Toledo Talent Alignment Strategy

Report 1: Talent Analysis

November 2018

CAEL avalanche

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01 | **Introduction**

About the Toledo Talent Alignment Strategy

The Toledo Regional Chamber is championing the Toledo Talent Alignment Strategy in partnership with the Lucas County Workforce Development Board. The purpose of this Strategy is to ensure education and workforce development efforts are aligned with the needs of employers and to coordinate existing education and workforce development initiatives currently underway throughout the region. Ultimately, the project aims to create the next generation workforce that the Toledo region will need to propel its economy forward.

The strategic planning process is an initiative from the Toledo Regional Chamber of Commerce, with engagement from key funding partners.

CAEL and Avalanche Consulting were engaged to facilitate and prepare the Strategy, to include the following:

Report 1: Talent Analysis will determine the makeup of the region's labor force and identify the industries and occupations that are thriving. This report serves to construct a baseline analysis of the Toledo region's demographics and an analysis of the trends in the workforce and education infrastructure pipeline, including the supply of graduates in the Toledo region.

Report 2: Supply-Demand Gap Analysis will identify what skills the workforce currently has, what skills employers need, and how to fill in gaps in the workforce pipeline. This report will review the growing industry and occupation clusters and provide a comprehensive inventory of all education and training assets in the region. Using this inventory, this report will include a supply, demand and program gap analysis as it relates to gaps in humans and educational programs.

Report 3: Talent Alignment Strategy will provide recommendations on how to align and improve the region's talent pipeline. The strategy will include high level goals for developing, retaining, and attracting talent within the region. These goals will include several strategy recommendations for action, tactics to be deployed across the region and talent development systems, as well as a high level implementation plan to guide strategic activity.

Supplemental Reports will include a Labor Shed Analysis of commuter impacts on available workforce and Occupational Profiles with line-item data on employment, forecasted jobs, and wage levels for individual occupations in target clusters.

Stakeholder Input will take place throughout this process. Focus groups and interviews will be facilitated with stakeholders in the region. A Steering Committee consisting of industry, education, and workforce leaders from throughout the Toledo region will serve as advisors to the project.

Project Partners and Funders

The University of Toledo

The University of Toledo is a student-centered, public metropolitan research university with 20,500 students. Established in 1872, the University has the third-largest public university operating budget in the state and is accredited by the Higher Learning Commission.

Bowling Green State University

Bowling Green State University is one of the top public universities nationwide with a strong commitment to first-year programs that lead to success. Founded in 1910, the university enrolls just over 19,000 students and provides experiences that enhances lives and prepares students for lifelong career growth.

Toledo Lucas County Port Authority

The Port Authority's business focuses on transportation and development. The business is shaped by the Port Authority's mission to move people and cargo through the region while employing innovative programs to stimulate development in the region.

Fulton County Economic Development Corporation

The Fulton County Economic Corporation works with companies of any size and in various industries to support their efforts to grow, invest, and hire in Fulton County. Their teams work in Business Development, Community Outreach and Workforce Development and Education.

Penta Career Center

Penta Career Center is a Career and Technical Education (CTE) school that provides industry-recognized certifications to high school students and adults. Penta provides courses a total of 16 school districts across the northwest Ohio region.

Owens Community College

Owens Community College is a comprehensive community college established in 1965 to provide educational opportunities and training to the residents of Toledo. Their mission is to foster student and community success by providing high quality and affordable education that leads to rewarding careers, personal growth, and regional economic strength.

Technical Team

The Toledo Regional Chamber is championing the Toledo Talent Alignment Strategy in partnership with the Lucas County Workforce Development Board. The project was facilitated and developed by CAEL and Avalanche Consulting, Inc.

CAEL (Council for Adult and Experiential Learning)
CAEL is a national, non-profit organization whose mission is to put meaningful learning, credentials and work within reach for every community. Since its founding in 1974, CAEL has been providing colleges and universities, companies, economic development organizations, labor organizations, and state and local governments with the tools and strategies they need for creating practical and effective lifelong learning solutions to address long-term skills needs.

Avalanche Consulting, Inc.
Avalanche Consulting is the nation's premier economic development strategist. Avalanche is deeply driven to make a positive impact and seek clients who are equally inspired to energize their economies. Headquartered in Austin, Avalanche was established in 2005 and its team has a combined 80+ years of experience working with more than 150 cities, counties, and regions across the country.

Steering Committee Members

The Toledo Talent Alignment Strategy project partners and consulting team sincerely thank the members of Toledo Talent's Steering Committee for helping inform and guide the development of this strategy. Members include:

Dr. Cecelia Adams, City of Toledo
Deborah Bubp, Hylant
Keith Burwell, Toledo Community Foundation
Lena Ciminillo, The Andersons, Inc.
Catherine Crosby, City of Toledo
Rashad Delph, Dana, Inc.
Andrea Domachowski, Lourdes University
Dr. Romules Durant, Toledo Public Schools
Ed Ewers, Penta Career Center
Martha Gebers, Wood County/Sauder Woodworking
Wade Gottshalk, Wood County
Wendy Gramza, Toledo Regional Chamber of Commerce
Andrea Gurscik, First Solar
Stacy Hammer, Manpower
Cindy Hurst, Lourdes University
Amy Kelley, Libbey Glass
Nicole Langenderfer, ProMedica
Joe Luzar, Lucas County Workforce Development Board
Ron Matter, Penta Career Center

Diane Miller, University of Toledo
Russell Mills, Bowling Green State University
Pam Mohler, Associated General Contractors
Angela Nowak, Mercy Hospitals
Timothy Richissin, SSOE
Carolyn Rodenhauser, Regional Growth Partnership/JobsOhio
Tonia Saunders, Lucas County Workforce Development Board
Jeff Schaaf, Toledo Regional Chamber of Commerce
Adam Schlatter, O-I
Denise Smith, Owens Community College
Steven Stockdale, Buckeye Broadband
Paul Toth, Toledo Lucas County Port Authority
Michael Veh, Lucas County
Courtney Wagner, Owens Corning
Tom Walsh, Toledo Regional Chamber of Commerce
Jennifer Wuertz, SSOE
Sarah Zibbel, Libbey Glass

About This Report

The Workforce Analysis is the first piece of the Toledo Talent Alignment Strategy. This analysis will determine the makeup of the region's labor force and identify the industries and occupations that are thriving. It will provide an in-depth analysis of the education, talent, and workforce in the Toledo region. The report begins with a Workforce Snapshot, followed by a Demand Analysis, and a Talent Supply Analysis.

Workforce Snapshot

The first step to determining the needs of the Toledo region's future workforce is to understand the condition of the current workforce. In this section, we examine characteristics such as population trends and age composition, employment trends and industry growth, educational attainment, and educational performance. This data enables us to better understand how to capitalize on the strengths of the current workforce, and how to best address areas of future need.

Demand Analysis

In this section, we identify the existing and emerging drivers of job creation within the Toledo region. This analysis can be used by economic and workforce developers to better align their efforts in recruitment and training. This analysis examines three components in both employment by industry and employment by occupation.

- Current size – the total number of individuals employed in each industry and occupation cluster.
- Relative concentration – calculated using the location quotient, which describes the per capita concentration of a local cluster relative to the US per capita average. A 2.0 LQ indicates a local cluster is 2x more concentrated locally.
- Past growth and future growth – the rate at which each industry and occupation cluster have grown in the past and in the future, with an emphasis on which clusters are growing the fastest.

Talent Supply Analysis

The Toledo region has numerous colleges and universities, but are these students pursuing the right degrees? Do they align with Toledo's target industry needs? Which technical degrees are the fastest growing and which ones might be under-represented given the target industry priorities? Our analysis will examine growth trends of degree clusters, their overall size of output, growth comparisons to the US, and "concentration quotients" to show the relative density of the degree group in the Toledo region.

Using This Report

Data included in this report can and should be utilized to aid in both economic and workforce development activities. Demographic data, industry, and occupational trends as well as education trends provide a clear detail on the current state of the Toledo regional workforce. This data includes helpful pieces of information for local businesses, prospective businesses, site selection efforts as well as talent development programs, initiatives and investments to better understand the current population, economic direction and education levels of Toledo's residents.

Defining the Region

The analysis in this first report focuses on a region that consists of the following four counties: Fulton, Lucas, Ottawa, and Wood. The Toledo Metropolitan Statistical Area includes just three counties (Fulton, Lucas, and Wood) and places Ottawa County in its own Port Clinton Micropolitan Statistical Area. We combine these two MSAs due to the strong linkages between the two and to align with the Toledo Chamber's service territory.

The Toledo Labor Shed is the larger area that captures commuters from outside the Toledo Region. The Labor Shed will be examined in a separate, supplemental report. Additionally, Monroe County MI will be included in Report 2: Supply & Demand Gap Analysis which examines the education programs across the regions and analyzes talent production against occupational clusters critical to the Toledo regional economy.
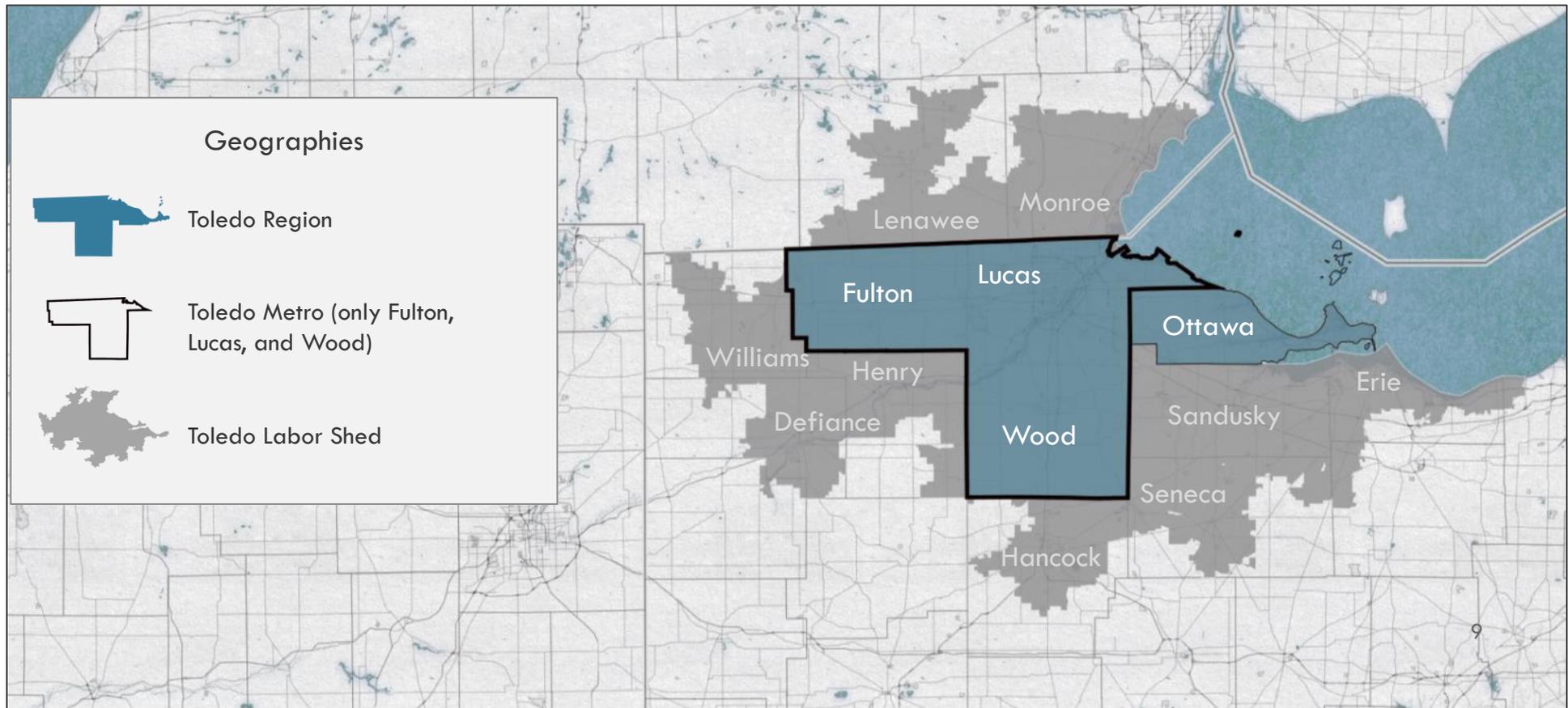
Why This Talent Alignment Strategy Is Important

The Toledo region is facing a labor shortage that is hasn't seen in decades. Strong, growing companies can't find the workers they need, and Toledo's renewed job growth and renaissance are threatened.

Today, we know without doubt that **the most important factor in corporate location / site selection is TALENT**. If you have it, you win. Communities that can develop, attract, and replenish their talent pool will consistently win the competition for jobs and investment. And, demand for talent is changing, with **renewed emphasis on middle skills where workers can apply technologies in new ways**, whether it is inside a manufacturing plant or by the bedside in a hospital, using knowledge gained through a Certificate or Associate's degree.

These new technologies aim to do more than just supplement or enhance existing job profiles. Many technologies will potentially change the entire workforce structure through automation. Rapid change in technology is happening at a time when demographic changes will also put pressure on workforce availability as Baby Boomers retire from the workforce. We call these technology and demographic trends **"Global Forces"** as they are trends in motion that will supersede traditional models and thinking.

Here is our list of **Top Global Forces** that will impact the Toledo region:

- **Retiring baby boomers** will pull people out of the Toledo workforce and also create new demand for health care. As more workers are needed in health care, fewer remain available for other growing industries in the region.
- An **aging workforce** in Toledo will mean that many skills and knowledge is at-risk of being lost, such as tool makers and engineers at manufacturing plants. Employers not only need to transfer this knowledge to the next generation of workers, but they must find a willing, young workforce to take this on.
- **Lower labor force participation** is a general trend, as people are less likely to be working than before the recession. There are many reasons for this; from skyrocketing child care costs which dis-incentivize mothers to work, to long-term unemployment due to the Great Recession and mis-aligned skills.
- **Millennials** are fast-growing part of the workforce, and the ability of regions like Toledo to attract and retain Millennials will be critical to their success. Furthermore, workplace environments will have to evolve to fit the needs of a Millennial workforce, particularly during times of low unemployment.
- Technological changes in **IT, Mobile Commerce, Social Media, and the Internet of Things** have already changed and will continue to transform US business models. The workforce in Toledo must be ready for technology change and "learn to learn" to maintain competitiveness.
- **Data Analytics, Machine Learning, and Artificial Intelligence** aim to reshape the entire economy through data. Now that data is the lifeblood for companies seeking to optimize their business and gain an advantage, Toledo workers must be savvy not only in IT but in the mathematics used in data analysis.
- **Robotics** continues to permeate the manufacturing sector, but now **Automation** and the resulting loss of jobs threatens occupations in the service industry and at all skill levels. From accountants to cashiers, few careers won't be affected by Automation in some way in the years to come.

02

**Information Gathering &
Summary of Findings**

Stakeholder Engagement

For the qualitative component of this Strategy, CAEL and Avalanche conducted seven focus groups (~ 60 participants) and 15 Individual Stakeholder Interviews in September of 2018 with key stakeholders from the following areas:

- Workforce Development
- Economic Development
- EPIC Toledo
- Small Business Owners
- Higher Education & Training Providers
- Major Employers
    - ProMedica, Owens Corning, Dana, The Andersons, O-I (among others)
- Community Service Providers
- K-12

During these focus groups and interview conversations, CAEL and Avalanche asked in-depth questions regarding Toledo's education and workforce ecosystem, such as:

- What is your perception of Toledo's overall workforce pipeline? What are the strengths and weaknesses of the current pipeline?

- Is the business community effectively engaged in CTE or experiential learning?

- What are some of the biggest workforce challenges you're facing as an employer?

- Do you see quality talent coming out of the regional K-12 and higher education system?

- How can we enhance organization collaboration across education, employers, workforce development and economic development?

