and state growth rates.

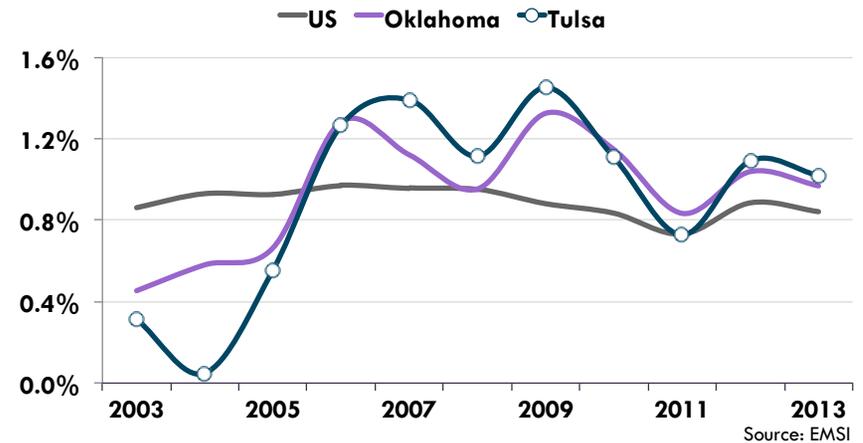
The Tulsa Region’s above average population growth since 2006 shows that new residents continue to move to the area.

Population growth in the Tulsa Region since 2010 has been lower than employment growth, indicating that jobs are being created at a fast rate than natural growth, helping close the gap of jobs lost in 2008 and 2009. Overall Tulsa Region’s population grew 2.9% from 2010 to 2013, the same as the State of Oklahoma and slightly above the US rate of 2.5%.

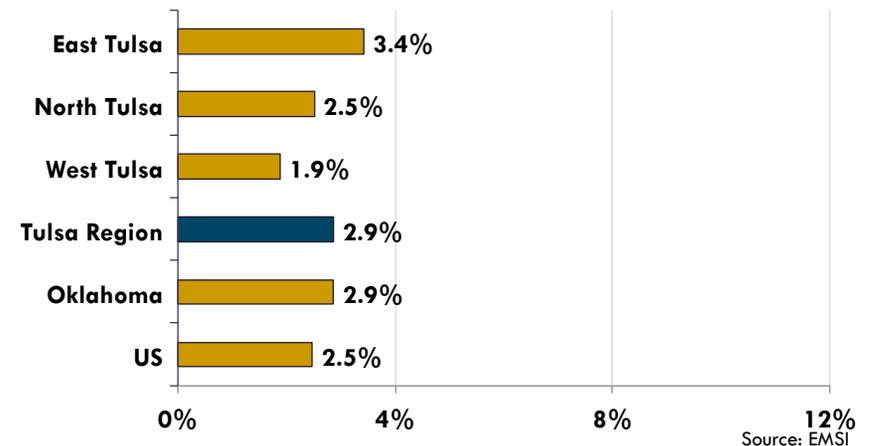
The distribution of population growth in the three Tulsa neighborhood areas varied from employment growth from 2010 to 2013. East Tulsa, which saw almost no employment growth, had the highest population growth at 3.4%, faster than the Tulsa Region. North Tulsa’s population grew 2.5%, compared to 3.3% employment growth. West Tulsa’s population only grew 1.9% at the same time employment grew 9.9%.

These trends show very different population and employment dynamics in the three examined Tulsa neighborhood area. This indicates that many jobs in each neighborhood are filled by non-residents and many residents work outside of their home neighborhood area. Slower job growth in East Tulsa, combined with relatively high labor participation, indicates a significant number East Tulsa residents are working in other parts of the region.

POPULATION GROWTH 2003 - 2013



POPULATION GROWTH 2010 - 2013



The Tulsa Region has a median household income of \$48,000, above the state (\$44,300) but below the US (\$51,400). Higher incomes in the Tulsa Region make it an attractive location for workers throughout the state but are partly offset by the higher relative cost of living. Lower salaries than national averages may make recruiting young, well-educated workers to the Tulsa Region a challenge.

Income levels are closely tied to education and following a similar trend. The Tulsa Region is better educated than the state average but less well educated than the US, and incomes are higher than state average but lower than the US. Within the Tulsa Region, 26% of residents have a bachelor’s degree or higher, compared to 23% in the State of Oklahoma and 29% nationally.

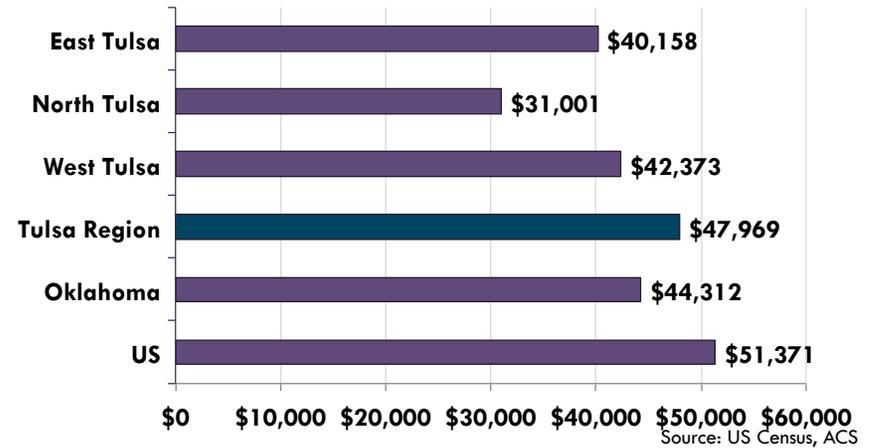
All three examined neighborhood areas have lower median household incomes and educational attainment levels than the region. West Tulsa has the highest median household income (\$42,400), followed by East Tulsa (\$40,200), and North Tulsa (\$31,000).

East and West Tulsa have the same share of residents with associate degrees (8%), but all neighborhood areas have lower bachelor’s and higher degrees. West Tulsa is the best educated of the three neighborhood areas, with 21% of residents holding a bachelor’s degree or higher, followed by North Tulsa (16%) and East Tulsa (15%).

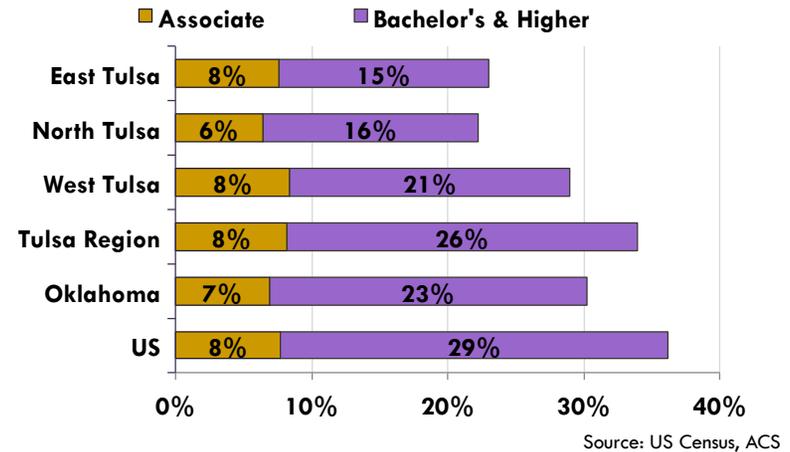
Additionally, a larger share of Tulsa Region residents have completed high school (88%) than the national (86%) and state (86%) averages. Following higher education trends, West Tulsa has the greatest share of high school graduates (87%).

East and North Tulsa both have well below average high school graduation rates. Only 80% of East Tulsa residents have completed high school and 78% of North Tulsa residents have completed high school.

MEDIAN HOUSEHOLD INCOME 2012



HIGHEST EDUCATIONAL ATTAINMENT 2012



Diversity is important in a community. More diverse communities are often attractive to companies, because employees from different backgrounds often bring unique perspectives and skill sets to the work environment. Diversity can also be a challenge, as minority and foreign-born residents often have unique educational needs, requiring ESL and other outreach programs.

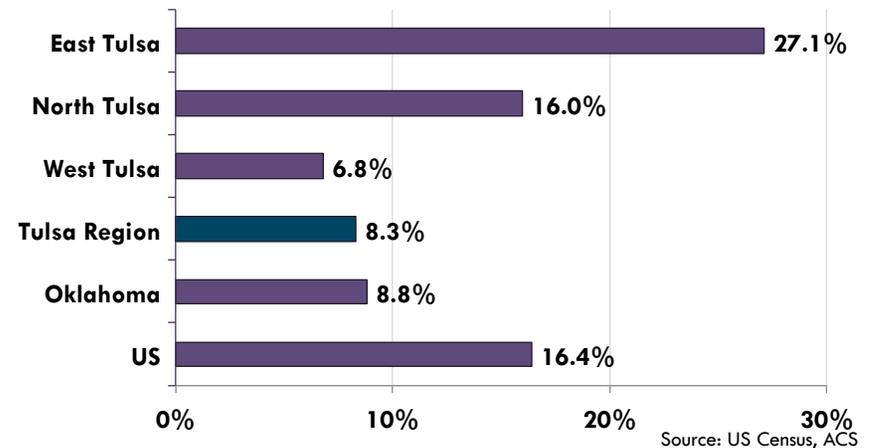
Diversity patterns in the Tulsa Region largely follow the State of Oklahoma. The Tulsa Region is 8% Hispanic, 6% foreign-born, and 9% of residents speak a language other than English at home. All of these figures follow the state but are less diverse than the national averages. The US is 16% Hispanic, 13% foreign-born, and 21% of US residents speak a language other than English at home.

The three neighborhood areas have a range of diversity, all different from the overall region. West Tulsa has the smallest Hispanic, foreign-born, and non-primary English speaking populations.

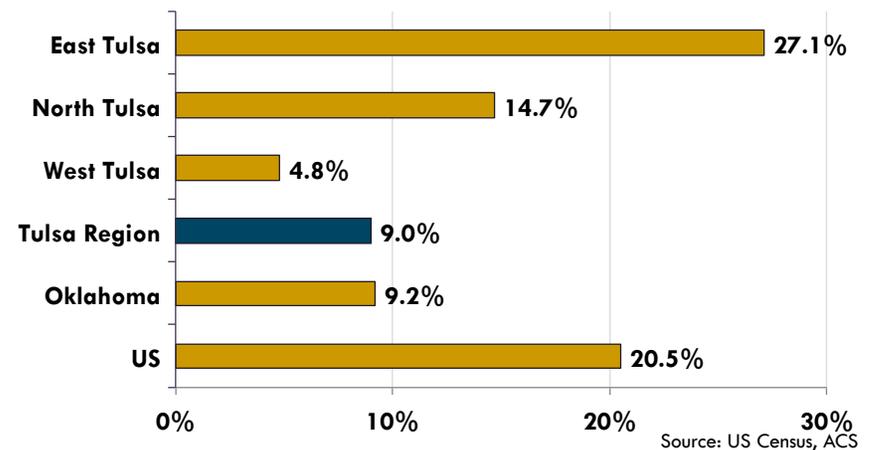
East Tulsa is the most diverse neighborhood in the Tulsa Region. 27% of East Tulsa residents are Hispanic, 17% are foreign-born, and 27% speak a language other than English at home.

North Tulsa is more diverse than the overall region but less than East Tulsa. 16% of North Tulsa residents are Hispanic, 9% are foreign-born, and 15% speak a language other than English at home.

% HISPANIC 2012



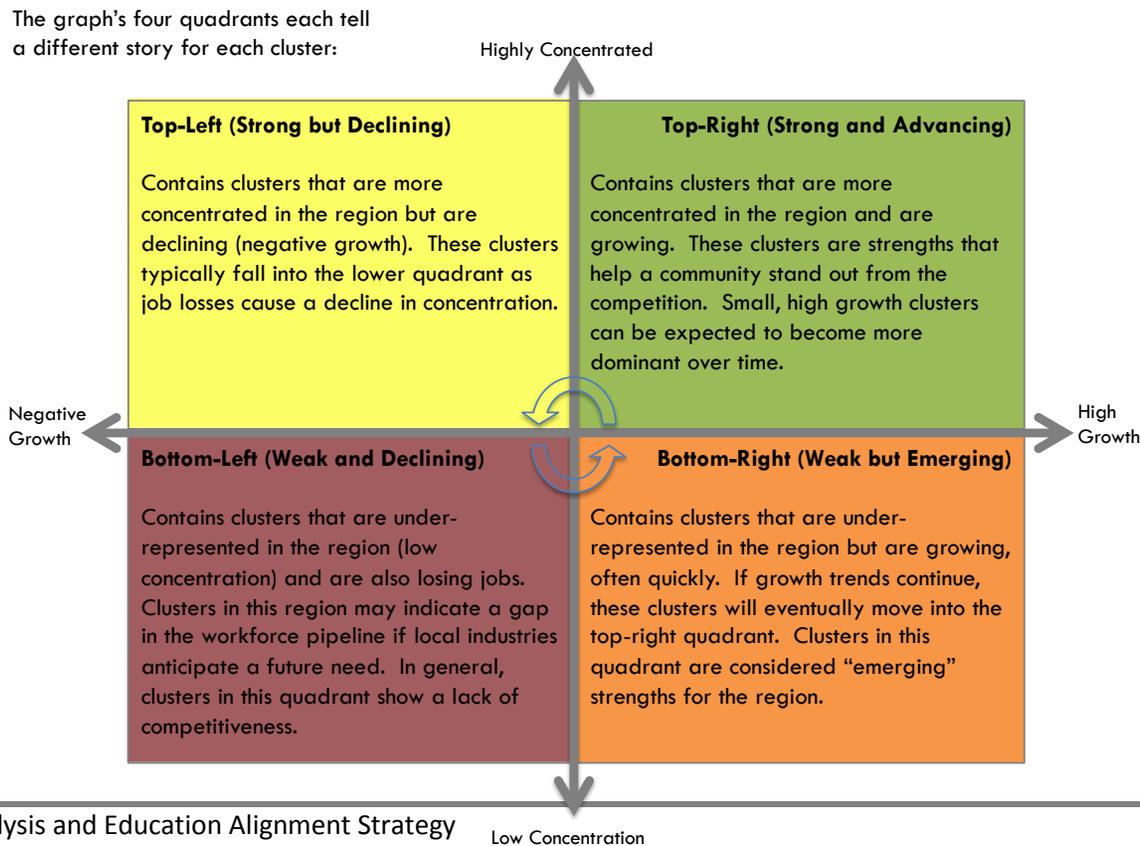
% ENGLISH NOT PRIMARY LANGUAGE AT HOME 2012



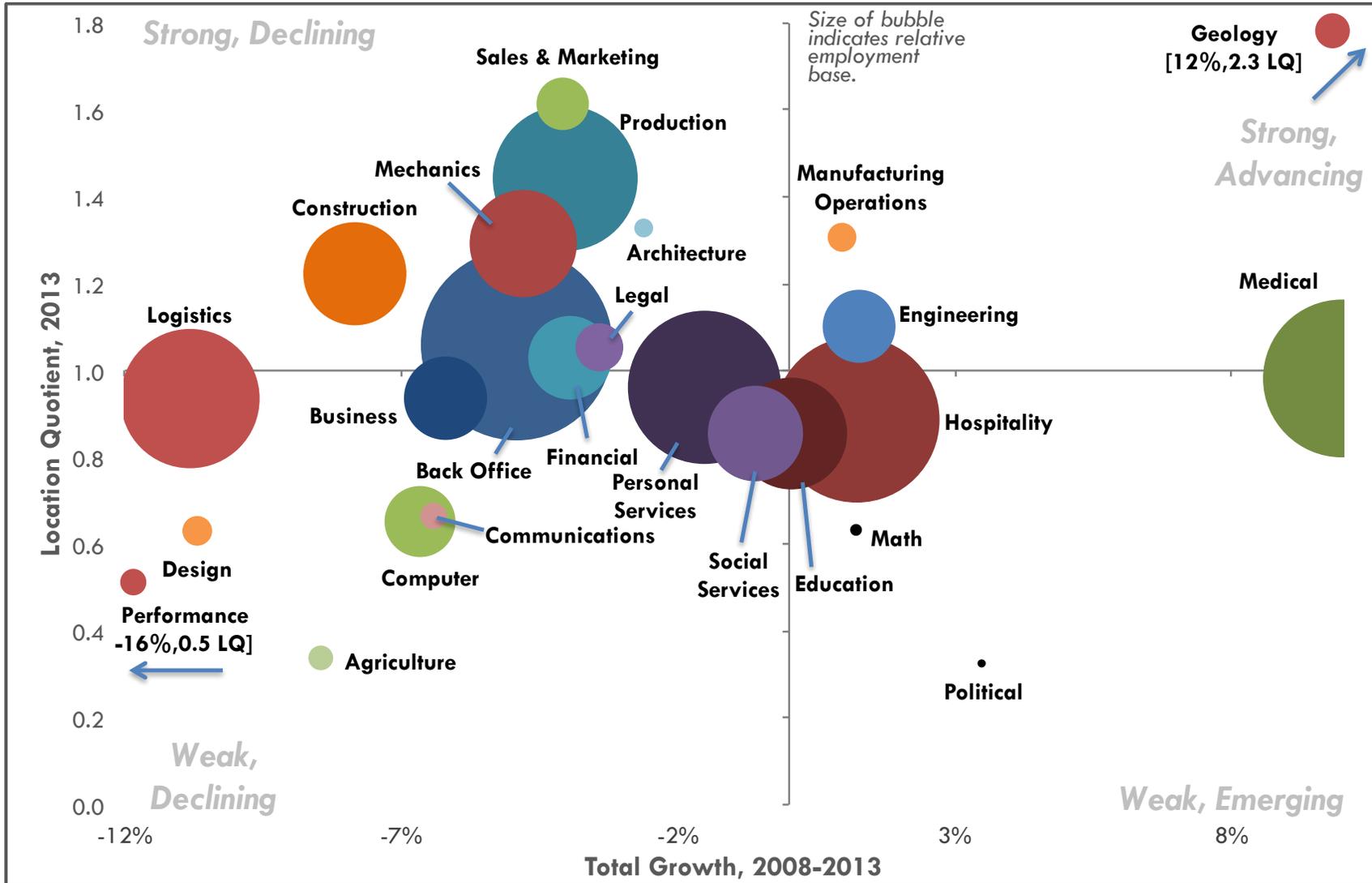
Occupational Cluster Trends

Location Quotients (LQs) calculate the relative employment concentration of specific industries or occupations in a local economy compared with the US average. An LQ of 1.75 indicates that the local economy has 75% more jobs per capita in that occupation than the US average. An LQ of 1.0 indicates parity with the US average. An LQ lower than 1 indicates an occupation is less concentrated than the US average.

The “bubble chart” on the next page shows LQ by occupation on the vertical axis. The horizontal axis shows historic growth for the occupational cluster, and the size of the bubble indicates the employment base of the occupation. The graph’s four quadrants each tell a different story for the occupational sector. While sectors in the top-right quadrant are viewed as competitive and should be priorities for talent development, sectors to the bottom-right (which are growing, but have below-average concentrations) are emerging sectors for the region. These sectors typically require extra attention such as entrepreneurial assistance or workforce training programs. We characterize each quadrant as follows:



Occupation Clusters: Tulsa Region, Oklahoma



Source: Avalanche Consulting using data from EMSI

The largest occupational clusters in the Tulsa Region are **Back Office** (65,300 jobs), **Hospitality** (48,900), **Medical** (44,200), **Personal Services** (41,800), and **Production** (37,400). Together, these five clusters represent 58% of all jobs in the Tulsa Region. Among Tulsa’s largest occupational clusters, only **Production** is significantly more concentrated than the US average.

The Tulsa Region’s most concentrated occupational clusters include **Geology** (2.3 LQ), **Sales & Marketing** (1.6), **Production** (1.4) and **Manufacturing Operations** (1.3). These occupational clusters reflect the region’s relative strengths in oil and gas as well as a range of advanced manufacturing industries.

In the past five years, the majority of occupational clusters in the Tulsa Region have experienced employment declines. Most employment declines were minimal. Employment in **Logistics** (-11% growth), **Design** (-11%), and **Performance** (-16%), however, all declined by double digits.

Occupational clusters that grew despite the recession include **Engineering** (1% growth), **Geology** (12%), **Hospitality** (1%), **Medical** (10%), and **Manufacturing Operations** (1%). **Geology** was the only occupational cluster to increase employment by more than 10%.

Despite recent losses, all occupations are projected to increase over the next five years. The greatest net job gains in the Tulsa Region are expected to be in **Medical** (5,900 new jobs), **Hospitality** (3,500), **Back Office** (2,900), **Personal Services** (2,100), **Education** (1,700), **Social Services** (1,600), and **Production** (1,100).

**Tulsa Region OK
Major Occupation Cluster Trends**

Occupational Cluster	2013 Employment	2013 LQ	2008 - 2013		Forecast, 2013 - 2018	
			Growth	New Jobs	Growth	New Jobs
AG Agriculture	1,082	0.34	-8.5%	(100)	3.0%	32
ARCH Architecture	630	1.33	-2.6%	(17)	4.0%	25
BACK Back Office	65,285	1.06	-4.9%	(3,379)	4.4%	2,902
BIZ Business	12,331	0.94	-6.2%	(816)	1.9%	229
COMM Communications	1,224	0.66	-6.4%	(84)	8.2%	100
COMP Computer	8,959	0.65	-6.7%	(640)	3.4%	305
CONS Construction	18,878	1.22	-7.8%	(1,607)	4.7%	883
DESI Design	1,562	0.63	-10.7%	(187)	0.7%	11
ED Education	22,149	0.85	0.0%	9	7.5%	1,661
ENG Engineering	9,449	1.10	1.3%	118	5.8%	548
FIN Financial	12,400	1.03	-4.0%	(511)	3.0%	378
GEO Geology	1,956	2.34	11.5%	202	8.4%	165
HOSP Hospitality	48,912	0.89	1.2%	590	7.2%	3,508
LEGA Legal	4,085	1.05	-3.4%	(145)	0.2%	10
LOGI Logistics	34,446	0.94	-10.8%	(4,180)	1.6%	548
MATH Math	251	0.63	1.2%	3	4.4%	11
MECH Mechanics	20,419	1.29	-4.8%	(1,030)	4.6%	935
MED Medical	44,228	0.98	10.0%	4,016	13.4%	5,940
MFTG Mfg. Operations	1,477	1.31	1.0%	14	4.9%	72
MKTG Sales & Marketing	4,901	1.61	-4.1%	(209)	6.4%	314
PERF Performance	842	0.50	-15.9%	(159)	5.8%	49
POLI Political	119	0.33	3.5%	4	10.1%	12
PROD Production	37,437	1.44	-4.0%	(1,578)	2.9%	1,082
SERV Personal Services	41,762	0.96	-1.5%	(648)	5.0%	2,100
SOCI Social Service	16,179	0.85	-0.6%	(99)	9.6%	1,548
All Occupations	410,914		-2.5%	(10,440)	5.7%	23,382

Source: Avalanche Consulting, EMSI Covered

Neighborhood Area Trends

East Tulsa

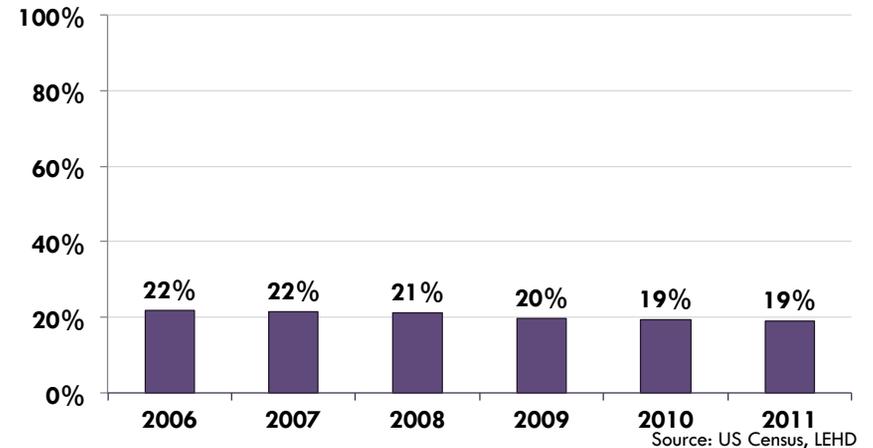
While examining trends at the neighborhood area level, it is important to recognize the regional character of labor markets. An examination of a neighborhood area's employment composition, for example, may have limited applicability to the area's residents, because jobs may be filled largely by non-residents. Commuting patterns reveal how far employees currently commute to an area for work, which serves to better understand the 'local' labor market supply. The labor market is not simply the people that live in a neighborhood area or city, but the entire possible population that is within a reasonable commute range.

In East Tulsa, only 19% of employed residents work within the neighborhood area. The remaining 81% commute outside of the neighborhood area for work each day.

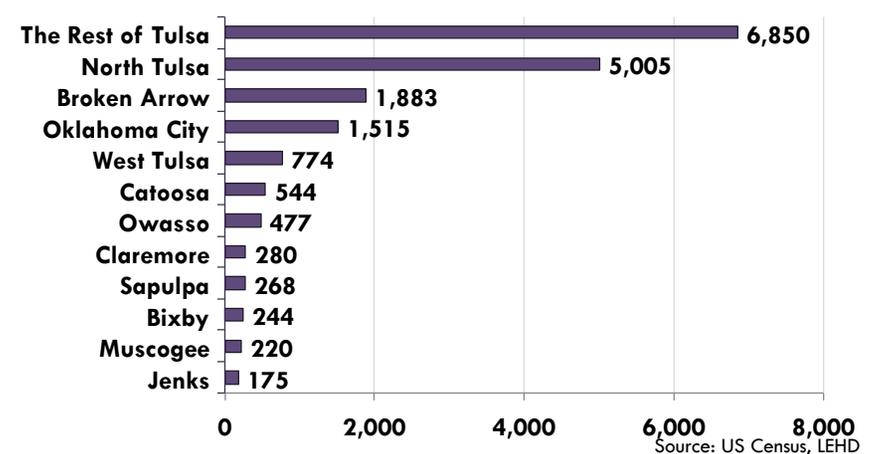
The largest share of East Tulsa's employed residents (6,850 residents) work within the City of Tulsa, but outside of the three examined neighborhood areas ("The Rest of Tulsa" on the chart to the right). The next largest employment destination for East Tulsa working residents is North Tulsa, where 5,000 work. Other leading employment destinations for East Tulsa workers include Broken Arrow (1,900 residents), Oklahoma City (1,500 residents), and West Tulsa (800).

Note: Oklahoma City may seem like a long commute, but commutes up to two hours each way are becoming increasingly common. More likely, these jobs may represent telecommuting patterns, part-time employment, relocated jobs, and other factors. These numbers offer a strong representation of regional employment and commute patterns but can be further verified through employer surveys and traffic counts.

**% OF RESIDENTS WORKING IN EAST TULSA
2006 – 2011**



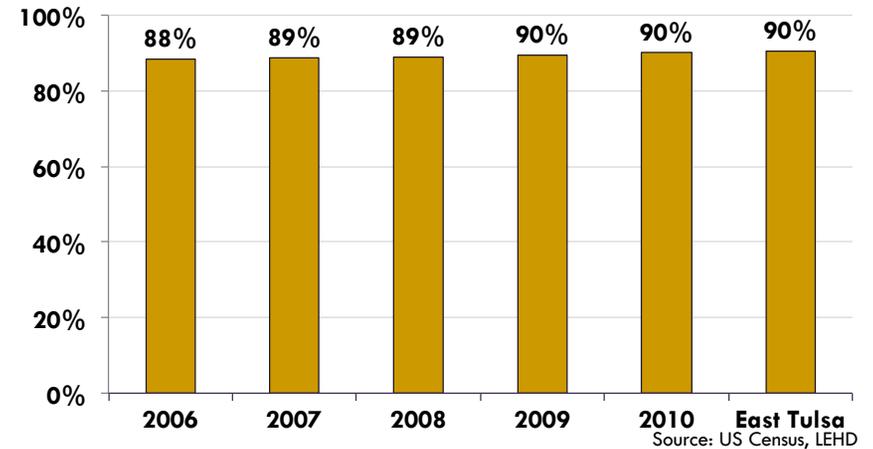
**TOP DESTINATIONS OF COMMUTING RESIDENTS
EAST TULSA – 2011**



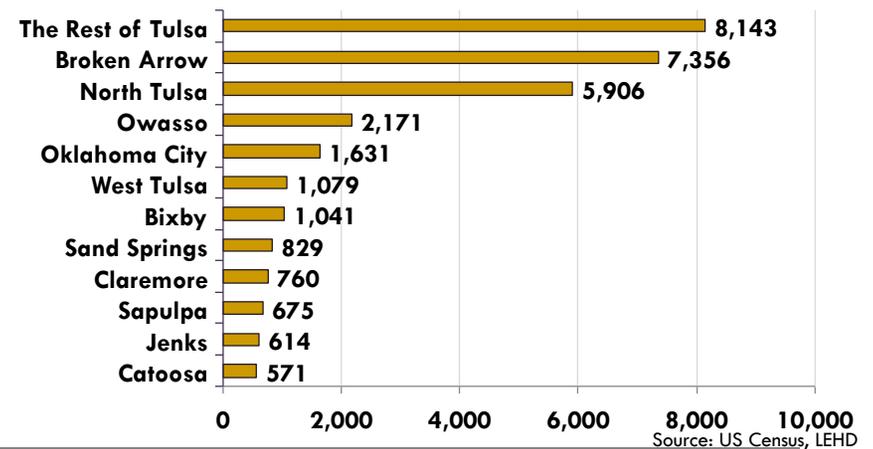
Just as many East Tulsa residents commute outside of the neighborhood for work, many non-residents of East Tulsa also cross neighborhood and city boundaries for work. A majority of individuals employed within East Tulsa do not live in the neighborhood. Non-residents of East Tulsa fill 90% of the jobs in the neighborhood.

The leading source of workers for East Tulsa jobs are residents for the City of Tulsa who do not live in one of the three examined neighborhood areas. 8,140 East Tulsa jobs are filled by residents of the rest of Tulsa. The other primary sources of workers employed in East Tulsa are Broken Arrow (7,400 workers), North Tulsa (5,900), Owasso (2,200), and Oklahoma City (1,600).

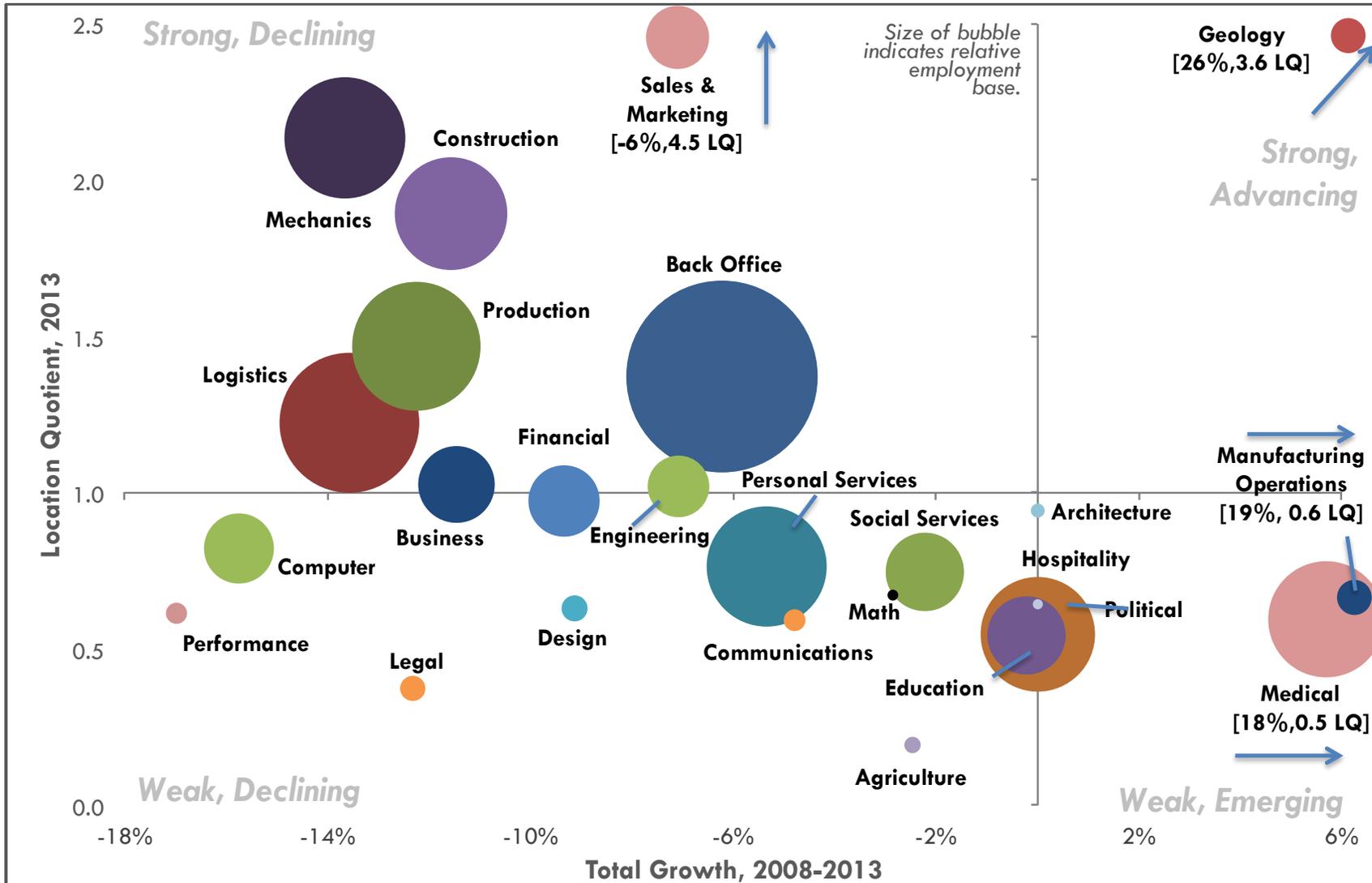
% OF EAST TULSA JOBS FILLED BY NON-RESIDENTS 2006 – 2011



TOP SOURCES OF COMMUTING WORKERS EAST TULSA – 2011



Occupation Clusters: East Tulsa, Oklahoma



Source: Avalanche Consulting using data from EMSI

The largest occupational clusters in East Tulsa include **Back Office** (10,800), **Logistics** (5,700), **Production** (4,900), **Mechanics** (4,300), and **Personal Services** (4,200). With the exception of **Personal Services**, all of these occupational clusters are at least 20% more concentrated in East Tulsa than the US average and represent occupations important to target industries.

The most concentrated occupational clusters in East Tulsa are **Sales & Marketing** (4.5 LQ), **Geology** (3.6), **Mechanics** (2.1) which includes positions in Aerospace, Automotive, Industrial, Computer and other Maintenance focused positions, **Construction** (1.9), and **Production** (1.5). With the exception of **Geology**, each of these occupational clusters lost jobs between 2008 and 2013.

The airport’s location in East Tulsa also contributes to a relatively high concentration of **Logistics** occupations (1.2 LQ).

The majority of East Tulsa’s occupational clusters are projected to expand in the years ahead. Between 2013 and 2018, occupations forecast to add the greatest number of jobs include **Back Office** (660 jobs), **Medical** (390), **Social Service** (330), **Hospitality** (215), **Construction** (170), and **Sales & Marketing** (170). Together, these six occupational clusters account for 93% off all net new jobs forecast in East Tulsa through 2018.

Production and **Manufacturing Operations** are forecast to create 54 and 10 jobs respectively.