Primary Data Sources

In order to further bolster these findings, CAEL and Avalanche are conducting more in-depth, hands-on engagements in late November of 2018 in order to gain further guidance and insight from steering committee members and others on the direction of the overall Strategy. In order to maximize the amount of information gathered, CAEL and Avalanche used the following quantitative data sources to supplement their qualitative analysis:

EMSI

EMSI provides detailed employment forecasts by industry for individual counties and metros, using proprietary methods to fill in gaps in publicly available data and to produce custom forecasts. Their data is based on the Bureau of Labor Quarterly Census of Employment and Wages (QCEW) program and Occupational Employment Statistics (OES).

Bureau of Labor Statics (BLS)

Unemployment rates for counties are based on the Local Area Unemployment Statistics (LAUS) program. LAUS estimates are produced using models that incorporate data from the BLS Current Employment Statistics (CES) program, the BLS Quarterly Census of Employment and Wages (QCEW) program, the Census Bureau's American Community Survey (ACS), the BLS Current Population Survey (CPS), and individual state Unemployment Insurance (UI) data.

US Census Bureau

The American Community Survey (ACS) is a nationwide survey conducted by the US Census Bureau that collects and produces information on demographic, social, economic, and housing characteristics about our nation's population every year. The ACS involves the participation of more than 3.5 million households each year. In addition to the ACS, this report uses data from other Census programs, including Population Estimates and Poverty & Income.

Integrated Postsecondary Education Data System (IPEDS)

Each year, the National Center for Education Statistics reports the number and types of degrees awarded by US postsecondary institutions. The survey, known as the Integrated Postsecondary Education Data System (IPEDS), collects data on the field of degree, the field of study, and the level of degree. IPEDS is an established system of interrelated surveys conducted annually by the US Department of Education's National Center for Education Statistics (NCES). IPEDS gathers information from every college, university, and technical and vocational institution that participates in the federal student financial aid programs.

Select additional data sources include Ohio School Report Cards.

Summary of Key Findings

As a result of the first information gathering trip, CAEL and Avalanche identified preliminary Strengths, Weaknesses, Opportunities, and Threats to the current talent pipeline. The SWOT analysis to the right details the high level qualitative findings as a result of the first trip to the Toledo region during which several focus groups and interviews were conducted with key leadership in education, workforce, business and economic development. In this report and the following supply and demand gap analysis (Report 2), the data analysis will supplement local employer and stakeholder input and frame the current challenges to be addressed in the strategic plan (Report 3).

Growing Economy, Labor Shortage. The Toledo region's economy is growing again, but labor shortages are getting worse. Since 2010, the region has created 23,000 jobs, but the working age population has fallen by 9,000 people. As a result, Toledo's unemployment rate (5.5% in 2017) is one of the lowest rates seen in 25 years.

Challenges Attracting/Retaining a Young Professional Workforce. Toledo's 35-54 year old population has shrunk by 36,000 people over the last ten years. While this demographic shift (fewer Gen X than Boomers) has been seen nationally, Toledo's 19% drop in this age demographic far exceeds the US drop of four percent. As such, employers express difficulty in finding an experienced workforce locally, or attracting this demographic into the region.

High Young and Minority Unemployment. Unemployment rates are particularly high for young workers 25-34 and for Black/African American and Hispanic workers. Many causes can be attributed to this, from a misalignment in skills, a need for additional education, or a lack of awareness of job opportunities, among others.

STRENGTHS

- Investment/redevelopment of downtown Toledo

- Increasing career pathing & guidance for high school students

- Many major employers investing in their own talent pool/pipeline

WEAKNESSES

- Employers struggling to find and retain the right talent

- Lack of staff capacity and alignment of roles

- Negative perception about Toledo among residents

- Significant teacher shortage

OPPORTUNITIES

- Increasing number of foreign-born and highly educated immigrants in the Toledo region

- New leadership (TPS, BGSU, OCC, Lourdes University)

- Reputation of region's Higher Education programs

- Growing partnerships between education and business

THREATS

- High turnover among large employers

- Challenges attracting and retaining young professional population

- Misperception of Toledo compared to other Midwest cities

- State policy and messaging on (traditional) college only pathways for students

Summary of Key Findings

Improving Educational Attainment. The adult population the Toledo region is becoming better educated. Both Associate's attainment and Bachelor's attainment has increased in the last five years. Still, Bachelor's attainment lags US levels by five percentage points. Associate's attainment exceeds US levels, reflecting Toledo's emphasis on a manufacturing workforce. Still, younger workers 25-34 years of age have lower Associate's attainment than older workers 45-64 years of age, which suggests a need to upskill younger workers to replace a more educated, retiring workers.

New Growing Industries in Health Care, Back Office/HQ, Others. While Toledo has historically been a manufacturing economy, new growth industries in Health Care and Back Office will help diversify the economy in the years ahead. The region's largest industry clusters by employment are Healthcare, Retail, Entertainment and Education. Several mid-sized industries such as Automotive, Transportation & Logistics, Industrial Machinery, and Materials have also seen strong, positive growth.

Large College Population Produces a Ready Workforce. The Toledo region produces 12,000 graduates per year, which is 20% more postsecondary graduates on a per capita basis than the US. Specifically, Bachelor's and Advanced Degrees produce more per capita than US levels. This represents both an opportunity for employers (to find new educated workers) and a challenge for the region to place and retain these new graduates in regional career pathways. Greater alignment between the college majors available to and chosen by current and future students with local demand in growing and in-demand skills will ensure more students are gainfully employed and therefore more inclined to stay in the region long term.

Toledo's Downtown Renaissance Will Boost Workforce Attraction and Retention. Employers and residents expressed strong pride in the positive developments in downtown, from new sports facilities to new housing to new restaurants and entertainment. Toledo will be tasked to promote these new amenities to outsiders and to create a buzz that "Toledo is on the move" to young workers.

Foreign-born Workers are Growing, and Asian-American Educational Attainment is Extremely High. Research shows that foreign-born workers are becoming a bigger part of Toledo's workforce and that this demographic is highly educated. A case in point, while the Asian-American population is very small (<2% of total population), they are fast-growing and have a 70% Bachelor's attainment rate, far higher than seen at the US level (54%).

New Partnerships Are Forming in the Region. New leadership at local colleges and renewed participation by employers in workforce development has led to the formation of new employer-education partnerships. This project will seek to build upon and formalize these partnerships, ensuring action to boost both short-term and long-term talent supply with the skills that employers need.

Increased focused on Career and Technical Education Offerings. With new education leadership has come a new strategic direction in further developing, promoting, and sustaining career and technical education programs aligned to, and validated by, regional employers with significant workforce needs both now and into the future. The focus on these types of education and training, specifically within the K-12 education system, is creating a pipeline of career-ready workers with the skills most in demand regionally.

03 | Workforce Snapshot

About the Workforce Snapshot

The first step to determine the needs of the Toledo region's future workforce is to understand the condition of the current workforce. In this section, we examine characteristics such as population trends and age composition, employment trends and industry growth, educational attainment, and educational performance.

WHY IS THIS IMPORTANT
Foundational data enables us to better understand how to capitalize on the strengths of the current workforce, and how to best address areas of future needs. Key takeaways from the data analyzed for the Toledo region include:

Population Trends – Population is one of the base indicators of overall economic prosperity in a community. Growing populations indicate a community has assets and job opportunities to retain residents and attract new talent. The Toledo region, however, has experienced a declining population for the past 10 years with a significant shortage in the critical 35-44 year old age range. This population decline has, and will continue, to worsen labor availability for regional employers, specifically within the mid-career professional occupations.

Employment Growth – Growth is a primary measure of a community's overall economic health. Strong job creation, relative to other benchmark communities, can indicate a more competitive business climate and the presence of supportive resources. Toledo is currently experiencing an improving job market. However, the population stagnancy and decline is creating regional labor shortages.

Labor Force Participation – Availability of talent drives business site location decisions, especially today when unemployment rates are at record lows for much of the country. Toledo's labor participation for the key working ages of 25-64 is 1.7% lower than the participation rates following the Great Recession. This is an indicator that there are many people completely stopped out of the labor market which could be re-engaged to fill some regional labor shortages. It's also critical for the region to attract talent and grow the workforce to have a competitive advantage and fuel economic momentum.

Education Attainment – The modern economy is increasingly knowledge-intensive. New jobs often require education beyond a high school diploma. Due to this growing reliance on skilled workers, many businesses choose to be located in regions with a higher portion of residents holding Associate's and Bachelor's degrees. The Toledo region, while having similar trends to the nation and Ohio for Bachelor's degrees, outpaces the state and national trends for Associate's degrees. This is a promising indicator that residents value post-secondary education.

Poverty Levels – The ability for residents to prosper and support their families is inextricably linked to access to jobs and consistent income. High poverty levels often reflect limited job opportunities, low educational attainment and significant demands of social service programs. Specifically in the Toledo region, poverty levels have been higher than national averages since 2004. Most notably, poverty levels within Lucas County well out pace regional, state and national averages.

Population Trend

The population of the Toledo region has decreased 5% over the past ten years to 644,000 in 2017. This decline is counter to the population growth seen in the US and in the state of Ohio, and is largely driven by population decline in Lucas County. The working-age population has declined even further — nearly 7% over the past ten years. **Toledo's declining population over the last ten years worsens labor availability for the region's employers.**

TOLEDO REGION TOTAL POPULATION 2000 – 2017
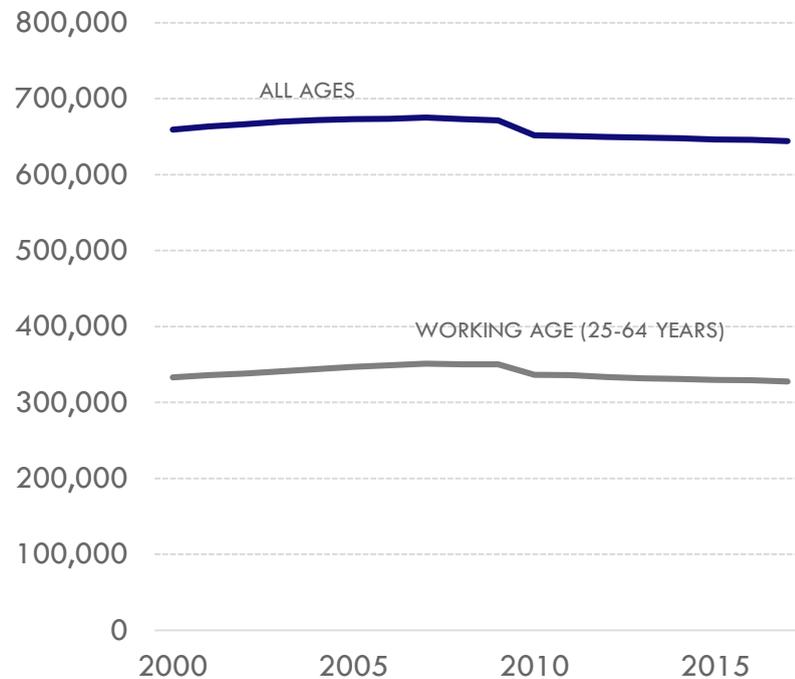
SOURCE: AVALANCHE CONSULTING / US CENSUS BUREAU POPULATION ESTIMATES

POPULATION GROWTH BY GEOGRAPHIC REGION 2007 – 2017
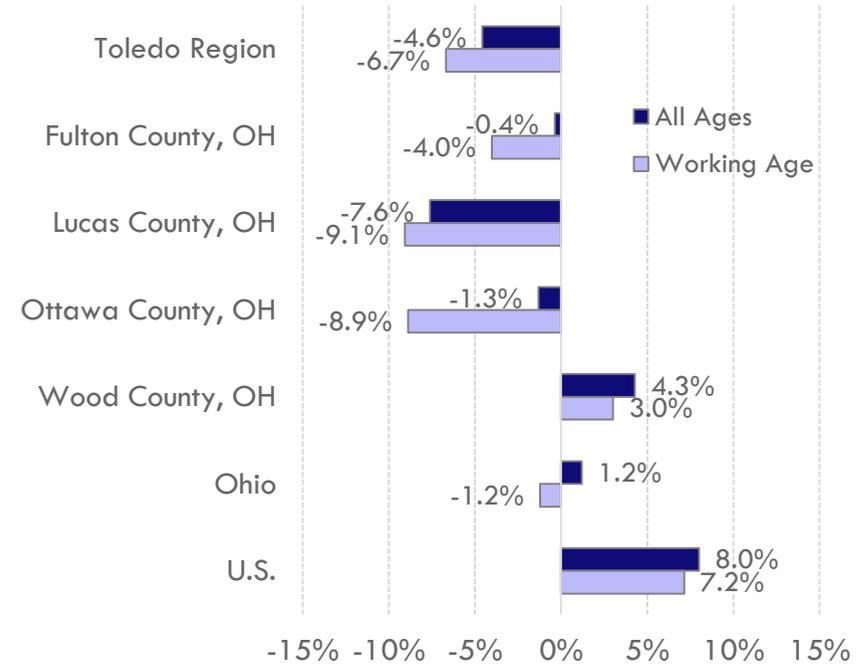
SOURCE: AVALANCHE CONSULTING / US CENSUS BUREAU POPULATION ESTIMATES

Population by Age Generation

The population of the Toledo region is generally much older than the US population overall, with the exception of a relatively large 15-24 year-old, college-age population. Unfortunately, the region is clearly not retaining its Millennial population, particularly older Millennials. In the chart on the right, we show each generation's population today versus 15 years ago to determine how well Toledo is retaining each generation. The region is doing well retaining and even attracting late teens and college age students (+4% growth from 15 years ago), but they don't stay after graduation. The Millennial population has shrunk 21% in the past 15 years, while it has grown 7% at the US level due to international in-migration. For older generations, there are 10% fewer people in Toledo than if Toledo followed US growth rates. However, Millennials are 28% smaller in Toledo than seen in the US Millennial growth rate. If Millennials were retained as well as older generations, **there would be 28,000 more Millennials living in the Toledo region today. And, when ranked among the largest 100 metros, Toledo is the 3rd worst metro for Millennial population growth.** See Appendix for more.