**East Tulsa, OK
Major Occupation Cluster Trends**

Occupational Cluster	2013 Employment	2013 LQ	2008 - 2013		Forecast, 2013 - 2018	
			Growth	New Jobs	Growth	New Jobs
AG Agriculture	79	0.19	-2.5%	(2)	-1.3%	(1)
ARCH Architecture	57	0.94	0.0%	0	5.3%	3
BACK Back Office	10,768	1.37	-6.2%	(715)	6.1%	660
BIZ Business	1,723	1.03	-11.5%	(223)	0.3%	6
COMM Communications	139	0.59	-4.8%	(7)	-4.3%	(6)
COMP Computer	1,439	0.82	-15.7%	(269)	3.0%	43
CONS Construction	3,723	1.89	-11.6%	(487)	4.5%	167
DESI Design	199	0.63	-9.1%	(20)	-7.0%	(14)
ED Education	1,796	0.54	-0.2%	(4)	6.1%	110
ENG Engineering	1,115	1.02	-7.1%	(85)	4.7%	52
FIN Financial	1,495	0.97	-9.3%	(154)	-1.7%	(25)
GEO Geology	387	3.64	26.1%	80	10.3%	40
HOSP Hospitality	3,847	0.55	0.0%	0	5.5%	213
LEGA Legal	185	0.37	-12.3%	(26)	-10.8%	(20)
LOGI Logistics	5,744	1.22	-13.6%	(902)	-2.4%	(139)
MATH Math	34	0.67	-2.9%	(1)	5.9%	2
MECH Mechanics	4,298	2.14	-13.7%	(680)	-2.7%	(117)
MED Medical	2,904	0.51	17.5%	433	13.5%	393
MFTG Mfg. Operations	81	0.56	19.1%	13	12.3%	10
MKTG Sales & Marketing	1,742	4.50	-6.5%	(121)	9.6%	167
PERF Performance	132	0.61	-17.0%	(27)	-20.5%	(27)
POLI Political	30	0.64	0.0%	0	0.0%	0
PROD Production	4,856	1.47	-12.3%	(678)	1.1%	54
SERV Personal Services	4,232	0.76	-5.3%	(239)	3.6%	154
SOCI Social Service	1,801	0.75	-2.2%	(41)	18.4%	331
All Occupations	52,346		-7.4%	(4,206)	4.0%	2,074

Source: Avalanche Consulting, EMSI Covered

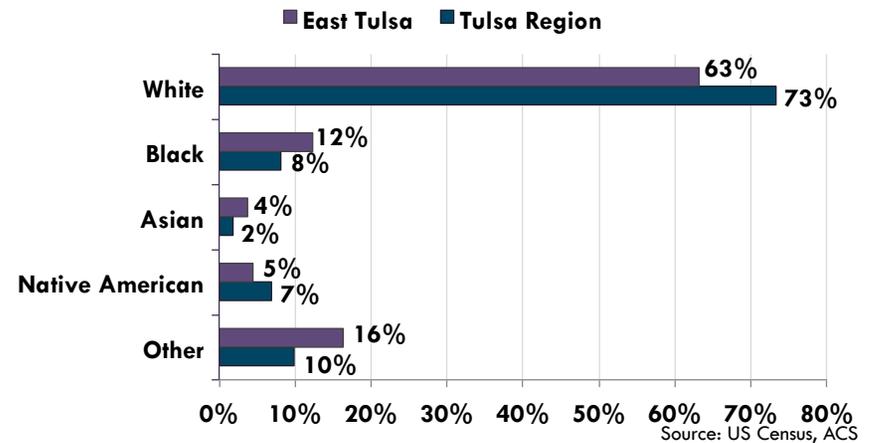
Alongside the largest Hispanic population in the Tulsa Region, East Tulsa has a higher share of black, Asian, and other residents than the region and a lower share of white and Native American residents. East Tulsa is 63% white, 12% black, 4% Asian, 5% Native American, and 16% a mix of other races. Overall, Tulsa Region residents are 73% white, 8% black, 2% Asian, 7% Native American, and 10% other.

East Tulsa is also younger than the Tulsa Region average, with a higher share of children under 10 years old and residents aged 25 to 44 years. 18% of East Tulsa residents are under 10 years old, compared to 14% of the Tulsa Region. Similarly, 30% of East Tulsa residents are between 25 and 44 years, compared to 36% of the region.

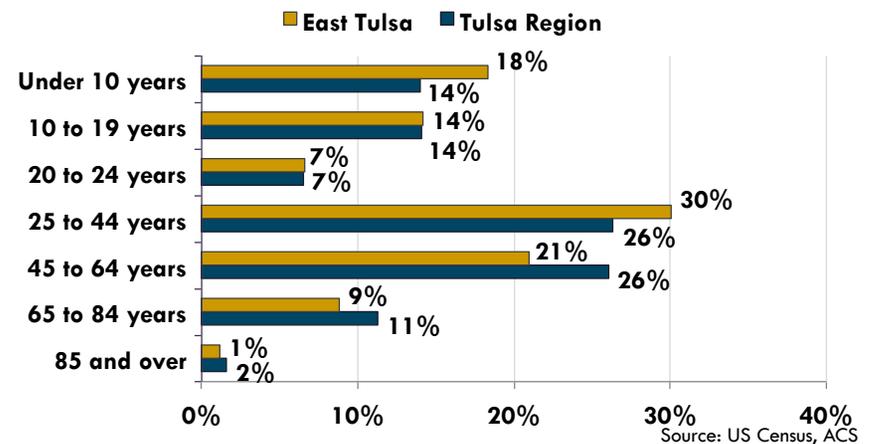
East Tulsa also has a lower share of residents above 45. Only 31% of East Tulsa residents are over 45 years old, compared to 39% of region residents.

The youthful population in East Tulsa highlights the importance of education in the coming years to ensure that residents can participate in the expanding economy.

RACIAL DIVERSITY EAST TULSA VS. TULSA REGION – 2012



AGE DISTRIBUTION EAST TULSA VS. TULSA REGION – 2012

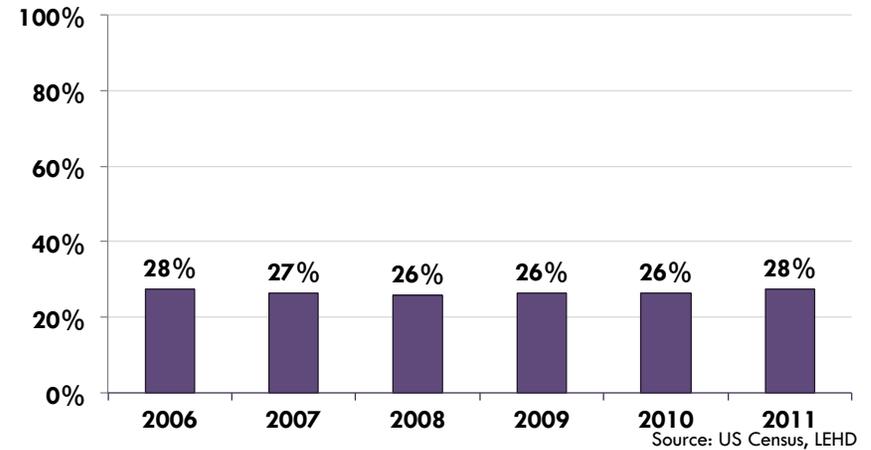


North Tulsa

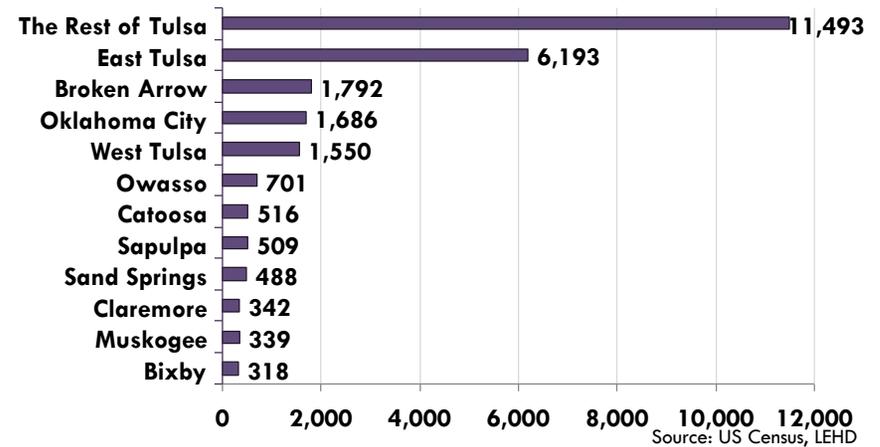
Of the three examined neighborhood areas, North Tulsa has the highest share of residents working in the neighborhood. 28% of employed North Tulsa residents also work within North Tulsa. The remaining 72% of employed residents commute outside of the neighborhood area each day. North Tulsa also has the highest unemployment rate and lowest labor participation among the three neighborhood areas.

The largest share of North Tulsa employed residents (11,500 residents) work within the City of Tulsa but outside of the three examined neighborhood areas. The next greatest destinations for employed North Tulsa residents are East Tulsa (6,200), Broken Arrow (1,800), Oklahoma City (1,700), and West Tulsa (1,600).

**% OF RESIDENTS WORKING IN NORTH TULSA
2006 – 2011**



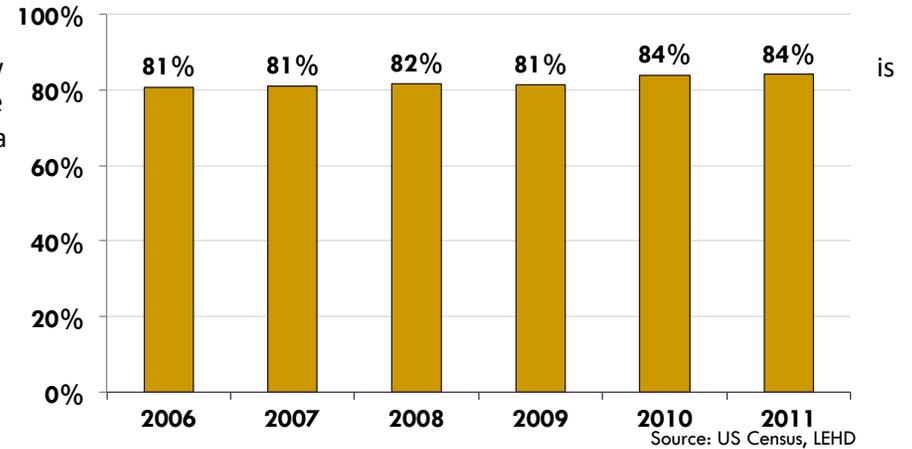
**TOP DESTINATIONS OF COMMUTING RESIDENTS
NORTH TULSA – 2011**



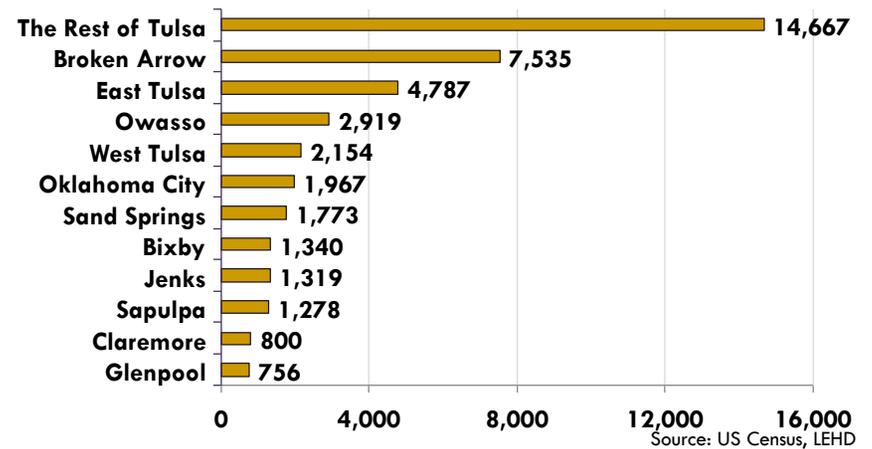
Non-residents fill 84% of the jobs in North Tulsa. This proportion is lowest among the three examined neighborhood areas.

The largest share of North Tulsa workers (14,700 workers) commute in from areas of the City of Tulsa outside of the three examined neighborhood areas. Broken Arrow the second largest source of North Tulsa Workers, with 7,500 workers making the commute each day. Other leading sources of North Tulsa workers include East Tulsa (4,800), Owasso (2,900), and West Tulsa (2,200).

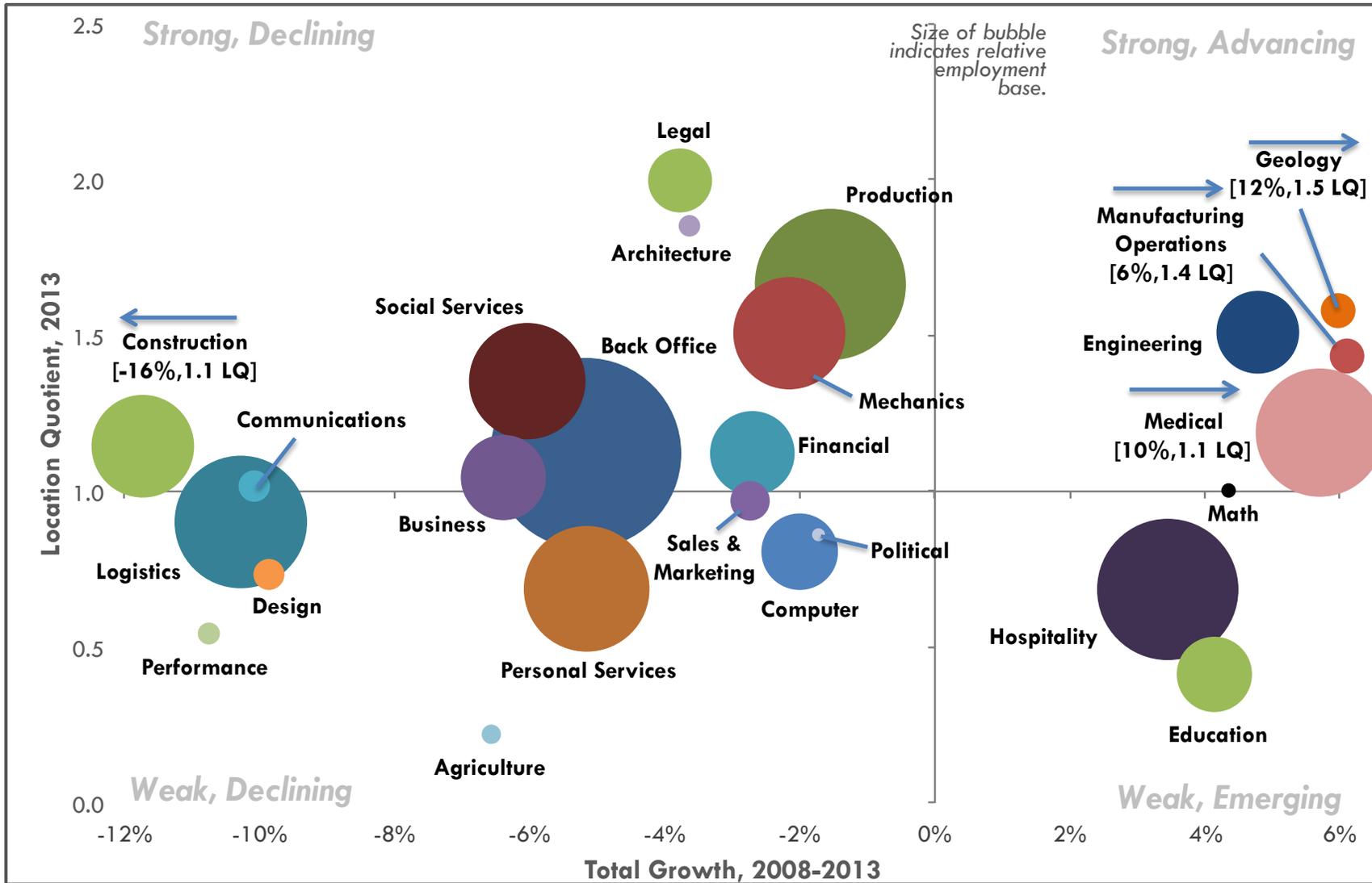
**% OF NORTH TULSA JOBS FILLED BY NON-RESIDENTS
2006 – 2011**



**TOP SOURCES OF COMMUTING WORKERS
NORTH TULSA – 2011**



Occupation Clusters: North Tulsa, Oklahoma



Source: Avalanche Consulting using data from EMSI

The largest occupational clusters in North Tulsa are **Back Office** (12,500), **Medical** (9,100), **Production** (7,800), **Hospitality** (6,800), and **Logistics** (6,000). Collectively, these occupational clusters represent 57% of all jobs in North Tulsa.

The most concentrated occupational clusters in North Tulsa reflect strengths in professional and technical services. Related concentrated occupational clusters include **Legal** (2.0 LQ), **Architecture** (1.9), **Production** (1.7), **Mechanics** (1.5), and **Engineering** (1.5). With the exception of Engineering, each of these concentrated cluster posted job losses between 2008 and 2013.

Between 2013 and 2018, virtually all occupational clusters in North Tulsa are expected to grow. Occupations forecast to create the greatest number of new jobs in North Tulsa over the next five years are **Medical** (1,180 jobs), **Hospitality** (490), **Back Office** (490), **Social Service** (250), and **Mechanics** (235). Through 2018, these clusters are projected to fuel 69% of all job creation in North Tulsa.

**North Tulsa, OK
Major Occupation Cluster Trends**

Occupational Cluster	2013 Employment	2013 LQ	2008 - 2013		Forecast, 2013 - 2018	
			Growth	New Jobs	Growth	New Jobs
AG Agriculture	128	0.22	-6.6%	(9)	0.8%	1
ARCH Architecture	159	1.85	-3.6%	(6)	8.8%	14
BACK Back Office	12,505	1.12	-5.2%	(682)	3.9%	488
BIZ Business	2,490	1.04	-6.4%	(170)	2.5%	62
COMM Communications	339	1.02	-10.1%	(38)	12.1%	41
COMP Computer	2,006	0.81	-2.0%	(41)	4.8%	97
CONS Construction	3,085	1.10	-16.2%	(596)	-1.0%	(32)
DESI Design	329	0.73	-9.9%	(36)	9.7%	32
ED Education	1,938	0.41	4.1%	77	6.3%	122
ENG Engineering	2,345	1.51	4.8%	107	8.3%	194
FIN Financial	2,447	1.12	-2.7%	(68)	5.3%	130
GEO Geology	223	1.48	11.5%	23	4.9%	11
HOSP Hospitality	6,843	0.69	3.4%	228	7.2%	494
LEGA Legal	1,402	2.00	-3.8%	(55)	2.1%	30
LOGI Logistics	6,014	0.90	-10.3%	(689)	2.0%	123
MATH Math	72	1.00	4.3%	3	6.9%	5
MECH Mechanics	4,311	1.51	-2.2%	(95)	5.4%	234
MED Medical	9,086	1.11	10.5%	862	13.0%	1,181
MFTG Mfg. Operations	291	1.42	6.2%	17	7.9%	23
MKTG Sales & Marketing	533	0.97	-2.7%	(15)	2.1%	11
PERF Performance	166	0.54	-10.8%	(20)	12.0%	20
POLI Political	57	0.86	-1.7%	(1)	3.5%	2
PROD Production	7,816	1.66	-1.5%	(123)	2.5%	195
SERV Personal Services	5,407	0.69	-5.2%	(294)	2.1%	113
SOCI Social Service	4,638	1.35	-6.0%	(298)	5.3%	247
All Occupations	74,365		-2.5%	(1,916)	5.2%	3,846

Source: Avalanche Consulting, EMSI Covered

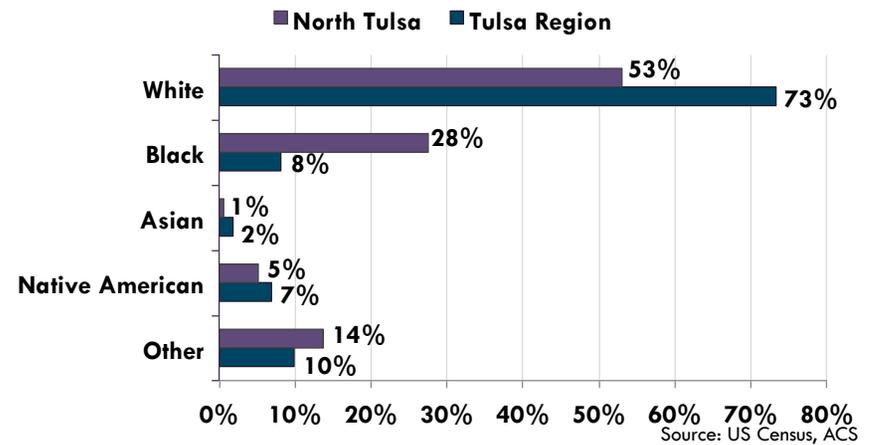
North Tulsa is not as young as East Tulsa but is still younger and more diverse than the Tulsa Region.

North Tulsa has a much higher share of black and other residents and a lower share of white, Asian, and Native American residents than the Tulsa Region average. North Tulsa residents are 53% white, 28% black, 1% Asian, 5% Native American, and 14% a mix of other races.

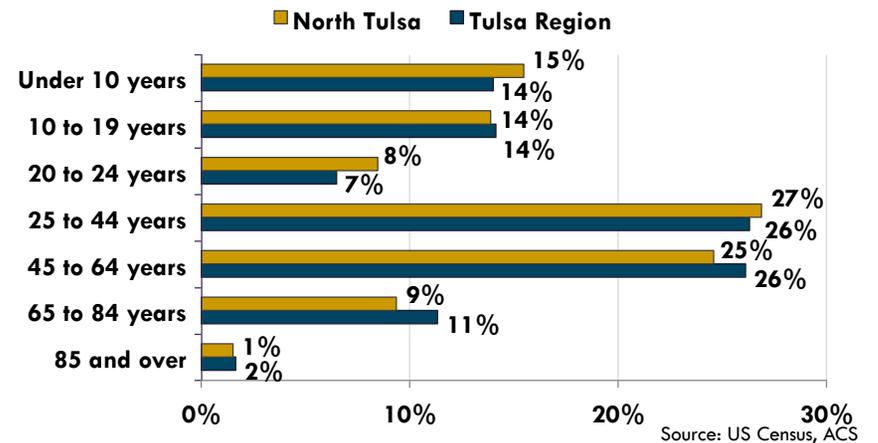
North Tulsa is also younger than the Tulsa Region average, with a higher share of children under 10 years and residents between 20 and 44 years old. 15% of North Tulsa residents are under 10 years old, compared to 14% of the region. Similarly, 8% of North Tulsa residents are between 20 and 24 years old and 27% are between 25 and 44.

North Tulsa has a lower share of residents above 45 than the overall region. 35% of North Tulsa residents are over 45 years old, compared to 39% of Tulsa residents.

RACIAL DIVERSITY NORTH TULSA VS. TULSA REGION – 2012



AGE DISTRIBUTION NORTH TULSA VS. TULSA REGION – 2012

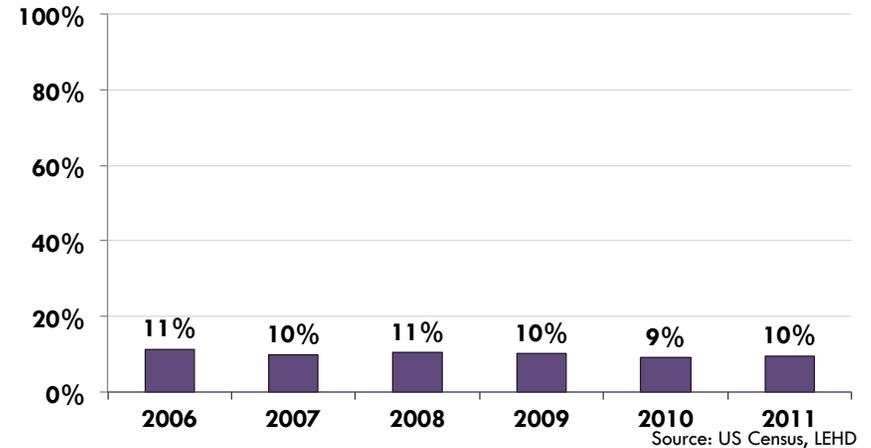


West Tulsa

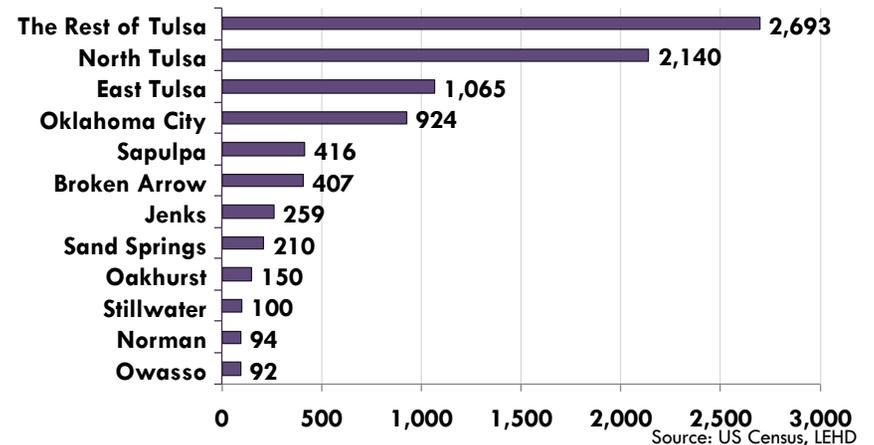
Only 10% of employed West Tulsa residents work within the neighborhood area. The remaining 90% commute outside of the neighborhood area for work each day. Among the three Tulsa neighborhood areas examined, West Tulsa has the lowest proportion of individuals that live and work within the community.

The largest number of commuting West Tulsa residents (2,700) work in the City of Tulsa but outside of the three examined neighborhood areas. North Tulsa and East Tulsa are the second largest destinations for West Tulsa employed residents, with 2,100 and 1,100 commuting to each respectively. Other destinations for West Tulsa residents are Oklahoma City (900 workers), Sapulpa (420), and Broken Arrow (410).

% OF RESIDENTS WORKING IN WEST TULSA 2006 – 2011



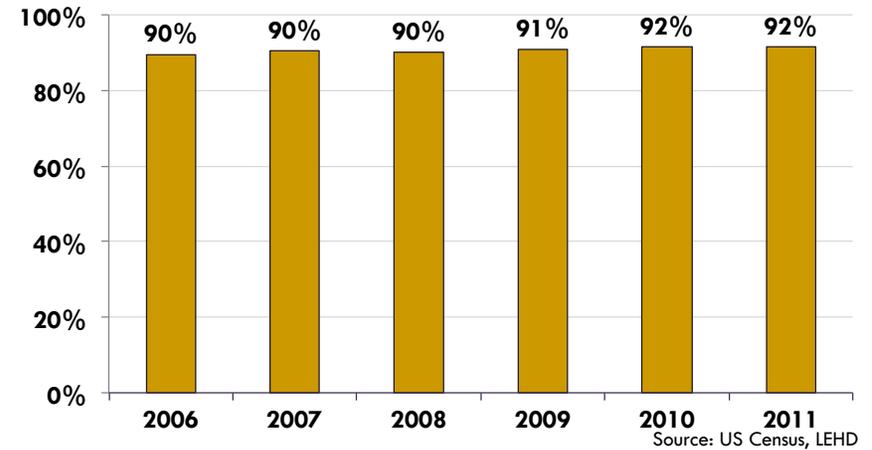
TOP DESTINATIONS OF COMMUTING RESIDENTS WEST TULSA – 2011



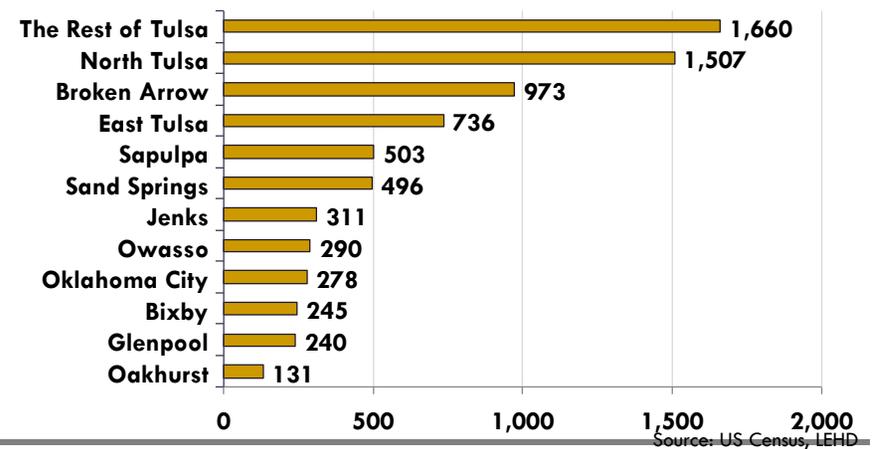
More than 90% of jobs in West Tulsa are filled by non-residents. No other examined Tulsa neighborhood area is more dependent on outside residents for its workforce. Over the past three years, West Tulsa has also created jobs more quickly than the other neighborhood area, but most of these new jobs have been filled by workers that live outside the neighborhood.

Like all other examined neighborhood areas, the largest share of workers (1,700) in West Tulsa commute from areas within the City of Tulsa but outside of the three neighborhood areas. Other leading sources of West Tulsa workers include North Tulsa (1,500), Broken Arrow (970), and East Tulsa (740).

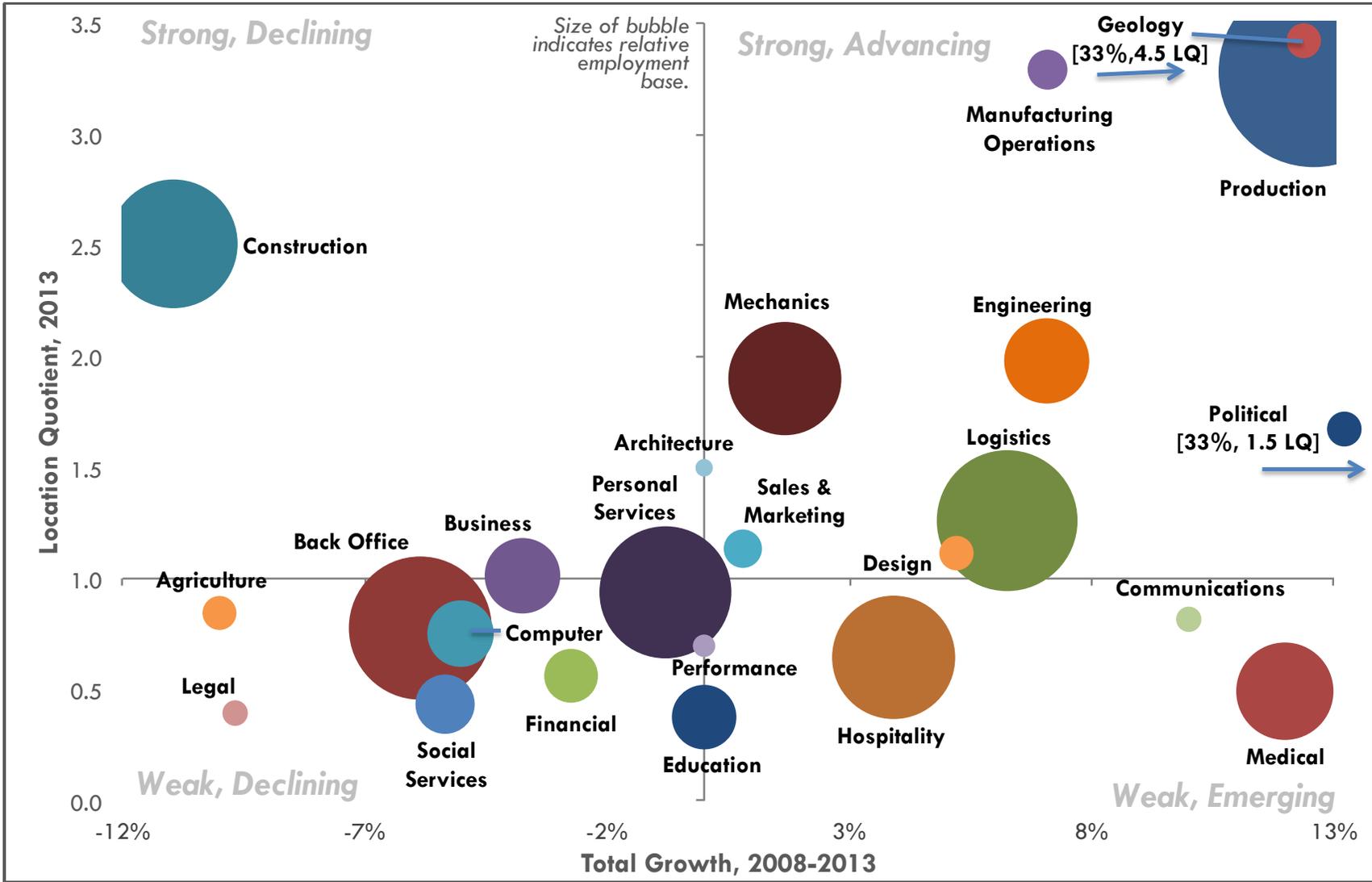
**% OF WEST TULSA JOBS FILLED BY NON-RESIDENTS
2006 – 2011**



**TOP SOURCES OF COMMUTING WORKERS
WEST TULSA – 2011**



Occupation Clusters: West Tulsa, Oklahoma



Source: Avalanche Consulting using data from EMSI

The largest occupational clusters in West Tulsa are **Production** (3,100), **Back Office** (1,800), **Logistics** (1,700), **Personal Services** (1,500), and **Construction** (1,400). Together, these five occupational clusters account for 63% of all jobs in West Tulsa.

The most concentrated occupational clusters in West Tulsa include **Geology** (4.5 LQ), **Production** (3.3), **Manufacturing Operations** (3.3), **Construction** (2.5), and **Engineering** (2.0). With the exception of **Construction**, each of these occupational clusters experienced positive employment growth between 2008 and 2013. These highlight West Tulsa’s strong concentration of manufacturing industries.

Through 2018, occupations forecast to create the most jobs in West Tulsa include **Production** (140 new jobs), **Mechanics** (120), **Personal Services** (100), **Hospitality** (95), and **Medical** (85). These five occupational clusters are expected to be responsible for 62% of all job creation in West Tulsa between 2013 and 2018.

**West Tulsa, OK
Major Occupation Cluster Trends**

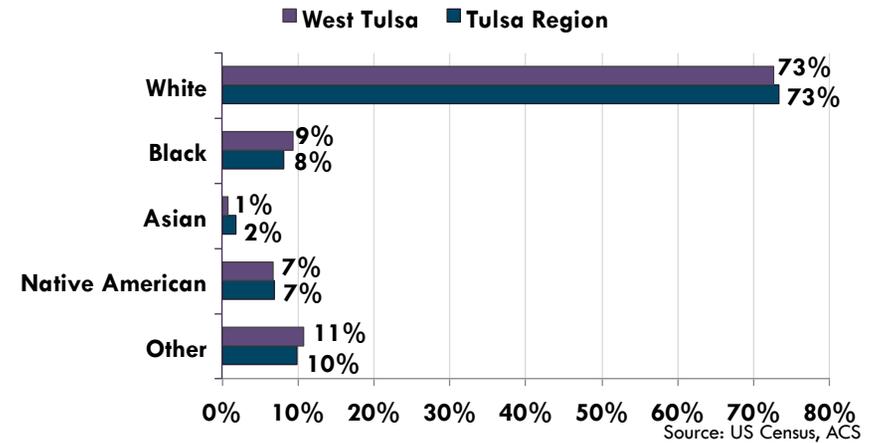
Occupational Cluster	2013 Employment	2013 LQ	2008 - 2013		Forecast, 2013 - 2018	
			Growth	New Jobs	Growth	New Jobs
AG Agriculture	99	0.85	-10.0%	(11)	3.0%	3
ARCH Architecture	26	1.50	0.0%	0	3.8%	1
BACK Back Office	1,752	0.78	-5.9%	(109)	3.6%	63
BIZ Business	488	1.01	-3.7%	(19)	1.8%	9
COMM Communications	55	0.82	10.0%	5	5.5%	3
COMP Computer	378	0.75	-5.0%	(20)	4.8%	18
CONS Construction	1,415	2.51	-11.0%	(174)	3.0%	43
DESI Design	101	1.11	5.2%	5	12.9%	13
ED Education	357	0.38	0.0%	0	2.0%	7
ENG Engineering	621	1.98	7.1%	41	5.2%	32
FIN Financial	248	0.56	-2.7%	(7)	2.8%	7
GEO Geology	137	4.48	33.0%	34	8.8%	12
HOSP Hospitality	1,302	0.65	3.9%	49	7.3%	95
LEGA Legal	56	0.39	-9.7%	(6)	1.8%	1
LOGI Logistics	1,699	1.26	6.3%	100	5.0%	85
MATH Math	10	0.69	0.0%	0	50.0%	5
MECH Mechanics	1,098	1.90	1.7%	18	10.7%	118
MED Medical	813	0.49	12.0%	87	10.5%	85
MFTG Mfg. Operations	136	3.29	7.1%	9	17.6%	24
MKTG Sales & Marketing	126	1.13	0.8%	1	4.0%	5
PERF Performance	43	0.70	0.0%	0	23.3%	10
POLI Political	20	1.50	33.3%	5	0.0%	0
PROD Production	3,114	3.28	12.6%	348	4.5%	139
SERV Personal Services	1,491	0.94	-0.8%	(12)	6.8%	102
SOCI Social Service	301	0.43	-5.3%	(17)	-5.0%	(15)
All Occupations	15,030		2.2%	324	5.7%	863

Source: Avalanche Consulting, EMSI Covered

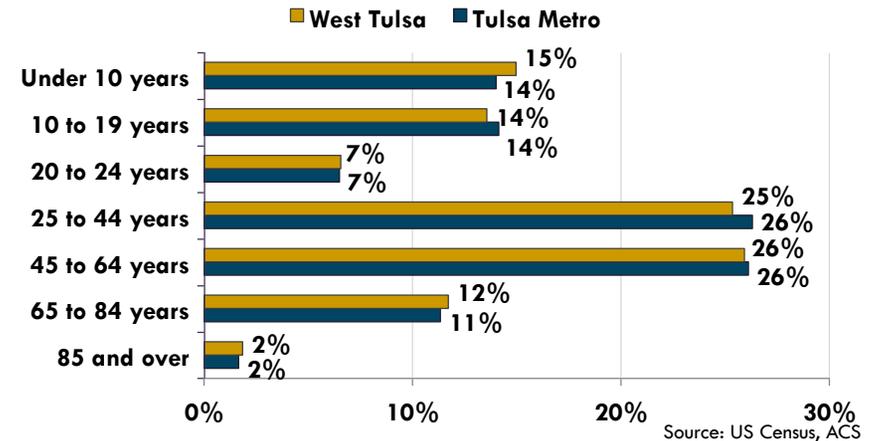
West Tulsa’s racial demographics roughly mirror the Tulsa Region. West Tulsa residents are 73% white, 9% black, 1% Asian, 7% Native American, and 11% a mix of other races.

West Tulsa’s age distribution is also very similar to the overall region, with a slightly higher concentration of children under 10 years and residents between 65 and 84 years old. 15% of West Tulsa residents are under the age of 10, compared to 14% of the Tulsa Region. Similarly, 12% of West Tulsa residents are between 65 and 84 years old, compared to 11% of the region.

RACIAL DIVERSITY WEST TULSA VS. TULSA REGION – 2012



AGE DISTRIBUTION WEST TULSA VS. TULSA REGION – 2012



Target Industry Brief

Overall Target Industry Trends

The Tulsa Region has significant strengths in all target industries, with higher than average concentrations of jobs in every industry, except Information Security. Information Security is an emerging industry, however, and difficult to capture and define using traditional government industry metrics. Despite low employment in Information Security, the Tulsa Region has strong competitive assets for this industry. The Tulsa Region has competitive assets for all industries, particularly manufacturing, which is one of the region's strongest areas, supporting Advanced Manufacturing, Aviation & Aerospace, and Energy.

The largest target industries in the Tulsa Region are Professional Services (57,800 jobs), Healthcare (56,200), and Advanced Manufacturing (37,400). The most concentrated industries are Aviation & Aerospace (3.6 LQ), Energy (3.1), Advanced Manufacturing (2.1), and Transportation & Logistics (1.4).

Total job growth for all seven target industries cannot be calculated, because there are overlaps between industries, but three out of seven targets created jobs over the past five years, despite the national recession. The highest growth from 2008 to 2013 was in Healthcare, which grew 11%, creating nearly 5,700 jobs, followed by Advanced Manufacturing (4% growth; 1,600 jobs), and Energy (2% growth; 300 jobs). It is notable that two of these were manufacturing industries

Tulsa Region OK Target Industry Trends

Industry	2013 Employment	2013 LQ	2008 - 2013		Forecast, 2013 - 2018	
			Growth	New Jobs	Growth	New Jobs
Advanced Manufacturing	37,420	● 2.10	4.4%	1,576	4.5%	1,701
Aviation & Aerospace	12,799	● 3.63	-0.9%	(110)	8.1%	1,032
Energy	20,312	● 3.07	1.5%	301	-0.3%	(67)
Healthcare	56,234	● 1.01	11.2%	5,651	14.5%	8,154
Information Security	2,259	● 0.31	-17.0%	(463)	-8.1%	(184)
Professional Services	57,778	● 1.02	-9.0%	(5,728)	6.8%	3,942
Transportation & Logistics	10,834	● 1.38	-21.4%	(2,956)	-1.7%	(187)

Source: Avalanche Consulting, EMSI Covered

(Advanced Manufacturing and Energy), which generally lost jobs across the country. This is one demonstration of the manufacturing strengths in Tulsa. Professional Services lost the most jobs during this period (5,700 jobs lost), followed by Transportation & Logistics (3,000 jobs lost).

Four out seven target industries are currently forecast to create jobs in the Tulsa Region over the next five years. The industries forecast to create the most jobs from 2013 to 2018 are Healthcare (8,200 new jobs), Professional Services (3,900), Advanced Manufacturing (1,700), and Aviation & Aerospace (1,000). Forecast job losses in other industries are fairly minimal, led by Transportation & Logistics (190 forecast lost jobs), Information Security (180), and Energy (70).

Each of the three neighborhood areas examined in Tulsa has unique target industry strengths and characteristics, but all neighborhood areas have above average concentrations in manufacturing and logistics industries.

The most concentrated target industries in East Tulsa are Aviation & Aerospace (13.5 LQ), Transportation & Logistics (6.1), Advanced Manufacturing (2.1), Energy, (2.0), and Professional Services (1.5). The industries forecast to create the most jobs in East Tulsa from 2013 to 2018 are Professional Services (1,600 new jobs), Healthcare (690 new jobs), Energy (98 new jobs), and Advanced Manufacturing (36 new jobs).

Tulsa Neighborhood Areas Target Industry Trends

Industry	East Tulsa			North Tulsa			West Tulsa		
	Jobs	LQ	Forecast	Jobs	LQ	Forecast	Jobs	LQ	Forecast
Advanced Manufacturing	4,663	● 2.06	36	9,469	● 2.94	500	3,925	● 6.03	134
Aviation & Aerospace	6,775	● 13.51	(52)	5,445	● 8.53	972	394	● 3.05	106
Energy	1,699	● 2.02	98	2,769	● 2.38	(254)	1,462	● 6.04	(65)
Healthcare	3,788	○ 0.53	686	12,144	○ 1.21	1,676	894	○ 0.44	66
Information Security	248	○ 0.27	(15)	446	○ 0.34	(41)	292	○ 1.09	17
Professional Services	10,740	● 1.48	1,620	8,111	○ 0.79	218	1,362	○ 0.66	123
Transportation & Logistics	6,154	● 6.14	(414)	1,571	● 1.10	104	365	● 1.27	(14)

Source: Avalanche Consulting, EMSI Covered

The most concentrated target industries in North Tulsa are Aviation & Aerospace (8.5 LQ), Advanced Manufacturing (2.9), Energy (2.4), Healthcare (1.2), and Transportation & Logistics (1.1). The industries forecast to create the most jobs in North Tulsa from 2013 to 2018 are Healthcare (1,700 new jobs), Aviation & Aerospace (970 new jobs), Advanced Manufacturing (500 new jobs), Professional Services (220 new jobs), and Transportation & Logistics (100 new jobs).

The most concentrated targeted industries in West Tulsa are Energy (6.0 LQ), Advanced Manufacturing (6.0), Aviation & Aerospace (3.1), Transportation & Logistics (1.3), and Information Security (1.1). The industries forecast to create the most jobs in West Tulsa from 2013 to 2018 are Advanced Manufacturing (130 new jobs), Professional Services (120 new jobs), Aviation & Aerospace (110 new jobs), Healthcare (66 new jobs), and Information Security (17 new jobs).

The following pages examine detailed trends for each target industry in the Tulsa Region and the examined neighborhood areas: East, North, and West Tulsa.

Advanced Manufacturing

About the Industry

Advanced Manufacturing involves the use of advanced materials, complex circuitry, computer operated machinery, and sophisticated engineering in the production process. Advanced Manufacturing techniques are typically employed in the creation of innovation-intensive products such as semiconductors, aircraft, and mobile phones.

The growing adoption of advanced technology into the manufacturing process has simultaneously increased the competitiveness of the domestic manufacturing industry while also contributing to employment declines. Complex machinery has increased the efficiency of operations, allowing US manufacturers to compete globally despite relatively high costs. At the same time, efficiency gains allow manufacturing firms to produce more products with fewer workers. Remaining positions often require specialized technical training and skills, further increasing the importance of strong local workforce training programs.

For more than 30 years, offshoring to relatively low cost and deregulated international locations helped drive dramatic reductions in US manufacturing operations. Thanks to the high-skill workforce requirements that cannot be easily met overseas, Advanced Manufacturing has been partially isolated from these trends. More recent dynamics, including increased labor costs abroad and low domestic energy costs, have further buttressed the industry. Manufacturing sectors such as automobile production, aerospace, mobile devices, and energy are once again growing in the US. These sectors benefit from domestic engineering assets, skilled workforce, university research, and expanding export markets for American goods.

Tulsa Metro, OK

Advanced Manufacturing Target Trends

NAICS	Industry	2013 Employment	2013 LQ	2008 - 2013		Forecast, 2013 - 2018	
				Growth	New Jobs	Growth	New Jobs
331210	Iron & Steel Pipe & Tube Mfg. from Purchased Steel	876	● 10.61	59.0%	325	15.1%	132
331221	Rolled Steel Shape Manufacturing	12	○ 0.19	-25.0%	(4)	-58.3%	(7)
332	Fabricated Metal Product Manufacturing	13,245	● 3.03	6.0%	744	3.1%	417
333	Machinery Manufacturing	12,793	● 3.80	4.0%	496	6.2%	799
334	Computer and Electronic Product Manufacturing	1,712	◐ 0.52	-23.6%	(528)	-6.5%	(111)
335	Electrical Equipment, Appliance, & Component Mfg.	1,937	● 1.73	-4.9%	(100)	-6.0%	(116)
336	Transportation Equipment Manufacturing	6,454	◐ 1.42	10.0%	586	9.2%	595
3391	Medical Equipment and Supplies Manufacturing	391	◐ 0.42	17.1%	57	-2.0%	(8)
Total		37,420	● 2.10	4.4%	1,576	4.5%	1,701

Source: Avalanche Consulting, EMSI Covered

Tulsa Region

Advanced Manufacturing is both concentrated and growing in the Tulsa Region. The overall Advanced Manufacturing industry accounts for 37,420 local jobs, with a location quotient of 2.1. Advanced Manufacturing employment increased 4.4% from 2008 to 2013, creating 1,600 jobs. Fabricated Metal Product Manufacturing, Machinery Manufacturing, and Transportation Equipment Manufacturing dominate the industry locally. Together, these three sectors account for 87% of all Advanced Manufacturing employment in the Tulsa Region.

The most concentrated Advanced Manufacturing subsectors in the Tulsa Region are Iron & Steel Pipe & Tube Manufacturing from Purchased Steel (10.6 LQ), Machinery Manufacturing (3.8), Fabricated Metal Product Manufacturing (3.0), Electrical Equipment, Appliance, & Component Manufacturing (1.7), and Transportation Equipment Manufacturing (1.4). The bulk of this Transportation Equipment Manufacturing is aircraft and aircraft parts manufacturing.

The fastest growing Advanced Manufacturing subsectors from 2008 to 2013 include Iron & Steel Pipe & Tube Manufacturing (59% growth), Medical Equipment & Supplies Manufacturing (17%), and Transportation Equipment Manufacturing (10.0%). Although Fabricated Metal Manufacturing grew more slowly, the sector is very large and created the most total jobs. Fabricated Metal Manufacturing added 740 jobs between 2008 and 2013, accounting for nearly half of all Advanced Manufacturing jobs created during this period.

From 2013 to 2018, the Tulsa Region is forecast to create an additional 1,700 Advanced Manufacturing jobs, primarily in Fabricated Metal Product Manufacturing (800 new jobs), Transportation Equipment Manufacturing (600), and Fabricated Metal Product Manufacturing (420).

Tulsa Neighborhood Areas

All three Tulsa neighborhood areas examined have high concentrations of Advanced Manufacturing employment. North Tulsa is home to the largest number of Advanced Manufacturing jobs of the three neighborhood areas examined. North Tulsa is home to nearly 9,500 Advanced Manufacturing jobs, more than East and West Tulsa combined. West Tulsa has the lowest number of Advanced Manufacturing jobs of the three neighborhood areas but the highest concentration, with an overall LQ of 6.0.

East Tulsa has the most diverse Advanced Manufacturing industry among the three neighborhood areas. The most concentrated Advanced Manufacturing sectors in East Tulsa are Fabricated Metal Product Manufacturing (1,600 jobs; 2.9 LQ); Transportation Equipment Manufacturing (1,500 jobs; 2.5 LQ); Iron & Steel Pipe & Tube Manufacturing from Purchased Steel (24 jobs; 2.3 LQ); Electrical Equipment, Appliance, & Component Manufacturing (230 jobs; 1.6 LQ); Computer & Electronic Product Manufacturing (670 jobs; 1.6 LQ); and Machinery Manufacturing (660 jobs; 1.5 LQ). From 2013 to 2018, East Tulsa is only forecast to create an additional 36 net new Advanced Manufacturing jobs. Most growth is predicted in Transportation Equipment Manufacturing (51 new jobs); Fabricated Metal Product Manufacturing (47 new jobs); and Machinery Manufacturing (17 new jobs).

North Tulsa's most concentrated Advanced Manufacturing sectors are Transportation Equipment Manufacturing (4,100 jobs; 5.0 LQ); Electrical Equipment, Appliance, & Component Manufacturing (950 jobs; 4.7 LQ); Fabricated Metal Product Manufacturing (3,500 jobs; 4.4 LQ); Iron & Steel Pipe & Tube

Manufacturing from Purchased Steel (41 jobs; 2.7 LQ); and Machinery Manufacturing (730 jobs; 1.2 LQ). The only sector forecast to create jobs in North Tulsa from 2013 to 2018 is Transportation Equipment Manufacturing, with a whopping 770 new jobs forecast.

West Tulsa has an incredibly high concentration of Advanced Manufacturing employment in Machinery Manufacturing (2,800 jobs; 22.5 LQ) followed by Fabricated Metal Product Manufacturing (1,000 jobs; 6.4 LQ). Machinery Manufacturing is forecast to create an additional 330 jobs in West Tulsa from 2013 to 2018.

Tulsa Neighborhood Areas Advanced Manufacturing Target Trends

NAICS	Industry	East Tulsa			North Tulsa			West Tulsa		
		Jobs	LQ	Forecast	Jobs	LQ	Forecast	Jobs	LQ	Forecast
331210	Iron & Steel Pipe & Tube Mfg. from Purchased Steel	24	● 2.28	(9)	41	● 2.74	(16)	5	● 1.66	0
331221	Rolled Steel Shape Manufacturing	0	○ 0.00	0	0	○ 0.00	0	0	○ 0.00	0
332	Fabricated Metal Product Manufacturing	1,585	● 2.85	47	3,461	● 4.38	(173)	1,025	● 6.42	(134)
333	Machinery Manufacturing	659	● 1.54	17	726	● 1.19	(11)	2,768	● 22.48	331
334	Computer and Electronic Product Manufacturing	666	● 1.58	(18)	155	○ 0.26	(7)	84	○ 0.69	(67)
335	Electrical Equipment, Appliance, & Component Mfg.	233	● 1.63	(37)	948	● 4.67	(61)	33	● 0.80	(1)
336	Transportation Equipment Manufacturing	1,451	● 2.50	51	4,123	● 5.00	770	5	○ 0.03	5
3391	Medical Equipment and Supplies Manufacturing	45	○ 0.38	(15)	15	○ 0.09	(2)	5	○ 0.15	0
Total		4,663	● 2.06	36	9,469	● 2.94	500	3,925	● 6.03	134

Source: Avalanche Consulting, EMSI Covered

Aviation & Aerospace

About the Industry

Aviation & Aerospace are related but distinct industries. While the Aviation industry entails the *use* of aircraft and related products, including the maintenance, repair, and operations of existing aircraft, the Aerospace industry is focused on *making* aircraft and related products. Specifically, Aviation primarily consists of passenger and cargo transportation and related support. Aerospace encompasses a wide array of activities, including the development and manufacture of aircraft, engines, parts, missiles, and space vehicles. Aircraft manufacturing is the largest and fastest growing subsector, representing a majority of industry sales and nearly half of industry. Slightly more than half of aircraft sales are for civilian uses, with military aircraft representing remaining sales.

The employment performance of the two sectors has followed different paths in recent years. During the past decade, Aerospace has been among the country's most resilient manufacturing sectors. Between 2002 and 2012, the Aerospace sector grew 7%. During this period, total manufacturing employment declined 22% in the US. There are currently more than 450,000 workers are directly employed in Aerospace in the US.

In contrast to Aerospace employment, Aviation employment has declined significantly during the past decade. Air carrier bankruptcies and industry consolidation resulted in a series of cost-cutting measures. Between 2001 and 2011, air transportation employment in the US dropped from nearly 615,000 in 2001 to 455,000 in 2011. As consolidation approaches regulatory limits, Aviation employment should prove more stable in the years ahead.

Looking ahead, the fortunes of the Aviation & Aerospace industries are mixed. Federal budget constraints and the reduction in global military operations will likely result in reduced spending by the US military. Forecasts for the civilian aviation market are much brighter. Over the next 20 years, growing international air travel demand will likely support sustained aircraft production. According to projections from the Federal Aviation Authority (FAA), total passenger traffic between the US and the rest of the world is expected to jump from 161.8 million in 2011 to 376.1 million by 2032. Growth in passenger travel will also create additional demand for Aviation services, including airline personnel and airport operations.

Tulsa Region

Aviation & Aerospace employment in the Tulsa Region is nearly four times as concentrated as the US average. The local industry employs nearly 12,800, with an LQ of 3.6. Between 2008 and 2013, the industry lost more than 100 jobs locally, but the industry is forecast to create another 1,000 net new jobs from 2013 to 2018 as the industry recovers. Most of these jobs will be in Aircraft Manufacturing (820 new jobs), Other Support Activities for Air Transportation (450 new jobs), and Other Aircraft Parts & Auxiliary Equipment Manufacturing (95 new jobs).

Scheduled Air Transportation (5,900 jobs) and Aircraft Manufacturing (3,600 jobs) represent the bulk of Tulsa’s Aviation & Aerospace employment. Together, these two subsectors comprise nearly 75% of Aviation & Aerospace jobs in Tulsa. Other large sectors include Other Support Activities for Air Transportation (1,300 jobs) and Other Aircraft parts & Auxiliary Equipment Manufacturing (1,200 jobs).

The most concentrated Tulsa Region Aviation & Aerospace subsectors are Flight Training (6.7 LQ); Aircraft Manufacturing (4.9); Scheduled Air Transportation (4.7); Other Support Activities for Air Transportation (4.3); and Other Aircraft Parts & Auxiliary Equipment Manufacturing (3.8). Over the past five years, the Tulsa Region gained significant employment in Aerospace Manufacturing (over 1,200 jobs), but lost employment in Aviation (more than 1,300 jobs). These trends largely offset one another, with the region only losing 0.9% of Aviation & Aerospace employment from 2008 to 2013.

Tulsa Region OK
Aviation & Aerospace Target Trends

NAICS	Industry	2013 Employment	2013 LQ	2008 - 2013		Forecast, 2013 - 2018	
				Growth	New Jobs	Growth	New Jobs
334511	Search, Det., Nav., Aero., & Naut. Syst. & Instr. Mfg.	331	0.83	31.9%	80	-6.6%	(22)
336411	Aircraft Manufacturing	3,562	4.93	40.3%	1,023	23.1%	823
336412	Aircraft Engine and Engine Parts Manufacturing	179	0.75	-30.4%	(78)	-88.3%	(158)
336413	Other Aircraft Parts & Aux. Equip. Mfg.	1,206	3.80	8.2%	91	7.9%	95
336414	Guided Missile and Space Vehicle Manufacturing	0	0.00	-	0	-	0
336415	Guided Missile & Space Veh. Prop. Unit & Parts Mfg.	0	0.00	-	0	-	0
336419	Other Guided Mis. & Space Veh. & Aux. Equip. Mfg.	0	0.00	-	0	-	0
4811	Scheduled Air Transportation	5,898	4.74	-16.2%	(1,138)	-2.2%	(130)
481219	Other Nonscheduled Air Transportation	0	0.00	-100.0%	(51)	-	0
488190	Other Support Activities for Air Transportation	1,287	4.32	-6.5%	(90)	34.6%	445
517410	Satellite Telecommunications	5	0.15	0.0%	0	-100.0%	(5)
611512	Flight Training	331	6.72	19.1%	53	-4.8%	(16)
Total		12,799	3.63	-0.9%	(110)	8.1%	1,032

Source: Avalanche Consulting, EMSI Covered

Tulsa Neighborhood Areas

The three examined Tulsa neighborhood areas have distinct Aviation & Aerospace industries. East and North Tulsa have the greatest number of Aviation & Aerospace jobs, at 6,075 and 5,450 respectively. West Tulsa is home to just 400 Aviation & Aerospace jobs, but the industry is highly concentrated in all three neighborhood areas.

East Tulsa is home to the airport and the highest concentration of aviation and aircraft part manufacturing jobs among the three examined neighborhood areas. With total employment of 6,100, East Tulsa has an Aerospace & Aviation LQ of 13.5, more than thirteen times more concentrated than the US average. The three subsectors in East Tulsa are Scheduled Air Transportation (5,200 jobs; 32.5 LQ); Other Aircraft Parts & Auxiliary Equipment Manufacturing (810 jobs; 20.1 LQ), and Other Support Activities for Air Transportation (110 jobs; 3.0 LQ). From 2013 to 2018, Scheduled Air Transportation is forecast to lose 145 jobs, but Other Aircraft Parts & Auxiliary Equipment Manufacturing is projected to create 57 new jobs and Other Support Activities for Air Transportation, 36.

Tulsa Neighborhood Areas Aviation & Aerospace Target Trends

NAICS	Industry	East Tulsa			North Tulsa			West Tulsa		
		Jobs	LQ	Forecast	Jobs	LQ	Forecast	Jobs	LQ	Forecast
334511	Search, Det., Nav., Aero., & Naut. Syst. & Instr. Mfg.	0	0.00	0	5	0.07	0	0	0.00	0
336411	Aircraft Manufacturing	0	0.00	0	3,562	27.25	823	0	0.00	0
336412	Aircraft Engine and Engine Parts Manufacturing	0	0.00	0	73	1.69	(68)	0	0.00	0
336413	Other Aircraft Parts & Aux. Equip. Mfg.	812	20.09	57	298	5.19	21	0	0.00	0
336414	Guided Missile and Space Vehicle Manufacturing	0	0.00	0	0	0.00	0	0	0.00	0
336415	Guided Missile & Space Veh. Prop. Unit & Parts Mfg.	0	0.00	0	0	0.00	0	0	0.00	0
336419	Other Guided Mis. & Space Veh. & Aux. Equip. Mfg.	0	0.00	0	0	0.00	0	0	0.00	0
4811	Scheduled Air Transportation	5,148	32.45	(145)	661	2.93	18	0	0.00	0
481219	Other Nonscheduled Air Transportation	0	0.00	0	0	0.00	0	0	0.00	0
488190	Other Support Activities for Air Transportation	114	3.00	36	631	11.71	196	352	32.31	109
517410	Satellite Telecommunications	0	0.00	0	0	0.00	0	0	0.00	0
611512	Flight Training	0	0.00	0	215	24.13	(18)	42	23.32	(3)
Total		6,074	13.51	(52)	5,445	8.53	972	394	3.05	106

Source: Avalanche Consulting, EMSI Covered

North Tulsa has a diverse Aviation & Aerospace industry, primarily focused on Aircraft Manufacturing and support activities, including Flight Training. With total employment of 5,500, North Tulsa has an Aerospace & Aviation LQ of 8.5. The most concentrated subsectors in North Tulsa are Aircraft Manufacturing (3,600 jobs; 27.3 LQ); Flight Training (220 jobs; 24.1 LQ); Other Support Activities for Air Transportation (630 jobs; 11.7 LQ); Other Aircraft Parts & Auxiliary Equipment Manufacturing (300 jobs; 5.2 LQ); Scheduled Air Transportation (660 jobs; 2.9 LQ); and Aircraft Engine & Engine Parts Manufacturing (73 jobs; 1.7 LQ). North Tulsa is forecast to create 820 jobs in Aircraft Manufacturing and 200 in Other Support Activities for Air Transportation from 2013 to 2018.

The furthest neighborhood area from the airport, West Tulsa has 390 Aviation & Aerospace jobs, with an LQ of 3.1. All these jobs are in Other Support Activities for Air Transportation (350 jobs; 32.3 LQ) and Flight Training (42 jobs; 23.3 LQ). West Tulsa has no aerospace manufacturing jobs. Other Support Activities for Air Transportation is forecast to create 110 jobs in West Tulsa from 2013 to 2018.

Energy

About the Industry

In many ways, the Energy industry overlaps with Advanced Manufacturing, encompassing a wide range of manufacturing activities related to extraction of natural resources, distribution of oil and gas, the generation, transmission, and distribution of power, renewable energies, and various support activities. Energy companies tend to locate in proximity to oil and gas extraction operations or near major refinery centers. Businesses that manufacturing equipment and parts for these activities prefer to cluster in proximity to clients, extraction operations, and major distribution lines.

The US Energy industry has boomed in recent years. New technology and markets have increased extraction of oil and gas from shale formations across the country, and domestic production has grown rapidly. This in turn has fueled demand for equipment manufacturing and a wide range of support activities.

Tulsa Region

The Tulsa Region is recognized internationally as a major Energy center, with a significant concentration of Energy manufacturing activities as well as oil and gas extraction companies. The local Energy industry employs over 20,300 with an LQ of 3.1. The industry grew 1.5% from 2008 to 2013, despite the recent recession and fueled by national industry growth since 2010.

The forecast is less bright, with the Tulsa Region Energy industry predicted to remain stagnant (losing 0.3% of jobs) from 2013 to 2018. The sectors that are forecast to grow are primarily related to extraction and distribution of oil and gas, not manufacturing. These sectors include Natural Gas Distribution (270 new jobs), Support Activities for Oil & Gas Operations (250 new jobs); Pipeline Transmission (150 new jobs); Oil & Gas Extraction (110 new jobs); and Metal Tank Manufacturing (93 new jobs).

The most concentrated Energy sectors in the Tulsa Region are Pump & Compressor Manufacturing (3,100 jobs; 19.4 LQ); Oil & Gas Extraction (4,700 jobs; 7.8 LQ); Natural Gas Distribution (2,600 jobs; 7.5 LQ); Pipeline Transportation (920 jobs; 6.7 LQ); Plate Work Manufacturing (910 jobs; 5.0 LQ); Metal Tank Manufacturing (460 jobs; 4.3 LQ); and many more related manufacturing sectors.

Tulsa Region OK Energy Target Trends

NAICS	Industry	2013 Employment	2013 LQ	2008 - 2013		Forecast, 2013 - 2018	
				Growth	New Jobs	Growth	New Jobs
211	Oil and Gas Extraction	4,688	● 7.83	3.3%	151	2.4%	112
213111	Drilling Oil and Gas Wells	368	● 1.26	-3.7%	(14)	15.8%	58
213112	Support Activities for Oil and Gas Operations	2,406	● 2.68	20.4%	408	10.5%	252
2211	Electric Power Generation, Transmission, & Dist.	1,363	● 1.13	-9.6%	(145)	-1.5%	(21)
2212	Natural Gas Distribution	2,562	● 7.49	26.1%	530	10.5%	270
2371	Utility System Construction	1,687	● 1.27	24.2%	329	-9.8%	(165)
3241	Petroleum and Coal Products Manufacturing	908	● 2.59	-19.9%	(225)	-32.6%	(296)
332313	Plate Work Manufacturing	759	● 4.98	-48.0%	(700)	-33.6%	(255)
33242	Metal Tank (Heavy Gauge) Manufacturing	460	● 4.34	11.9%	49	20.2%	93
332722	Bolt, Nut, Screw, Rivet, and Washer Manufacturing	43	○ 0.36	-65.9%	(83)	-53.5%	(23)
332911	Industrial Valve Manufacturing	184	● 2.24	-16.0%	(35)	3.8%	7
332912	Fluid Power Valve and Hose Fitting Manufacturing	64	○ 0.56	-47.1%	(57)	-92.2%	(59)
332919	Other Metal Valve and Pipe Fitting Manufacturing	208	● 4.23	593.3%	178	13.0%	27
332996	Fabricated Pipe and Pipe Fitting Manufacturing	438	● 4.12	-37.7%	(265)	-54.8%	(240)
33329	Other Industrial Machinery Manufacturing	42	○ 0.16	-44.7%	(34)	-28.6%	(12)
33361	Engine, Turbine, & Power Transmission Equip. Mfg.	136	○ 0.44	-42.9%	(102)	44.1%	60
33391	Pump and Compressor Manufacturing	3,073	● 19.38	8.2%	232	-0.7%	(22)
486	Pipeline Transportation	923	● 6.65	10.0%	84	15.9%	147
Total		20,312	● 3.07	1.5%	301	-0.3%	(67)

Source: Avalanche Consulting, EMSI Covered

Tulsa Neighborhood Areas

All three examined neighborhood areas have high concentrations of Energy industry employment, but West Tulsa is the most specialized. West Tulsa is a major Energy center in the city, with 1,500 Energy jobs and an LQ of 6.0. The most concentrated Energy sectors in West Tulsa are Pump & Compressor Manufacturing (420 jobs; 72.8 LQ); Fabricated Pipe & Pipe Fitting Manufacturing (210 jobs; 53.0 LQ); Pipeline Transportation (140 jobs; 27.4 LQ); Natural Gas Distribution (130 jobs; 10.7 LQ); Fluid Power Valve & Hose Fitting Manufacturing (40 jobs; 9.1 LQ); Support Activities for Oil & Gas Operations (270 jobs; 8.1 LQ), and more. The overall industry is forecast to lose jobs in West Tulsa from 2013 to 2018, but Pipeline Transportation (58 new jobs); Pump & Compressor Manufacturing (42 new jobs); and Support Activities for Oil & Gas Operations (30 new jobs) are projected to grow.

Tulsa Neighborhood Areas Energy Target Trends

NAICS	Industry	East Tulsa			North Tulsa			West Tulsa		
		Jobs	LQ	Forecast	Jobs	LQ	Forecast	Jobs	LQ	Forecast
211	Oil and Gas Extraction	400	● 5.24	11	709	● 6.54	20	19	● 0.87	0
213111	Drilling Oil and Gas Wells	5	○ 0.13	0	5	○ 0.09	6	5	○ 0.47	0
213112	Support Activities for Oil and Gas Operations	712	● 6.23	80	178	● 1.10	20	266	● 8.11	30
2211	Electric Power Generation, Transmission, & Dist.	174	● 1.13	4	173	○ 0.79	5	137	● 3.09	(31)
2212	Natural Gas Distribution	0	○ 0.00	0	983	● 15.87	108	134	● 10.70	15
2371	Utility System Construction	231	● 1.37	(9)	146	○ 0.61	(73)	41	● 0.85	(3)
3241	Petroleum and Coal Products Manufacturing	21	○ 0.47	(1)	81	● 1.28	(2)	5	○ 0.39	0
332313	Plate Work Manufacturing	5	○ 0.26	0	250	● 9.07	(150)	45	● 8.08	(27)
33242	Metal Tank (Heavy Gauge) Manufacturing	0	○ 0.00	0	83	● 4.32	(78)	0	○ 0.00	0
332722	Bolt, Nut, Screw, Rivet, and Washer Manufacturing	0	○ 0.00	0	13	○ 0.60	(8)	0	○ 0.00	0
332911	Industrial Valve Manufacturing	0	○ 0.00	0	0	○ 0.00	0	0	○ 0.00	0
332912	Fluid Power Valve and Hose Fitting Manufacturing	18	● 1.24	(13)	0	○ 0.00	0	38	● 9.14	(33)
332919	Other Metal Valve and Pipe Fitting Manufacturing	0	○ 0.00	0	0	○ 0.00	0	0	○ 0.00	0
332996	Fabricated Pipe and Pipe Fitting Manufacturing	5	○ 0.37	0	151	● 7.85	(85)	206	● 52.98	(116)
33329	Other Industrial Machinery Manufacturing	23	○ 0.68	(9)	14	○ 0.29	(3)	5	○ 0.52	0
33361	Engine, Turbine, & Power Transmission Equip. Mfg.	48	● 1.22	37	40	○ 0.72	(14)	0	○ 0.00	0
33391	Pump and Compressor Manufacturing	27	● 1.34	6	0	○ 0.00	0	422	● 72.75	42
486	Pipeline Transportation	30	● 1.70	(8)	21	● 0.84	0	139	● 27.39	58
Total		1,699	● 2.02	98	2,847	● 2.38	(254)	1,462	● 6.04	(65)

Source: Avalanche Consulting, EMSI Covered

East Tulsa has 1,700 Energy jobs with an LQ of 2.0. The most concentrated Energy sectors in East Tulsa are Support Activities for Oil & Gas Operations (710 jobs; 6.2 LQ); Oil & Gas Extraction (400 jobs; 5.2 LQ); Pipeline Transportation (30 jobs; 1.7 LQ); Pump & Compressor Manufacturing (27 jobs; 1.3 LQ); and Fluid Power Valve and Hose Fitting Manufacturing (18 jobs; 1.2 LQ). The industry is forecast to create 98 net jobs from 2013 to 2018, with the most growth in Support Activities for Oil & Gas Operations (80 new jobs) and Engine, Turbine, & Power Transmission Equipment Manufacturing (37 new jobs).

North Tulsa has 2,900 Energy jobs with an LQ of 2.4. The most concentrated Energy sectors in North Tulsa are Natural Gas Distribution (980 jobs; 15.9 LQ); Plate Work Manufacturing (250 jobs; 9.1 LQ); Fabricated Pipe & Pipe Fitting Manufacturing (150 jobs 7.9 LQ); Oil & Gas Extraction (710 jobs; 6.5 LQ); and Metal Tank Manufacturing (83 jobs; 4.3 LQ). North Tulsa is also forecast to lose overall Energy jobs from 2013 to 2018, with limited projected growth in Natural Gas Distribution (110 new jobs), Oil & Gas Extraction (20 new jobs), and Support Activities for Oil & Gas Operations (20 new jobs).

Healthcare

About the Industry

The Healthcare industry encompasses activities related to human health, including doctor and dentist offices (included in Ambulatory Health Care Services), hospitals, nursing facilities, social programs, and others. The size and success of a city's Healthcare industry is largely dependent on demographics and geography. Hospitals and other healthcare operations tend to locate in larger metropolitan areas and rural hub cities, where they can serve a large population. Some Healthcare centers, such as Houston and Miami, are world-renowned for providing high-quality treatment for specific medical issues, such as cancer, or through facilities, such as the Mayo Clinic. These can also be a draw for medical visitors from across the country and globe and are less dependent on local demographics.

Healthcare is one of the fastest growing industries nationally, with growth driven primarily by population trends and technological innovation. The US population continues to age rapidly, and an increasingly high share of the population is over retirement age and has higher demands for Healthcare. This retired population will grow even more rapidly in coming years as the Baby Boomer generation retires. Technological innovation, such as new medical devices or cancer treatment, also drives demand for Healthcare.