POPULATION BY AGE
2017

Age	Toledo Region	US
< 15	18.5%	18.7%
15 to 24	14.4%	13.3%
25 to 34	13.2%	13.9%
35 to 44	11.3%	12.5%
45 to 54	12.5%	13.0%
55 to 65	13.8%	12.9%
65+	16.3%	15.6%

0% 5% 10% 15% 20% 25%
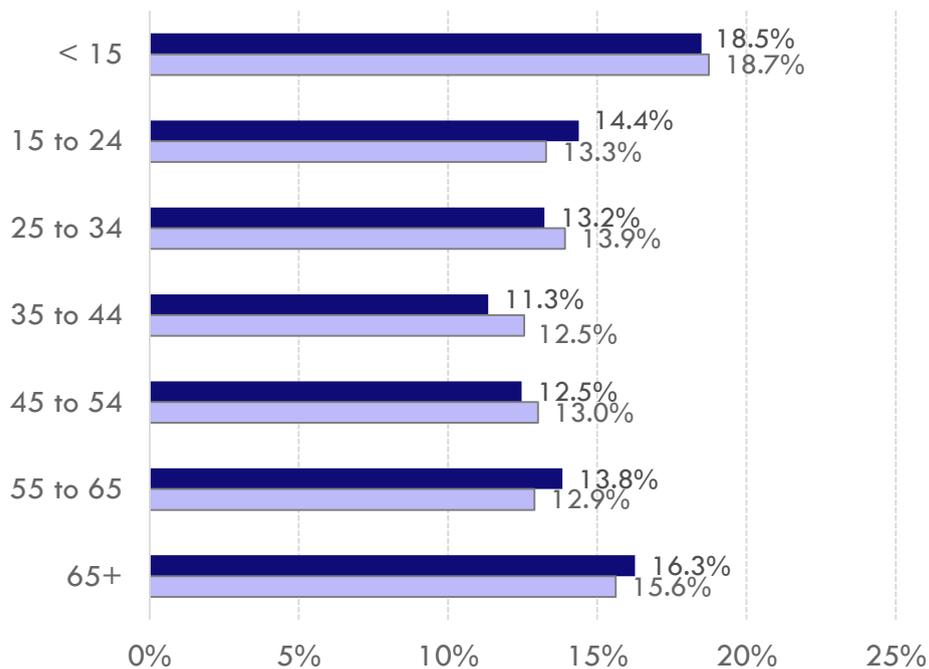
■ Toledo Region
■ US

TOLEDO REGION POPULATION BY GENERATION
TODAY VS. 15 YEARS AGO

LOCAL CHANGE VS US

Generation	15 Years Ago	Today, 2017	Local Change vs US
Older Gen Z (15-24 now)	88,694	92,677	+4% / +9%
Millennials (25-39 now)	154,860	122,839	-21% / +7%
Generation X (40-54 now)	130,858	115,748	-12% / +1%
Boomers (55-69 now)	146,934	125,196	-15% / -6%
Greatest Gen (70-84 now)	81,210	54,770	-33% / -24%

0 50,000 100,000 150,000 200,000
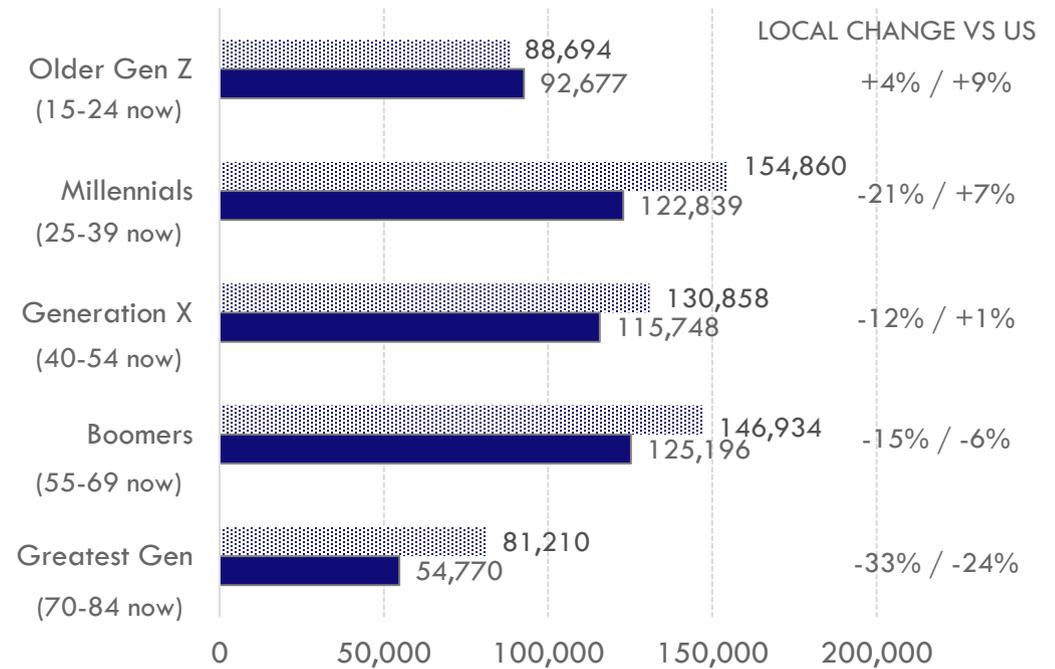
SOURCE: AVALANCHE CONSULTING / US CENSUS BUREAU
NOTE: GENERATIONS ARE APPROXIMATE IN ORDER TO SET FIX EACH TO A 15-YEAR PERIOD.

▦ 15 Years Ago
■ Today, 2017

Population by Age

Toledo's growing imbalance in its working age population will further complicate worker hiring, attraction, and retention for its employers. Between 2007 to 2017, the Toledo region experienced a decline in the number of individuals in each age group younger than 55. This was primarily led by residents aged 35 to 54 aging into older groups, with those aged 55 or higher growing over the period. Declines are particularly large for older Millennials and younger Generation X: combined, the 35-54 age group has fallen nearly 20% and has 36,000 fewer people in just 10 years. **Toledo is currently facing a shortage of mid-career professionals and is threatened by a large demographic that will retire in the next 5-10 years.** See Appendix for more detail.

POPULATION % GROWTH BY AGE
2007 - 2017
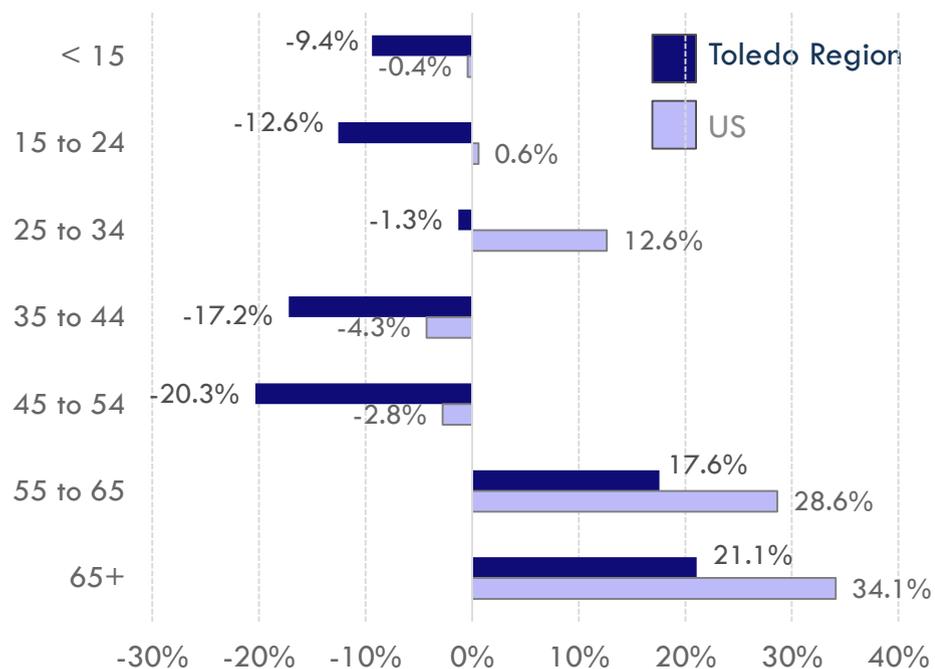
TOLEDO REGION POPULATION CHANGE
2007 - 2017

SOURCE: AVALANCHE CONSULTING / US CENSUS BUREAU
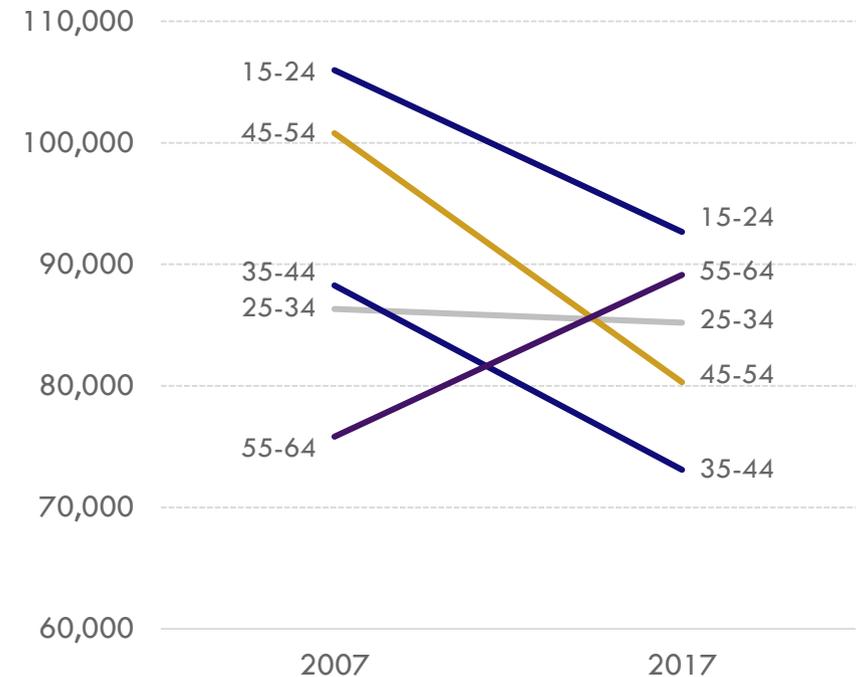
SOURCE: AVALANCHE CONSULTING / US CENSUS BUREAU

Population by Race/Ethnicity

The population of the Toledo region is slightly less diverse than the US, due to relatively small populations of Hispanics and Asians. However, Black/African Americans represent a slightly larger proportion of the population in the region than in the US. Like the US, the region is diversifying, as non-White populations have experienced the most growth since 2007. **The lack of a diverse workforce similar to the profile of the US creates problems for employers when attracting racial minorities to the region.**

POPULATION BY RACE/ETHNICITY
2017

POPULATION GROWTH BY RACE/ETHINCITY
2007 - 2017

■ Toledo Region
■ US

White: 75.6% / 60.7%
Black or African-American: 13.6% / 12.5%
Hispanic: 6.8% / 18.1%
Asian: 1.5% / 5.2%
Other: 2.5% / 3.5%

White: -9.6% / -0.6%
Black or African-American: 3.8% / 10.0%
Hispanic: 31.7% / 29.8%
Asian: 19.5% / 28.9%
Other: 50.2% / 64.3%
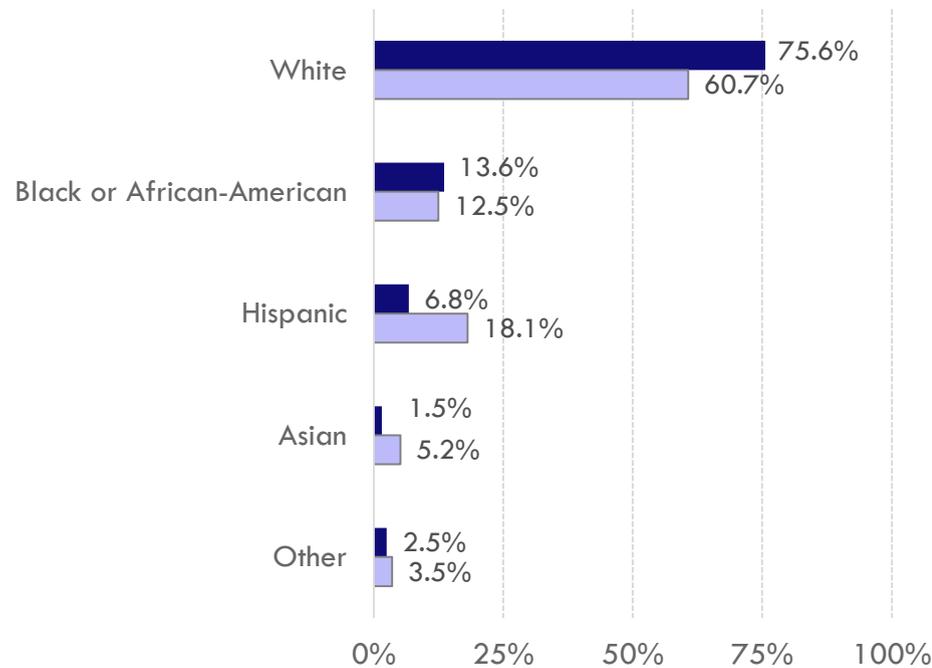
SOURCE: AVALANCHE CONSULTING / US CENSUS BUREAU

DATA SEPARATES ALL HISPANICS OF ANY RACE INTO ONE CATEGORY
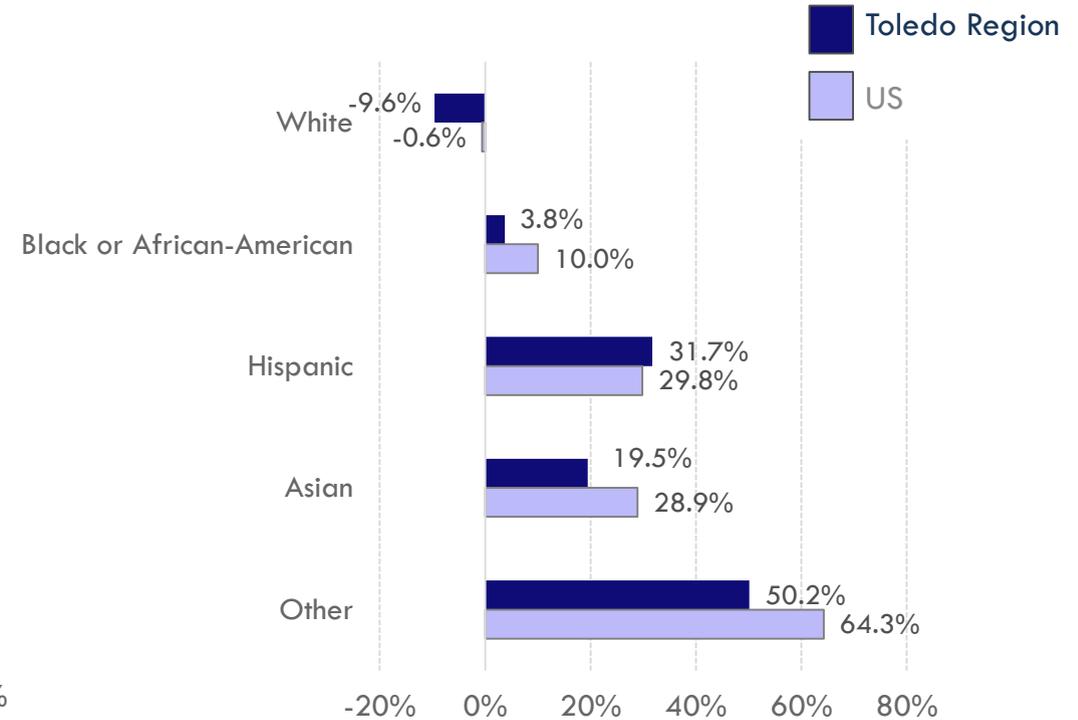
SOURCE: AVALANCHE CONSULTING / US CENSUS BUREAU

Employment Growth

Employment in the Toledo region is slightly lower now than ten years ago before the recession. Just after the recession in 2009, employment stood at under 284,000 before climbing to nearly 308,000 in 2016. From 2010 to 2017, area employment has grown by just under 23,000, or 8.0%. Employment dropped slightly over the past year. Within the region, Wood County is the only county to increase its employment base since 2007. **Toledo's improving job creation environment but a flat-to-shrinking working age population has created regional labor shortages not seen in decades.**