Tulsa Region OK Healthcare Target Trends

NAICS	Industry	2013 Employment	2013 LQ	2008 - 2013		Forecast, 2013 - 2018	
				Growth	New Jobs	Growth	New Jobs
621	Ambulatory Health Care Services	21,630	1.08	20.7%	3,715	14.9%	3,215
622	Hospitals (Private)	18,652	1.27	4.2%	758	16.3%	3,046
623	Nursing and Residential Care Facilities	7,816	0.79	-5.5%	(451)	5.5%	426
624	Social Assistance	6,967	0.86	12.2%	757	20.1%	1,398
90262	Hospitals (State Government)	428	0.41	-	428	1.4%	6
90362	Hospitals (Local Government)	741	0.37	149.5%	444	8.5%	63
Total		56,234	1.01	11.2%	5,651	14.5%	8,154

Source: Avalanche Consulting, EMSI Covered

Tulsa Region

Healthcare is the second largest target industry in the Tulsa Region, employing over 56,200 with an LQ of 1.0, an equal concentration to the US average. The Tulsa Region Healthcare industry created 5,700 jobs from 2008 to 2013, an 11% growth rate and is forecast to create an additional 8,200 jobs over the next five years, at a rate of 15%. Growth is forecast in all subsectors of Healthcare, with the largest number of jobs in Ambulatory Health Care Services (3,200 new jobs) and Hospitals (3,100 new jobs).

The most concentrated Healthcare subsectors in the Tulsa Region are Hospitals (18,700 jobs; 1.3 LQ) and Ambulatory Health Care Services (21,600 jobs; 1.1 LQ). The fastest growing subsectors from 2008 to 2013 were Local Government Hospitals (440 new jobs; 150% growth), Ambulatory Health Care Services (3,700 new jobs; 21% growth), and Social Assistance (760 new jobs; 12% growth).

Tulsa Neighborhood Areas

North Tulsa is the only one of the three examined neighborhood areas to have an above average concentration of Healthcare employment. With over 12,100 jobs, North Tulsa's Healthcare industry has an LQ of 1.2. The most concentrated subsectors in North Tulsa are Private Hospitals (6,300 jobs; 2.4 LQ), State Hospitals (390 jobs; 2.1 LQ), and Ambulatory Health Care Services (3,600 jobs; 1.0 LQ). All sectors are forecast to create jobs from 2013 to 2018, lead by Private Hospitals (1,000 new jobs) and Ambulatory Health Care Services (450 new jobs).

Tulsa Neighborhood Areas Healthcare Target Trends

NAICS	Industry	East Tulsa			North Tulsa			West Tulsa		
		Jobs	LQ	Forecast	Jobs	LQ	Forecast	Jobs	LQ	Forecast
621	Ambulatory Health Care Services	2,399	0.94	389	3,637	1.00	447	281	0.38	39
622	Hospitals (Private)	119	0.06	62	6,293	2.37	1,006	307	0.57	60
623	Nursing and Residential Care Facilities	416	0.33	3	724	0.41	47	145	0.40	(6)
624	Social Assistance	854	0.83	232	1,099	0.75	170	156	0.53	(27)
90262	Hospitals (State Government)	0	0.00	0	391	2.06	6	5	0.13	0
90362	Hospitals (Local Government)	0	0.00	0	0	0.00	0	0	0.00	0
Total		3,788	0.53	686	12,144	1.21	1,676	894	0.44	66

Source: Avalanche Consulting, EMSI Covered

East Tulsa has nearly 3,800 Healthcare jobs but an LQ of only 0.5. All of East Tulsa's Healthcare subsectors are less concentrated than the US average. The largest two sectors are Ambulatory Health Care Services (2,400 jobs; 0.9 LQ) and Social Assistance (850 jobs; 0.8 LQ). All subsectors are forecast to create jobs from 2013 to 2018, lead by Ambulatory Health Care Services (390 new jobs) and Social Assistance (230 new jobs).

West Tulsa has only 890 Healthcare jobs with an LQ of only 0.4. Like East Tulsa, all subsectors are less concentrated than the US average. The largest two sectors are Private Hospitals (310 jobs; 0.6 LQ) and Ambulatory Health Care Services (280 jobs; 0.4 LQ). West Tulsa is forecast to lose jobs in Social Assistance and Nursing & Residential Care Facilities but create jobs in Private Hospitals (60 new jobs) and Ambulatory Health Care Services (39 new jobs).

Information Security

About the Industry

Information Security is a relatively new industry and therefore difficult to measure using traditional government industry classification. Much of the work of Information Security exists at the intersection of industry sectors such as software, computer systems designs, Internet publishing, data centers, and other information services. The industry is not yet a major employment cluster but is growing rapidly as concerns about data security rise. Evolving hardware and software is creating both new challenges and opportunities in Information Security and bringing it to the forefront of emerging industries.

Tulsa Region

Information Security jobs are less concentrated in the Tulsa region, despite significant competitive assets locally. Information Security only employs 2,300 in the Tulsa Region with an LQ of 0.3. All sectors lost jobs from 2008 to 2013, with the overall Information Security industry declining 17% locally and losing 460 total jobs. The forecast is also relatively bleak, with the industry projected to decline 8% from 2013 to 2018, losing 180 net jobs. The only sectors forecast to grow in the region over this period are Computer Systems Design & Related Services (90 new jobs) and Internet Publishing & Broadcasting & Web Search Portals (10 new jobs).

Tulsa Region OK Information Security Target Trends

NAICS	Industry	2013 Employment	2013 LQ	2008 - 2013		Forecast, 2013 - 2018	
				Growth	New Jobs	Growth	New Jobs
518	Data Processing, Hosting and Related Services	260	0.33	-58.8%	(371)	-81.2%	(211)
5112	Software Publishers	217	0.25	-12.9%	(32)	-28.1%	(61)
5415	Computer Systems Design and Related Services	1,704	0.33	-2.5%	(44)	5.1%	87
51913	Internet Pub. & Broadcasting & Web Search Portals	73	0.18	-9.9%	(8)	8.2%	6
51919	All Other Information Services	5	0.13	-61.5%	(8)	-100.0%	(5)
Total		2,259	0.31	-17.0%	(463)	-8.1%	(184)

Source: Avalanche Consulting, EMSI Covered

Tulsa Neighborhood Areas

West Tulsa has a relatively high concentration of Information Security employment but the other two examined neighborhood areas have very low industry concentrations. West Tulsa has 290 Information Security jobs with an LQ of 1.1. The two concentrated sectors are Computer Systems Design & Related Services (280 jobs; 1.5 LQ) and All Other Information Services (5 jobs; 3.5 LQ). Computer Systems Design & Related Services is forecast to create another 30 jobs in West Tulsa from 2013 to 2018.

East Tulsa has 250 Information Security jobs with an LQ of 0.3. All sectors are less concentrated than the US average, but the largest sectors are Computer Systems Designs & Related Services (170 jobs; 0.3 LQ) and Software Publishers (60 jobs; 0.5 LQ). The overall Information Security industry is forecast to lose jobs in East Tulsa from 2013 to 2018, but Computer Systems Design & Related Services is projected to create 10 jobs.

North Tulsa has 450 Information Security jobs with an LQ of 0.3. All sectors are less concentrated than the US average, but the largest sectors are Computer Systems Design & Related Services (360 jobs; 0.4 LQ) and Software Publishers (75 jobs; 0.5 LQ). All Information Security sectors in North Tulsa are forecast to lose employment from 2013 to 2018.

Tulsa Neighborhood Areas Information Security Target Trends

NAICS	Industry	East Tulsa			North Tulsa			West Tulsa		
		Jobs	LQ	Forecast	Jobs	LQ	Forecast	Jobs	LQ	Forecast
518	Data Processing, Hosting and Related Services	17	0.17	(12)	11	0.08	(6)	5	0.17	(5)
5112	Software Publishers	59	0.52	(16)	75	0.47	(21)	0	0.00	0
5415	Computer Systems Design and Related Services	172	0.26	13	360	0.38	(14)	282	1.48	27
51913	Internet Pub. & Broadcasting & Web Search Portals	0	0.00	0	0	0.00	0	0	0.00	0
51919	All Other Information Services	0	0.00	0	0	0.00	0	5	3.47	(5)
Total		248	0.27	(15)	446	0.34	(41)	292	1.09	17

Source: Avalanche Consulting, EMSI Covered

Professional Services

About the Industry

Professional Services encompasses a wide array of occupations, including professional, technical, business, and support services. Despite differences that exist within the industry, Professional Services firms are characterized by their shared reliance on a skilled workforce, with education requirements ranging from advanced degrees to technical training. Examples of Professional Services companies include architecture, finance, engineering, accounting, design, management, business support, and other consulting firms.

During the past 30 years, Professional Services has been a vital source of US employment gains. As automation, technological development, and outsourcing have increased efficiencies in manufacturing industries, these traditionally large sectors have required fewer and fewer workers. Professional Services has been one of the rising industries to fill this gap and sustain national economic growth.

Professional Services generally require a higher level of education. A bachelor's degree is a prerequisite for most Professional Services jobs and many positions require a master's or technical degree as well. Due to elevated education requirements and the demand for specialized labor, Professional Services positions typically pay higher salaries.

Sufficient access to skilled workers is often the most important site requirement of Professional Services firms. The need to attract talented workers also leads firms to locations with high quality of life and amenities. The industry has few hard infrastructure requirements. Companies require broadband Internet and proximity to clients. Professional Services firms also frequently cluster in proximity to their clients and competitors.

During the recession, Professional Services employment dipped slightly in the US. As subsectors such as Finance, Insurance, and Real Estate begin to recover, the industry is expected to experience greater rates of job growth.

Tulsa Region

The Professional Services industry employs 57,800 in the Tulsa Region, with a US average LQ concentration of 1.0. The industry lost 5,700 jobs from 2008 to 2013 through the recession but is forecast to create another 4,000 from 2013 to 2018. Forecast growth is primarily in Administrative & Support & Waste Management & Remediation Services (3,400 new jobs) and Professional, Scientific, and Technical Services (630 new jobs).

The most concentrated Professional Services subsectors in the Tulsa Region are Administrative & Support & Waste Management & Remediation Services (31,900 jobs; 1.3 LQ) and Management of Companies & Enterprises (6,500 jobs; 1.0 LQ). Professional, Scientific, and Technical Services employs 19,400 in the region but only has an LQ of 0.8. Management of Companies & Enterprises was the only sector to grow from 2008 to 2013, creating 510 jobs locally.

Tulsa Region OK Professional Services Target Trends

NAICS	Industry	2013 Employment	2013 LQ	2008 - 2013		Forecast, 2013 - 2018	
				Growth	New Jobs	Growth	New Jobs
54	Professional, Scientific, and Technical Services	19,444	0.78	-3.8%	(765)	3.3%	633
55	Management of Companies and Enterprises	6,455	1.03	8.5%	508	-1.5%	(100)
56	Admin. & Support & Waste Mgmt. & Remed. Svcs.	31,879	1.25	-14.6%	(5,471)	10.7%	3,409
Total		57,778	1.02	-9.0%	(5,728)	6.8%	3,942

Source: Avalanche Consulting, EMSI Covered

Tulsa Neighborhood Areas

East Tulsa is the only of the three examined neighborhood areas with an above average concentration of Professional Services employment. East Tulsa has 10,700 Professional Services jobs, with an LQ of 1.5. The sector with above average concentration in East Tulsa is Administrative & Support & Waste Management & Remediation Services, which employs 8,200 with an LQ of 2.5. This sector is forecast to create an additional 1,700 jobs in East Tulsa from 2013 to 2018.

North Tulsa is home to 8,100 Professional Services jobs with an LQ of 0.8. The sector with above average concentration in North Tulsa is Management of Companies & Enterprises, which has 1,600 jobs and an LQ of 1.4. The sectors projected to create jobs in North Tulsa from 2013 to 2018 are Professional, Scientific, & Technical Services (150 new jobs) and Administrative & Support & Waste Management & Remediation Services (130 new jobs).

West Tulsa has only 1,400 Professional Services jobs with an LQ of 0.7. All Professional Services sectors in West Tulsa have below average concentration but the largest are Professional, Scientific, & Technical Services (700 jobs) and Administrative & Support & Waste Management & Remediation Services (520 jobs). The sectors forecast to create jobs in West Tulsa from 2013 to 2018 are Professional, Scientific, & Technical Services (73 new jobs) and Administrative & Support & Waste Management & Remediation Services (54 new jobs).

Tulsa Neighborhood Areas Professional Services Target Trends

NAICS	Industry	East Tulsa			North Tulsa			West Tulsa		
		Jobs	LQ	Forecast	Jobs	LQ	Forecast	Jobs	LQ	Forecast
54	Professional, Scientific, and Technical Services	1,775	0.56	(18)	4,246	0.94	147	697	0.76	73
55	Management of Companies and Enterprises	721	0.90	(8)	1,639	1.44	(57)	142	0.62	(4)
56	Admin. & Support & Waste Mgmt. & Remed. Svcs.	8,244	2.53	1,646	2,226	0.48	128	523	0.56	54
Total		10,740	1.48	1,620	8,111	0.79	218	1,362	0.66	123

Source: Avalanche Consulting, EMSI Covered

Transportation & Logistics

About the Industry

Transportation & Logistics is a fundamental support industry, encompassing the storage and distribution of materials, components, and finished goods and the transportation of passengers. Cities with strong manufacturing sectors, such as Tulsa, are highly dependent on Transportation & Logistics activities, particularly trucking, to maintain supply chains. Air Transportation is another critical sector of Transportation & Logistics, covering the travel of passengers, a critical need for many businesses, as well as cargo.

Increased global trade and new transportation technologies drive growth in the Transportation & Logistics industry. International trade agreements over the past 50 years have opened new markets for the import and export of minerals, materials, and manufactured products. In recent years, air cargo operations and the development of large cargo sea ships have fundamentally change the Transportation & Logistics industry, particularly for international distribution. Domestically, trucking and rail remain the primary means of distribution.

Tulsa Region

The Transportation & Logistics industry has above average concentration in the Tulsa Region but lost a significant number of jobs over the past five years. Transportation & Logistics employs over 10,800 in the Tulsa Region with an LQ of 1.4, but the industry declined 21% from 2008 to 2013, losing nearly 3,000 jobs. Job losses were spread across all sectors. The industry forecast for the next five years is mixed. Air Transportation is forecast to create only 20 jobs in the Tulsa Region from 2013 to 2018 and Warehousing & Storage 140 new jobs. These gains are offset by a projected loss of 340 jobs in Truck Transportation over the same period.

Tulsa Region OK

Transportation & Logistics Target Trends

NAICS	Industry	2013 Employment	2013 LQ	2008 - 2013		Forecast, 2013 - 2018	
				Growth	New Jobs	Growth	New Jobs
481	Air Transportation	6,200	4.55	-16.3%	(1,208)	0.3%	17
482	Rail Transportation	0	0.00	-	0	-	0
483	Water Transportation	0	0.00	-	0	-	0
484	Truck Transportation	3,953	0.94	-26.2%	(1,402)	-8.6%	(340)
4931	Warehousing and Storage	681	0.32	-33.7%	(346)	20.0%	136
Total		10,834	1.38	-21.4%	(2,956)	-1.7%	(187)

Source: Avalanche Consulting, EMSI Covered

The largest Transportation & Logistics sectors in the Tulsa Region are Air Transportation (6,200 jobs; 4.6 LQ); Truck Transportation (4,000 jobs; 0.9 LQ); and Warehousing & Storage (680 jobs; 0.3 LQ).

Tulsa Neighborhood Areas

All three examined neighborhood areas have above average concentrations of Transportation & Logistics employment, with the strongest cluster in East Tulsa. East Tulsa, home to the airport, has nearly 6,200 Transportation & Logistics jobs with an LQ of 6.1. The most concentrated sectors in East Tulsa are Air Transportation (5,200 jobs; 29.7 LQ) and Truck Transportation (920 jobs; 1.7 LQ). Both of these sectors are projected to lose jobs from 2013 to 2018, but Warehousing & Storage is forecast to create 20 jobs over this period.

North Tulsa employs nearly 1,600 in Transportation & Logistics, with an LQ of 1.1. The only sector with above average concentration in North Tulsa is Air Transportation (950 jobs; 3.9 LQ). The industry is forecast to create over 100 net jobs in North Tulsa from 2013 to 2018, with growth in Air Transportation (160 new jobs) and Warehousing & Storage (40 new jobs) but declines in Truck Transportation.

West Tulsa has 370 Transportation & Logistics jobs, with an LQ of 1.3. The only meaningful sector in West Tulsa is Truck Transportation, which has 360 jobs in the neighborhood area and an LQ of 2.3. Like the rest of the region, this sector is forecast to lose jobs over the next five years.

Tulsa Neighborhood Areas Transportation & Logistics Target Trends

NAICS	Industry	East Tulsa			North Tulsa			West Tulsa		
		Jobs	LQ	Forecast	Jobs	LQ	Forecast	Jobs	LQ	Forecast
481	Air Transportation	5,148	● 29.66	(145)	953	● 3.86	155	0	○ 0.00	0
482	Rail Transportation	0	○ 0.00	0	0	○ 0.00	0	0	○ 0.00	0
483	Water Transportation	0	○ 0.00	0	0	○ 0.00	0	0	○ 0.00	0
484	Truck Transportation	919	● 1.72	(288)	473	● 0.62	(87)	355	● 2.31	(16)
4931	Warehousing and Storage	87	○ 0.33	19	145	○ 0.38	36	10	○ 0.13	2
Total		6,154	● 6.14	(414)	1,571	● 1.10	104	365	● 1.27	(14)

Source: Avalanche Consulting, EMSI Covered

Strengths, Weaknesses, Opportunities, & Threats (SWOT)

The consulting team has spent numerous days in Tulsa interviewing leadership, stakeholders, businesses, residents, and numerous education and workforce leaders. Over the course of this project the consulting team engaged with over 50 organizations/institutions and received input for this report and analysis from over 100 individuals. The following section summarizes the findings from these interviews, providing an inventory of Tulsa’s Strengths, Weaknesses, Opportunities, and Threats (SWOT). The SWOT is specifically focused on the Education and Workforce System at the Tulsa Region level as well as within the three target neighborhood areas: East, North and West Tulsa. The following list represents a vast sample of the groups the consulting team engaged with to create this SWOT overview.

- OESC & DESI - Workforce
- Dream It Do It, OK2Grow, High School Drop Out Prevention, Career Pathways
- Transportation Connections WorkAdvance - Madison Strategies
- Workforce Tulsa
- City of Tulsa
- MidAmerican Industrial Park - Business & Industry partners
- MidAmerican Industrial Park - Community, Education & Workforce partners
- Manpower
- Road Trip for Teachers participants and companies
- Tulsa Public Schools
- Broken Arrow Public Schools
- Jenks Public Schools
- Union Public Schools - Collegiate Academy
- Union Public Schools Adult Education Programs
- Tulsa Tech
- Tulsa Community College
- Tulsa Community College Outreach Centers
- Tulsa Regional STEM Alliance
- Tulsa Chamber Economic Development Staff
- OSUIT
- YWCA Immigration Services
- Sapulpa Economic Development
- The Port of Catoosa
- Goodwill Industries
- Tulsa Area United Way
- OK Department of Commerce
- Chamber's Education & Workforce staff
- NTEDi
- Manufacturing Employers
- Professional Services/IT Employers
- Transportation & Logistics Employers
- Healthcare Employers
- Aerospace Employers
- Energy Employers
- Call Center Employers
- Employer Workforce Outlook
- Neighborhood Meetings (6) in East, North and West Tulsa

Tulsa Region – Education & Workforce

Strengths	Challenges
<ul style="list-style-type: none"> • Tulsa Regional STEM Alliance has brought together more than 60 agencies to address local challenges • Technology Centers are a very strong assets for training, work directly with employers • Manufacturing workforce is one of the best in the country, with skills in numerous subsectors • Oklahoma’s Early Childhood Education programs are some of the best in the nation • TCC, Tulsa Tech, OSU, and others all offer strong programs throughout the community 	<ul style="list-style-type: none"> • Many residents are unaware of careers that are growing locally and training programs that are available to them • Maintenance positions are particularly challenging to fill • Soft skills are a common challenge • Many residents face transportation issues; public transportation options are limited • Difficulty getting employers involved in STEM Mentoring • Many organizations are operating in silos without communicating with each other, which creates gaps and redundancies • Recruiting top-level talent can be challenging due to perceived quality of life issues and lower salaries than some cities • Pipeline industry has been luring workers away
Opportunities	Threats
<ul style="list-style-type: none"> • Advertising for middle and high school training programs at sporting events • Need to help residents become more aware of career and training opportunities available throughout the region • By getting more employers and educators at the table, discussing their specific needs, programs can be better aligned • Need to educate people about the nature of modern manufacturing and the opportunities available in manufacturing careers • “Ban the box” – stop punishing people after they get out of the prison system by restricting their employment opportunities 	<ul style="list-style-type: none"> • If employers are unwilling to do their share of on-the-job training, educators will be unable to meet all of their training needs • If potential employees are not better prepared with soft skills, STEM skills, and other basic education, they will still not be ready for on-the-job training opportunities offered by employers • Without better IT training programs at all levels and IT job creation, Tulsa may continue to miss out on future opportunities

East Tulsa – Education & Workforce

Strengths	Challenges
<ul style="list-style-type: none"> • Large Manufacturing base in the community • Presence of Call Centers offer entry level job opportunities for residents • Trio Center doing outreach to dynamic cultural base in community about job and training opportunities • Catholic Charities conducting Hispanic centered meetings in East Tulsa • Support for Bridges Out of Poverty program through Catholic Charities outreach • “Job Club” events offered every 3rd Wednesday of the month through the One Stop center to keep residents connected to job opportunities and available training programs 	<ul style="list-style-type: none"> • Limited access to High School and other English as a Second Language and Adult Basic Education programs • Lack of connection to the education system from High School to Higher Education • Large presence of For-Profit institutions across the Region and in East Tulsa • Minimal understanding of the career opportunities available within the Aerospace and Aviation sector (largely based in East Tulsa) • Highest mix of cultures, over 27 nationalities represented in East Tulsa • Limited access to bus lines going into East Tulsa
Opportunities	Threats
<ul style="list-style-type: none"> • Expansion of the Tulsa Community College outreach efforts in East Tulsa • Connect workforce efforts (outreach, job placement, job awareness and training opportunities) through the Faith Based Organizations as center of gravity in East Tulsa • Utilize the cultural outreach efforts through Catholic Charities to connect with other non-Hispanic residents • Development of Chartered based schools to meet the needs of historically underserved populations in East Tulsa • Expected growth in manufacturing and production level positions in the next five years 	<ul style="list-style-type: none"> • Lack of transportation a key issue in East Tulsa • Cultural mix of residents presents a scalability challenge for outreach and social services • US Citizen Documentation barriers create a perceived fear of education and participation in the labor market

North Tulsa – Education & Workforce

Strengths	Challenges
<ul style="list-style-type: none"> • Higher share of residents working locally than other neighborhood areas • Strong network of community, religious and social services, including education, healthcare, mentoring and related services • Mayoral support for Housing, Workforce Development, Branding and Business Development • Active local leadership focusing on economic development of the North Tulsa area • Tulsa Technology Center, Tulsa Community College and OSU presence • Strong and advancing occupational clusters including Medical, Manufacturing Operations, Engineering and Geology 	<ul style="list-style-type: none"> • Limited transportation options for commuting within and outside of the neighborhood area • There is a history of disinvestment and residential flight • Relatively high proportion of formerly incarcerated individuals, a significant barrier to employment • Local economic development focused on lower-wage retail • Existing educational assets are aimed at lower-wage, lower growth occupations • Small business lending is a challenge • High School career programs have been slow to get off the ground
Opportunities	Threats
<ul style="list-style-type: none"> • Align education and training programs with strong and emerging occupational/industry areas • Enhance Career and Technical programs at the secondary level • There is an Industrial Park in North Tulsa which could be a venue for job creation in high wage occupations • Workforce Tulsa could expand its presence at the Urban League • Emerging transportation possibilities include van pooling to reach industrial areas • Most occupational areas are expected to grow in the coming years 	<ul style="list-style-type: none"> • Transportation barriers may be very difficult to address • The network of community, religious and social services is difficult to coordinate and align • Reluctance to hire ex-offenders severely limits individuals' options for lawful employment • Addressing the immediate need for commercial development in the area to support consumers offers only very limited opportunities for livable wages • Relatively low educational attainment rates prevent many residents from attaining the best jobs available in the community

West Tulsa – Education & Workforce

Strengths	Challenges
<ul style="list-style-type: none"> • Strong sense of community in West Tulsa; many residents were born and raised locally • Community leadership, including the local chamber, are engaged and willing to continue building partnerships and programs • Job growth has been strong in West Tulsa, but many residents are not getting these jobs • Goodwill Industries has a strong presence. Representing Tulsa Works they help people get jobs, offering training, Life Skills boot camp, and other programs • Many strong programs and organizations: OESC, DESI, TCC, Tulsa Tech, Rapid Response Sessions, Veteran’s program, Tulsa Achieves 	<ul style="list-style-type: none"> • Many residents are unaware of organizations and programs that are available to assist them in finding work and education • Bus service is highly limited in Tulsa: “does not go where you want to go or when you want to go” • Limited availability of child care, particularly in the evenings and on the weekends, makes it difficult for many residents to attend training and seek jobs • Stringent employer requirements about hiring residents with former convictions limits a lot of opportunities; many employers are not knowledgeable about programs like OESC that help • Soft skills are a major challenge • Many training programs require Pell grants and are predicated on a “livable wage” which limits opportunities for some residents and jobs
Opportunities	Threats
<ul style="list-style-type: none"> • Through better marketing, residents could be made more aware of the many good programs available in West Tulsa • Better educating the community about the necessity of further education and lifelong learning, including computer and STEM skills, will help them participate more in the workforce • Better educating employers about successful programs to get residents with convictions back to work will help raise trust and increase labor participation • Need to make sure the educators are emphasizing training in jobs that are being created, particularly in industrial machinery and other manufacturing fields • Looking for partnerships to engage the youth: faith-based 	<ul style="list-style-type: none"> • Limited funding and legal restrictions on marketing make it hard for local educational and other programs to raise awareness. Without increase funding for marketing of programs, many residents will remain unaware of them • If training programs relevant to West Tulsa employers are not offered within West Tulsa or developed along regular bus lines, many residents will be unable to reach them • There is a fear that many residents are getting heavily in debt to private educational programs that offer poor training and degrees

Part 2 – Education and Training Landscape

Beginning in High School, students begin to think longer term about the importance of their studies and the associated career opportunities those choices allow. Sometimes these decisions about academic courses and associated career pathways begin even earlier in a students' career. In addition to traditional academic content, helping High School students in Tulsa understand the range of career opportunities that are available in the local economy is also critical to students learning and planning. The following provides an overview of the Career and Technical Education (CTE) offerings in Tulsa presently. This review provides a greater understanding of the types of pathways available to students across the Tulsa MSA. These academic programs address skills that are important to Tulsa's target industries, and provide foundational skills that can enable access to jobs, careers and to higher level education and training.

High School Level Program Alignment and Overview

Beginning in High School, students begin to think longer term about the importance of their studies and the associated career opportunities those choices allow. Sometimes these decisions about academic courses and associated career pathways begin even earlier in a students' career. In addition to traditional academic content, helping High School students in Tulsa understand the range of career opportunities that are available in the local economy is also critical to students learning and planning. The following section will highlight the CTE programs offered and how they relate to the target sections in the Tulsa region, as well as some high level recommendations for these programs.

High School Career and Technical Education Programming

Tulsa offers Career and Technical Education (CTE) focused programming within the scope of traditional high school courses. These CTE offerings address skill development in a number of areas which support skill needs of the target sectors in Tulsa, and are often the first place where students learn about specific career areas and their relationship to learning at the high school level and beyond. The following graphs show the availability of programs at each school district across the Region and in the East, North and West areas of Tulsa.

The overview highlights key areas that are strongly represented throughout the region versus those programs that are underrepresented, relative to their importance in the regional economy. For example, the programs most frequently offered by schools in the area are Information Specialist (Computers), Finance, and Manufacturing programs. These are key areas that will be in demand in the local economy.

Conversely, there are a number of programs that address key talent and skill gaps in the local economy, but which nonetheless are rarely offered in the region, and in some cases have only one program across all districts. Aviation and Aerospace, Energy, and Transportation and Logistics all represent strong career

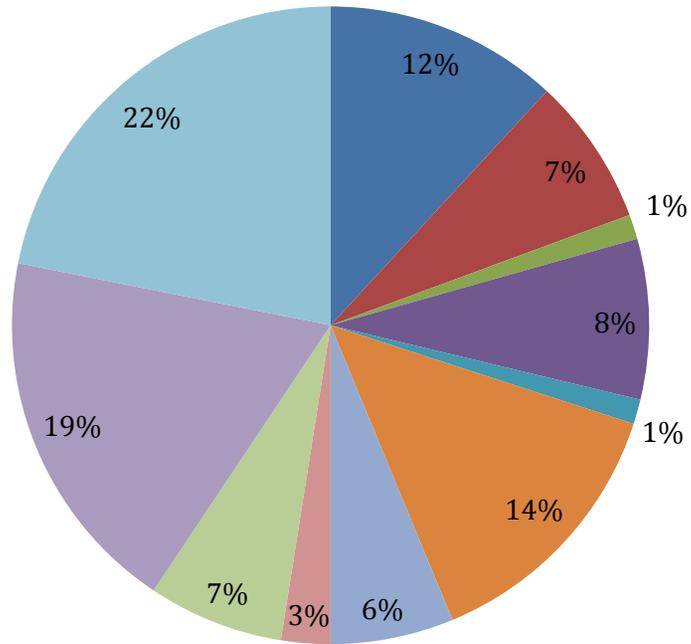
opportunities locally. However, there are few programs offered in the region that support Aviation Maintenance, Production and Aerospace Management competencies. It is suggested that the region increase program offerings and availability here in order to support future demand.

However, there is a messaging challenge associated with the skills development area. Most students believe that when they are on the Pre-Engineering pathway, they will need to pursue a 4-year degree or higher in order to find high wage sustainable employment. In Tulsa there are a number of industries that are looking for talent with engineering skills at the technician level. In fact, these are some of the skill sets that are hardest to find. It is important to continue growing these Pre-Engineering programs in terms of availability for students while also addressing messaging that emphasizes local career opportunities available to students who do not immediately pursue a four-year degree.

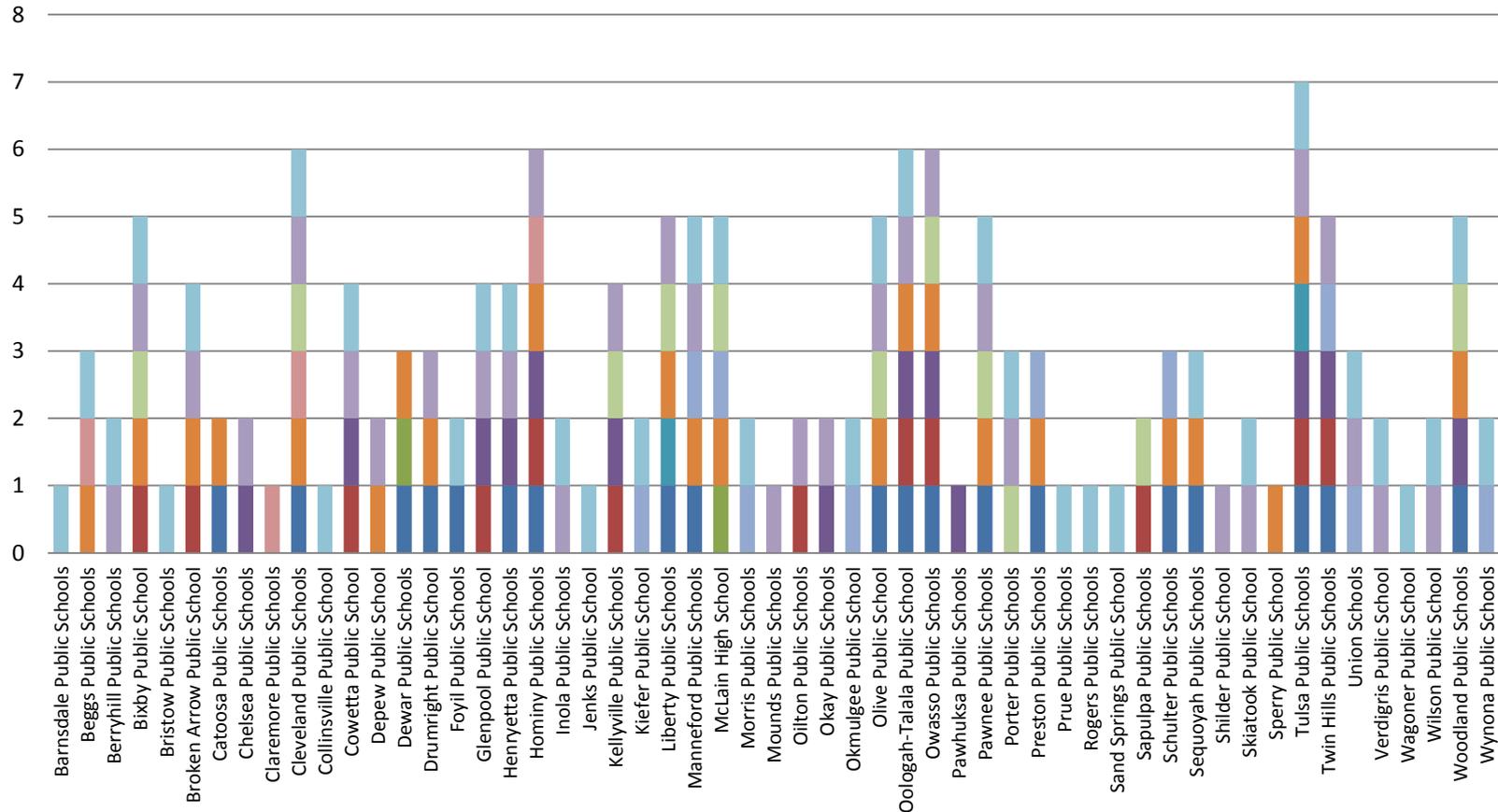
The graphs on the following pages show program availability and the alignment each program has with the target sectors and competencies in the region.

Tulsa MSA High School Career and Technical Programs

- Manufacturing Programs (19)
- Aviation and Aerospace Programs (2)
- Energy Programs (2)
- Information Security Programs (10)
- Geology Programs (11)
- Information Specialist (Computers) Programs (35)
- Accounting Programs (12)
- Marketing Programs (13)
- Engineering Programs (22)
- Transportation and Logistics Programs (4)
- Finance Programs (30)



High School Career and Technical Education Programs



- Manufacturing Programs
- Marketing Programs
- Information Security Programs
- Finance Programs
- Accounting Programs
- Energy Programs
- Transportation and Logistics Programs
- Information Specialist (Computers) Programs
- Aviation and Aerospace Programs
- Engineering Programs
- Geology Programs

Tulsa High School Career and Technical Education Programs by School District

The following charts show the program types offered at each Tulsa high school district. Notable in this overview is the limited program availability in support of Aviation and Aerospace, Information Security, Energy, and Transportation and Logistics programs across these school districts. While there is a strong presence of Engineering, Information Specialist (Computers), and Finance programs within the districts, it would be beneficial to add more programs within Aviation and Aerospace, general Information Security, Manufacturing, and Energy, given that these are areas forecasted for growth. Increasing these offerings at the CTE level fosters more opportunities for academic and career pathways in related programs.

School District	Program Competency										
	Accounting	Aviation and Aerospace	Energy	Engineering	Finance	Geology	Information Security	Information Specialist (Computers)	Manufacturing	Marketing	Transportation and Logistics
Barnsdale Public Schools											
Beggs Public Schools											
Berryhill Public Schools											
Bixby Public School											
Bristow Public Schools											
Broken Arrow Public School											
Catoosa Public Schools											
Chelsea Public Schools											
Claremore Public Schools											
Cleveland Public Schools											
Collinsville Public School											
Cowetta Public School											
Depew Public School											
Dewar Public Schools											
Drumright Public School											
Foyil Public Schools											
Glenpool Public School											
Henryetta Public Schools											
Hominy Public Schools											

School District	Program Competency										
	Accounting	Aviation and Aerospace	Energy	Engineering	Finance	Geology	Information Security	Information Specialist (Computers)	Manufacturing	Marketing	Transportation and Logistics
Inola Public Schools											
Jenks Public School											
Kellyville Public Schools											
Kiefer Public School											
Liberty Public Schools											
Maneford Public Schools											
McLain High School											
Morris Public Schools											
Mounds Public Schools											
Oilton Public Schools											
Okay Public Schools											
Olive Public School											
Okmulgee Public School											
Oologah-Talala Public School											
Owasso Public Schools											
Pawhusa Public Schools											
Pawnee Public Schools											
Porter Public Schools											

School District	Program Competency										
	Accounting	Aviation and Aerospace	Energy	Engineering	Finance	Geology	Information Security	Information Specialist (Computers)	Manufacturing	Marketing	Transportation and Logistics
Preston Public Schools											
Prue Public Schools											
Rogers Public Schools											
Sand Springs Public School											
Sapulpa Public Schools											
Shilder Public School											
Schulter Public Schools											
Sequoyah Public Schools											
Skiatook Public School											
Sperry Public School											
Tulsa Public Schools											
Twin Hills Public Schools											
Union Schools											
Verdigris Public School											
Wagoner Public School											
Wilson Public School											
Woodland Public Schools											
Wynona Public Schools											

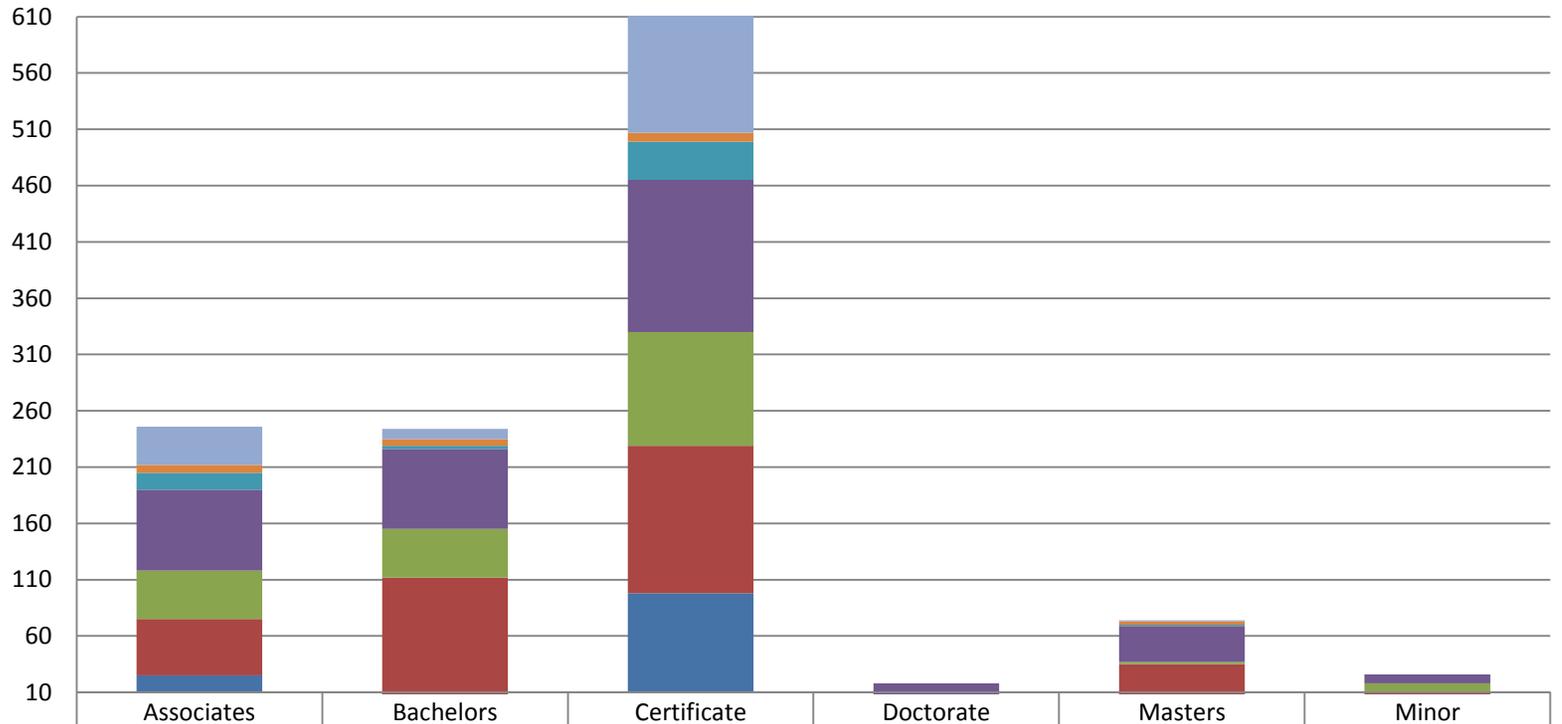
Post-Secondary Education Assets Review

Sector/Competency and Institutional Overview: Post-Secondary Institutions

The first graph shown below (**Credentials per Sector & Competency**) details the total number and type of credential offered supporting each target sector and competency (Associate, Bachelor, etc.). This graph shows how some sectors and competencies have more programs supported at different levels. Notably there are more than double Certificate level programs than any other Post-Secondary credential within the region, and there are a minimal number of Doctorate programs offered in the area in any discipline. Professional Services, Healthcare, and Advanced Manufacturing comprise the majority of Certificate programs offered, while Aviation and Aerospace is only marginally represented. This focus on Professional Services and Healthcare is also replicated at the Associate and Baccalaureate levels. Interestingly, there is an equal number of Information Security programs offered at both the Associate and Baccalaureate level. The primary options for a Masters degree within these sectors are within the Professional Services and Healthcare, a handful of options in Information Security, Aviation/Aerospace, and Transportation and Logistics, and no options for Advanced Manufacturing.

These graphs indicate that the Tulsa region currently aims on the lower end of the spectrum of credentials offered. There is a heavy focus on certificate level skills rather than higher level work that could lead to individuals reaching the Baccalaureate level and above. Shifting the focus towards these higher level programs could eventually create a critical mass of high level skills that employers in the Tulsa region would find very desirable.

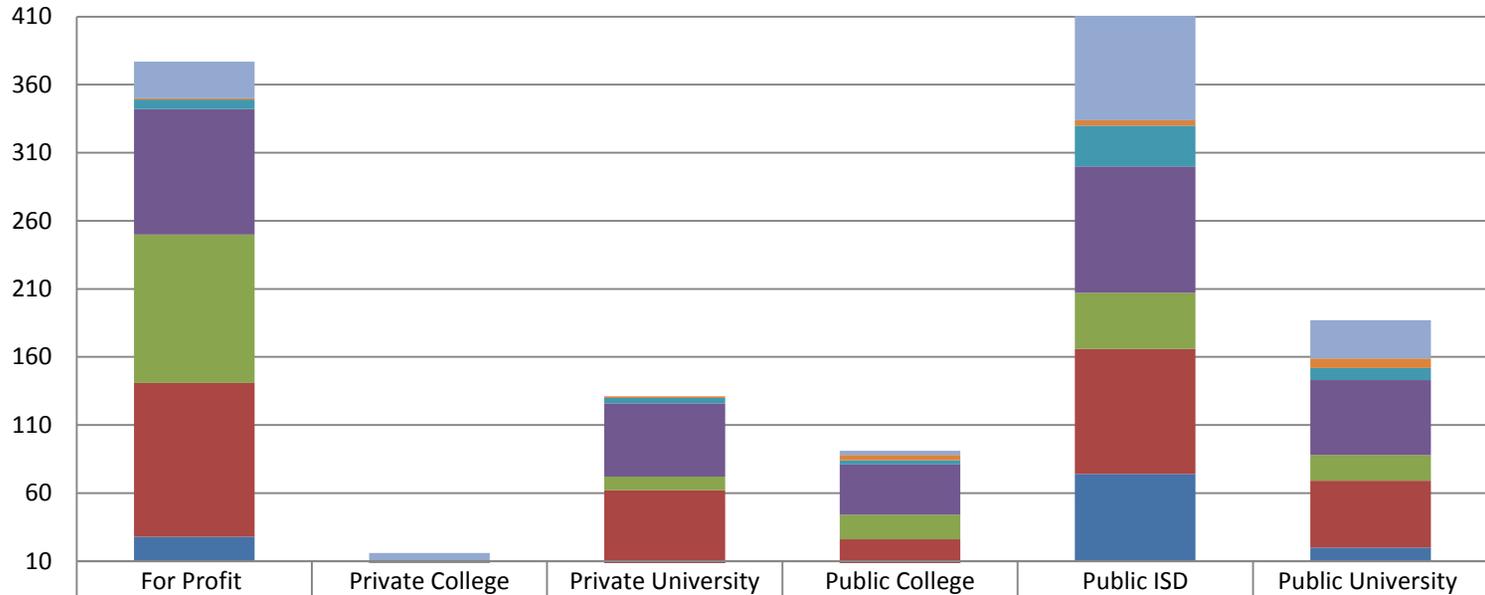
Higher Education Credentials per Sector and Competency



	Associates	Bachelors	Certificate	Doctorate	Masters	Minor
Advanced Manufacturing	34	9	157		1	
Aviation/Aerospace	7	6	8		3	
Energy	15	3	34		1	
Healthcare	72	71	135	13	32	8
Information Security	43	43	101	1	2	7
Professional Services	50	110	131	4	34	11
Transportation and Logistics	25	2	98		1	

The second graph (**Type of Institution Programs per Sector and Competency**) details the type of institution which offers education and training opportunities supporting the target sectors and competencies. The data shows a significant percentage of targeted skill development programs are offered at For Profit Institutions and Public Independent School Districts, specifically for Advanced Manufacturing, Information Security, Professional Services, and Healthcare. These totals more than double the programs represented by both public and private institutions in the area.

Type of Institution Programs per Sector and Competency

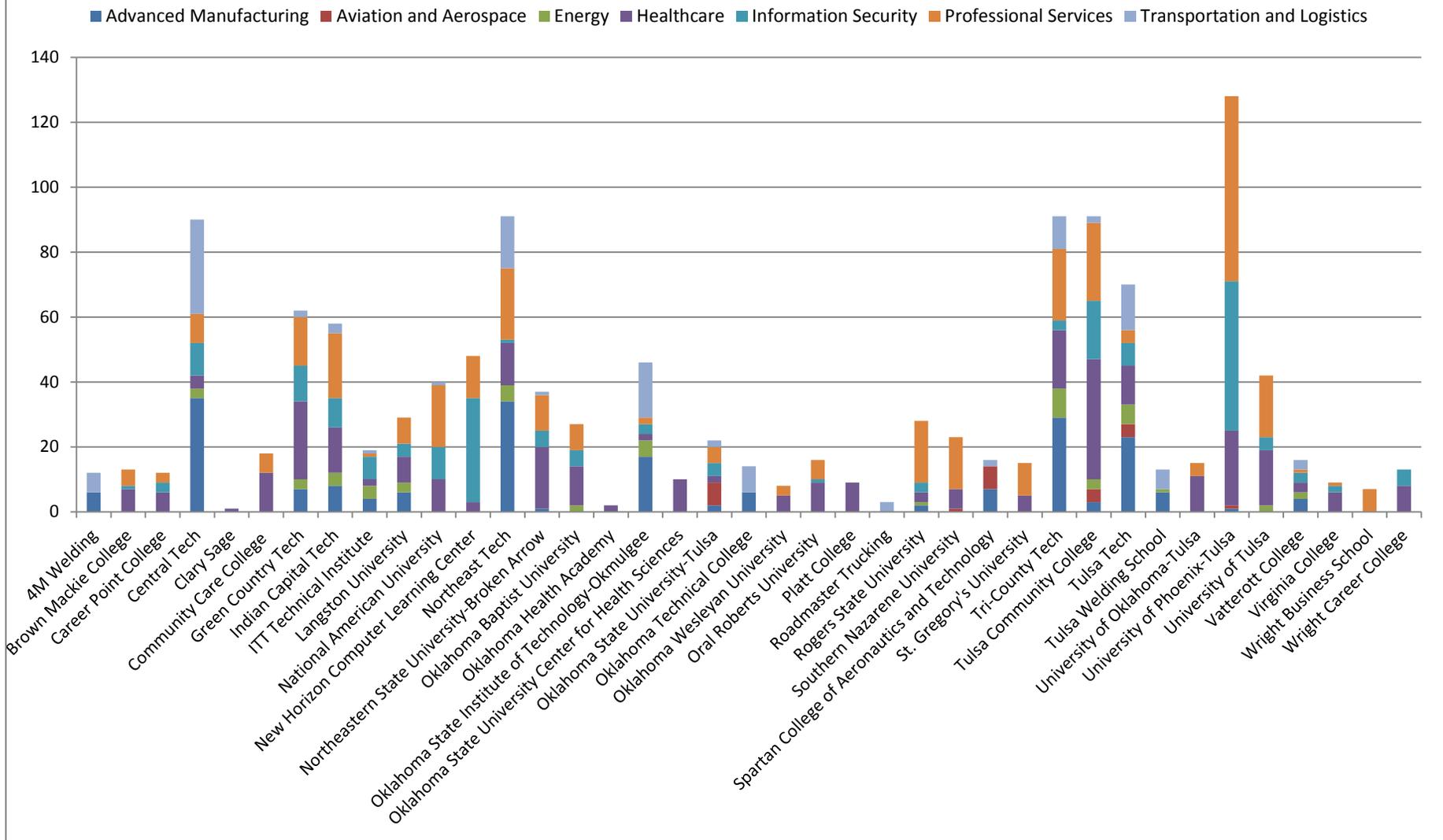


	For Profit	Private College	Private University	Public College	Public ISD	Public University
Advanced Manufacturing	27	7		3	136	28
Aviation/Aerospace	1	7	1	4	4	7
Energy	7		4	3	30	9
Healthcare	92		54	37	93	55
Information Security	109		10	18	41	19
Professional Services	113		62	24	92	49
Transportation and Logistics	28	2		2	74	20

The last graphs in this section (**Programs per Institution by Sector**) provide further detail for programming in each sector within the collection of education and training programs in Tulsa. University of Phoenix-Tulsa is the standout in this section as offering not only the most programs, but the most programs in Professional Services and Information Security. With the exception of a few institutions, namely Central Technology Center, Northeast Technology Center, Tri-County Career Tech, Tulsa Technology Center and Tulsa Community College, comparatively fewer programs are offered in the region at the more traditional institutions. This is true both of the higher and lower level programs. Clearly there are many offerings available to curate a talented local pipeline, both from the Technical College and 4 year institution perspectives, the question becomes whether or not these programs are addressing critical skills gap as perceived by employers. Back up data totals are provided for each sector and institution in the chart below the second graph and in the appendix.

While there are many programs available in the Tulsa region, the amount of for-profit programs offered outweighs the number of other programs offered by the colleges and universities in the region. Clearly there is enough capacity within the learner market to support a wide array of institutions and programs. However, we need a way of understanding what each program offers in terms of content, application, the population that is served, and the benefits provided in the job search.

Higher Education Programs per Institution by Sector



Sector Program Analysis

To following target sector inventory provides the foundation for analysis on each sector. The analysis looked at the following sectors across Regional Tulsa:



Advanced Manufacturing



Aerospace and Aviation



Energy



Healthcare



Information Security



Professional Services



Transportation and Logistics

Each target sector reviewed in the inventory analysis provides the following Higher Education detail in chart format:

- **Program Credential Type** (Pie Chart) –shows the percentage breakdown of the type of credentials (Certificate through Doctorate) per sector programs
- **Programs and Institution Types** (Bar Graph) –compares type of credential and institution (For Profit, Public College, Private University, etc.) per sector
- **Competency Program per Institution** (Bar Graph) –provides a side by side comparison for each institution and the competency addressed per sector
- **Competency Programs by Credential Type** (Bar Graph) –provides a competency and credential overview per sector
- **Sector Matrix** – each sector has a matrix included which details, by each competency, what type of credential is offered and by what institution in Tulsa the program is available

Through this analysis, the Tulsa region will have further insight into how more mature markets are addressing target sector skills needs, and how Tulsa can adjust its target sector mix of offerings to strengthen its ability to support and attract those industries.

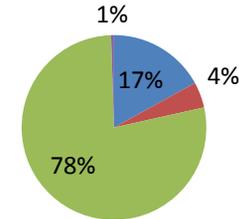
Advanced Manufacturing Programs

Overall the Advanced Manufacturing Sector in Tulsa has a high number of Certificate programs and a very low number of Bachelors degrees offered. The majority of these programs are held in Welding Technology and Automotive Technology. There are almost no programs offered in Supply Chain Management.

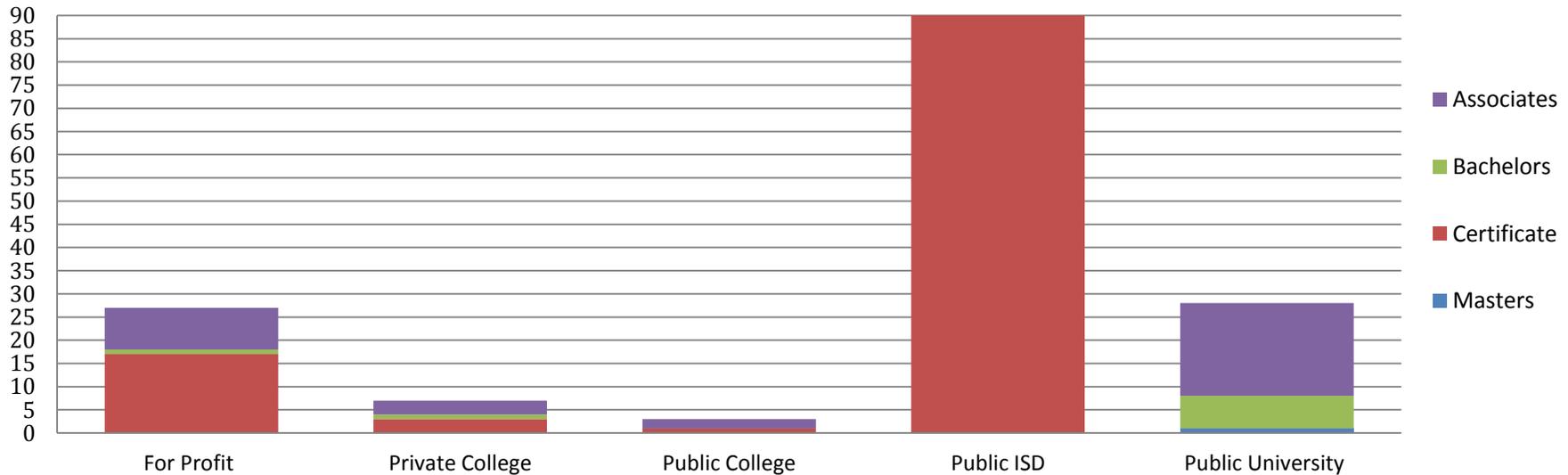
This information is important to understand in terms of types of programs to be developed in the future for Advanced Manufacturing-specific skill development in Tulsa.

Advanced Manufacturing Programs Credential Type Total

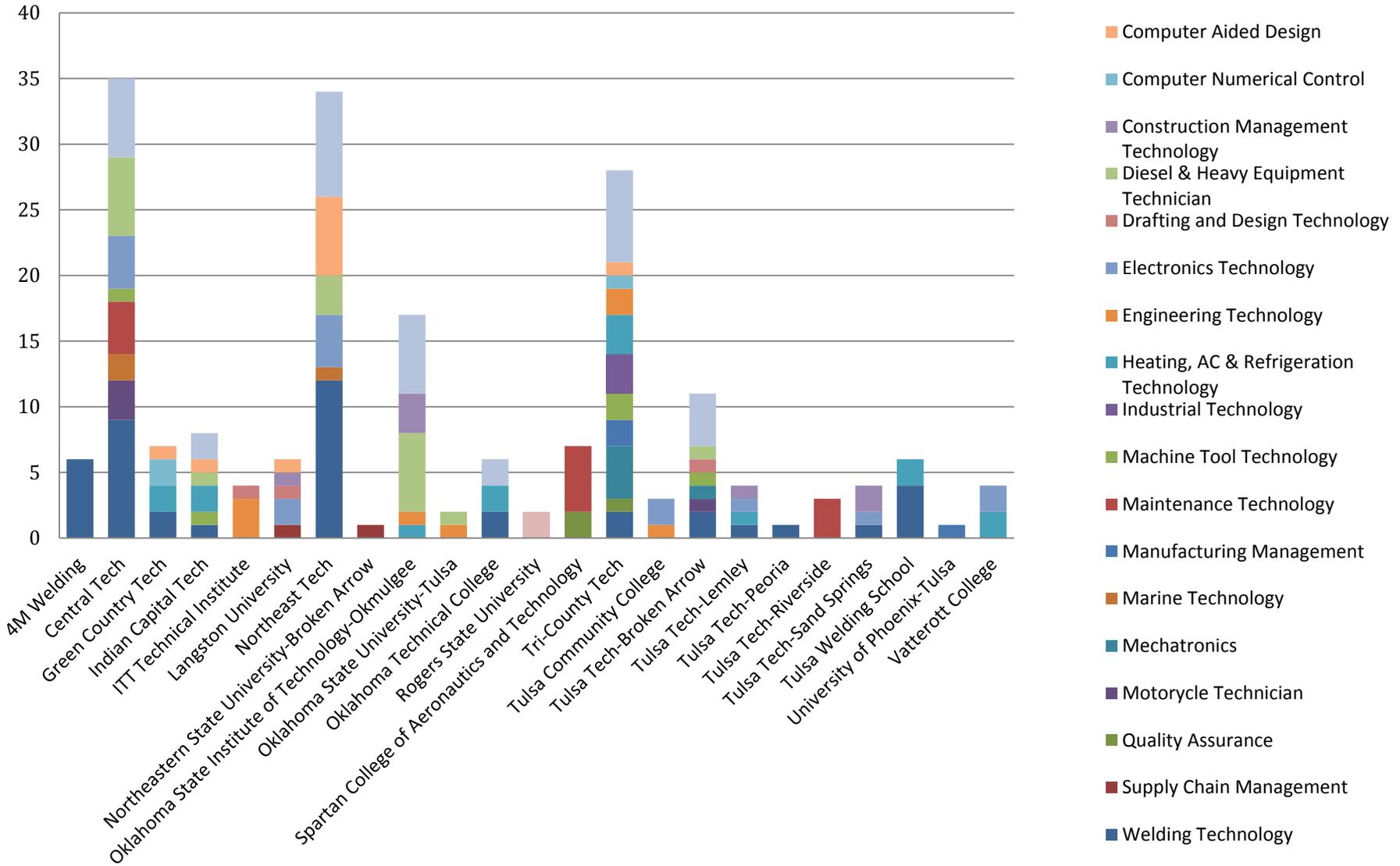
■ Associates ■ Bachelors ■ Certificate ■ Masters



Advanced Manufacturing Programs and Institution Types

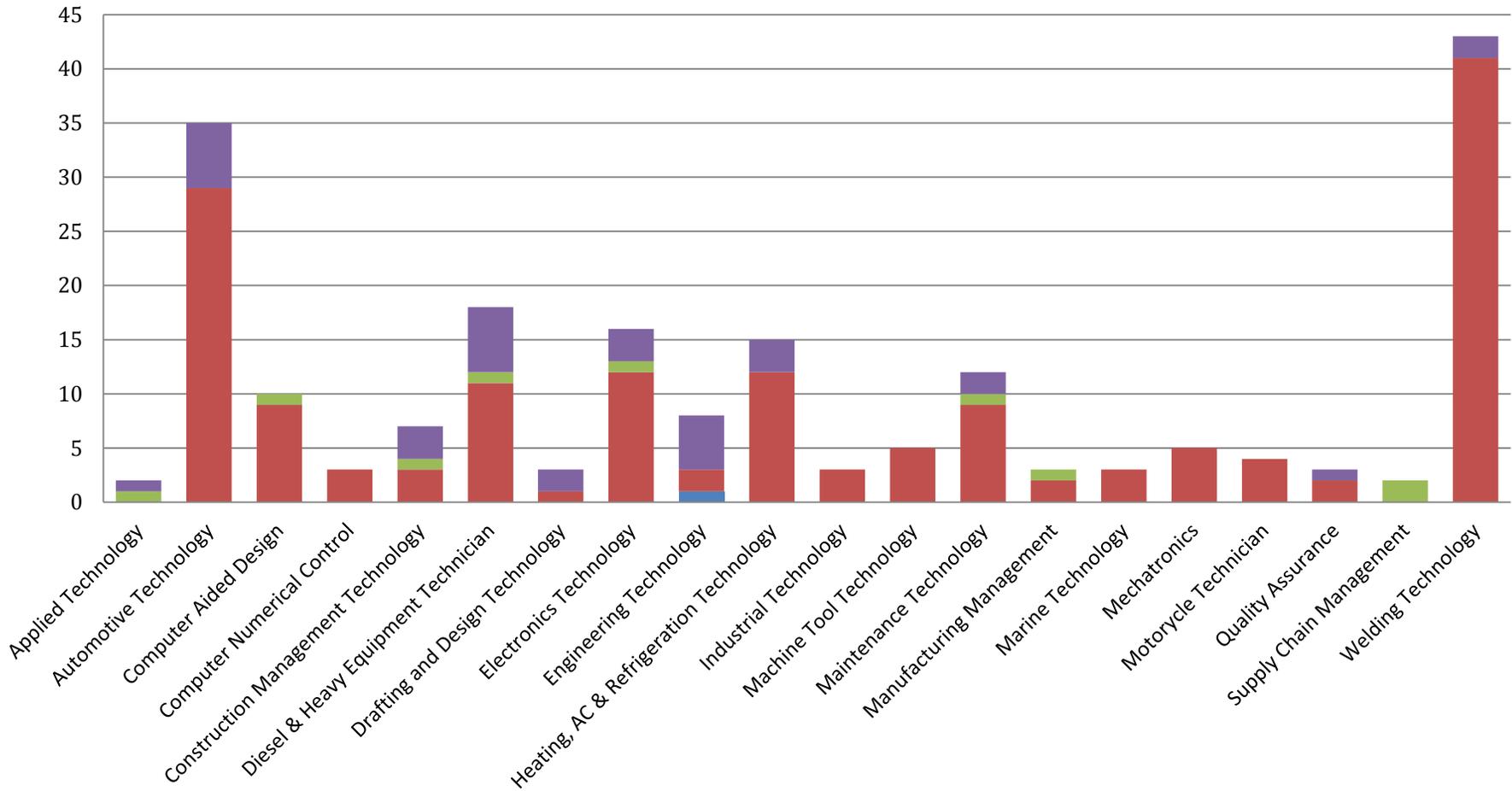


Advanced Manufacturing Programs per Institution



Advanced Manufacturing Programs by Credential Type

■ Masters ■ Certificate ■ Bachelors ■ Associates



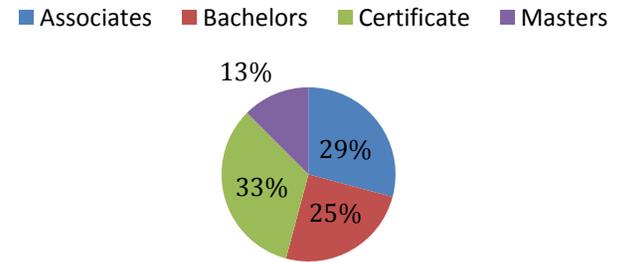
Advanced Manufacturing Program Competencies

	4M Welding	Central Tech	Green Country Tech	Indian Capital Tech	ITT Technical Institute	Langston University	Northeast Tech	Northeastern State University- Broken Arrow	Oklahoma State Institute of Technology-Okmulgee	Oklahoma State University- Tulsa	Oklahoma Technical College	Rogers State University	Spartan College of Aeronautics and Technology	Tri-County Tech	Tulsa Community College	Tulsa Tech- Broken Arrow	Tulsa Tech-Lemley	Tulsa Tech-Peoria	Tulsa Tech-Riverside	Tulsa Tech-Sand Springs	Tulsa Welding School	University of Phoenix-Tulsa	Vatterott College
Applied Technology												B, A											
Automotive Technology		C		C			C		A		C			C		C							
Computer Aided Design			C	C		B	C							C									
Computer Numerical Control			C											C									
Construction Management Technology						B			A							C					C		
Diesel & Heavy Equipment Technician		C		C			C		A	B													
Drafting and Design Technology					A	A										C							
Electronics Technology		C				B, A	C								A, C		C				C		A, C
Engineering Technology					C				A	M				A	A								
Heating, AC & Refrigeration Technology			C	C					A		A, C			C			C				C		A, C
Industrial Technology														C									
Machine Tool Technology		C		C										C		C							
Maintenance Technology		C											B, A, C										C
Manufacturing Management														C								B	
Marine Technology		C					C																
Mechatronics														C		C							
Motorcycle Technician		C														C							
Quality Assurance													A, C	C									
Supply Chain Management						B		B															
Welding Technology	C	C	C	C			C				A, C			C		C	C	C		C	A, C		

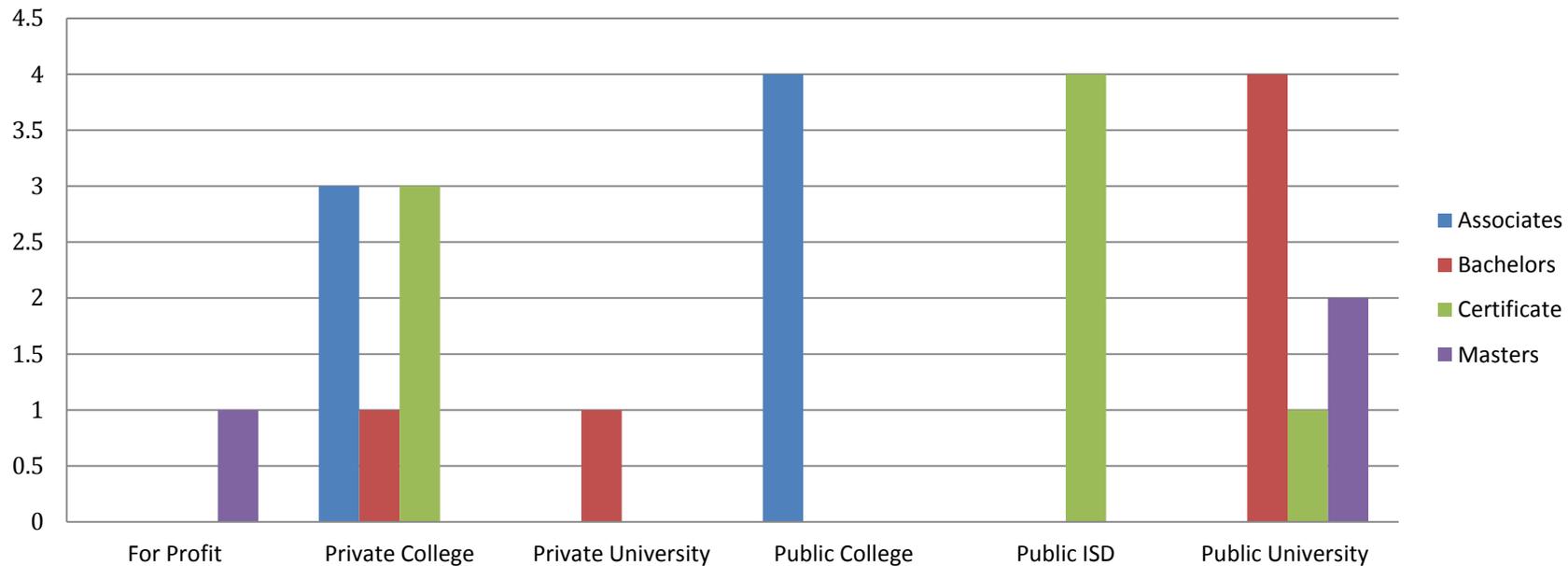
Aerospace and Aviation Programs

Overall Aerospace and Aviation Sector in Tulsa has a relatively even distribution of programs offered for Associates, Bachelors, and Certificate programs. Oklahoma State University-Tulsa and Spartan College of Aeronautics and Technology offer the same number of programs, but differ in the specific programs, such as Aerospace Security and Flight.