TOLEDO REGION TOTAL EMPLOYMENT
1997 – 2017
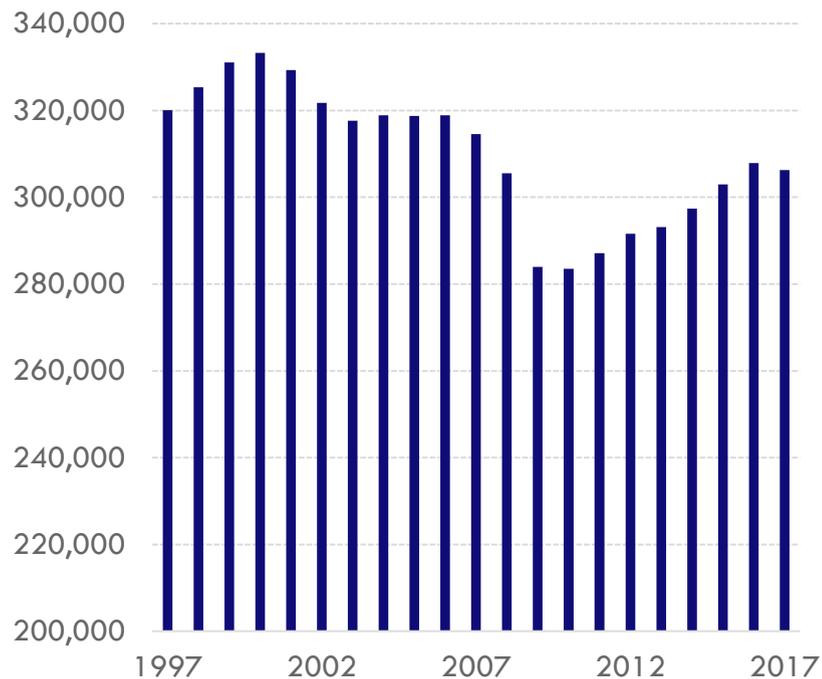
EMPLOYMENT GROWTH
2007 – 2017

Toledo Region	-2.6%
Fulton County	-10.7%
Lucas County	-6.0%
Ottawa County	-3.6%
Wood County	13.3%
Ohio	1.1%
U.S.	6.3%
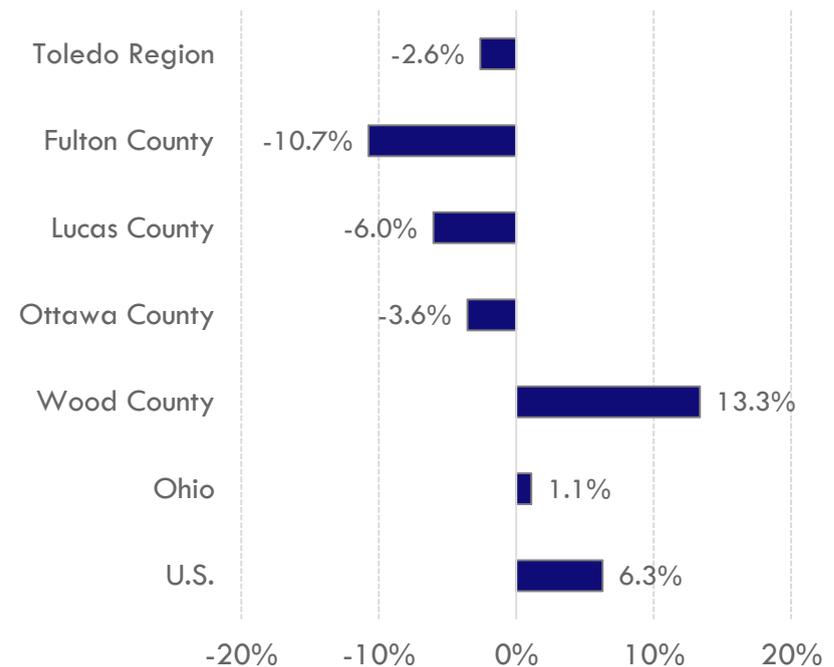
Unemployment Trend

The unemployment rate in the Toledo region has descended from a high of 12.5% in 2009 to a recent low of 5.0% in 2015. More recently, the region sits at 5.2% in July 2018, which ranges from 4.4% in Wood County to 5.5% in Lucas County. This most recent regional rate is slightly higher than Ohio as a whole (4.9%) and over a single percentage point higher than the US, which is at 4.1%. **Toledo's labor shortage reached its worst levels in 2016, when strong job growth drove the unemployment rate below the US rate for the first time in 25+ years; a recent deceleration in growth in 2017 caused unemployment to increase slightly.**

UNEMPLOYMENT RATE 1990 - 2017

UNEMPLOYMENT RATE JULY 2018

SOURCE: AVALANCHE CONSULTING / BUREAU OF LABOR STATISTICS
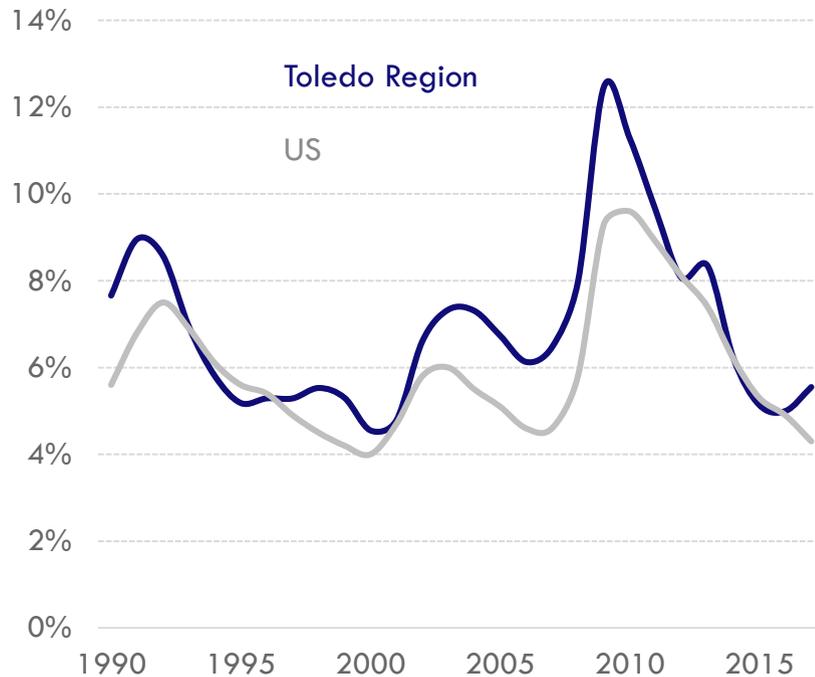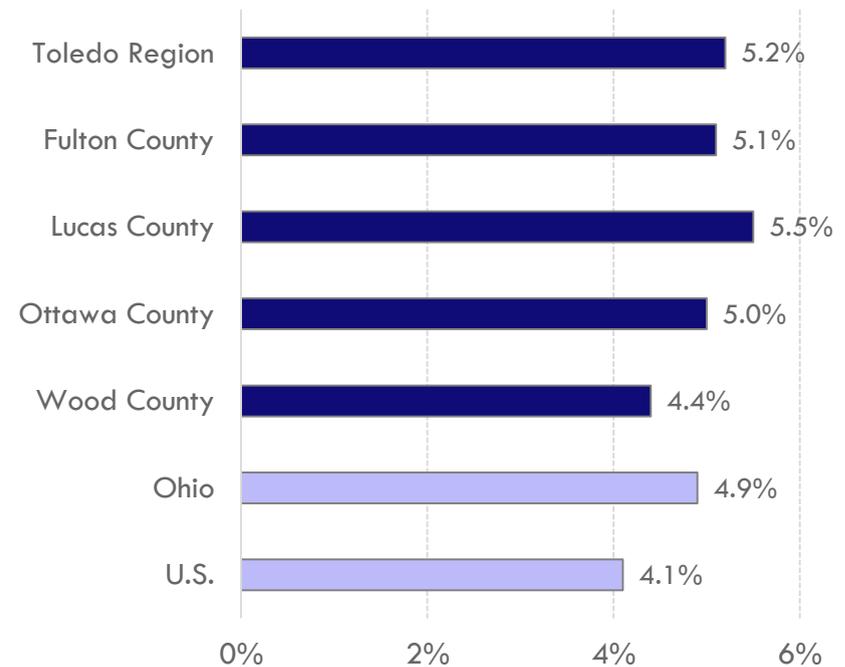
SOURCE: AVALANCHE CONSULTING / BUREAU OF LABOR STATISTICS

Unemployment by Age, Race, Gender for Working Age

Unemployment characteristics in the Toledo MSA show slightly higher levels of unemployment than the US for people of working age (25-64 years). Males are more likely to be unemployed than females and their US male counterparts, and workers generally experience lower unemployment rates as they get older. Still, Toledo's youngest age group (25-34) is much more likely to be unemployed than their US counterparts, but 35-44 year-olds are less so. Black/African-American residents in the Toledo MSA are over twice as likely than White workers to be unemployed.

UNEMPLOYMENT CHARACTERISTICS 2017

Legend: Toledo MSA | US | Ohio | Lucas County

TOTAL WORKFORCE, 25-64

Toledo MSA*	US	Ohio	Lucas County
5.9%	4.3%	4.2%	7.1%

AGE

	25 to 34	35 to 44	45 to 54	55 to 64
Toledo MSA	8.4%	5.2%	5.3%	4.0%
US	5.5%	4.2%	3.7%	3.5%
Ohio	5.7%	4.3%	3.6%	3.1%
Lucas County	9.8%	6.6%	6.0%	5.0%

(Gender)

	Male	Female
Toledo MSA	6.8%	5.4%
US	5.0%	4.8%
Ohio	4.9%	4.4%
Lucas County	8.4%	6.7%

(Race/Ethnicity)

	White alone	Black/African American	Asian	Hispanic
Toledo MSA	5.3%	11.8%	n/a	7.8%
US	4.5%	9.5%	4.2%	6.0%
Ohio	4.3%	10.2%	4.1%	7.1%
Lucas County	6.1%	12.2%		9.8%
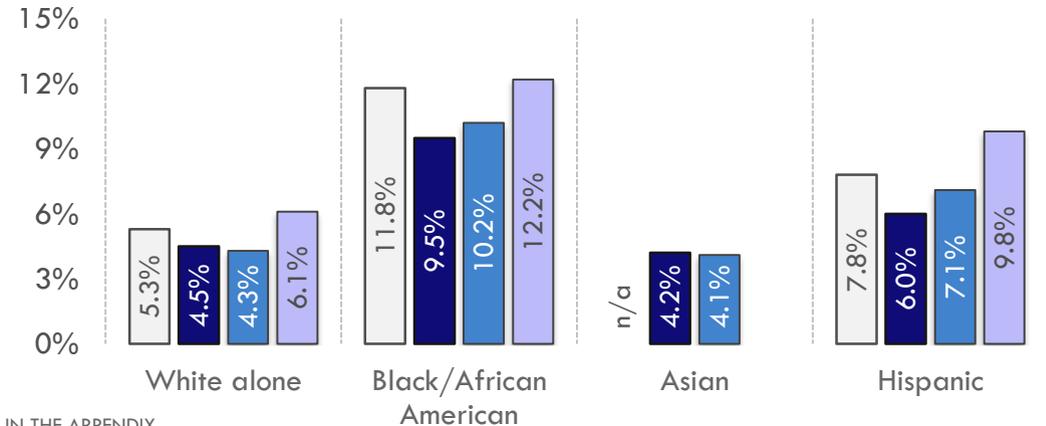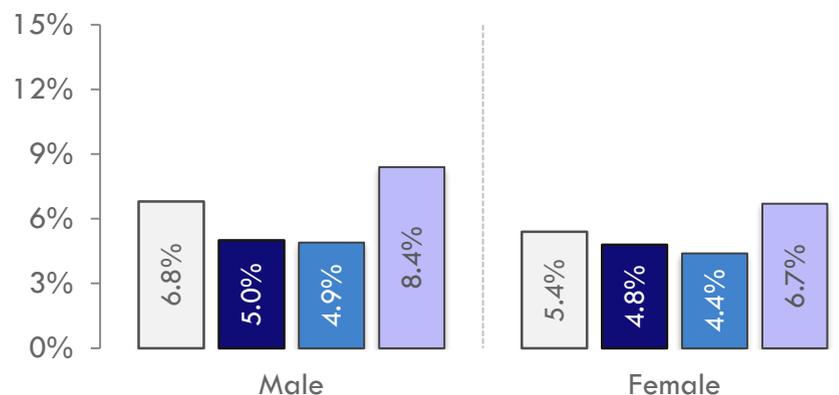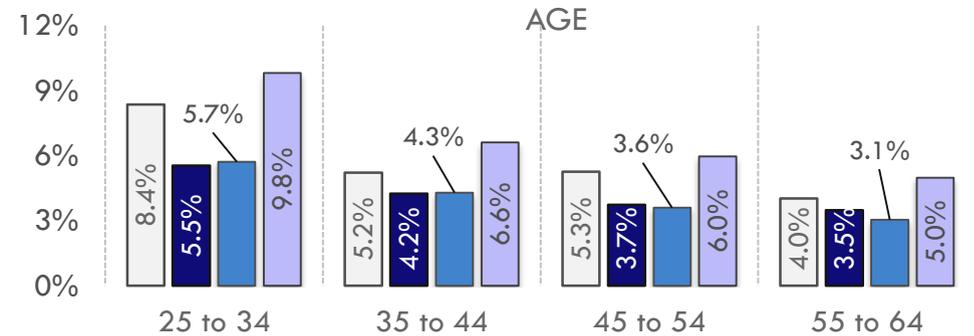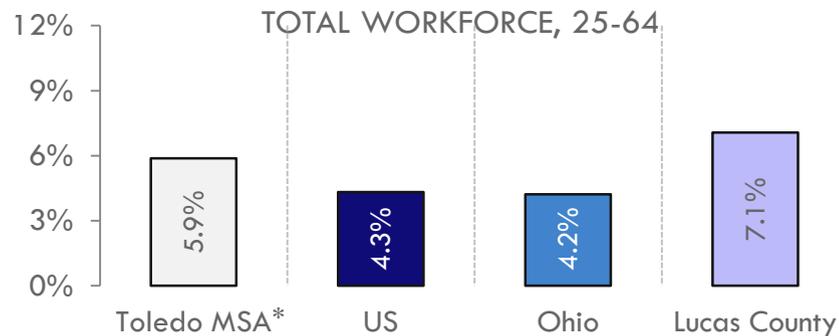
SOURCE: AVALANCHE CONSULTING / US CENSUS BUREAU / SUB-REGIONAL STATISTICS AVAILABLE IN THE APPENDIX

* DATA IS ONLY AVAILABLE FOR THE 3-COUNTY MSA. SUBSEQUENT PAGES ALSO HAVE MSA-ONLY DATA.

Labor Force Participation by Age, Race, Gender

Labor force participation in the Toledo MSA overall is similar to the level seen nationally. However, the participation level for males in Toledo is about a percentage point lower than for males nationally, females participate around 0.7 percentage points more than females nationally. Labor force participation drops as people get older, following the national pattern. Most notably, Hispanics in the Toledo MSA are participating in the labor force at a higher rate than any other race or ethnicity group. The labor force participation rate for ages 25-64 is 1.7 percentage points lower in 2017 than in 2009, a more dramatic decrease than the 1.0 percentage point decrease seen nationally during the same period.

LABOR FORCE PARTICIPATION CHARACTERISTICS 2017

Legend: Toledo MSA | US | Ohio | Lucas County

TOTAL WORKFORCE, 25-64

Toledo MSA	US	Ohio	Lucas County
77.5%	77.8%	77.6%	75.5%

AGE

	Toledo MSA	US	Ohio	Lucas County
25 to 34	85.2%	82.8%	83.9%	83.4%
35 to 44	84.5%	82.4%	83.4%	82.9%
45 to 54	79.3%	80.6%	80.7%	76.1%
55 to 64	62.6%	64.9%	63.7%	61.0%

GENDER, 25-64

	Toledo MSA	US	Ohio	Lucas County
Male	82.0%	83.0%	81.7%	79.7%
Female	73.3%	72.6%	73.5%	71.5%

RACE/ETHNICITY, 25-64

	Toledo MSA	US	Ohio	Lucas County
White alone	78.9%	78.4%	78.5%	77.1%
Black/African American	68.1%	74.1%	72.7%	67.6%
Asian	n/a	78.9%	75.7%	0.0%
Hispanic	83.8%	77.5%	75.9%	0.0%
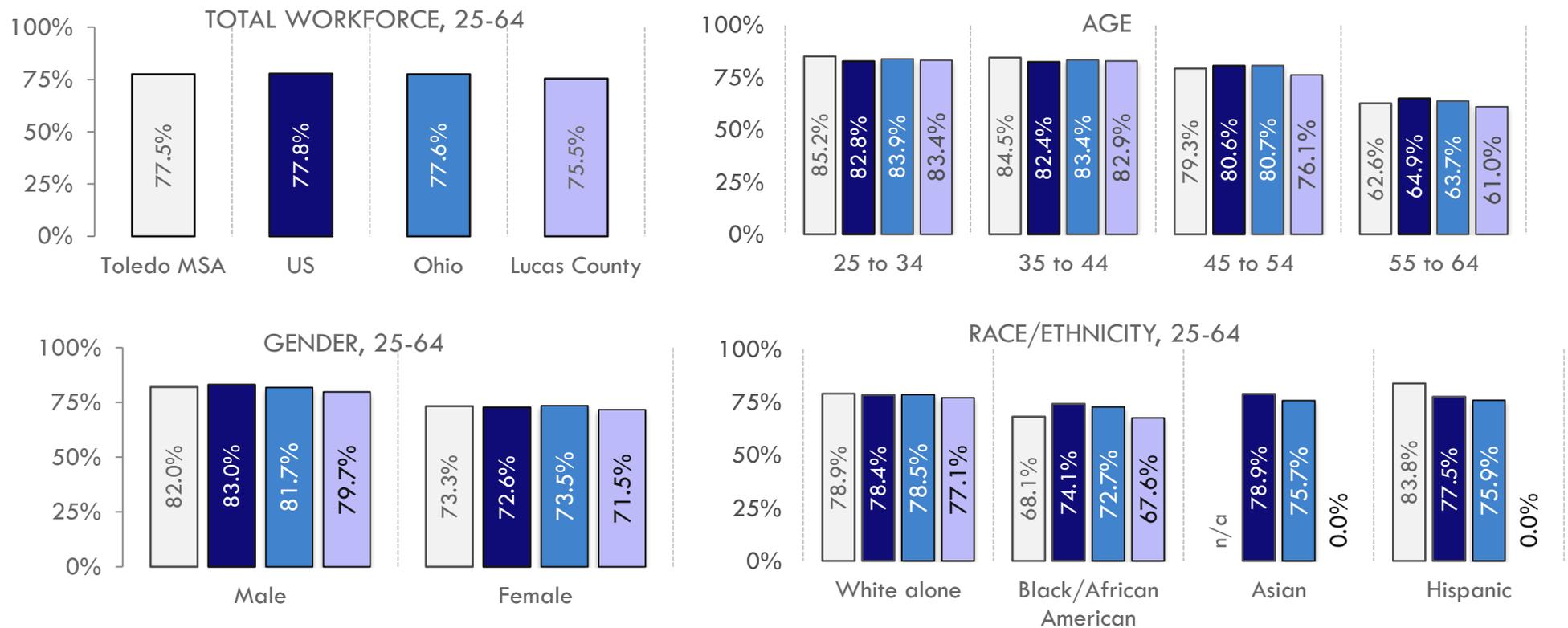
SOURCE: AVALANCHE CONSULTING / US CENSUS BUREAU / SUB-REGIONAL STATISTICS AVAILABLE IN THE APPENDIX

Veteran Population Characteristics

In the Toledo MSA, Veterans are less likely to be unemployed than Nonveterans, but participate in the labor force at a lower rate than Nonveterans. The gap in unemployment between Veterans and Nonveterans in Toledo is 2.3 percentage points, a larger gap than is seen nationally or in Ohio. The labor force participation rate for Nonveterans in the region is over three percentage points higher than for Veterans, opposite the trend seen nationally (where Veterans participate in the labor force slightly more than Nonveterans). In the Toledo MSA, Veterans have a higher rate of attaining some college or an Associate's degree, but a lower rate of attaining a Bachelor's degree or higher, following a national trend.

VETERAN CHARACTERISTICS 2017

Legend: ☐ Toledo MSA ■ US ■ Ohio ■ Lucas County

UNEMPLOYMENT RATE (18-64)

Veteran:
- Toledo MSA: 4.5%
- US: 4.4%
- Ohio: 4.2%
- Lucas County: 5.9%

Nonveteran:
- Toledo MSA: 6.8%
- US: 5.3%
- Ohio: 5.1%
- Lucas County: 8.1%

SOME COLLEGE OR ASSOCIATE'S

Veteran:
- Toledo MSA: 35.7%
- US: 37.2%
- Ohio: 34.3%
- Lucas County: 35.9%

Nonveteran:
- Toledo MSA: 31.5%
- US: 28.1%
- Ohio: 28.4%
- Lucas County: 31.2%

LABOR FORCE PARTICIPATION RATE (18-64)

Veteran:
- Toledo MSA: 74.6%
- US: 76.5%
- Ohio: 75.6%
- Lucas County: 74.1%

Nonveteran:
- Toledo MSA: 77.7%
- US: 76.2%
- Ohio: 76.7%
- Lucas County: 75.4%

BACHELOR'S+

Veteran:
- Toledo MSA: 20.8%
- US: 28.8%
- Ohio: 21.4%
- Lucas County: 20.3%

Nonveteran:
- Toledo MSA: 27.7%
- US: 32.2%
- Ohio: 28.6%
- Lucas County: 27.1%
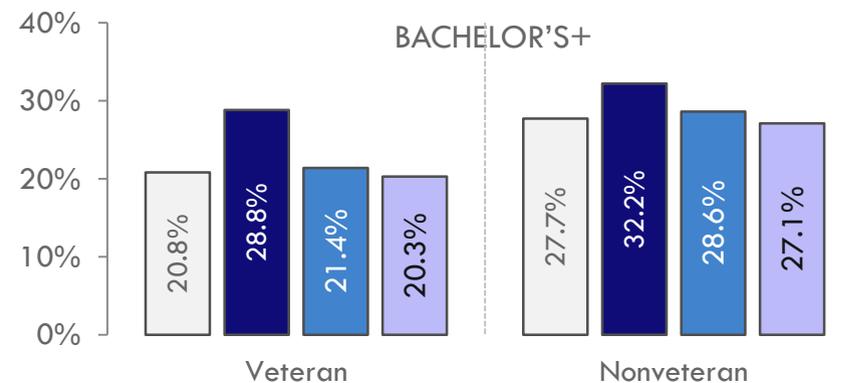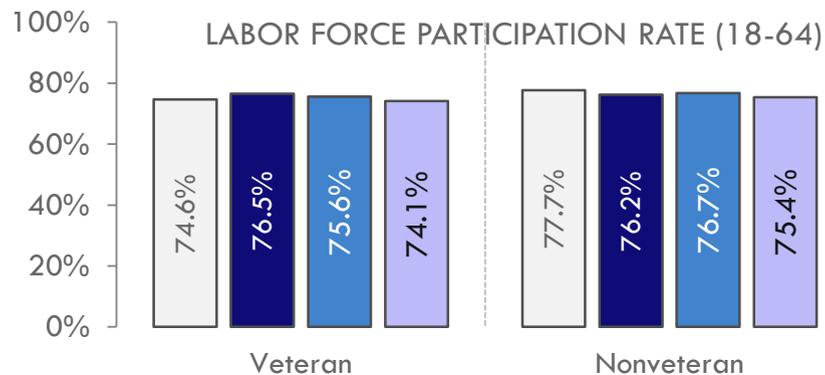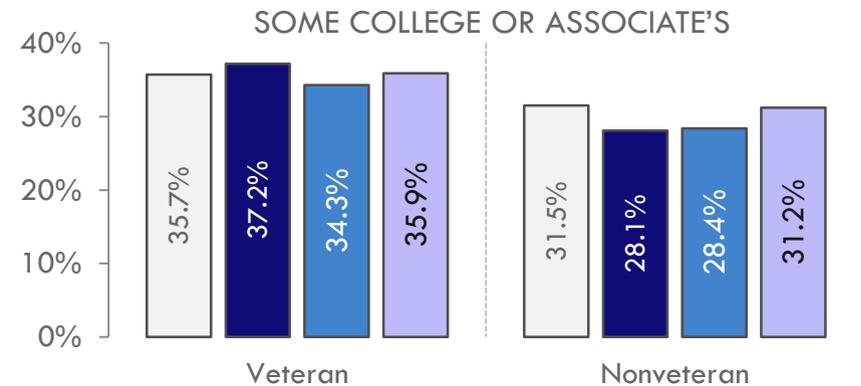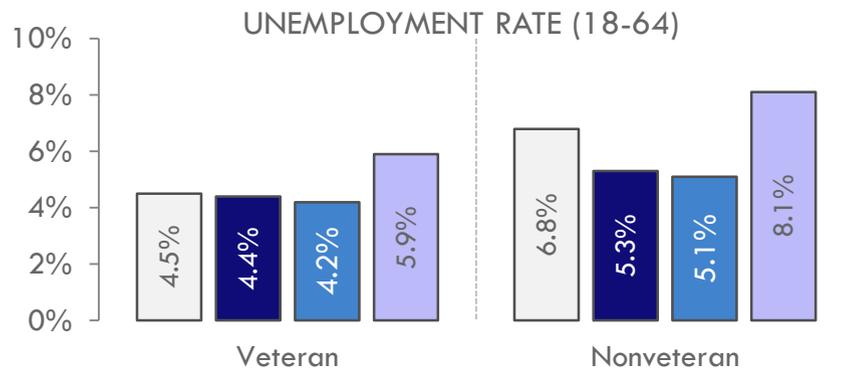
SOURCE: AVALANCHE CONSULTING / US CENSUS BUREAU

Educational Attainment

Educational attainment levels in the Toledo MSA skew lower than attainment rates seen nationally. Adults (25 years or older) within the Toledo MSA are less likely to hold a Bachelor's degree, graduate or professional degree than adults nationally. And, residents are more likely to have an Associate's degree or some college. Fortunately, Toledo residents have higher high school attainment rates than seen at the US level, though slightly below Ohio levels.

EDUCATIONAL ATTAINMENT BY DEGREE LEVEL 2017

Legend: Toledo MSA | US | Ohio | Lucas County

Degree Level	Toledo MSA	US	Ohio	Lucas County
<HS	10.5%	12.0%	9.7%	12.3%
HS	30.4%	27.1%	33.3%	29.6%
Some college	22.1%	20.4%	20.2%	22.2%
Assoc.	9.8%	8.5%	8.8%	9.4%
Bach.	16.7%	19.7%	17.3%	16.4%
Grad+	10.4%	12.3%	10.6%	10.1%
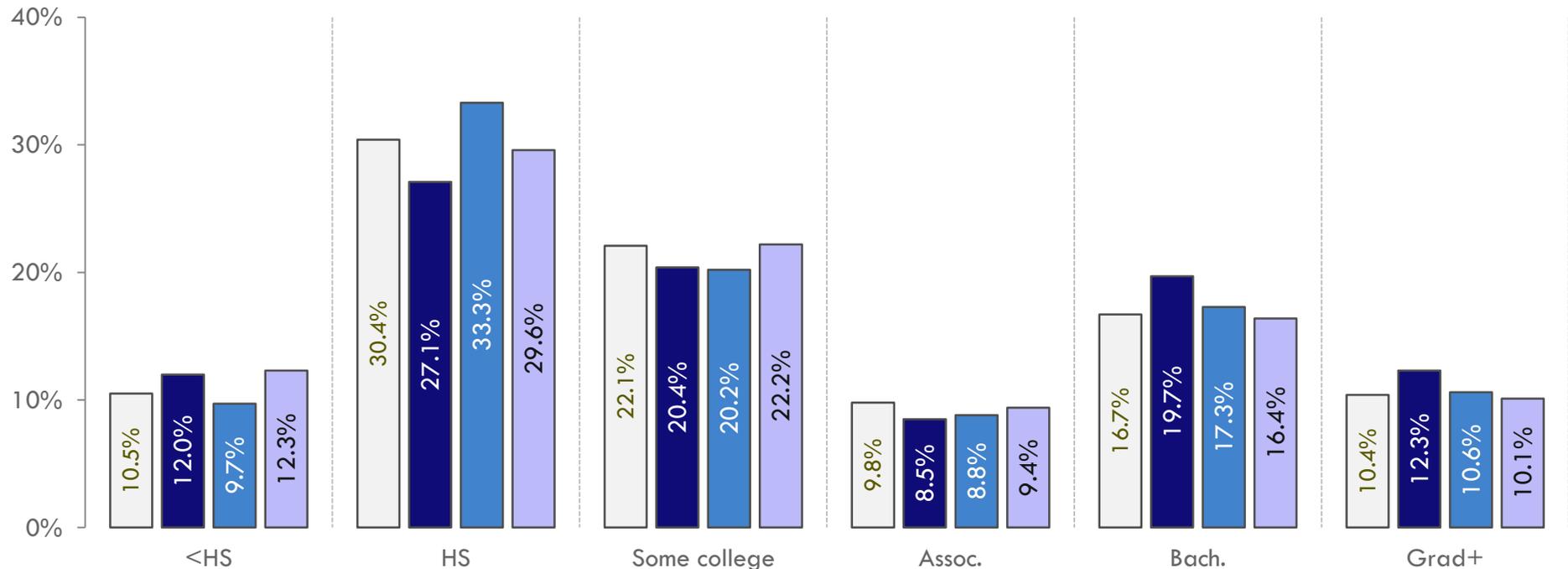
SOURCE: AVALANCHE CONSULTING / US CENSUS BUREAU

Educational Attainment (cont.)

Nearly 10% of adults (25+ years of age) in the region hold an Associate's degree and just over 27% hold a Bachelor's degree or higher. The level of Associate's holders exceeds both the statewide and national average, while the Bachelor's degree and higher rate is lower. Education levels in the Toledo MSA have risen over the past 5 years, with the level of Associate's degree holders rising by half a percentage point. The proportion of adults with a Bachelor's degree or higher grew by over three percentage points since 2012.
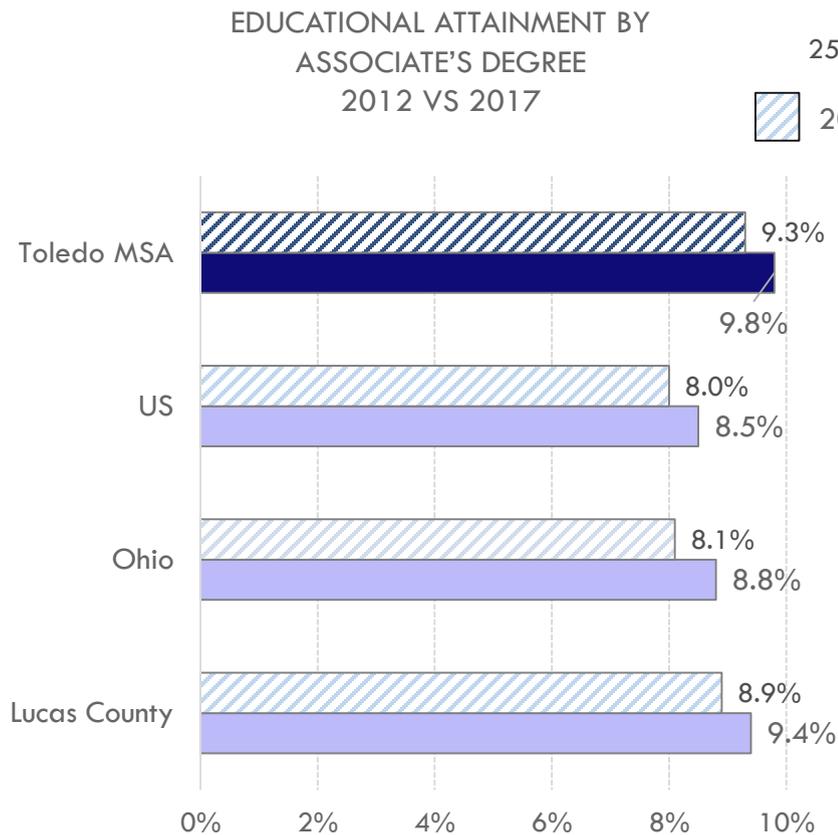
EDUCATIONAL ATTAINMENT BY
ASSOCIATE'S DEGREE
2012 VS 2017