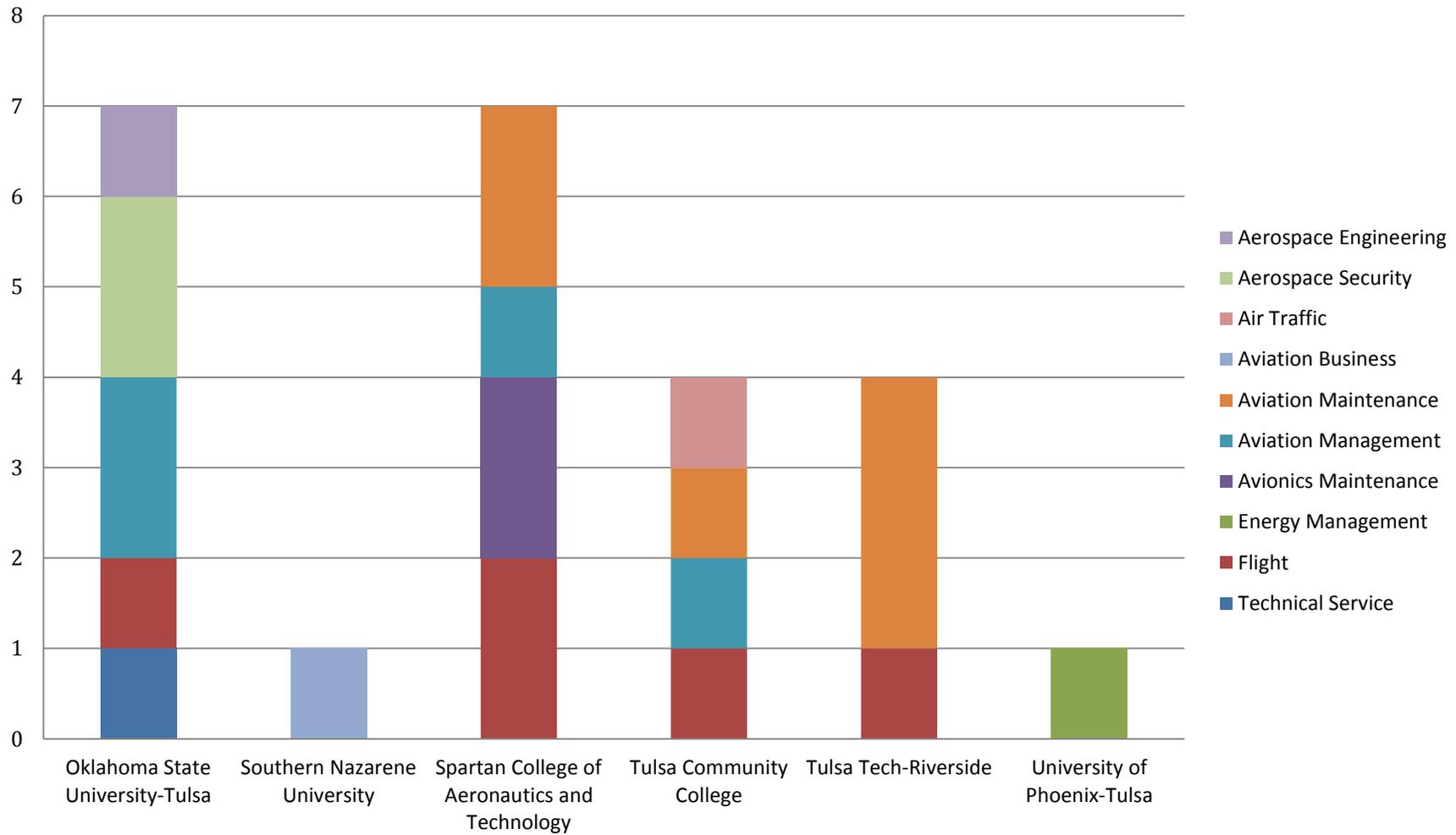
Aerospace Credential Type Total



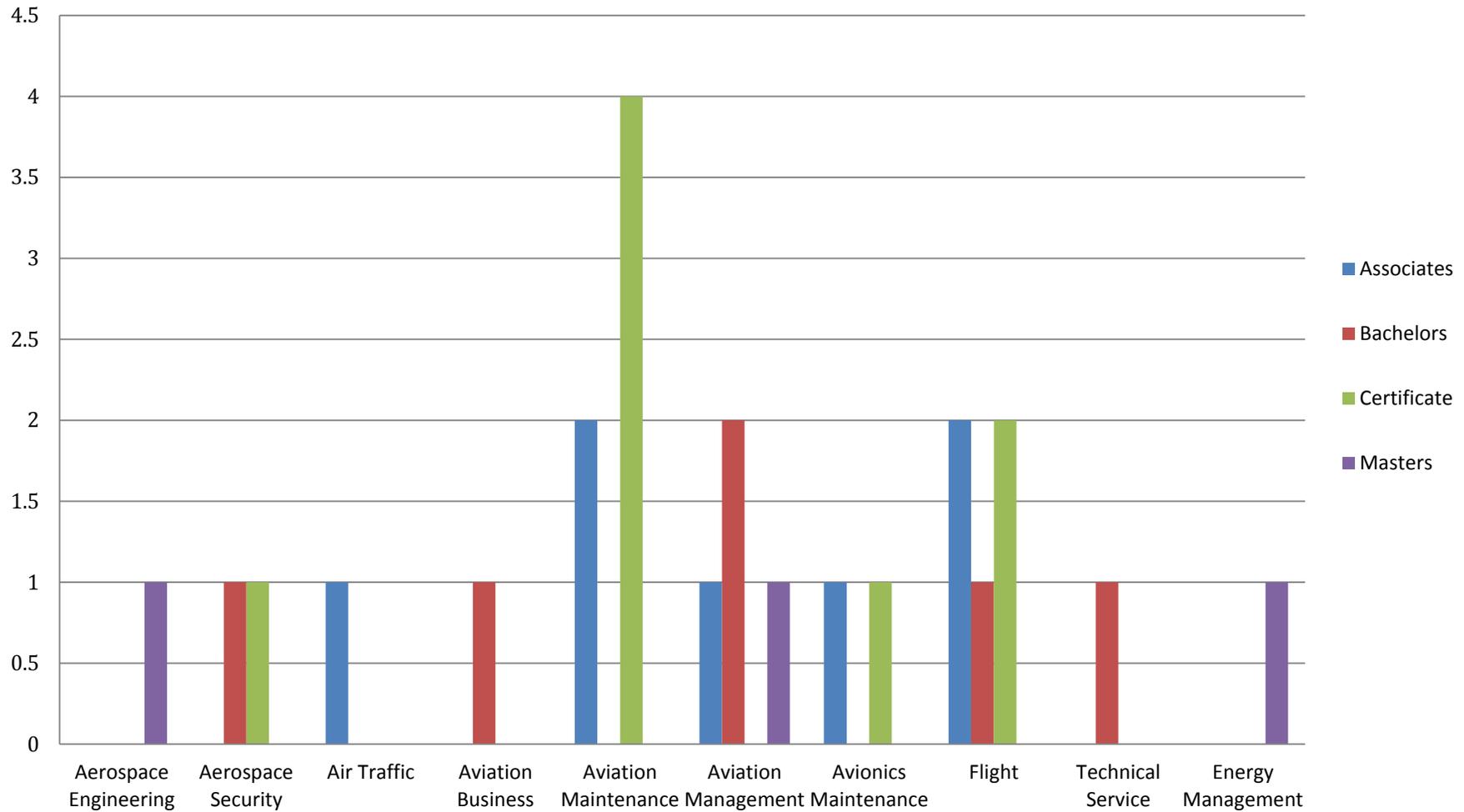
Aerospace Programs and Institution Types



Aerospace Programs per Institution



Aerospace Programs by Credential Type

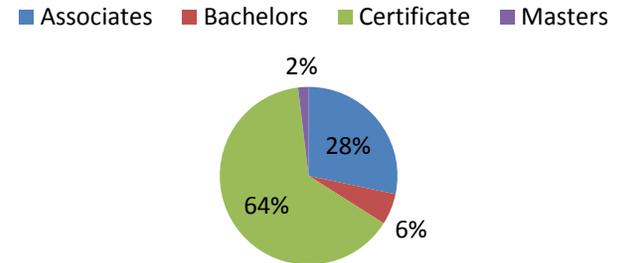


Aerospace Program Competencies	Oklahoma State University-Tulsa	Southern Nazarene University	Spartan College of Aeronautics and Technology	Tulsa Community College	Tulsa Tech-Riverside	University of Phoenix-Tulsa
Aerospace Engineering	M					
Aerospace Security	B, C					
Air Traffic				A		
Aviation Business		B				
Aviation Maintenance			A, C	A	C	
Aviation Management	B, M		B	A		
Avionics Maintenance			A, C			
Energy Management						M
Flight	B		A, C	A	C	
Technical Services	B					

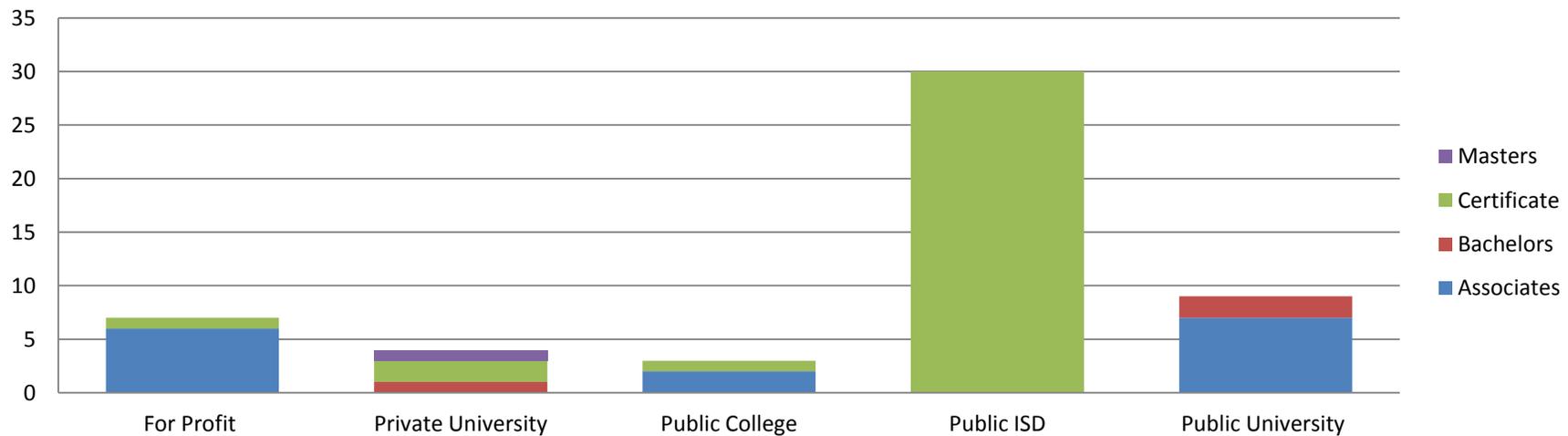
Energy Programs

The Energy programs in Tulsa are disproportionately offered by Public Independent School Districts, with almost all of the programs existing at the Certificate level. The second most offered credentials offered lie at the Associates level almost equally at For-Profit institutions and Public Universities. Heating, AC & Refrigeration Technology and Computer Aided Design (CAD) are offered the most, followed closely by Electronic Technology. With the exception of Tri-County Tech, the number of programs offered at other institutions fairly evenly distributed. While Tri-County Tech offers the most programs to the region, the majority of its offerings are represented by Mechatronics.

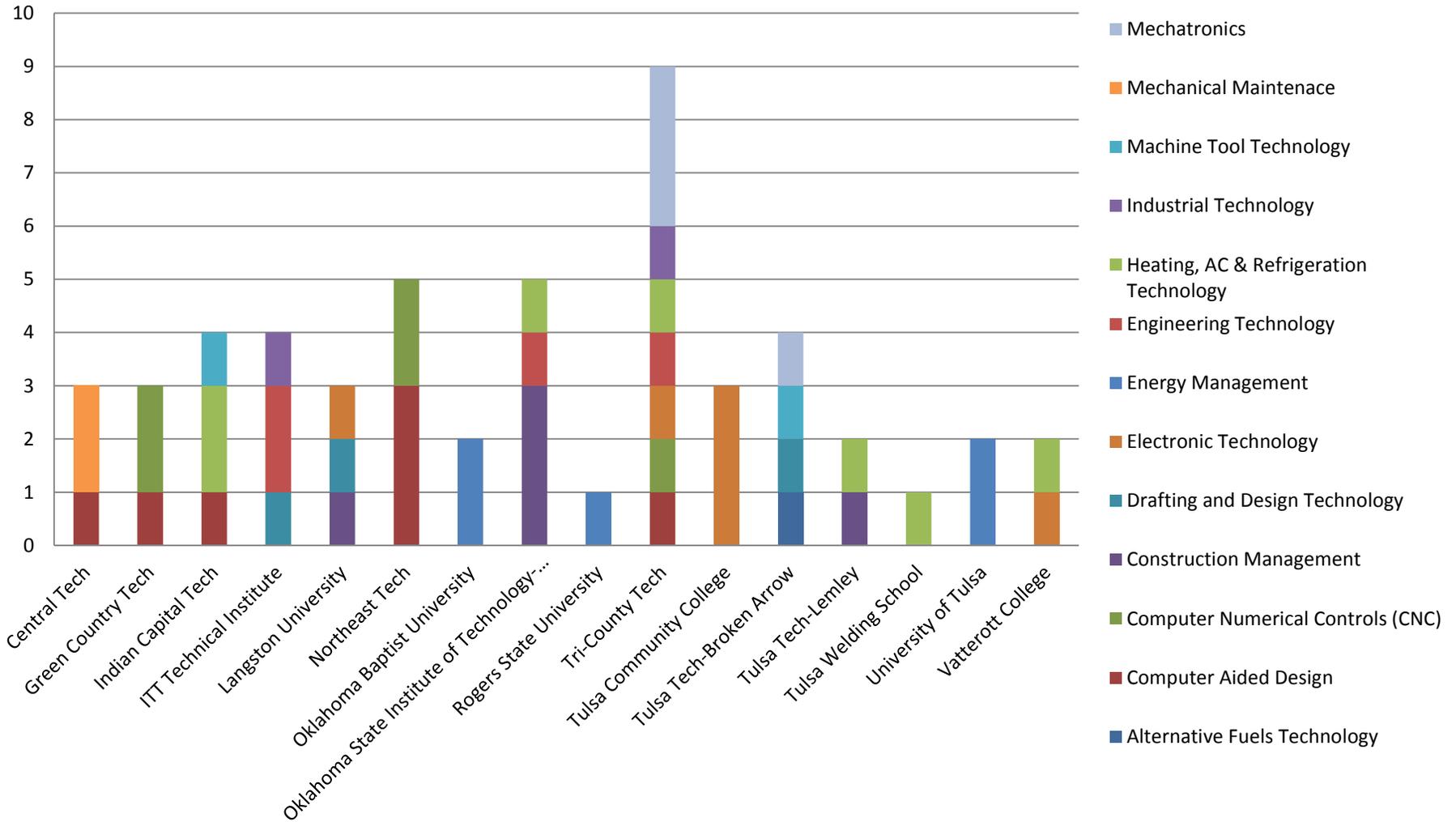
Energy Program Credential Type Total



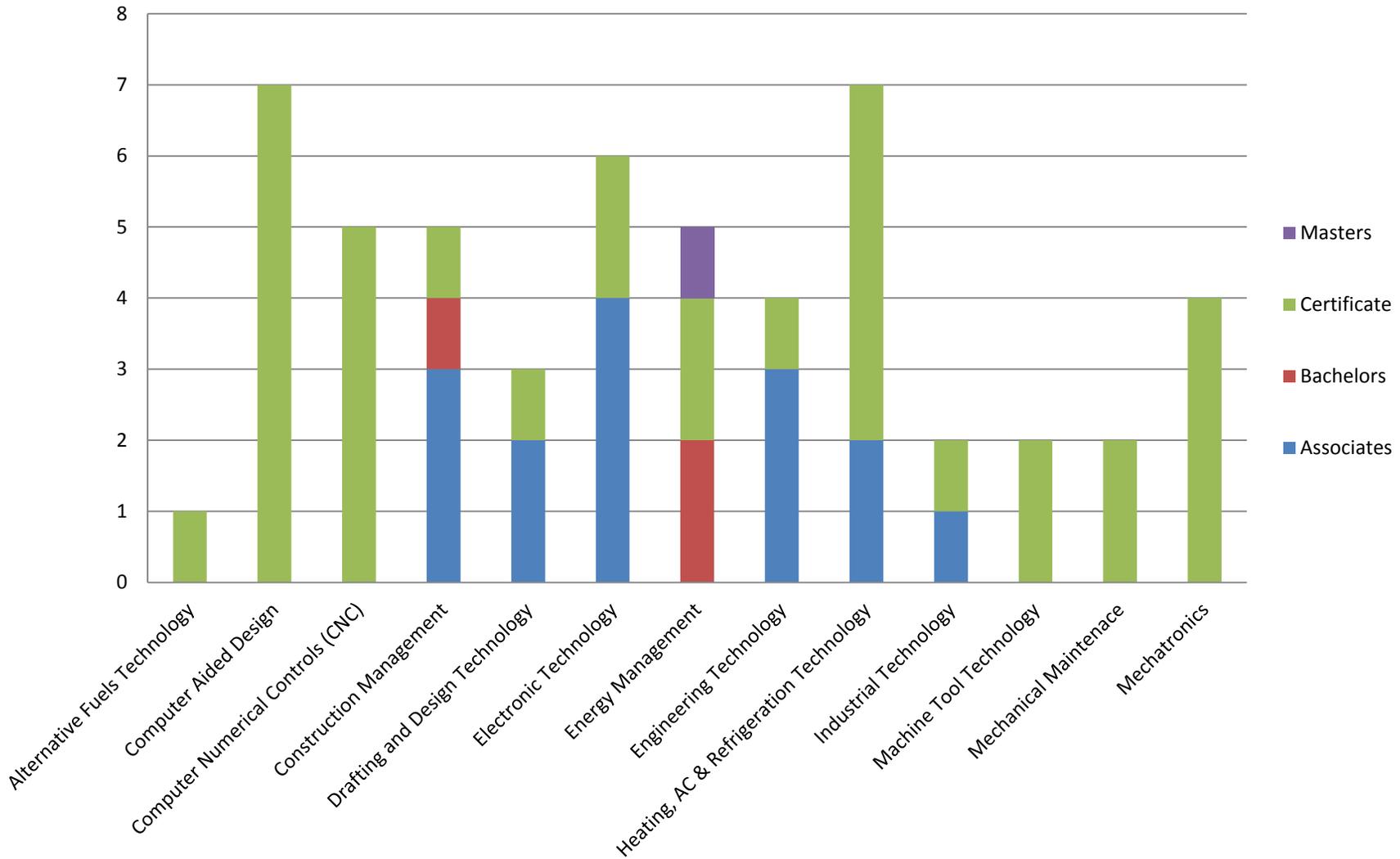
Energy Programs and Institution Types



Energy Competency Programs per Institution



Energy Competency Programs by Credential Type



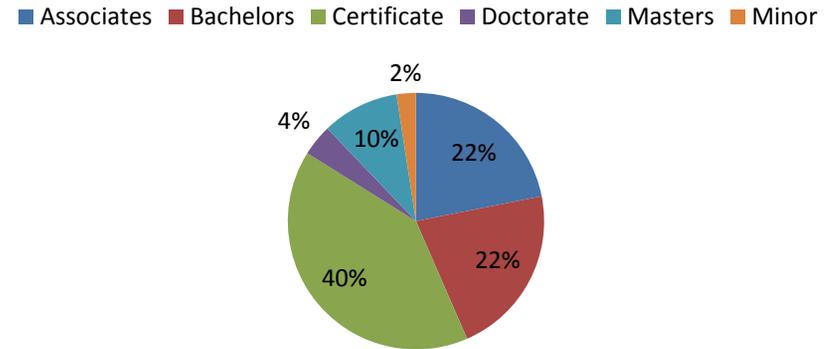
Energy Program Competencies

	Central Tech	Green Country Tech	Indian Capital Tech	ITT Technical Institute	Langston University	Northeast Tech	Oklahoma Baptist University	Oklahoma State Institute of Technology-Okmulgee	Rogers State University	Tri-County Tech	Tulsa Community College	Tulsa Tech-Broken Arrow	Tulsa Tech-Lemley	Tulsa Welding School	University of Tulsa	Vatterott College
Alternative Fuels Technology												C				
Computer Aided Design	C	C	C			C				C						
Computer Numerical Controls (CNC)		C				C				C						
Construction Management					B		A						C			
Drafting and Design Technology				A	A							C				
Electronic Technology					A					C	A, C					A
Energy Management							C		B						B, M	
Engineering Technology				A				A		C						
Heating, AC & Refrigeration Technology			C					A		C			C	C		A
Industrial Technology				A						C						
Machine Tool Technology			C									C				
Mechanical Maintenance	C															
Mechatronics										C		C				

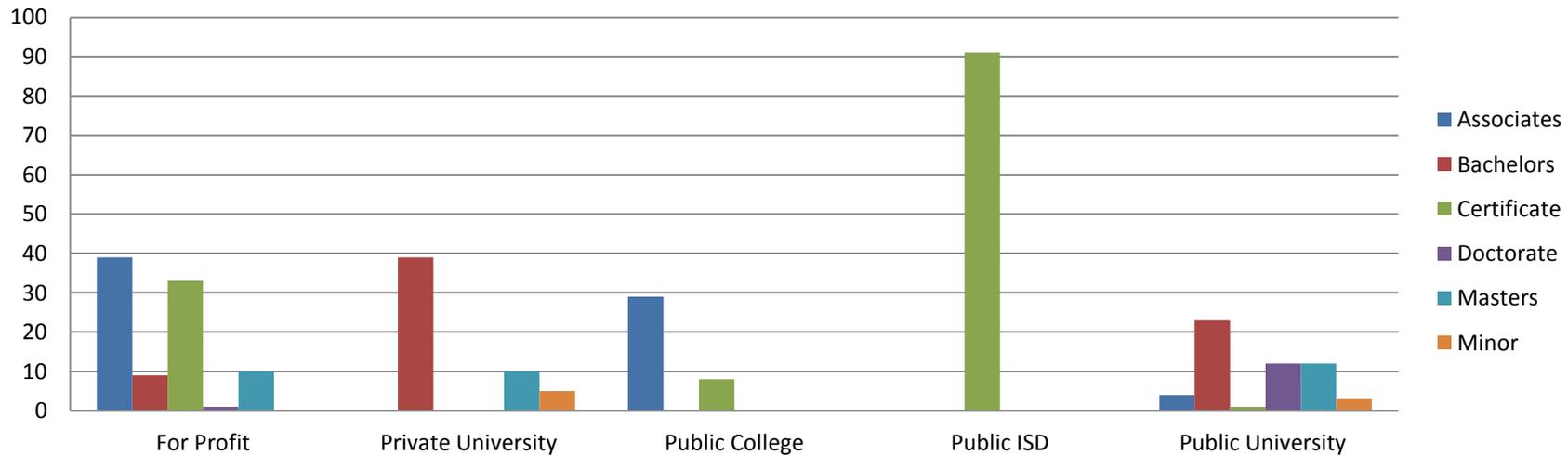
Healthcare Programs

The Healthcare Sector in Tulsa lies mostly in Certificate programs, and is evenly represented between Bachelors degrees and Associates degrees. The most prevalent programs within this sector are Nursing, Health Information Technology, and Medical Assistant. The least offered programs are Public Health, Gerontology, and Respiratory Care.

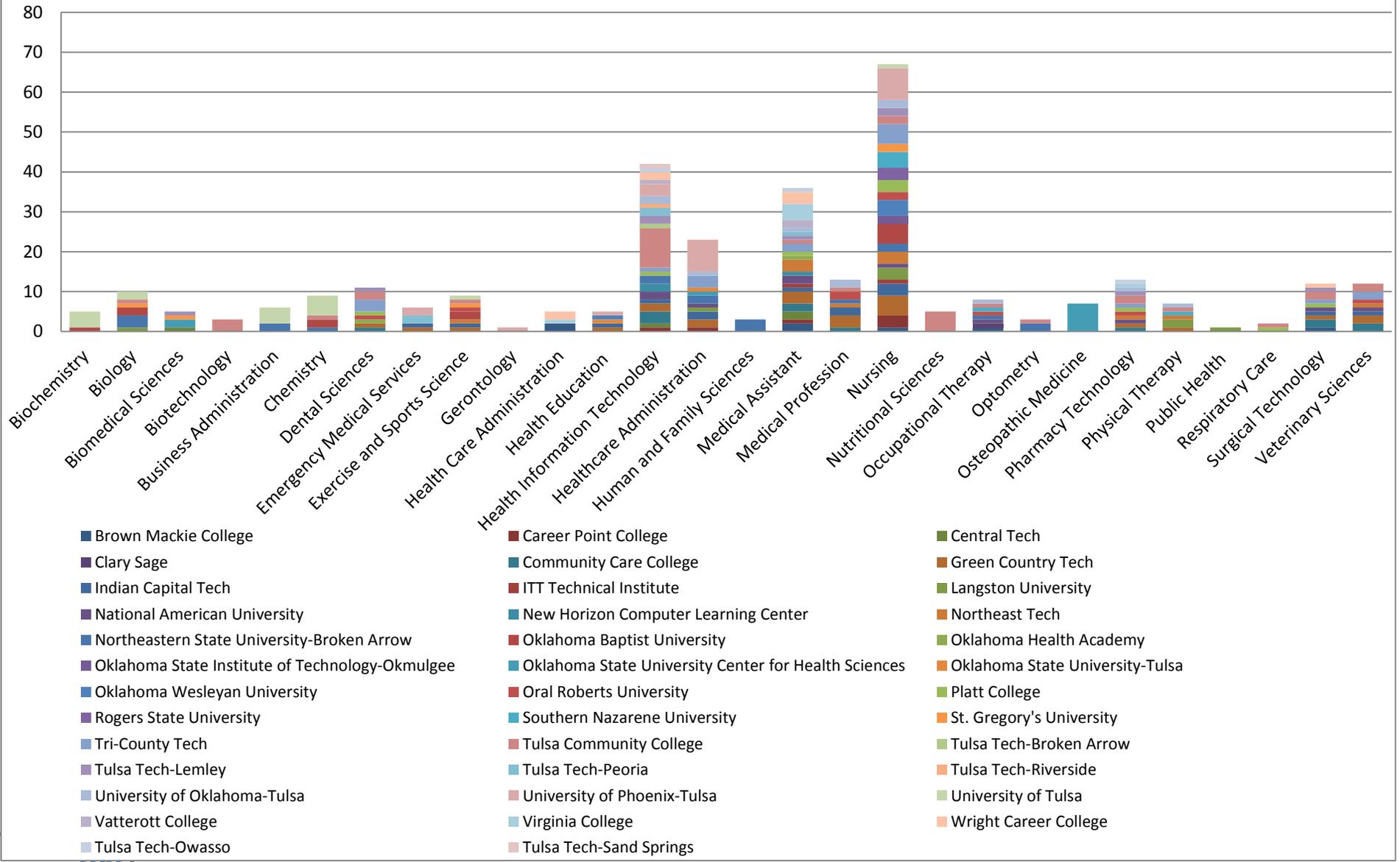
Healthcare Programs Credential Type Total



Healthcare Programs and Institution Types

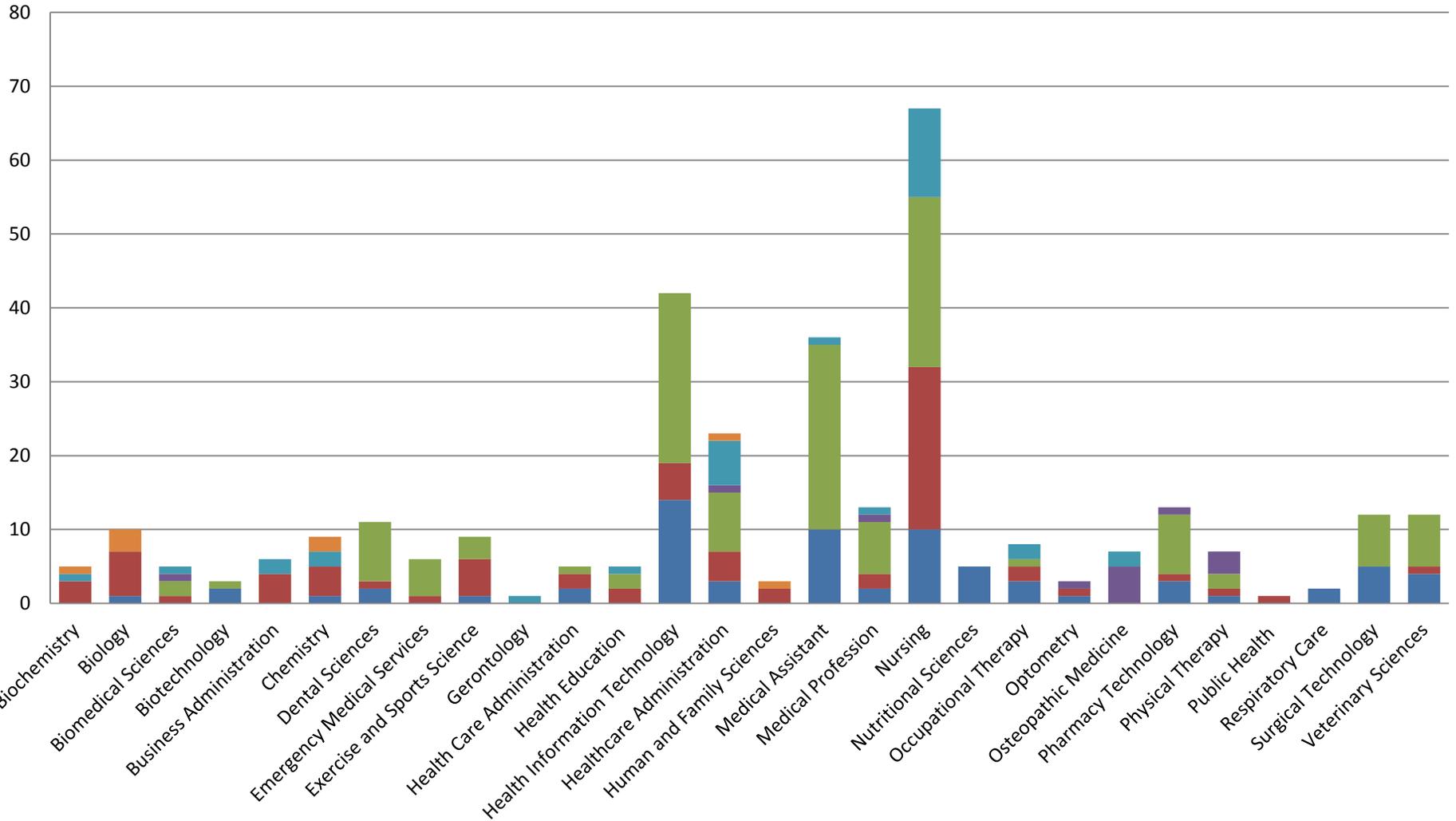


Healthcare Competency Programs per Institution



Healthcare Competency Programs by Credential Type

■ Associates
 ■ Bachelors
 ■ Certificate
 ■ Doctorate
 ■ Masters
 ■ Minor



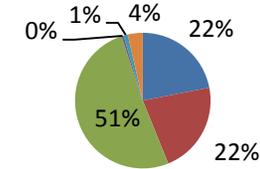
Information Systems Programs

Similar to the Healthcare Sector, the Information Systems Sector is comprised primarily of Certificate programs, and followed closely with Associates and Bachelors degrees. Network Security and Administration is a clear leader in number of programs being offered, only followed by Security/Cybersecurity. The other programs are evenly distributed.

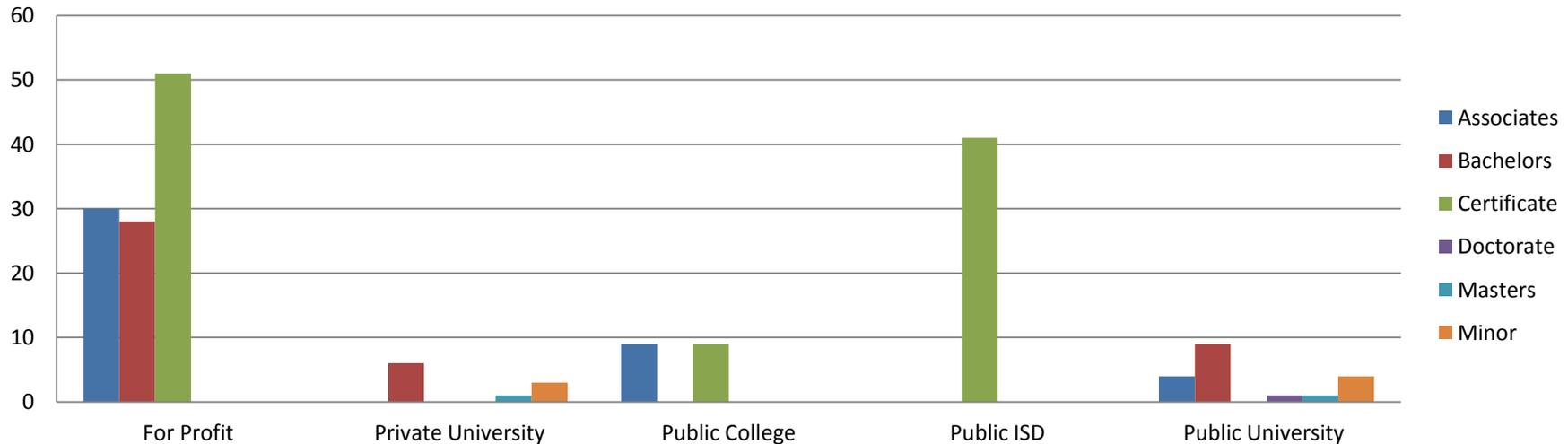
While many of these Information Systems programs are closely tied in the number of programs offered, it will be important to keep these numbers in mind when developing career awareness programs in this sector, specifically for underrepresented areas such as Electronics Technology and Database Management.

Information Systems Programs Credential Type Total

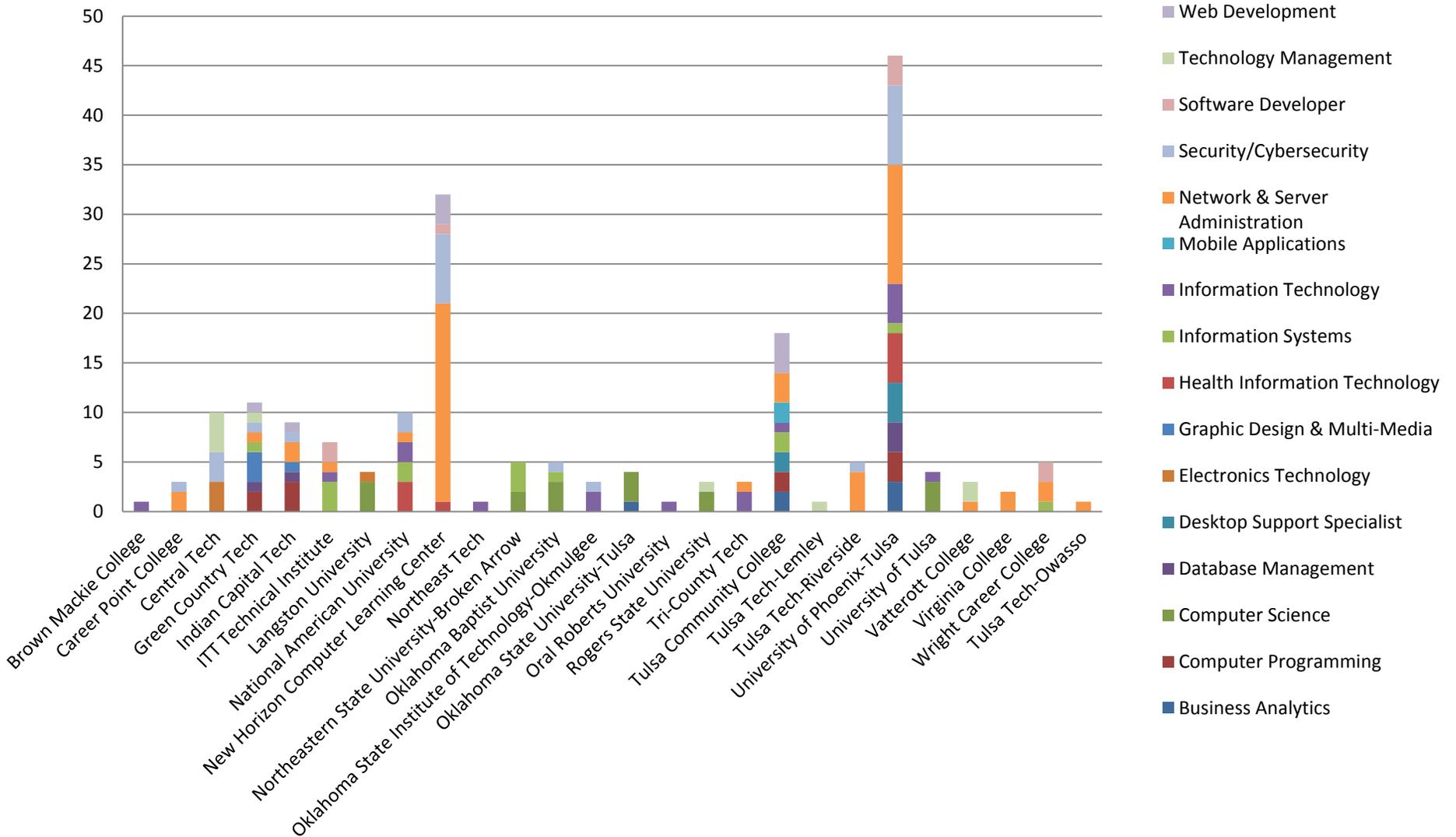
■ Associates ■ Bachelors ■ Certificate
 ■ Doctorate ■ Masters ■ Minor



Information Systems Programs and Institution Type

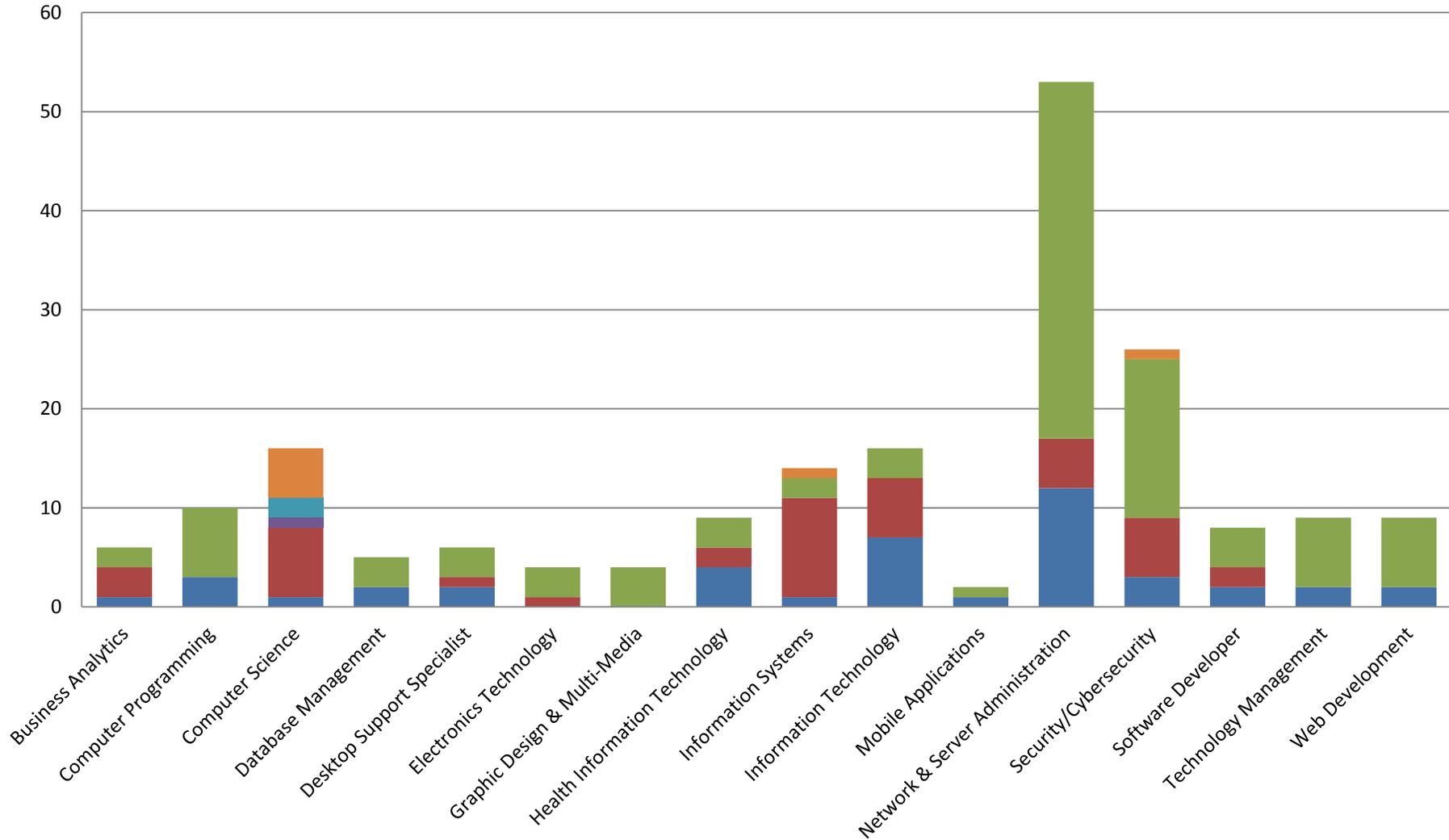


Information Systems Competency Programs per Institution



Information Systems Competency Programs by Credential Type

Associates Bachelors Certificate Doctorate Masters Minor



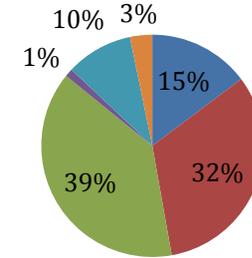
Information Systems Program Competencies	Brown Mackie College	Career Point College	Central Tech	Green Country Tech	Indian Capital Tech	ITT Technical Institute	Langston University	National American University	New Horizon Computer Learning Center	Northeast Tech	Northeastern State University-Broken Arrow	Oklahoma Baptist University	Oklahoma State Institute of Technology-Okmulgee	Oklahoma State University-Tulsa	Oral Roberts University	Rogers State University	Tri-County Tech	Tulsa Community College	Tulsa Tech-Lemley	Tulsa Tech-Owasso	Tulsa Tech-Riverside	University of Phoenix-Tulsa	University of Tulsa	Vatterott College	Virginia College	Wright Career College
	Business Analytics														B				C, A				C, B			
Computer Programming				C	C													C, A				C, A				
Computer Science							B				Mi, B	Mi, B		Mi, M, D		A, Mi								Mi, B, M		
Database Management				C	C																	C, A				
Desktop Support Specialist																		C, A				C, A, B				
Electronics Technology			C				B																			
Graphic Design & Multi-Media				C	C																					
Health Information Technology								A, B	C													C, A, B				
Information Systems				C		B		B			Mi, B	B						C, A				B				B
Information Technology	A					B		A, B		C			A		B		C	A				A, B	B			
Mobile Applications																		C, A								
Network & Server Administration		A, B		C	C	A		B	C								C	C, A		C	C	C, A, B		A	C, A	A
Security/Cybersecurity		A	C	C	C			A, B	C			Mi	B									C, A, B				
Software Developer						A, B			C																	C, A
Technology Management			C	C											A				C					C, A		
Web Development				C	C				C									C, A								

Professional Services Programs

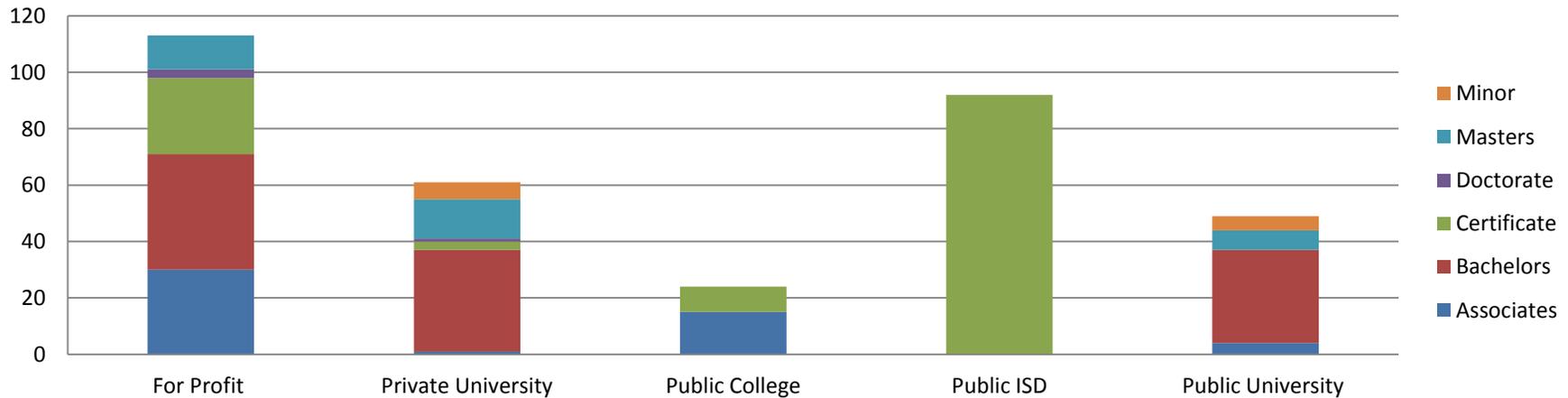
The Professional Services Sector is comprised largely of Accounting, Business Administration, and Business Information Technology programs. The majority of these programs are in either the Certificate or Baccalaureate levels. University of Phoenix-Tulsa offers the most programs in this sector. Tulsa Community College and Rogers State University also offer a comparable number of programs to a few of the regional technology centers in this sector.

Professional Services Credential Type Total

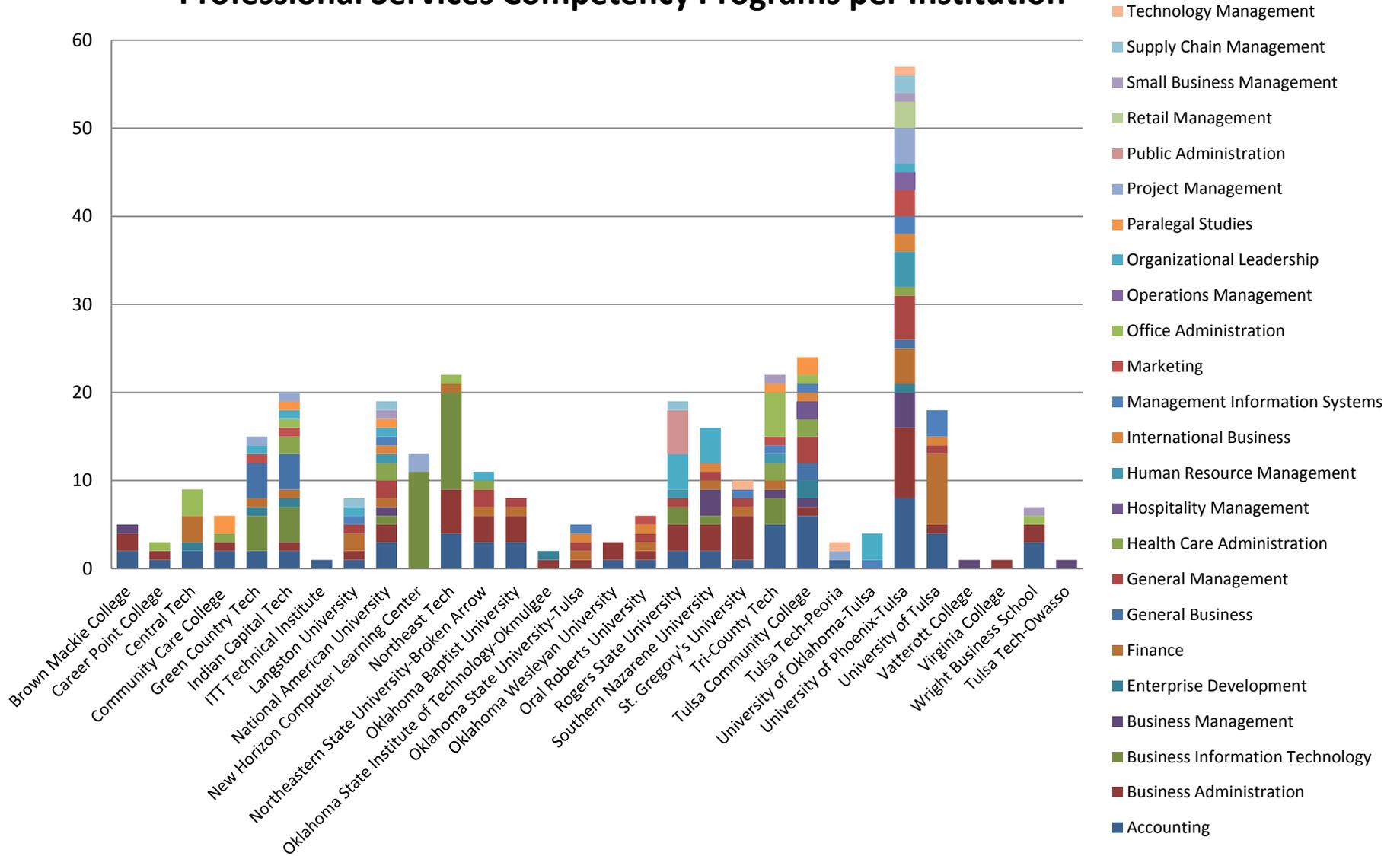
■ Associates ■ Bachelors ■ Certificate
 ■ Doctorate ■ Masters ■ Minor



Professional Services Program and Institution Types

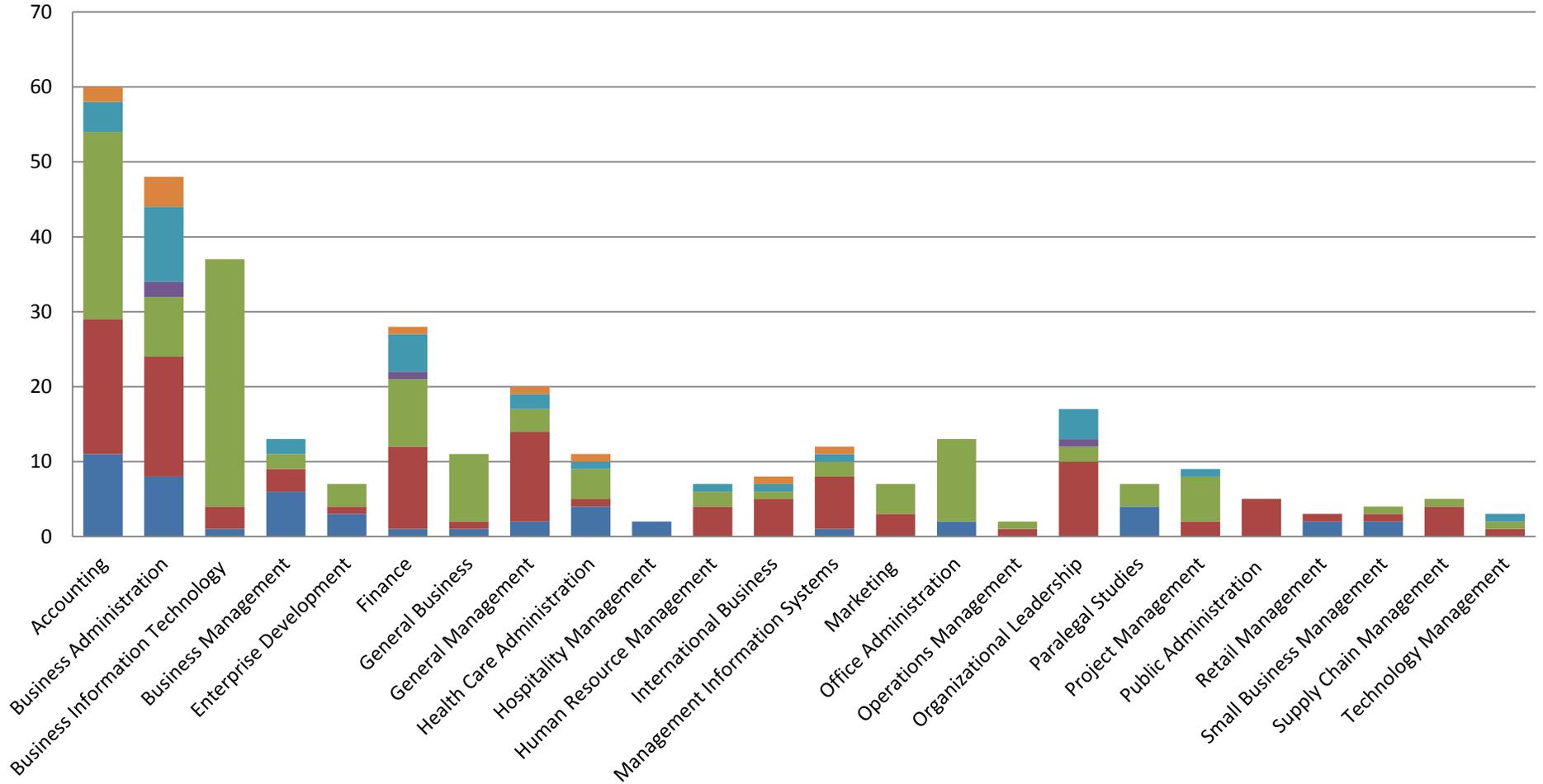


Professional Services Competency Programs per Institution



Professional Services Competency Programs by Credential Type

Associates Bachelors Certificate Doctorate Masters Minor

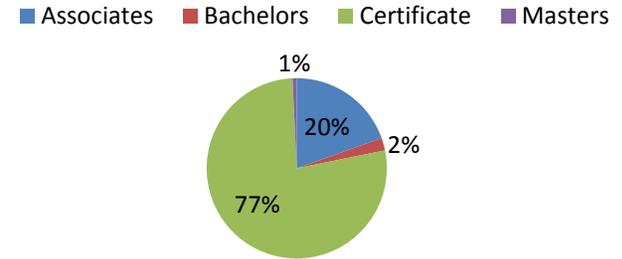


Professional Services Program Competencies	Brown Mackie College	Career Point College	Central Tech	Community Care College	Green Country Tech	Indian Capital Tech	ITT Technical Institute	Langston University	National American University	New Horizon Computer Learning Center	Northeast Tech	Northeastern State University	Oklahoma Baptist University	Oklahoma State Institute of Technology	Oklahoma State University-Tulsa	Oklahoma Wesleyan University	Oral Roberts University	Rogers State University	Southern Nazarene University	St. Gregory's University	Tri-County Tech	Tulsa Community College	Tulsa Tech-Owasso	Tulsa Tech-Peoria	University of Oklahoma-Tulsa	University of Phoenix-Tulsa	University of Tulsa	Vatterott College	Virginia College	Wright Business School
Accounting	C, A	A	C	C, A	C	C	A	B	B, A		C	B, M, Mi	B			B	B	B	B	B	C	C, A		C		A, B, M	B, C, M, Mi			B, C, A
Business Administration	C, B	B		A		C		B	B, A		C	M, Mi	M, Mi	A	M	B, M	B	A, M, Mi	B	A, B, M		A				B, C, M, Mi	Mi		A	B, A
Business Information Technology					C	C		A	C	C							B	B			C									
Business Management	A							B										B			C		C			A		A		
Enterprise Development			C			C							A									A				B				
Finance			C		C	C		B	B		C	B	B		B		B		B	B	C					B, C, M	B, C, M			
General Business					C	C																C				B				
General Management								B	B, A			B, Mi	B		B		B	B	M			A, C				B, C, B				
Health Care Administration				A		C			B,			Mi									C	A				M				
Hospitality Management																						A								
Human Resource Management									B									B			C					C, M				
International Business									B						B		B		B			C				B, C, Mi				
Management Information Systems								B	B					B						B	C	A			B	C, M, Mi	C, Mi			
Marketing					C	C											B				C					B,				
Office Administration		A	C			C					C										C	A								C
Operations Management																														
Organizational Leadership					C	C		B	B			B					B	B,							B,	B, D				
Paralegal Studies				C,		C			A												C	A								
Project Management					C	C				C														C		B, C,				
Public Administration																		B												
Retail Management																														
Small Business Management									A												C					B				A
Supply Chain Management								B	B								B									B,				
Technology Management																					B			C		M				

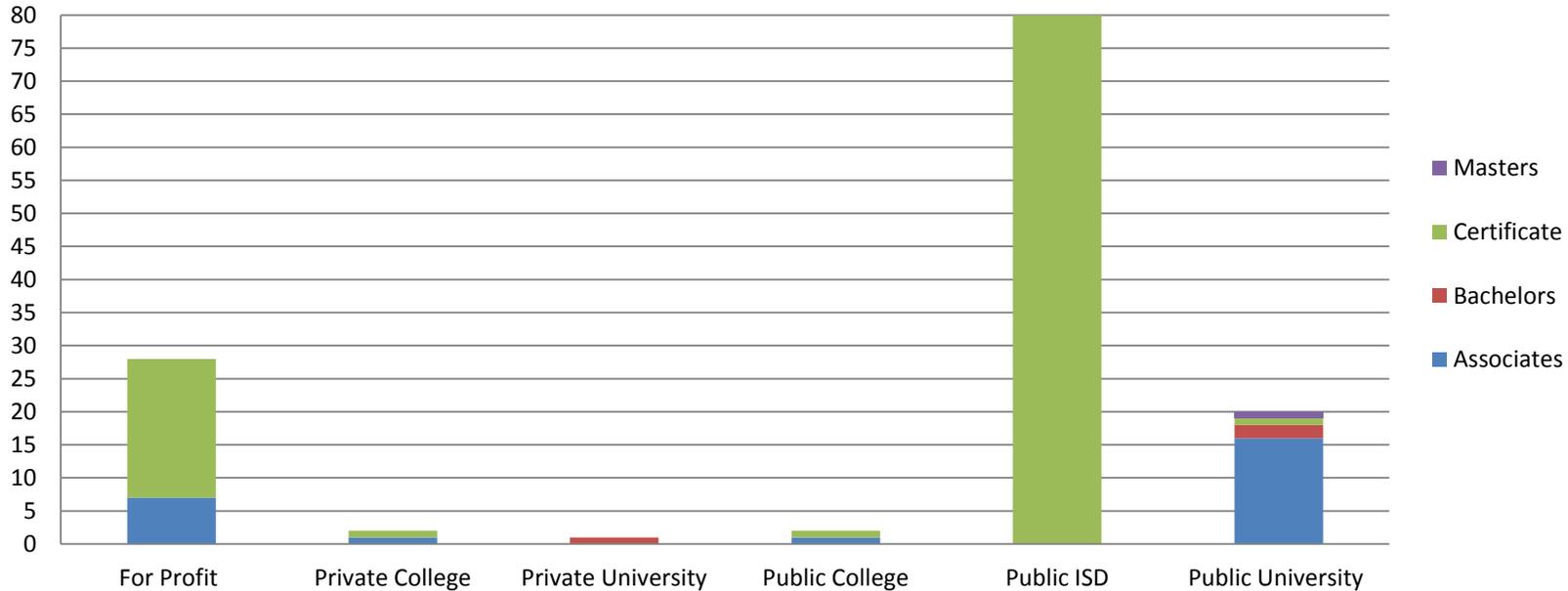
Transportation and Logistics Programs

The Transportation and Logistics Sector is disproportionately comprised of Certificate programs, with little to no representation from Private Colleges, Public Colleges, and Private Universities. Automotive Technology, Welding Technology, and Diesel & Heavy Equipment Technician are offered the most at these institutions.

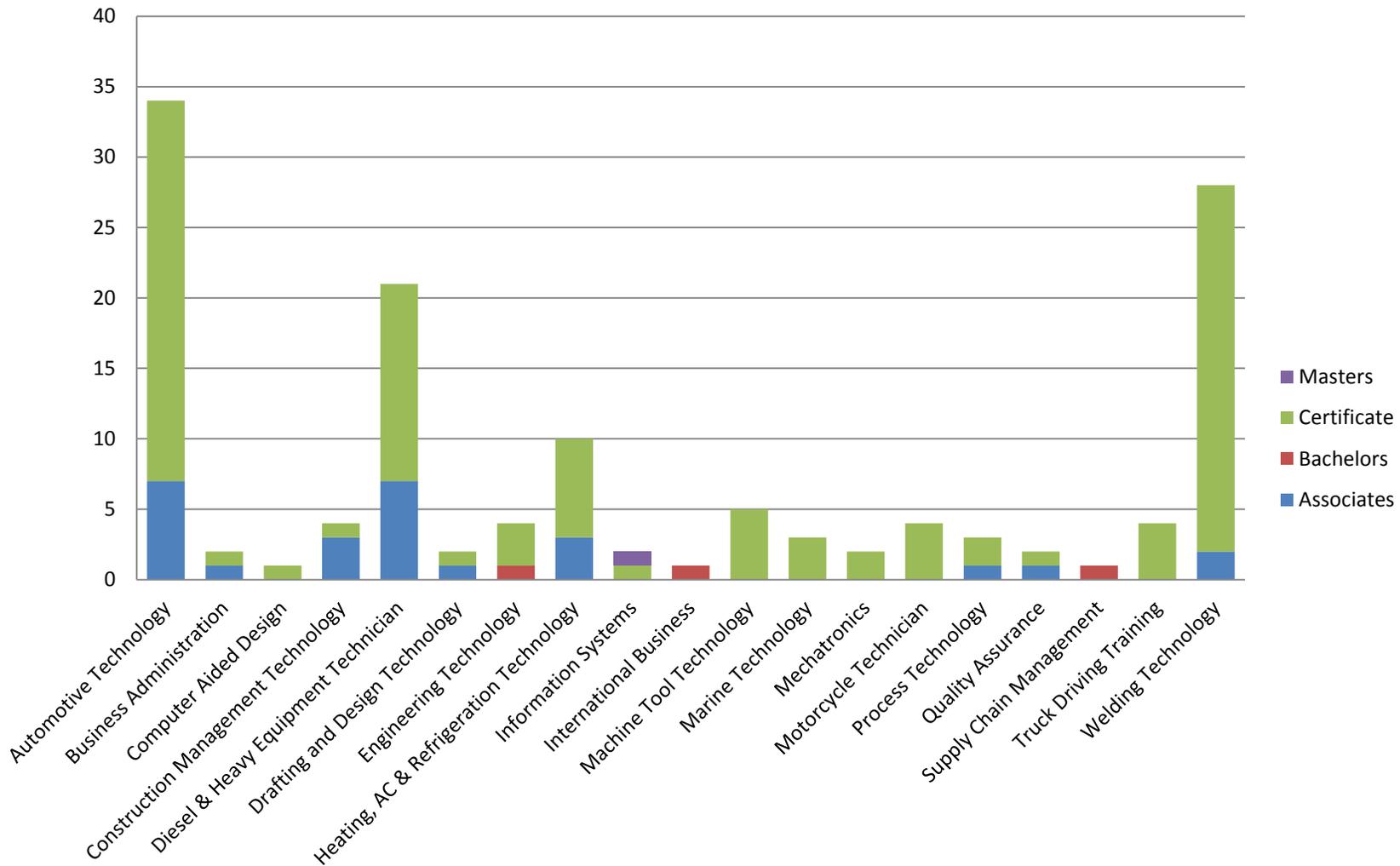
Transportation and Logistics Credential Type Total



Transportation and Logistics Programs and Institution Types



Transportation and Logistics Competency Programs by Credential Type



Transportation & Logistics Program Competencies

	4M Welding	Central Tech	Green Country Tech	Indian Capital Tech	ITT Technical Institute	National American University	Northeast Tech	Northeastern State University-Broken Arrow	Oklahoma Baptist University	Oklahoma State Institute of Technology-Okmulgee	Oklahoma State University-Tulsa	Oklahoma Technical College	Roadmaster Trucking	Spartan College of Aeronautics and Technology	Tri-County Tech	Tulsa Community College	Tulsa Tech-Broken Arrow	Tulsa Tech-Lemley	Tulsa Tech-Peoria	Tulsa Welding School	Vatterott College	
Automotive Technology		C		C			C			A		C			C		C					
Computer Aided Design							C															
Construction Management Technology										A								C				
Diesel & Heavy Equipment Technician		C		C			C			A		A, C					C					
Drafting and Design Technology					A												C					
Engineering Technology		C								B					C							
Heating, AC & Refrigeration Technology			C							A		A, C						C		C		C, A
Information Systems											M, C											
Marine Technology		C					C															
Mechatronics																	C	C				
Motorcycle Technician		C															C					
Process Technology		C														A, C						
Quality Assurance														A, C								
Supply Chain Management								B														
Truck Driving Training		C											C									
Welding Technology	C	C	C				C					A, C			C		C	C	C		C	C, A

Transportation & Logistics Program Competencies	4M Welding	Central Tech	Green Country Tech	Indian Capital Tech	ITT Technical Institute	National American University	Northeast Tech	Northeastern State University-Broken Arrow	Oklahoma Baptist University	Oklahoma State Institute of Technology-Okmulgee	Oklahoma State University-Tulsa	Oklahoma Technical College	Roadmaster Trucking	Spartan College of Aeronautics and Technology	Tri-County Tech	Tulsa Community College	Tulsa Tech-Broken Arrow	Tulsa Tech-Lemley	Tulsa Tech-Peoria	Tulsa Welding School	Vatterott College
Automotive Technology		C		C			C			A		C			C		C				
Computer Aided Design							C														
Construction Management Technology										A								C			
Diesel & Heavy Equipment Technician		C		C			C			A		A, C					C				
Drafting and Design Technology					A												C				
Engineering Technology		C								B					C						
Heating, AC & Refrigeration Technology			C							A		A, C						C		C	C, A
Information Systems											M, C										
Marine Technology		C					C														
Mechatronics																	C	C			
Motorcycle Technician		C															C				
Process Technology		C														A, C					
Quality Assurance														A, C							
Supply Chain Management								B													
Truck Driving Training		C											C								
Welding Technology	C	C	C				C					A, C			C		C	C	C	C	C, A

Transportation & Logistics Program Competencies	4M Welding	Central Tech	Green Country Tech	Indian Capital Tech	ITT Technical Institute	National American University	Northeast Tech	Northeastern State University-Broken Arrow	Oklahoma Baptist University	Oklahoma State Institute of Technology-Okmulgee	Oklahoma State University-Tulsa	Oklahoma Technical College	Roadmaster Trucking	Spartan College of Aeronautics and Technology	Tri-County Tech	Tulsa Community College	Tulsa Tech-Broken Arrow	Tulsa Tech-Lemley	Tulsa Tech-Peoria	Tulsa Welding School	Vatterott College	
Automotive Technology		C		C			C			A		C			C		C					
Computer Aided Design							C															
Construction Management Technology										A									C			
Diesel & Heavy Equipment Technician		C		C			C			A		A, C					C					
Drafting and Design Technology					A												C					
Engineering Technology		C								B					C							
Heating, AC & Refrigeration Technology			C							A		A, C						C		C	C, A	
Information Systems											M, C											
Marine Technology		C					C															
Mechatronics																	C	C				
Motorcycle Technician		C															C					
Process Technology		C														A, C						
Quality Assurance														A, C								
Supply Chain Management								B														
Truck Driving Training		C											C									
Welding Technology	C	C	C				C					A, C			C		C	C	C	C	C, A	

Part 3 – Workforce Analysis Strategy and Recommendations

Workforce and Education Alignment Strategy and Recommendations

The analysis from the Labor Market Analysis and Regional and Neighborhood Area level Target Industry Profiles coupled with the Regional Education Asset Inventory detailed in the respective sections of this report and informed by input from many stakeholders throughout the Tulsa Region (including, but not limited to, High School and Higher Education leaders, workforce system partners, community based organization leaders and many industry representatives) have informed the following Workforce Analysis and Education Alignment Strategy and Recommendations for Regional Tulsa. These recommendations provide a roadmap for a comprehensive strategy to collectively impact greater education alignment, career and education programming awareness, increased regional capacity and collaboration across the Tulsa region. Additionally this strategy includes specific content modifications to current programming that will support stronger alignment with industry needs and overall help to foster a sustained talent pipeline in the region. This collective impact model will go beyond the sector specific content recommendations included below in address the broader recommendations around career and education awareness, economic opportunity communication, regional level collaboration and increased institutional and organizational capacity.

The following strategy is broken into four separate parts with particular recommendations that address Content, Collaboration, Communication and Capacity within the education and talent development system in Tulsa Region. The strategy was developed as a framework for achieving collective impact across the economy regardless of which industry sector or collections of stakeholders are prominent across Tulsa.

When appropriate, the recommendations reference national best practices, or local best practices underway in Tulsa, as a guide to future implementation as well as the relative priority for each strategy. A general definition of each priority level can be interpreted as the following:

- **High Priority – develop and implement recommendation in the short term and complete objectives within 1-2 years**
- **Mid Term Priority – identify and create strategic objectives and implement recommendation over the next 3-5 years**
- **Long Term Priority – finalize overall strategic recommendation outcomes and impact within 5-10 years**
- **Continuous Priority – focus on implementing the recommendation continuously without reaching completion. These are recommendations that focus on systematic support rather than concrete program or product development.**





Content Recommendations

Content recommendations have been informed by identifying which industries and occupations are forecasted to grow in the Tulsa Region as well as within each of the targeted neighborhood areas: East, North and West Tulsa. Labor market information was matched against the current mix of education and training programs available across the spectrum of skill development assets in the Tulsa eco-system which includes the High School Districts, Tech Centers, Workforce System approved providers and Higher Education Institutions (including public, private, for-profit two and four year institutions). These recommendations identify areas where programs can be developed or increased as well as specific competency areas that warrant further care and attention from the skill development stakeholders in the region – education, employers, workforce system and other civic leaders.

Focus on Highly Concentrated Industries and Associated Occupations = Mid Term Priority, Continuous Support

Aviation and Aerospace, Energy and Advanced Manufacturing are highly concentrated industry sectors across the entire Tulsa region. Within these sectors the highest growing occupations are represented by the following categories and Tulsa regions:

- Production (growing across Tulsa)
- Construction (East and West Tulsa)
- Mechanics (North and East Tulsa)
- Manufacturing Operations (Regional Tulsa and West Tulsa)
- Engineering (North and West Tulsa)

In order to ensure that effective and aligned education and training is provided to support the health of the workforce in these areas it is recommended to increase the number of programs and credential levels (certificate, Associate, Bachelor, etc.) available to residents and the current workforce across Tulsa. Within Degree Attainment efforts it is important to ensure that there are pathways for higher level post-secondary education degrees. Equally important are high value technical certificates and credentials that are stackable within higher level degree pathways. Regional collaboration is key to ensure that technical certificates represent entry points onto a degree pathway and that learning is validated within the higher education system.

- Engineering Technology
- Production Management
- Process Technology
- Industrial Technology
- Mechatronics
- Welding Programs



Content Recommendations (continued)

The skills developed within these program areas represent foundational skill sets in constant demand in Aviation and Aerospace, Energy and Advanced manufacturing where the highest growth is concentrated across the Tulsa Region. Additionally these skills transfer across the target occupation categories forecast to grow within the neighborhood area sub-regions of Tulsa.

****Please note that the occupations category of Mechanics includes the following sector areas and growth projections for the Region and Neighborhood Area levels:***

Tulsa Region Mechanics:

- Aerospace: 145
- Automotive: 57
- Computer: 71
- Equipment: 20
- Industrial: 520
- Maintenance: 72
- Supervisors: 50

East Tulsa Mechanics:

- Aerospace: -94
- Automotive: 1
- Computer: -10
- Equipment: 3
- Industrial: 8
- Maintenance: -15
- Supervisors: -10

North Tulsa Mechanics:

- Aerospace: 166
- Automotive: -16
- Computer: 0
- Equipment: 4
- Industrial: 64
- Maintenance: 6
- Supervisors: 10

West Tulsa Mechanics:

- Aerospace: 41
- Automotive: 1
- Computer: 2
- Equipment: 0
- Industrial: 62
- Maintenance: 7
- Supervisors: 5



Content Recommendations (continued)

Target Sector Content Enhancements and Support = Mid and Long Term Priority

The following overview details various program modifications, enhancements and other recommendations for content development and support for competencies critical to the health of the seven (7) target sectors the Tulsa region has identified for investment. In some cases recommendations are in both the High School and Higher Education sectors of skill development. Depending on the identified sector growth and the current availability of programs recommendations aim to reflect both immediate and long term needs within the workforce pipeline.



Advanced Manufacturing

With significant growth forecasted for this sector it will become increasingly important to ensure that skills are being developed along the spectrum of needs as identified by the local employer community, from entry to senior level positions.

- **Increase the Engineering Technology and Mechatronics** programs to offer degree pathways beyond the Certificate and Associate degree levels. Many employers indicated a challenge in finding mid-career or Baccalaureate and above skill sets within the current Tulsa Workforce pipeline. Developing these programs will increase the strength of the talent pipeline and mitigate the need to consistently have to identify and recruit talent into the Tulsa region.
- **Incentivize Welding program offerings at Tulsa Tech centers.** Welding is a key skill set within Advanced Manufacturing (in addition to Aviation and Energy skill needs) that can be a part of a larger degree pathway. It is recommended to create articulation pathways for Welding credits into the Industrial Technology Associate of Applied Science degree through Tulsa Community College. Creating this pathway ensures that students from Tulsa Tech can continue onto an education pathway and increase their career progression in the labor market.



Content Recommendations (continued)



Aerospace and Aviation

The Tulsa region has made a significant investment in the Aviation and Aerospace sector. In order to ensure these important sectors have significant talent and a continual pipeline of a skilled workforce it is recommended to support education and training offerings at both the High School and Higher Education levels of the eco-system in the Tulsa Region.

- **High School Aviation and Aerospace Support.** Currently only 1% (2 identified programs) of the total Career and Technical Education (CTE) programs offered across the Tulsa Metropolitan Statistical Area (MSA) support the Aviation and Aerospace sector. It is recommended to **increase these offerings** and the associated pathway to related programs at Tulsa Tech, Tulsa Community College, Oklahoma State University and other credit bearing programs throughout the region.
- **Higher Education Aviation and Aerospace Support.** There are few programs supporting the **Aviation Maintenance, Production and Aerospace Management competencies** in the region. It is recommended to increase program offerings and availability specifically within the public Higher Education system in Tulsa.



Energy

High School Energy Support. Similar to the Aviation and Aerospace sector the Energy sector has very few skill development or awareness efforts at the High School level. Energy has 1% (2 identified programs) of all the CTE offerings in the Tulsa MSA. It is recommended to **increase these offerings and connect the skill development to other Higher Education programs** that will connect to credit and higher level degree pathways.



Content Recommendations (continued)

Higher Education Energy Support. Within the Higher Education system there should be development of **credit bearing programs in support of Alternative Fuel** skill development, currently these programs are at the Certificate level that do not articulate to higher level degrees such as Associates or Bachelor programs. Additionally it is recommended to **increase the Industrial Technology program** (which supports the Advanced Manufacturing sector as well as Energy) beyond the Associate level. Creation of programs that continue beyond the Associate level address employer challenges in finding and recruiting talent to fill advanced positions and help internal career progression along.



Healthcare

Expand programming beyond Healthcare Delivery. Healthcare is forecasted to grow significantly (14.5% through 2018) which largely represents the service delivery side of the sector. The program availability in Tulsa is dense within these areas and will not need to create new programs, simply increase capacity through online delivery of programs when appropriate. To build on this sector growth the region can invest in the development of **Biomedical and Biotechnology** programs that offer a different market opportunity in research and development as opposed to direct services. Currently there are a handful of programs supporting Biomedical and Biotechnology skill development, increasing these opportunities could position the Tulsa Region to further diversify the Healthcare sector in the long term.