25+ YEARS OF AGE

2012   2017

EDUCATIONAL ATTAINMENT BY
BACHELOR'S DEGREE+
2012 VS 2017

Toledo MSA
9.3%
9.8%

US
8.0%
8.5%

Ohio
8.1%
8.8%

Lucas County
8.9%
9.4%

0%   2%   4%   6%   8%   10%

SOURCE: AVALANCHE CONSULTING / US CENSUS BUREAU

Toledo MSA
23.7%
27.1%

US
29.1%
32.0%

Ohio
25.2%
28.0%

Lucas County
23.6%
26.5%

0%   10%   20%   30%   40%
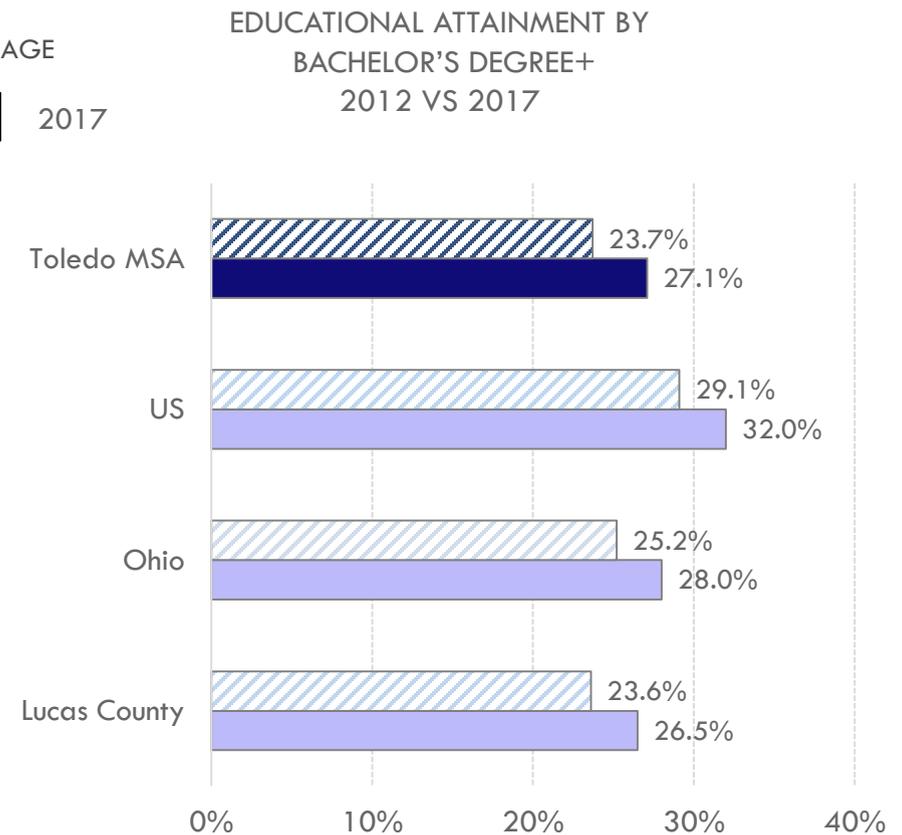
SOURCE: AVALANCHE CONSULTING / US CENSUS BUREAU

Educational Attainment by Age (Associate's)

The proportion of Associate's degree holders in the Toledo MSA is higher than the national average at every age level, with the exception of those 65 and older. Approximately 11.3% of all Toledo MSA residents between the ages of 25 to 64 possess an Associate's degree, compared to only 5% of individuals 65 and older. For those between the ages of 25 to 34, the regional Associate's degree attainment level is slightly behind the statewide rate of 9.7%.

ASSOCIATE'S DEGREE EDUCATIONAL ATTAINMENT BY AGE 2017

Toledo MSA   US   Ohio   Lucas County

	25 to 34	35 to 44	45 to 64	65+
Toledo MSA	9.4%	11.4%	12.3%	5.0%
US	9.1%	9.3%	9.1%	6.2%
Ohio	9.7%	10.5%	9.7%	5.3%
Lucas County	9.1%	11.4%	11.4%	4.7%
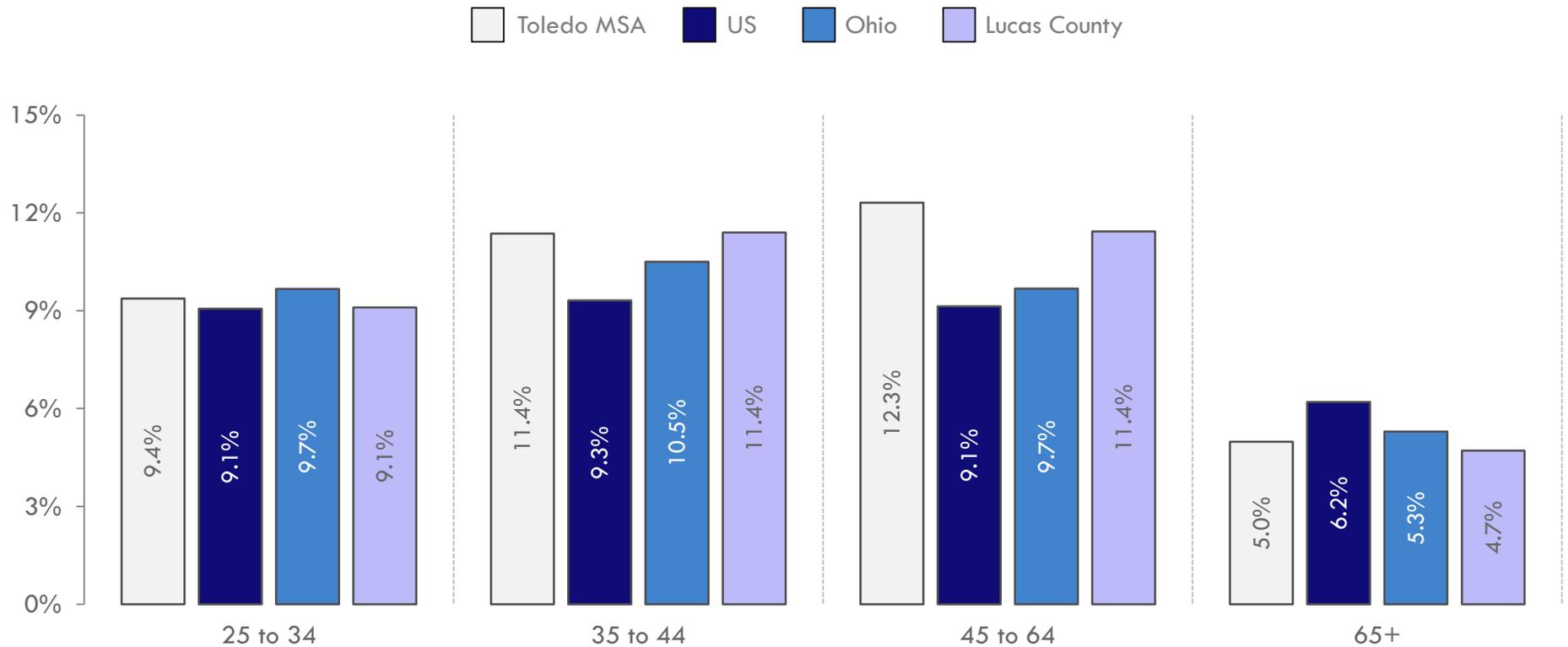
SOURCE: AVALANCHE CONSULTING / US CENSUS BUREAU

Educational Attainment by Age (Bachelor's)

Approximately 32% of Toledo MSA residents between the ages of 25 and 44 possess a Bachelor's degree or higher. Bachelor's attainment levels trail the US averages, with the biggest gaps for workers 45 to 64 years of age. Within the region, Bachelor's degree or higher attainment rates decline for older cohorts of the workforce, from 33.2% for the youngest workers to 22.6% for those ages 65 and older.

BACHELOR'S DEGREE + EDUCATIONAL ATTAINMENT BY AGE 2017

Legend: Toledo MSA | US | Ohio | Lucas County

Age Group	Toledo MSA	US	Ohio	Lucas County
25 to 34	33.2%	35.6%	32.9%	31.8%
35 to 44	30.6%	35.9%	33.6%	29.1%
45 to 64	25.2%	30.8%	26.4%	24.5%
65+	22.6%	27.6%	22.5%	23.3%
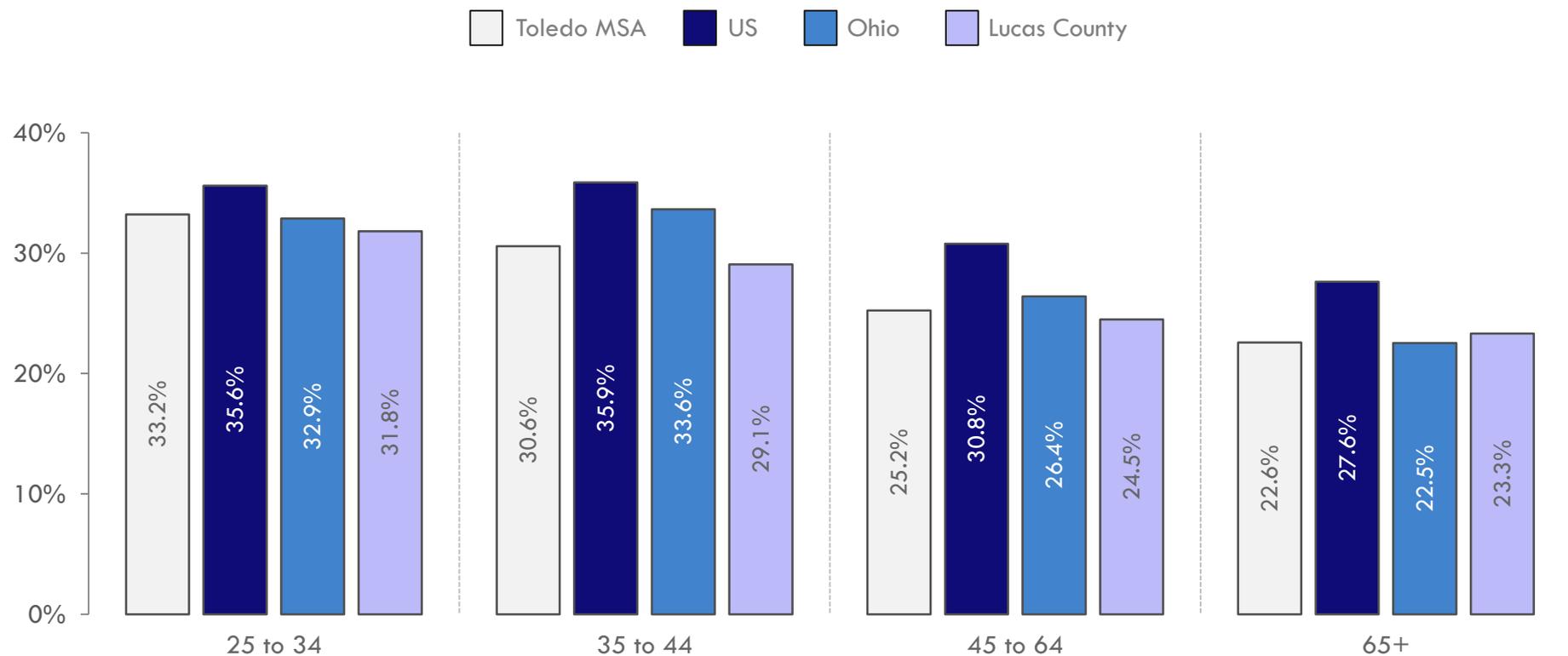
SOURCE: AVALANCHE CONSULTING / US CENSUS BUREAU

Educational Attainment by Race/Ethnicity

White individuals within the Toledo MSA are more likely be Bachelor's holders than Black/African-American and Hispanic individuals, similar to the US. Nearly 30% of the Toledo MSA's White residents hold a Bachelor's or higher. The figures for Black/African-American and Hispanic residents are 10.5% and 15.2%, respectively. Following the statewide and national trend, Asian individuals in the Toledo MSA are far more likely to hold a Bachelor's degree or above at nearly 70%.

BACHELOR'S+ EDUCATIONAL ATTAINMENT BY RACE/ETHNICITY 2017

Legend: Toledo MSA | US | Ohio | Lucas County

25+ YEARS OF AGE

White (Non-Hispanic):
- Toledo MSA: 29.6%
- US: 35.8%
- Ohio: 29.0%
- Lucas County: 30.2%

Black/African American:
- Toledo MSA: 10.5%
- US: 21.4%
- Ohio: 16.8%
- Lucas County: 10.0%

Asian:
- Toledo MSA: 69.6%
- US: 53.8%
- Ohio: 62.0%
- Lucas County: 71.1%

Hispanic:
- Toledo MSA: 15.2%
- US: 16.0%
- Ohio: 18.5%
- Lucas County: 12.7%
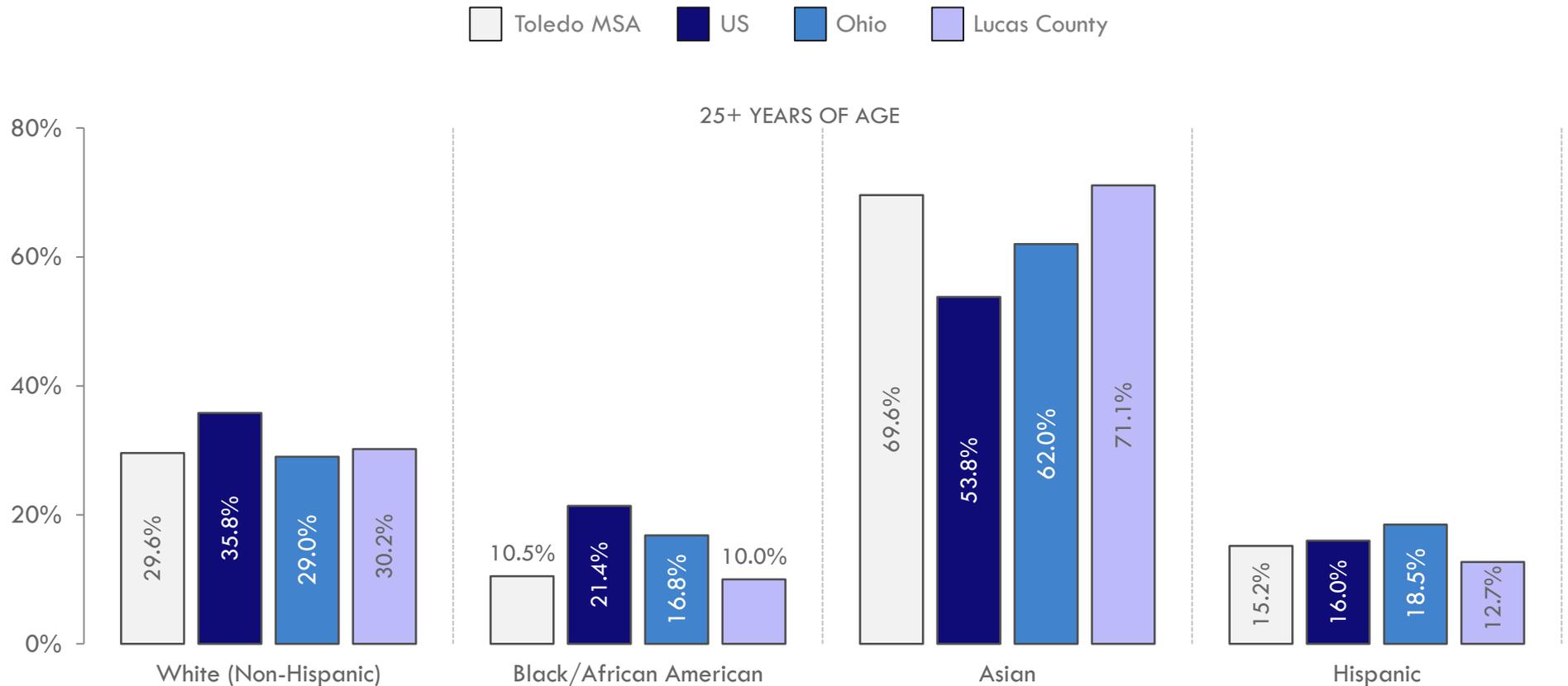
SOURCE: AVALANCHE CONSULTING / US CENSUS BUREAU

Educational Attainment by Gender

In the Toledo MSA, women are more likely to hold Bachelor's degrees than their male counterparts, which is similar to the US. This dynamic holds true for Ohio as well as for Lucas County. The college educational attainment rate for Toledo MSA women is 27.7%. The corresponding figure for men is 26.5%.