Information Security

There is significant programming at the High School level in support of Information Technology and Information Security skill development. Within the current post-secondary education and training system there is a need for further development of offerings in support of the Electronics Technology and Technology Management programs. Additionally Health Information Technology (dually supporting Healthcare and Information Security) has the highest degree offered at the Baccalaureate level, development of higher level, Masters and above, might be warranted given the strength of both the Information Security and Healthcare sectors in the region.



Content Recommendations (continued)



Professional Services

Professional Services represents a large portion of the current economy across the Tulsa Region and has forecasted growth within each of the targeted neighborhood areas through 2018. Most of these growth positions are within the Administrative and Support services. Given these are typically entry-level positions with little to no prior education and training required it is recommended that these positions lead to **higher level positions via increased availability and offerings within business management**. Allowing the workforce to connect to these learning opportunities will help to progress the current workforce to middle and upper level positions creating a continual flow of talent into and through the Professional Services sector.



Transportation and Logistics

There are a number of supporting programs that offer direct access into the Transportation and Logistics sector, mostly within the technician level programs such as Computer Aided Design, Heating and Refrigeration and Machine Tool Technology. However, programs that are squarely within the Transportation and Logistics sector competency, such as Supply Chain Management, have limited opportunities in the Tulsa region. **Supply Chain Management** skill development can be represented through addition of Certificate and Associate level programs that will lead into the upper level, Bachelor programs already available in the education eco-system in Tulsa. Additionally **Process Technology and Quality Assurance** skill development currently exists in lower credential levels, Certificate and Associates. It may be necessary to create Bachelor and above programs in these areas.



Communication Recommendations

Communication is key in any region to ensuring that local residents understand the career opportunities available to them in their community know how to connect with the right type of learning to access these opportunities and helps to connect the various leaders with a stake in talent development. The following recommendations are centered on enhancing the current communication efforts in Tulsa, and the targeted neighborhood areas, as it relates to strengthening the regional workforce and ensuring residents have access to strong and growing careers.

Tulsa Regional Chamber is re-launching ChooseTulsaJobs.com as an online portal, which will serve as a centralized location for education and workforce related resources tied to talent development, educational pathways and workforce attraction and retention related efforts in the Tulsa region. This website will have information for job seekers, businesses, parents, educators and residents to stay abreast of developing workforce and education initiatives, job fairs, current career opportunities and regional programming.

Implement a Career Awareness Campaign = High Priority

The education system in Tulsa is of incredibly high quality, including opportunities that start at the High School level. There are a number of Career and Technical Education (CTE) programs within the High School and Tech Center system, however, a full communication and marketing campaign highlighting these opportunities is a key missing piece in the Tulsa region. The general lack of understanding in terms of job opportunities, appropriate education and training at the Post-Secondary Education (PSE) level and the High School programs that spark student interest in career fields is a substantial gap in the community. ***Developing a public service announcement and outreach campaign*** will help to educate all residents as to the opportunities across the Tulsa Region and can specifically highlight opportunities in the target neighborhood areas. Some tactics to help broaden and deepen the communication across the region includes:

- Develop **targeted marketing plan** for Region in general with specific content related to opportunities in East, North and West Tulsa
- **Create online resources** to supplement Tulsa Jobs to showcase career opportunities and related training in High School and PSE
- Utilize a **Mobile Outreach center** to reach each Neighborhood area
- Identify current **Champion Employers to sponsor the messaging** and assist with neighborhood area outreach to residents
- **Neighborhood Area driven Job Fairs** with Employers and Education Providers to directly connect with training opportunities
- Public Service Campaign on to highlight High School CTE and Technical PSE programs as **Highly Skilled education pathways**



Communication Recommendations (continued)

- BEST PRACTICE:
 - Highlighting High School CTE Programming: The Academies of Nashville, marketing video: <https://fordnjl.com/video/the-academies-of-nashville-ad>
 - Web-based career awareness tools:
 - Telecommunications: <http://www.vividfuture.org/>
 - Energy: <http://www1.eere.energy.gov/solar/careermap/>

Sector Driven One Stop Workforce Centers = Medium to Long Term Priority

Centralizing services to support a specific sector provides a structure for a deeper understanding of workforce needs and enhances the relationship between Education, Training, the Workforce system and sector Employers. By developing sector specific workforce centers, **similar to the Transportation WorkAdvance model** in Tulsa, the region would be creating a deeper understanding of include needs and be able to provide one stop services for employer and job seeker while enhancing the skills training opportunities.

Sector specific support will turn the workforce system from a “jack of all trades” approach to a **subject matter expert model** when addressing needs specific to certain high growth sectors, like Aerospace and Aviation, for example. It is recommended that within these sector driven efforts that localized Employer and Neighborhood Area relationships are developed to there is a real life connection between the career opportunities and East, West and North Tulsa residents that are not currently engaged in the sector or workforce.

- **BEST PRACTICE: New York City Sector One Stop Centers** – The workforce system in NYC created innovative one stop centers to support two of their largest and highest growth sectors, Healthcare and Transportation. This model allows center staff to become experts on the skill and occupational need within one sector as opposed to all opportunities in the local economy. <http://www.nyc.gov/html/sbs/wf1/html/about/healthcare.shtml>

Increase Effectiveness of Industry and Education Communication = High and Continuous Priority

- **Expand Roadtrip for Teachers Experience.** The current Roadtrip for Teachers opportunity is a wonderful asset to the Professional Development and Industry connection for High School and Middle School teachers across the Tulsa region, even at its current high level approach.



Communication Recommendations (continued)

This experience can be deepened to further contextualize industry concepts as they relate lessons teacher's give in the classroom. It is recommended to structure this experience by subject matter area of interest and expertise and have each group of teachers and industry representatives focus on particular careers, skills and concepts.

- **BEST PRACTICE: Washington Alliance for Better Schools STEM Teacher Externship Program** – This is a highly engaged and in-depth professional development opportunity for STEM focused teachers where they have exposure to industry for several weeks and work directly with industry to develop classroom lessons and activities that relate curriculum learning to career application. <http://www.wabsalliance.org/academic-leadership/stem/stem-teacher-externships/>

- **Create Regional structure for Industry Internships and Externships.** By formalizing a structure around internship and externship programs, at both the High School and Post-Secondary Education levels, industry and education partners will have increased clarity as to what will be gain and required during the experience. It is **recommended to develop a menu of services, obligations of industry, education and student or teacher participants, outline touch points and other educational guidance for faculty and industry representatives.** Documenting what is expected of each partner will help to provide easier onboarding for new education staff or industry partners in future engagements. This will also incentivize employer participation by clearly stating expectations and general return on investment for working with students or teachers to expose them to industry processes and activities.



Collaboration Recommendations

Across the Tulsa Region there are numerous efforts, groups and initiatives underway with a mission to support the health and well being of the local economy, the workforce pipeline and the education and training system. Collaboration is ingrained in the culture in Tulsa, something that should be highlighted as a key asset to the region in general and something that should not be taken for granted. These collaboration recommendations are meant to highlight opportunities that will increase the effectiveness of the collaboration underway in Tulsa.

Develop clearinghouse of regional education and workforce focused efforts and initiatives = High Term Priority

With so much going on across the region, and specifically within the target neighborhood areas, it is highly recommended to identify and document each effort to encourage transparency of all education, training, workforce and employer supported initiatives underway currently. By identifying the focus and objectives of each initiative in Tulsa leaders in talent development will have a **better understanding of how to increase their collaboration, leverage limited capacity and limit duplicative efforts region wide**. Making this information publically available will help to break down any perceived or actual “turf-ism” among and across talent development leaders in education, industry and civic sectors in Tulsa.

- **BEST PRACTICE: Innovate Northeast Florida** website detailing regional alignment strategy. This structure can be modeled to detail initiatives, focus, contact person, other collaborators, etc. <http://innovatenortheastflorida.com/status-reports/>

Create Industry and Education regional roundtable = Mid to Long Term Priority

- **Leverage advisory committee learning** from the Public High School system, Tech Centers, Tulsa Community College, Oklahoma State University Institute of Technology and other Chamber led workforce efforts to increase the impact of the industry input for all stakeholders through more in-depth collective conversations. Employers are consistently called upon to provide insight into industry skill needs, skill gaps and to provide subject matter expertise for program and curriculum development. By **centralizing this input** the collection of education and training providers can learn from industry together and avoid any committee fatigue that employers may be subjected to with support to each institution individually.



Collaboration Recommendations (continued)

- **Best Practice:** Industry and Education collaboration through the Clemson University Center for Workforce Development and the **CU-ICAR program (Clemons University – International Center for Automotive Research)** - an advanced technology research campus where education, industry and civic organizations collaborate on automotive research.
<http://cuicar.com/>
- **Identify opportunities for sector focused Career Academies or Sector Based High Schools.** Given the investment that many employers have made in terms of their operations in Tulsa and the target neighborhood areas it is advisable to use the Education and Industry Roundtables to identify if and where sector driven High School academies or fully inclusive schools are needed to develop, foster and support a youth pipeline into industry.
 - **Best Practice: Aviation High School, New York, NY** - Aviation High School is a uniquely specialized, co-educational high school that prepares students for careers in aviation maintenance and the aerospace industry. Aviation High School's Federal Aviation Administration (FAA) certified program developed and expanded with the evolution of the aviation industry. Students complete rigorous vocational and academic programs that provide excellent preparation for aviation-related careers as well as college.
<http://www.aviationhs.net/>

Collaborate on regional funding requests, engagement of the Philanthropic community = High Priority

- **Unify philanthropic education requests from the region.** It is recommended that the region create an inventory of philanthropic dollars coming into Tulsa in an effort to better aggregate education and skill development requests and support.
 - **Best Practice – National Fund for Workforce Solutions (NFWS) San Francisco** – NFWS partners with businesses, communities and philanthropy to develop employer-driven workforce strategies to create a local talent supply chain that closes skills gaps and strengthens local economies. In San Francisco the Bay Area Workforce Funding Collaborative (BAWFC) has focused on building the workforce training capacity of community colleges. The BAWFC focused on a set of strategies aimed at improving training and employment outcomes for individual students enrolled in sector-specific career training programs, while at the same time

lead to long-term systems change in the way that colleges design and deliver career pathway programs.
<http://www.nfwsolutions.org/regional-collaboratives>



Collaboration Recommendations (continued)

Localized services to address specific barriers in each Neighborhood Area= Mid Term Priority

- **Unique services are necessary in each of the three targeted neighborhood areas in Tulsa.** It is recommended that to effectively serve these populations and assist their career progression or transition into the workforce and associated skill development opportunities the following services are provided in each neighborhood area:
 - English as a Second Language and English Language Learner support to residents in East Tulsa
 - Ex-Offender outreach and employment programs and skill development in North Tulsa
 - Enhanced childcare services in West Tulsa



Capacity Recommendations

Addressing the strain on capacity in the Tulsa region is central to addressing the other recommendations outlined in this strategy. Ensuring that the region can do more with what they have currently, or by recalibrating how certain programs, services and initiatives are structured will create collective impact on the regional efforts on workforce and talent development in Tulsa.

Increase Higher Education Access to Non-Traditional Students and Working Learners = High Priority

- **Expand Prior Learning Assessment (PLA) practices in Higher Education and Workforce System.** There are plenty of skills that the Adult workforce, **specifically the Veteran population**, can bring to the Higher Education programs in Regional Tulsa. By developing strong policies and practices that will **assess prior learning and grant college credit for that learning**, the Higher Education system will be in a position to attract a larger student population and help those students receive a college credential or degree in a shorter amount of time. This mechanism is in place and is being strengthened between the Tech Centers and Tulsa Community College, however, a comprehensive policy that will look at learning in the workplace and through the military will provide significant impact on the ability of more Tulsa residents to get onto a degree pathway.
- **Increase Online and Distance Learning Programs.** Development of **online credential and degree courses or programs** will immediately infuse capacity into the college and workforce training system in the Tulsa Region. This method of program delivery will allow non-traditional students and working learners with other pressing obligations during the normal hours of college courses to take advantage of the Higher Education system. By **developing an online Soft Skills or Work Readiness training program** offered through the High School system, Outreach Centers, Adult Learning Centers and Workforce System the region will be positioned to ensure foundational skills are being developed prior to entering Higher Education programs or the workforce.
- **Enhance Career Services, Networking and Job Placement.** The local K-12 school system and other non-Higher Education venues are places where residents feel comfortable engaging with. **Providing Career Services, Networking opportunities and Job Placement services within the Elementary, Middle and High School locations** will create a stronger connection between the population and the labor market than is achieved through the current workforce system that many residents choose not to utilize.



Capacity Recommendations (continued)

- **Incorporate Lifelong Learning messaging into Tulsa Young Professionals Network.** The Tulsa Typro's network is a wonderful program in the region to continuously engage with the younger working adult in the region. Focusing on the **value of continued learning** and advance degree completion among the members of the network will help increase the higher level (Bachelors and above) workforce pipeline development across Tulsa.
- **Continue to improve High School and Technical Education articulation to Higher Education Degree Programs.** Recently there have been regulations passed down by the regional accrediting body for Oklahoma, the Higher Learning Commission, which have create a break in previously "seamless" articulation between Technical programs and offerings at other 2 and 4 year Higher Education institutions. There are **significant efforts underway at Tulsa Community College to make the necessary structure and policy changes** to ensure that these articulation agreements continue in the future. It is recommended that the focus of these programmatic changes center on the target sectors with the most immediate needs in the economy to help support higher level skill development in these areas.

Invest in Supportive Services and Outreach Efforts to Residents to Increase Labor Participation Rates

- **Invest in Regional Work and Education Based Transportation Options.** The current Vanpooling program, in development stages currently, pilot utilized by the Indian Nations Council of Governments (INCOG) will provide vanpooling services for job seekers, training program participants and recent job placements is a model that should continue to be supported and incentivized so that more employers and industry leaders participate. By focusing on the most underserved neighborhood areas and investing in areas where transportation is a significant barrier to employment the Tulsa leaders can incentivize both small and large companies to promote and develop ride sharing programs for commuting to work. It is important in the development of this program that the top priority is route creation along the highest need areas and not necessarily based on immediate ridership.

- **BEST PRACTICE: San Bernardino Associated Governments Ride Share Program**, The SANBAG program offers financial incentives to large and small companies in the San Bernardino region to encourage and support ride share programs created under their organizational structure. <http://www.sanbag.ca.gov/commuter/rideshare.html>

- **Highlight investment in Ex-Offender workforce pipeline.** There is a very large percentage of the population across Tulsa that are ex-offenders and have very high barriers to employment and often find themselves locked out of high wage, high growth employment opportunities. There are a number of employers that are open to working with this population, however, they do not advertise this openness among the ex-offender job seeking population, nor to their industry colleagues. It is important to find some industry champions to highlight the ROI for engaging this population and help to shine a light on their successes in the workforce.
 - **BEST PRACTICE:** Currently the **Tulsa Workforce Investment Board is utilizing the Women in Recovery program** which provides employment to females in drug, alcohol or other dependency recovery and the formerly incarcerated. Additionally there have been two successful legislation efforts in Baltimore and San Francisco to remove barriers to employment for ex-offenders.
 - **Passing “Ban the Box” ordinance in Baltimore and a “Fair Chance” ordinance in San Francisco**

Strategy Session Workshop

In order to validate the Workforce Alignment Strategy and begin to develop an action and implementation plan for the various recommendations a Strategy Workshop was convened. This session included over 60 local and regional leaders from the Education, Economic Development, Workforce Development, Business and Industry, Philanthropy and Public Sector groups. During the session the process of the Workforce Analysis Project was reviewed and significant detail was provided on the 4 strategy categories (Content, Communication, Collaboration and Capacity) and the associated recommendations for stronger and more efficient alignment within the workforce system in the Tulsa region. The set of strategies and recommendations for enhanced Workforce Alignment included:

- Expansion of high school career and technical offerings in aerospace and energy.
- Increase technical certificate and associate level options.
- Increase bachelors and above level programs.
- Implement a career awareness plan.
- Creation of Sector One Stop Workforce Centers.
- Increase industry and education communication effectiveness.
- Create clearinghouse (inventory) for education and workforce focused initiatives.
- Convene industry and education roundtables.
- Unify philanthropic requests.
- Localize services to address barriers in neighborhood areas.
- Increase education access for non-traditional students and working learners.
- Targeted Supportive Services and outreach efforts.

After the overview of the project and strategy was conducted the participants were asked to self-select into one of the 4 strategy groups and begin to brainstorm on what an effective action and implementation plan might be for each recommendation. Given the depth and breadth of the strategy this was just a starting point for the larger discussion in the community and across the region. However, given the short period of time available, much was accomplished in each of the working groups. The teams were asked to review each recommendation and think about specific action steps, potential success metrics for the action, identify key leaders and partners for implementing the action, call out potential barriers to success given the current system and prior efforts related to the action, discuss potential funding avenues and finally to allocate a general timeline and priority for each of the steps.

The comments received during that session are included in the worksheets detailed below. Where there was not direct discussion at the Strategy Workshop for certain recommendations the consulting team has offered some thoughts as to sample action steps, leaders, funding and priority (these recommendations are italicized and highlighted red). These strategy worksheets are to serve as the very beginning of this action planning exercise. They are meant to serve as a template for future conversations and can be leveraged to continue the momentum in the Tulsa region among the key stakeholders that was generated during the analysis and strategy development aspects of this process.

Content Recommendations

Expand High School Career and Technical Education Offerings in Aerospace and Energy (added Manufacturing)

Action Steps	Success Metrics	Critical Partners & Leaders	Barriers to Success	Potential Funding Sources	Priority & Timeline
-Increasing awareness of students of industries and career pathways – get them started at a younger age	-More students enrolling in programs that have careers in region -More students staying in region	-Tulsa Tech Schools -Comprehensive Schools -Parents -School Counselors	Getting students into the positions while mitigating employer risk (apprenticeships) -Minors are often not allowed in the workplace setting (particularly manufacturing)	-Shifting resources and being more deliberate with the funding that schools have *Do not necessarily need more funding, be more strategic with current funding	-High, 1-2 years with a continual priority
-Increase program offerings and revise the current curriculum to ensure that the content aligns with workforce and industry needs	-Convene program curriculum committee -Agreement from industry on new program development	-Tulsa Tech -Employers	-Lack of communication between the various stakeholders -Time restrictions on staff	-Requires further local discussion	-High, continued
-High Schools work to expose students to programs, specifically the non-traditional students	-Leverage communication campaign on the career opportunities in Tulsa -increased non-traditional student enrollment in target sector programs	-Tulsa Regional Chamber -Adult Education -Education Leadership -Workforce System	-Inability to change program to fit needs of non-traditional students	-Requires further local discussion	-High, continued
-Bring together the various stakeholders (Education and Industry) inside new program development	-Convene program curriculum committee -Agreement from industry on new program development	-Industry -Education	-Lack of time and capacity	-Requires further local discussion	-High, continued

Content Recommendations

Increase Technical Certificate and Associate Level Options: Biomedical/Biotechnology, Energy (Alternative Fuels, Energy Management), Supply Chain Management

Action Steps	Success Metrics	Critical Partners & Leaders	Barriers to Success	Potential Funding Sources	Priority & Timeline
-Reevaluate and revise offerings to meet Industry needs	-Increased number of graduates with Certificates and Associate Degrees	-Universities and Higher Education -Industry Partners	-Lack of communication between the various stakeholders -Time restrictions on staff and industry	-Requires further local discussion	-High, continued
-Bring together the various stakeholders for program development conversations	-Create regional platform for cross industry and education input	-Universities and Higher Education -Industry Partners	-Proprietary program and industry processes -Lack of regional coordinating leadership for conversation	-Requires further local discussion	-High, continued
-Directory of current meetings, workforce projects and other regional coordination	-Create regional calendar of meetings -Plan out annual agenda for each session	-Universities and Higher Education -Industry Partners	-Identifying all the meetings across the various stakeholders	-Requires further local discussion	-High, continued
-Define "certificate" and communication to employers content within the certificate programs	-Create messaging for communication -Obtain employer buy-in	-Industry Partners -Higher Education	-Lack of communication between employers and industry on what certificates entail -Gaining agreement of employers	-Requires further local discussion	-High, continued
-Assign career pathway advisors, positions other than counselors specific to career development	-Identify new position within school -Identify funding to support	-High schools -Board of Education	-Lack of communication between partners	-Requires further local discussion	-High, continued

Content Recommendations

Increase Bachelor and Above Level Programs: Engineering Technology, Industrial Technology, Biomedical/Biotechnology, Health Information Technology, Process Technology and Quality Assurance

Action Steps	Success Metrics	Critical Partners & Leaders	Barriers to Success	Potential Funding Sources	Priority & Timeline
-Work to improve the credit transfers between the higher education institutions	-More students graduating with higher degrees and continuing on a learning pathway	-Higher Education -Technical Schools -State Board of Regents	-Ability to have students understand entry from TCC into a 4 year institution -State Board of Regents are not perceived to understand or value technical certificates	-Requires further local discussion	High
-Identify benchmark programs from other regions to serve as a basis for new program development	-List of other programs from comparable regions -Hold meeting with Industry to determine best program to use as foundation for new programs	-Industry -Higher Education -Technical Schools -State Board of Regents	-Identifying a common need across employers, going beyond the specific needs of each employer	-Requires further local discussion	High
-Create regional plan for program development, marketing, enrollment target and faculty	-Identify which institution will create which program -Determine the target enrollment needed to meet industry openings	-Industry -Higher Education -Technical Schools -State Board of Regents	-Regional governance to implement program development across Tulsa	-Requires further local discussion	High

Communication Recommendations

Implement a Career Awareness Plan. Include a Targeted Marketing Plan, Creation of Online Resources and Messaging to Highlight the Value of Technical Pathways

Action Steps	Success Metrics	Critical Partners & Leaders	Barriers to Success	Potential Funding Sources	Priority & Timeline
-Expand “neighborhood area” job centers. Use TCC center at 21 st and Garnett as a best practice	-Meetings to discuss best practices, lessons learned and scalability -Develop Vision 2025 proposal	-TCC -Foundations -Business -City	-Sustainable funding	-Vision 2025 -Foundations and Business for possible pilot	-6-8 months for Vision 2025 proposal
-Student marketing campaign on industries and pathways including education specific “what is a ____” mechanic, engineer, etc.	-Create video message and other “commercials” to run on local stations	-Counselors at School -Industry Experts -Marketing Staff	-Funding to refresh message	-Foundation possibilities -Requires further local discussion	High, Continuous
-Teacher and Counselor marketing and education campaign	-Expand road trip for teachers -Annual updated materials on industries, growth and jobs	-Teachers, Counselors -Industry	-Funding to refresh message	-Foundation possibilities -Requires further local discussion	High, Continuous
-Expand “Dream It, Do It” program to other Industries, use work in manufacturing as best practice	-Create industry marketing materials, flyers, web-site specific to certain sectors	-School Faculty -Industry Experts -Marketing Staff	-Funding to refresh message	-Foundation possibilities -Requires further local discussion	High, Continuous
-Asset map of workforce programs, service learning opportunities, track funding sources and amounts	-Create database for collection of information -Annual updates to database	-GKFF (currently doing this for Transportation Industry)	-Leadership to refresh data	-Foundation possibilities -Requires further local discussion	High, Continuous
-Growing industry marketing campaign (target age 18-25)	-Create video message and other “commercials” to run on local stations	-Higher Education -Industry Experts -Marketing Staff	-Funding to refresh message	-Foundation possibilities -Requires further local discussion	High, Continuous

Communication Recommendations

Creation of Sector One Stop Workforce Centers. Streamline service and efforts for one Industry Sector.

Action Steps	Success Metrics	Critical Partners & Leaders	Barriers to Success	Potential Funding Sources	Priority & Timeline
-Determine which sectors have the greatest need and would benefit from a centralized support center	-Identify which sectors are highly utilized by the Workforce Board -Create regional plan for implementing the development of the center and services offered	-Industry -Workforce System -Tulsa Regional Chamber	-Time, funding, resources and staff capacity	-Requires further local discussion	Long term
-Utilize the Transportation WorkAdvance Model for new sectors	-Determine timeline for system replication -Increased participation in planning meetings by industry	-Transportation WorkAdvance -Industry -Workforce System	-Time, funding, resources and staff capacity	-Requires further local discussion	Long term
-Create online presence and physical one stop centers to support the sector	-Creation of website to support the target sector -Utilize information gathered during Workforce Analysis Strategy to guide website content -Increased utilization of Workforce system on behalf of target sector	-Industry -Workforce System -Tulsa Regional Chamber	-Time, funding, resources and staff capacity	-Requires further local discussion	Long term
-Target Growing Industry Careers	-Engage industry to determine key skill needs in the growing occupations -Focus job development and participant outreach in Sector Centers on these occupations	-Industry -Workforce System	-Time, funding, resources and staff capacity	-Requires further local discussion	Long Term

Communication Recommendations

Increase Industry and Education Communication Effectiveness. Expand Road Trip for Teachers Experience. Create Regional Structure for Internships and Externships with Industry.

Action Steps	Success Metrics	Critical Partners & Leaders	Barriers to Success	Potential Funding Sources	Priority & Timeline
-Parent and Career Guidance Programs (Use McClain as an example)	-Obtain information and guidance from McClain program -Create information to share with other HS's and Industry for replication of program	-Industry -Education Leadership -Roadtrip for Teachers Leadership	-Funding to replicate program -Time and resources to create informational materials	-Industry support -Board of Education funding	Mid-Long
-Expand Roadtrip for Teachers to be a several day Professional Development experience	-Identify 2-3 Industry Partners for full week experience -Develop learning outcomes and structure each day of training -Convene pilot group for experience over summer months	-High School Staff -Higher Education Staff -Industry Partners -Tulsa Regional Chamber	-Input from Industry -Buy-in from Industry -Time Commitment from Education	-Requires further local discussion	Mid-long
-Create regional guidebook for template for implementing Industry exposure via student internships and teacher externships	-Identify structure where internships and externships are already taking place -Determine from Industry what they would need to ease the utilization of intern/extern programs	-Industry -Education Leadership -Roadtrip for Teachers Leadership	-Limited time to develop structure -Limited capacity within industry to take on in terms	-Requires further local discussion	Mid-long

Collaboration Recommendations

Create a Clearinghouse (Inventory) for Education and Workforce Focused Initiatives. Clearer understanding of where the Region can increase collaboration and limit duplication of effort.

Action Steps	Success Metrics	Critical Partners & Leaders	Barriers to Success	Potential Funding Sources	Priority & Timeline
-Identify a leader for these focused efforts	-Create list of all initiatives -Create list of all initiatives key leadership staff	-Tulsa Regional Chamber -Impact Tulsa -Workforce System -Education Alliance	-Hard to identify some initiatives or organizations across the region	-Leverage current grant funding	High
-Survey known workforce and talent development initiatives within the greater Tulsa Region -Determine areas of focus, current partners, initiative or organizational goals	-Create survey -Distribute survey -Conduct analysis on survey	-Tulsa Regional Chamber -Impact Tulsa -Workforce System -Education Alliance	-Hard to identify some initiatives or organizations across the region	-Leverage current grant funding	High
-Create database or website clearinghouse of information that can be updated quarterly, semi-annually or annually	-Upload data into database or website -Provide guidance for updating information including data to refresh, frequency, key point person to manage update	-Tulsa Regional Chamber -Impact Tulsa -Workforce System -Education Alliance	-Hard to identify some initiatives or organizations across the region	-Leverage current grant funding	High

Collaboration Recommendations

Convene Industry and Education Roundtables. Leverage the learning from Sector Advisory Committees. Identify opportunities for new programs and Sector Career Academies

Action Steps	Success Metrics	Critical Partners & Leaders	Barriers to Success	Potential Funding Sources	Priority & Timeline
-Identify existing groups and measure engagement/participation in particular areas	-Create initial list of participants, as participants to add other colleagues or partners -Create agenda for meeting and identify date, location and participants -Create specific ROI messaging for each group	-Tulsa Regional Chamber -Workforce Investment Board -Education -Industry -Tulsa Achieves	-Someone to lead the effort, someone to be in charge	-Utilizing current funding supporting individual Advisory Committee's and pool funding to support the work of the regional/sector driven Committees	High and Continual
-Designate teams for specific initiatives	-Create a list of each group -Allow participants to provide input as to what group they would like participate	-Tulsa Regional Chamber -Workforce Investment Board -Education -Industry -Tulsa Achieves	-Keeping the attention of employers -Connecting various initiative efforts to benefit the larger group	-Utilizing current funding supporting individual Advisory Committee's and pool funding to support the work of the regional/sector driven Committees	High and Continual
-Create response team for workforce emergencies	-Have group determine who needs to be in the group -Create on MOU for partnership and typical action terms to guide effective response to workforce emergencies	-Tulsa Regional Chamber -Workforce Investment Board -Education -Industry -Tulsa Achieves	-Ensuring effective responses to support the emergency	-Utilizing current funding supporting individual Advisory Committee's and pool funding to support the work of the regional/sector driven Committees	High and Continual

Collaboration Recommendations

Unify Philanthropic Request and Efforts as it relates to Education, Skill Development and Workforce Needs.

Action Steps	Success Metrics	Critical Partners & Leaders	Barriers to Success	Potential Funding Sources	Priority & Timeline
-Create inventory of all the local, regional, national Foundation and Grant dollars coming into Tulsa	-Identifying grant dollars into the community	-Tulsa Regional Chamber -Local Foundations -Education/Workforce -Community Based Organizations	-Lack of desire to work together in seeking grant funding	-Leverage current dollars, potentially no new funding needed	-Mid, continual
-Leverage the inventory of local workforce/education initiatives to determine where people are asking for funding	-Incorporate grant programs into initiative inventory	-Tulsa Regional Chamber -Local Foundations -Education/Workforce -Community Based Organizations	-Identification of all the funding sources and the willingness to share that information	-Leverage current dollars, potentially no new funding needed	-Mid, continual
-Host meeting to determine where leaders are best positioned to focus their grant funding “ask”	-Identify areas of funding that are most asked for from the community	-Tulsa Regional Chamber -Local Foundations -Education/Workforce -Community Based Organizations	-Time constraints	-Leverage current dollars, potentially no new funding needed	-Mid, continual

Collaboration Recommendations

Localize Services to Address Specific Barriers in Tulsa Neighborhood Areas.

Action Steps	Success Metrics	Critical Partners & Leaders	Barriers to Success	Potential Funding Sources	Priority & Timeline
-Centralize existing information from population on barriers to work (possibly create a Barriers Database)	-Develop a timeline to assemble this data	-Community Service Council -CAP Tulsa -INCOG -Adult Education -IAUW Agencies -City Councilors -Census	-Standardizing the data -Time to collect data -Updating the information -On-going collection of data	-Requires further local discussion	High
-Determine the capacity to leverage work currently underway to address barriers in each neighborhood area	-Hold meeting with outreach and community services entities	-Community Service Council -CAP Tulsa -INCOG -Adult Education -IAUW Agencies -City Councilors	-Limited capacity and funding	-Requires further local discussion	High
-Formulate a regional plan to target specific activities to impact common barriers across Tulsa	-Create a timeline of activity -Develop and MOU between CBO's and other outreach services to coordinate across the region	-Community Service Council -CAP Tulsa -INCOG -Adult Education -IAUW Agencies -City Councilors	-Lack of coordination and collaboration between services providers	-Requires further local discussion	High

Capacity Recommendations

Increase Education Access for Non-Traditional Students and Working Learners

Action Steps	Success Metrics	Critical Partners & Leaders	Barriers to Success	Potential Funding Sources	Priority & Timeline
Expand Prior Learning Assessment Offers	<ul style="list-style-type: none"> -Review current policy of Prior Learning Assessment at each Higher Education Institution -Develop policy changes -Implement staff training on new policy -Market opportunity to students 	<ul style="list-style-type: none"> -Academic and Institutional Policy Makers at Higher Education Institutions 	<ul style="list-style-type: none"> -Current policy barriers -Concern for loss of tuition 	<ul style="list-style-type: none"> -Utilizing Higher Education and other grant supported funding 	<ul style="list-style-type: none"> -High to Mid Term
Increase Online Program Options	<ul style="list-style-type: none"> -Convene program development staff from education and training -Determine which curriculum can be facilitated online -Develop plan for transferring programs online 	<ul style="list-style-type: none"> -Education and Industry to determine which programs are in the highest need for online options 	<ul style="list-style-type: none"> -Traditionally focused faculty and learners 	<ul style="list-style-type: none"> -Needs further local discussion 	<ul style="list-style-type: none"> -Continual
Enhance Career Services	<ul style="list-style-type: none"> -Defining the available jobs and pathways into training and education that develop the right skills -Telling the story of the jobs in Tulsa effectively -Career aptitude discussions in schools -Cross-sector taskforce to develop solutions -Seamless transition between education institutions 	<ul style="list-style-type: none"> -Employers from Key Industry Sectors -Common Education Partners -OSU-IT, TCC, TTC -Human Resource Professionals -Junior Achievement 	<ul style="list-style-type: none"> -Lack of awareness around existing programming, career paths available -Communicating both the nature and benefits of these career paths -Transportation -Child care 	<ul style="list-style-type: none"> -Individual businesses -Foundations 	<ul style="list-style-type: none"> -Continual

Capacity Recommendations

Increase Education Access for Non-Traditional Students and Working Learners

Action Steps	Success Metrics	Critical Partners & Leaders	Barriers to Success	Potential Funding Sources	Priority & Timeline
Improve Articulation Agreements	<ul style="list-style-type: none"> -Continue work with Tulsa Tech and TCC to develop and improve these agreements -Include High School Career Academy staff in conversation 	-Education leadership, OK Board of Regents contact and guidance from the Higher Learning Commission	-Availability of faculty and equipment at facilities to offer articulation of learning from one institution to another	-Utilization of current funding, access to grant dollars in OK to support these agreements	-Continual
Focus on Lifelong Learning in TYPros Network	<ul style="list-style-type: none"> -Offer professional development workshop sessions -Highlight the value of continuing on a degree pathway in Tulsa -TYPros becomes messaging and marketing leadership for Degree Attainment/Continued learning in Tulsa 	-TYPros leaders, Industry and Education	-Transition from traditional college pathway thinking	-Marketing dollars to support new messaging	-Mid to Long Term

Capacity Recommendations

Supportive Services and Outreach Efforts

Action Steps	Success Metrics	Critical Partners & Leaders	Barriers to Success	Potential Funding Sources	Priority & Timeline
Invest in Work and Education Based Transportation	<ul style="list-style-type: none"> -Track utilization and ROI for pilot transportation programs in Tulsa -Survey employers and education institutions for interest in transportation programs -Create scale plan for pilot transportation programs 	<ul style="list-style-type: none"> -Industry, Transportation providers, Workforce System, Chamber or other Civic entity 	<ul style="list-style-type: none"> -Costs -Determining routes -Incentivizing employer participation -Gaining ridership 	<ul style="list-style-type: none"> -Needs further local discussion to determine funding sources 	<ul style="list-style-type: none"> -Mid Term, Continual
Highlight Investment in Ex-Offender Workforce Pipeline	<ul style="list-style-type: none"> -Support “Ban the Box” legislation at the State level -Conduct employer survey to determine ROI on tapping into this portion of the workforce -Develop transition training programs specifically for target sectors and this population 	<ul style="list-style-type: none"> -Industry, Education, Department of Corrections, Workforce System, Civic Leadership 	<ul style="list-style-type: none"> -Stigma of population -Unwillingness of employers to hire ex-offenders 	<ul style="list-style-type: none"> -Needs further local discussion to determine funding sources 	<ul style="list-style-type: none"> -High

Thank You to the Project Funders



The U.S. Department of Commerce Economic Development Administration provides grants designed to help retain jobs and stimulate economic growth. EDA Regional Director Pedro Garza is a major partner in this initiative.



George Kaiser Family Foundation (GKFF) is a charitable organization dedicated to breaking the cycle of poverty through investments in early childhood education, community health, social services and civic enhancement. GKFF works primarily on initiatives developed in collaboration with Tulsa-based direct service organizations.



The Community Service Council provides leadership for mobilizing efforts that improve the lives of thousands of Oklahomans each day.



The Indian Nations Council of Governments (INCOG) is a voluntary association of local and tribal governments in the Tulsa metropolitan area in northeast Oklahoma.



Public Service Company of Oklahoma provides electric service to more than 530,000 customers in Oklahoma and is headquartered in Tulsa. PSO is a unit of American Electric Power.