BACHELOR'S+ EDUCATIONAL ATTAINMENT BY GENDER 2017

Legend: Toledo MSA | US | Ohio | Lucas County

25+ YEARS OF AGE

Male
- Toledo MSA: 26.5%
- US: 31.3%
- Ohio: 27.6%
- Lucas County: 25.7%

Female
- Toledo MSA: 27.7%
- US: 32.6%
- Ohio: 28.3%
- Lucas County: 27.2%
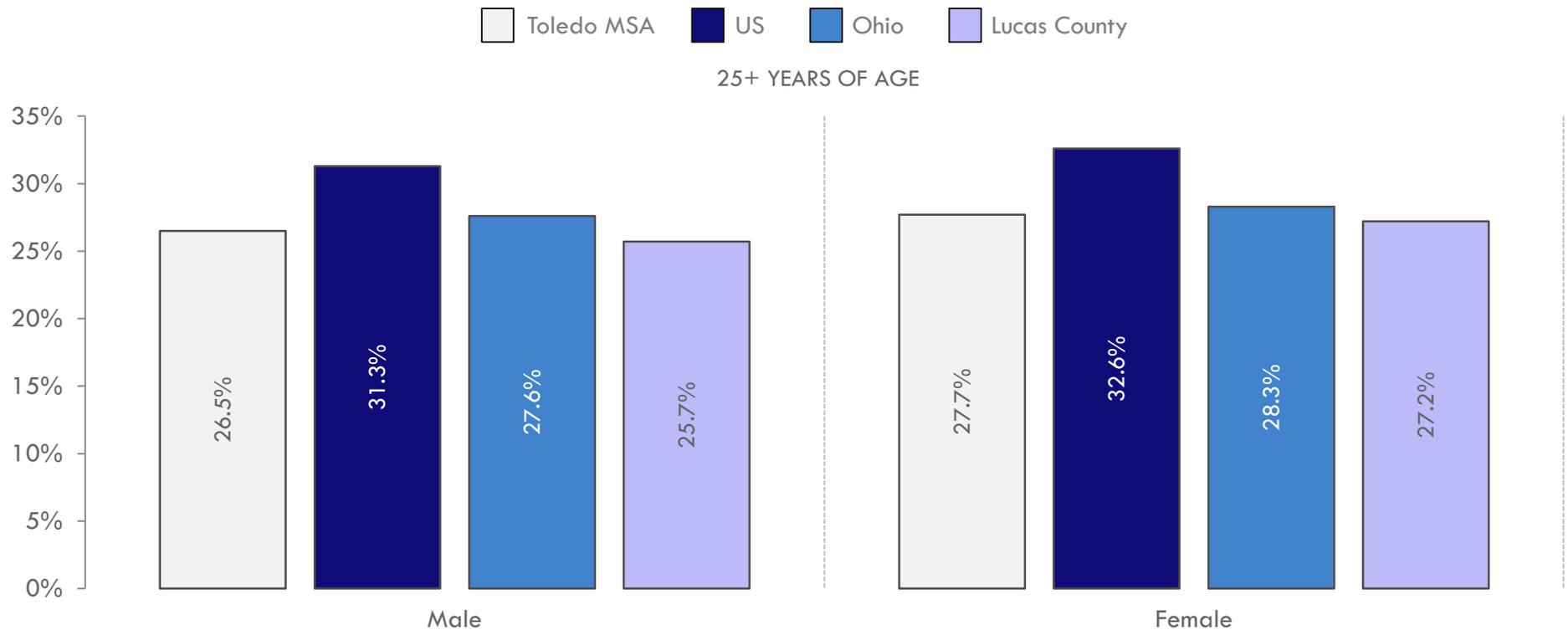
SOURCE: AVALANCHE CONSULTING / US CENSUS BUREAU

High School Graduation Rates

In 2017, nearly 90% of students in the Toledo region who enrolled in high school four years earlier graduated from high school, a rate that exceeds the statewide average by over 5 percentage points. High school graduation rates in the region have stayed relatively steady over the past two years, while the statewide rate has climbed one percentage point.

HIGH SCHOOL GRADUATION RATES 2016 - 2018

■ Toledo Region   ■ Ohio

100%			
	88.4%	88.8%	88.8%
	83.0%	83.6%	84.1%
75%			
50%			
	2015-16	2016-17	2017-18
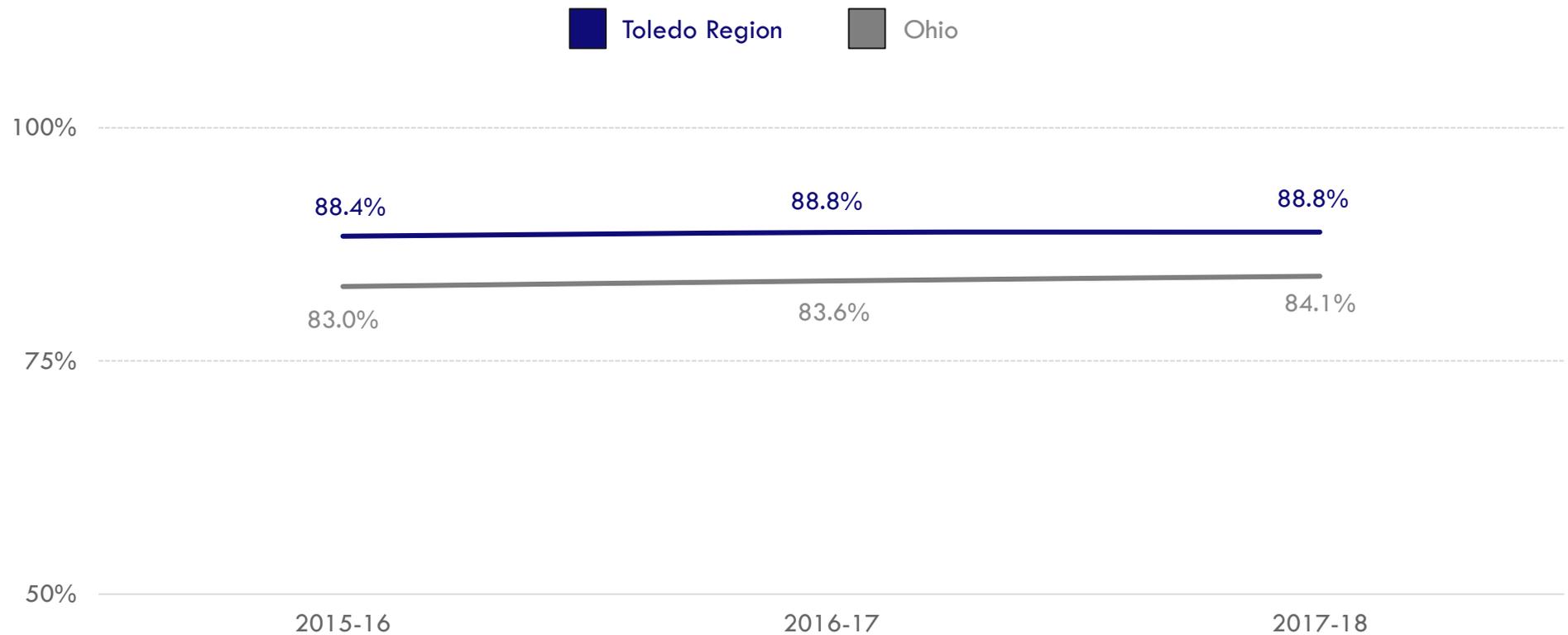
SOURCE: AVALANCHE CONSULTING / OHIO SCHOOL REPORT CARDS

Math & Reading Proficiency

Students in Ohio complete assessments in a variety of subjects throughout their K-12 education, and two pivotal markers of progress are 8th grade math and 3rd grade reading, with a notable measure being the percent of students at or above proficiency level. In the most recent school year, all four counties in the Toledo region had districts reporting proficiency rates above the statewide average of 54.3 percent and 61.2 percent for math and reading, respectively. Notably, all four districts in Ottawa County bested the statewide average in both subjects. Fulton County also achieved this for 3rd grade reading, as did Wood County in 8th grade math.

% OF STUDENTS AT OR ABOVE PROFICIENCY ON STATE END-OF-COURSE ASSESSMENT
2017/18, BY DISTRICT

8th GRADE MATH
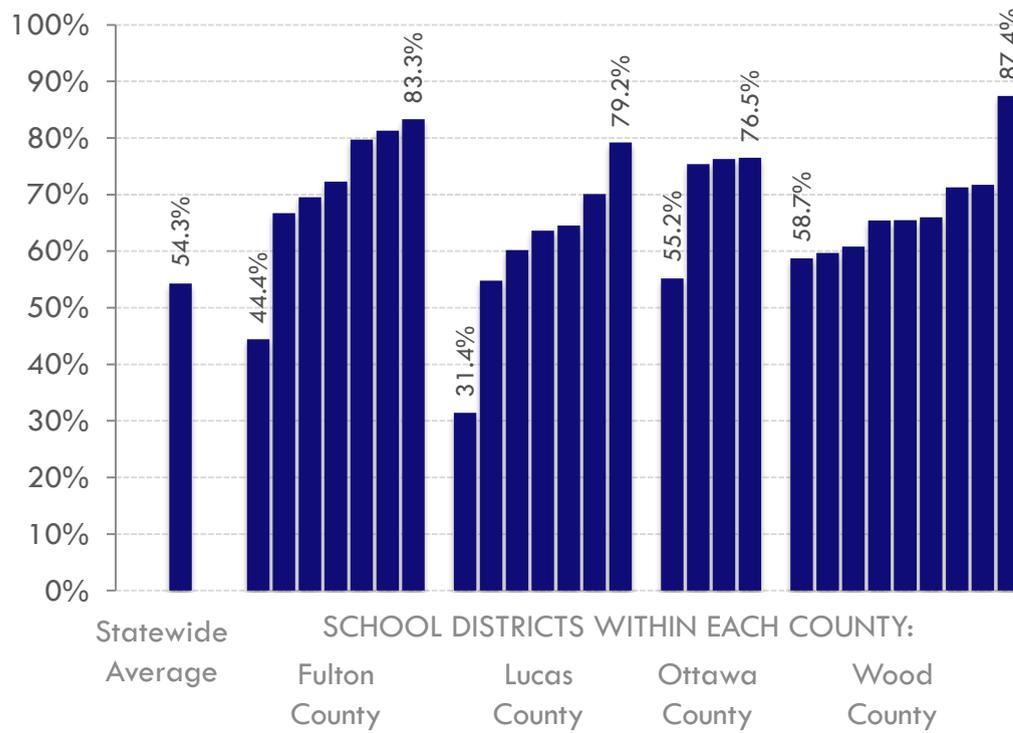
3rd GRADE READING
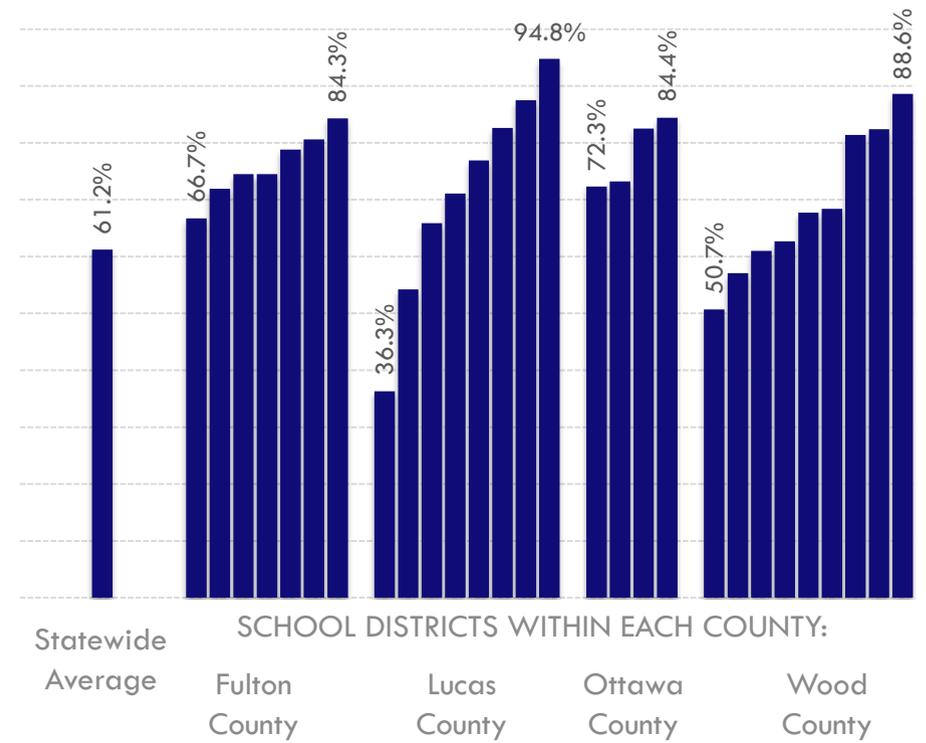
SOURCE: AVALANCHE CONSULTING / OHIO SCHOOL REPORT CARDS

ACT Scores

Nearly 59% of all Toledo region high school students take the ACT exam, slightly ahead of the statewide rate of 56%. Just under one-quarter of students were remediation-free (meaning they are considered to be prepared to succeed in their college courses) on the ACT in 2017, mirroring the rate of remediation-free students in Ohio. Within the Toledo region, the highest rate of remediation-free students were in Wood County, where 34.1% of students were remediation-free.

% OF STUDENTS TAKING ACT
2017

Ohio	56.0%
Toledo Region	58.8%
Fulton	58.2%
Lucas	55.2%
Ottawa	61.3%
Wood	67.9%
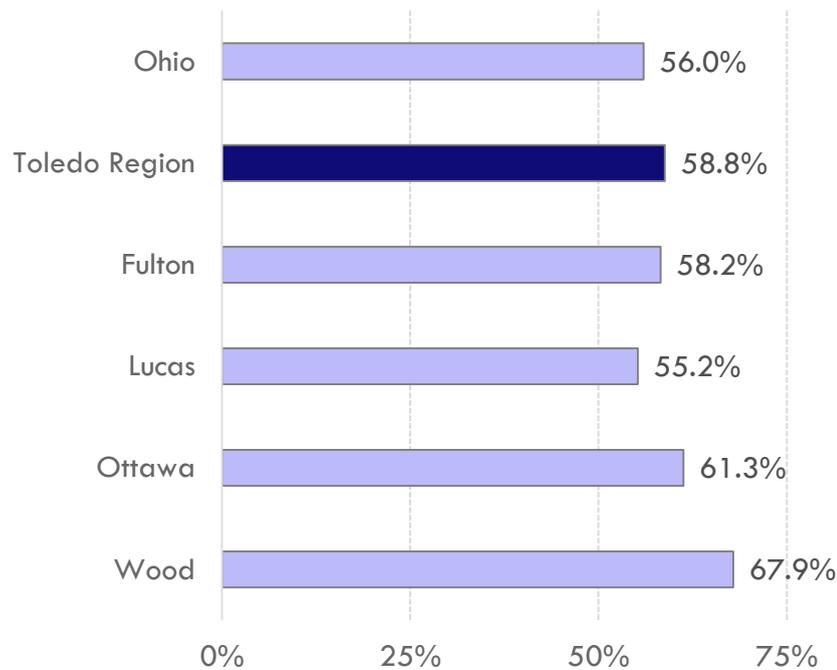
SOURCE: AVALANCHE CONSULTING / OHIO SCHOOL REPORT CARDS

Percent of Students Remediation-Free on ACT
2017

Ohio	24.8%
Toledo Region	24.8%
Fulton	24.6%
Lucas	21.5%
Ottawa	23.8%
Wood	34.1%
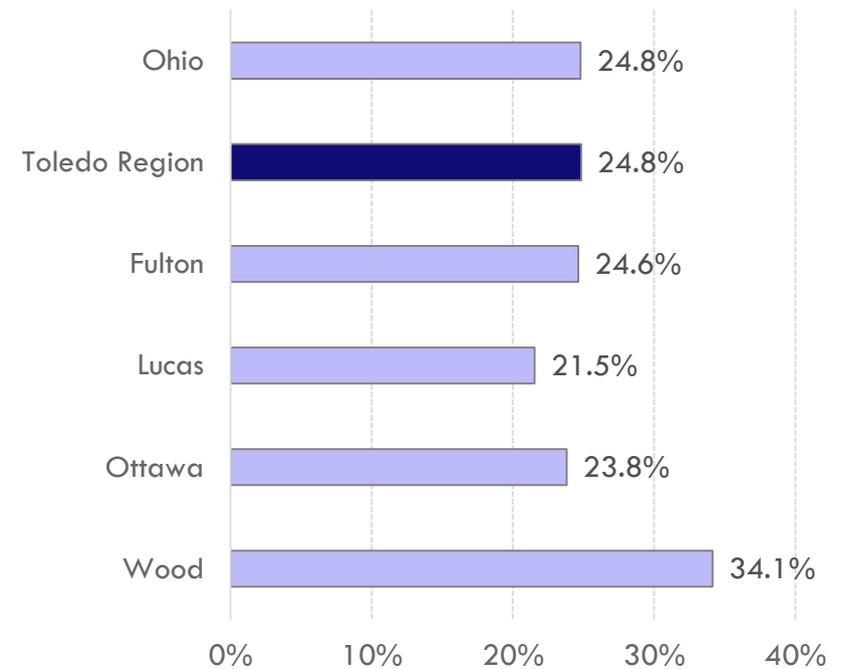
SOURCE: AVALANCHE CONSULTING / OHIO SCHOOL REPORT CARDS

Poverty Levels

Poverty rates in the Toledo region sat at 16.8% in 2016, continuing a trend of having higher regional poverty rates than those seen at the US. This trend has persisted since 2004. Within the Toledo region, this poverty rate was largely driven by Lucas County at 19.8%, which offset lower than average rates in the other three counties. The poverty rate in the Toledo region increased over the past year, but has been steadily declining since a recent high of 19.8% in 2011.
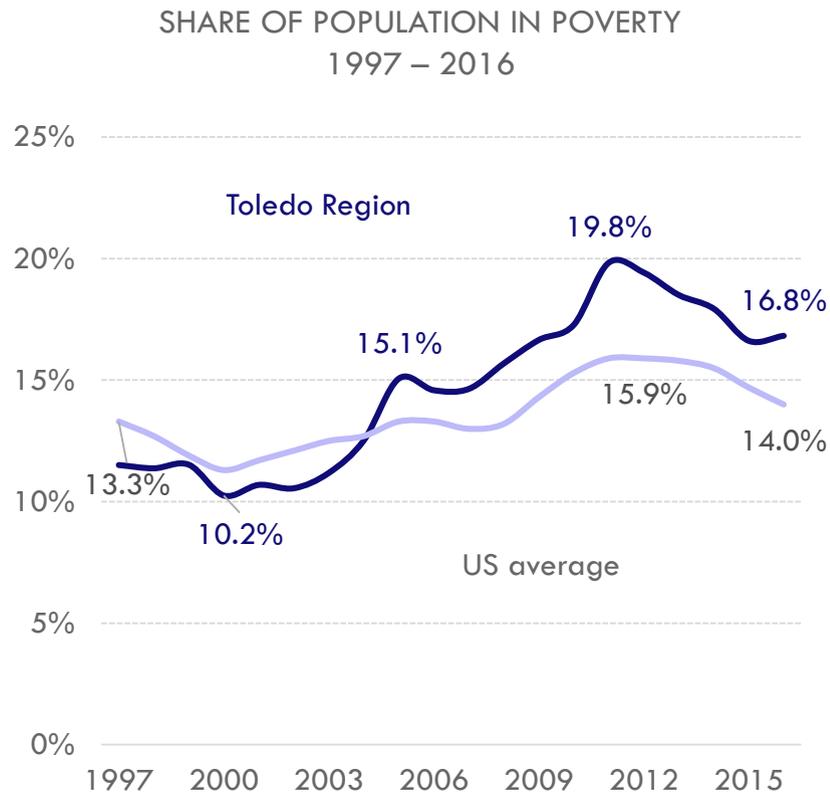
SHARE OF POPULATION IN POVERTY
1997 – 2016

Toledo Region

19.8%

16.8%

15.1%

15.9%

14.0%

13.3%

10.2%

US average

SOURCE: AVALANCHE CONSULTING / US CENSUS BUREAU

SHARE OF POPULATION IN POVERTY
2016

Toledo Region	16.8%
Fulton County, OH	8.9%
Lucas County, OH	19.8%
Ottawa County, OH	10.4%
Wood County, OH	11.4%
Ohio	14.5%
U.S.	14.0%
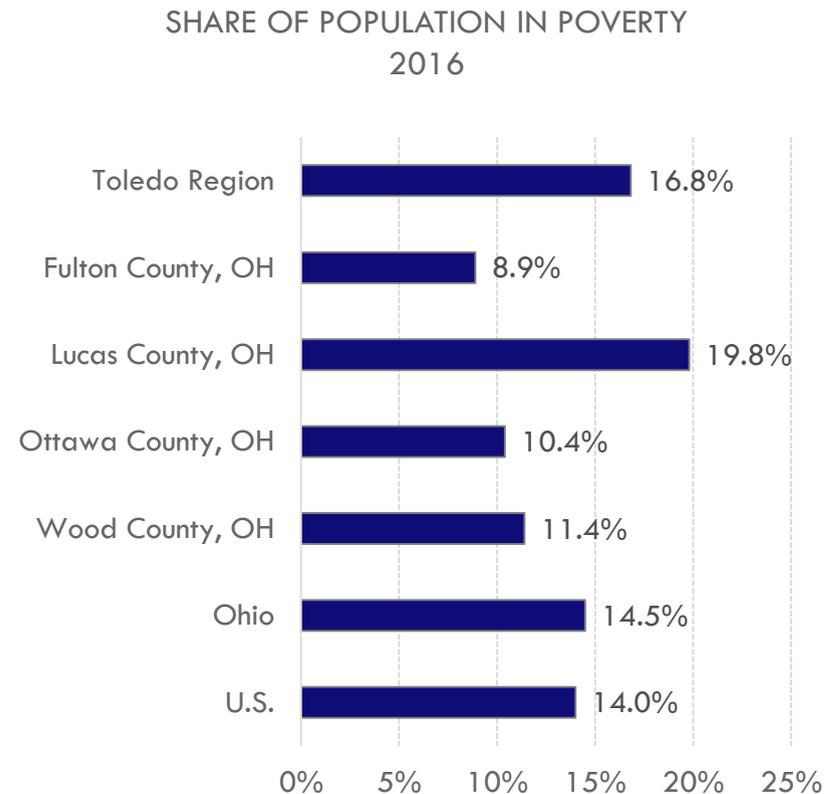
SOURCE: AVALANCHE CONSULTING / US CENSUS BUREAU

04 | **Demand Analysis**

About the Demand Analysis

In this section, we identify the existing and emerging drivers of job creation within the Toledo region. This analysis can be used by economic and workforce developers to better align their efforts in recruitment and training. This analysis examines three components in both employment by industry and employment by occupation.

- Current size – the total number of individuals employed in each industry and occupation cluster.

- Relative concentration – calculated using the location quotient, which describes the per capita concentration of a local cluster relative to the US per capita average. A 2.0 LQ indicates a local cluster is 2x more concentrated locally.

- Past growth and future growth – the rate at which each industry and occupation cluster have grown in the past and in the future, with an emphasis on which clusters are growing the fastest.

This analysis looks at high-level trends for clusters. Further analysis on occupational demand and sub-cluster dynamics will be conducted in the forthcoming Gap Analysis section

WHY IS THIS IMPORTANT
Resilient economies employ residents in a diverse mix of industries and occupations. A diverse industry and economic base allows for communities to better weather economic downturns that typically affect one industry more than others. Diverse economies provide a variety of jobs requiring different educational and professional expertise allowing for the development of many career pathways and access points to opportunities within the labor market.

Specifically in the Toledo region, industry growth has been steady over the past five years with a resurgence in Manufacturing activity and significant positive growth within Back Office/Headquarter Operations as well as within Healthcare and Construction. Much of the growth within Professional Services occupations, those supporting Back Office/Headquarter functions, represents higher skilled technical and management positions pointing to a much higher skilled workforce which is, and will continue to be, required by regional businesses.

Employment by Industry Cluster

Employment in the Toledo region is spread across a number of industries. The region's largest industry clusters by employment are Healthcare (16.1%), Retail (12.7%), Entertainment (11.7%) and Education (8.7%).

The Toledo region's share of employment is much higher than the national average in Automotive Manufacturing, Healthcare, Transportation & Logistics, Construction, and Furniture Manufacturing.

A full set of descriptions for each of these clusters is included in the Appendix, however, some key industry details are included here for quick reference:

Back Office: Operations engaged in support activities for the day-to-day operations of other businesses, including office administration, facilities support, employment services, and business support.

Entertainment: Operations engaged in leisure and accommodation, including hotels, restaurants, bars, casinos, museums, performing arts, and sporting facilities. Also includes independent performers, artists, and direct tourist activities.

Transportation & Logistics: Operations engaged in transportation of goods and individuals; warehousing and storage of goods; and delivery of post and packages. This includes commercial, personal, and tourism transportation on air, rail, water, and roads.

EMPLOYMENT BY INDUSTRY CLUSTER
2017

Industry Cluster	Toledo Region
Healthcare	16.1%
Retail	12.7%
Entertainment	11.7%
Education	8.7%
Back Office	7.7%
Construction	7.4%
Government	5.9%
Automotive	5.1%
Transportation & Logistics	4.0%
Finance	2.9%
Professional Services	2.6%
Industrial Machinery	2.5%
Metalworking	2.0%
Materials	1.8%
Electronics	1.2%
Non-Profits	1.1%
Energy	1.1%
Creative Content	1.0%
Furniture	1.0%
Agribusiness & Food	0.9%
Telecom Services	0.5%
Software / Info. Tech.	0.4%
Research	0.4%
Biomedical	0.4%
Consumer Goods Mftg	0.3%

Legend: Toledo Region / US

SOURCE: AVALANCHE CONSULTING ANALYSIS OF DATA FROM EMSI

Industry Cluster Performance

A majority of the Toledo region's largest industry clusters have experienced positive job growth over the past 5 years – Back Office/HQ, Healthcare, Entertainment, and Construction. Several mid-sized industries such as Automotive, Transportation & Logistics, Industrial Machinery, and Materials have also seen strong, positive growth. Education, Retail, Government, and Professional Services have experienced zero to negative growth. Many of Toledo's high growth industry clusters are in Manufacturing – a welcomed return to the region's historic roots.

Industry Cluster Trends: Toledo Region
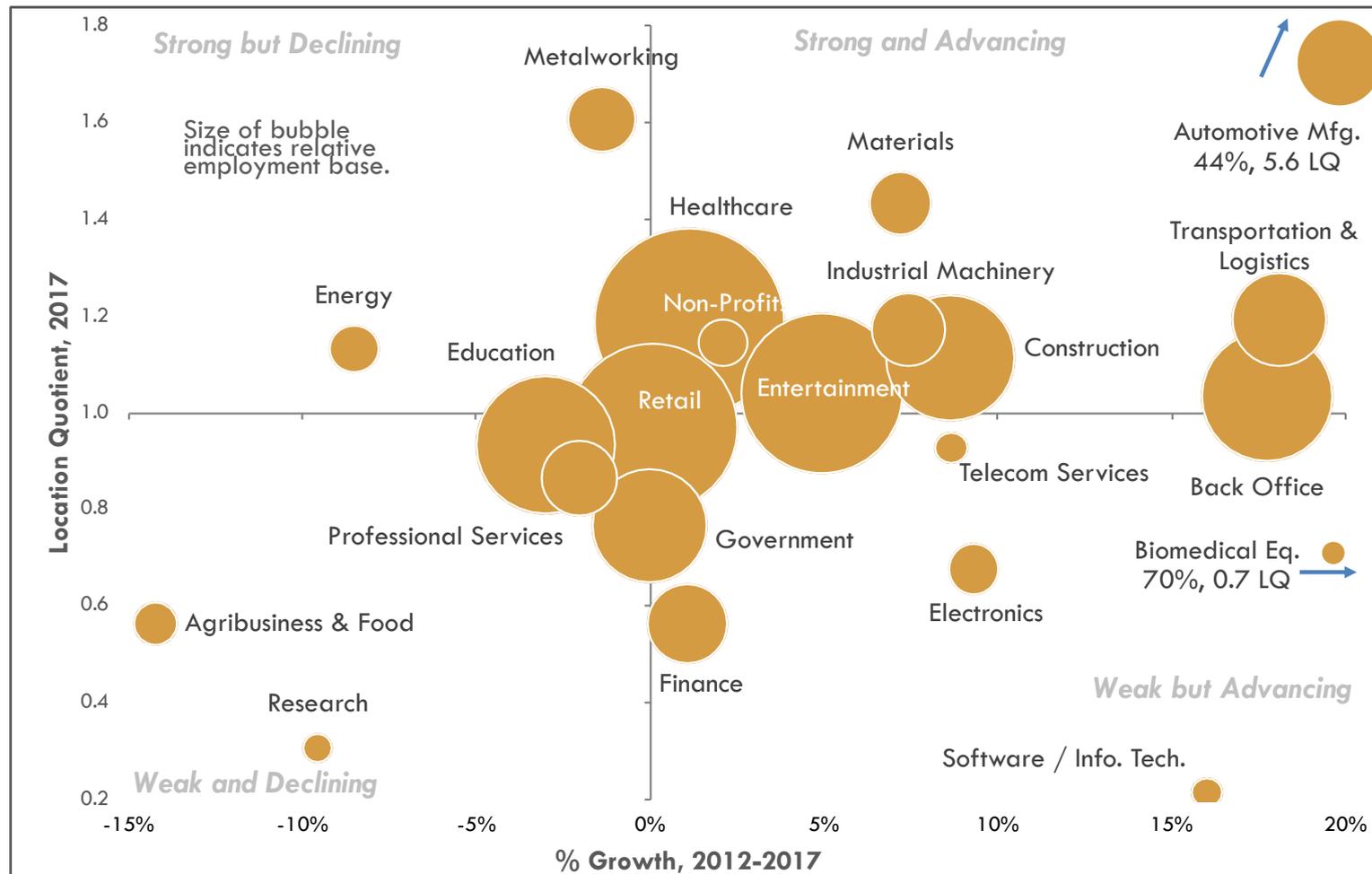
Source: Avalanche Consulting calculations; data from EMSI

Employment by Occupation Cluster

Employment in the Toledo region is supported by a variety of occupations. Six occupation clusters make up two-thirds of all jobs in the region: Hospitality (14.4%), Back Office (12.7%), Logistics (10.3%), Medical (10.2%), Personal Services (9.6%), and Production (8.9%).

Production, Logistics, Medical, Hospitality, and Education have much higher concentrations of employment locally than compared to the national level.

A full set of descriptions for each of these clusters is included in the Appendix, however, some key occupational details are included here for quick reference:

Hospitality: Includes food related occupations such as cooks and wait staff, as well as laborers and maintenance workers in industries such as gaming and lodging. Hospitality occupations typically require a high school diploma or some on-the-job training.

Logistics: Includes air passenger and cargo workers, drivers, laborers in the shipping and rail industries, and transportation-related machine operators. Most Logistics occupations do not require a post-secondary education.

Mechanics: Includes technicians and repair personnel for a host of industries, including automotive, aircraft, telecommunications, electrical, and electronic products. Most Mechanics occupations do not require a post-secondary education.

Production: Includes assembly workers, machinists, and equipment operators in a variety of manufacturing-oriented industries.

EMPLOYMENT BY OCCUPATION CLUSTER
2017

Cluster	Value
Hospitality	14.4%
Back Office	12.7%
Logistics	10.3%
Medical	10.2%
Personal Services	9.6%
Production	8.9%
Education	6.8%
Social Service	4.8%
Mechanics	4.2%
Construction	3.8%
Business	2.1%
Financial	1.9%
Engineering	1.7%
Computer	1.6%
Sales & Marketing	0.5%
Performance	0.5%
Legal	0.4%
Design	0.4%
Plant Operators	0.4%
Agriculture	0.3%
Communications	0.3%
Architecture	0.1%

Toledo Region

US
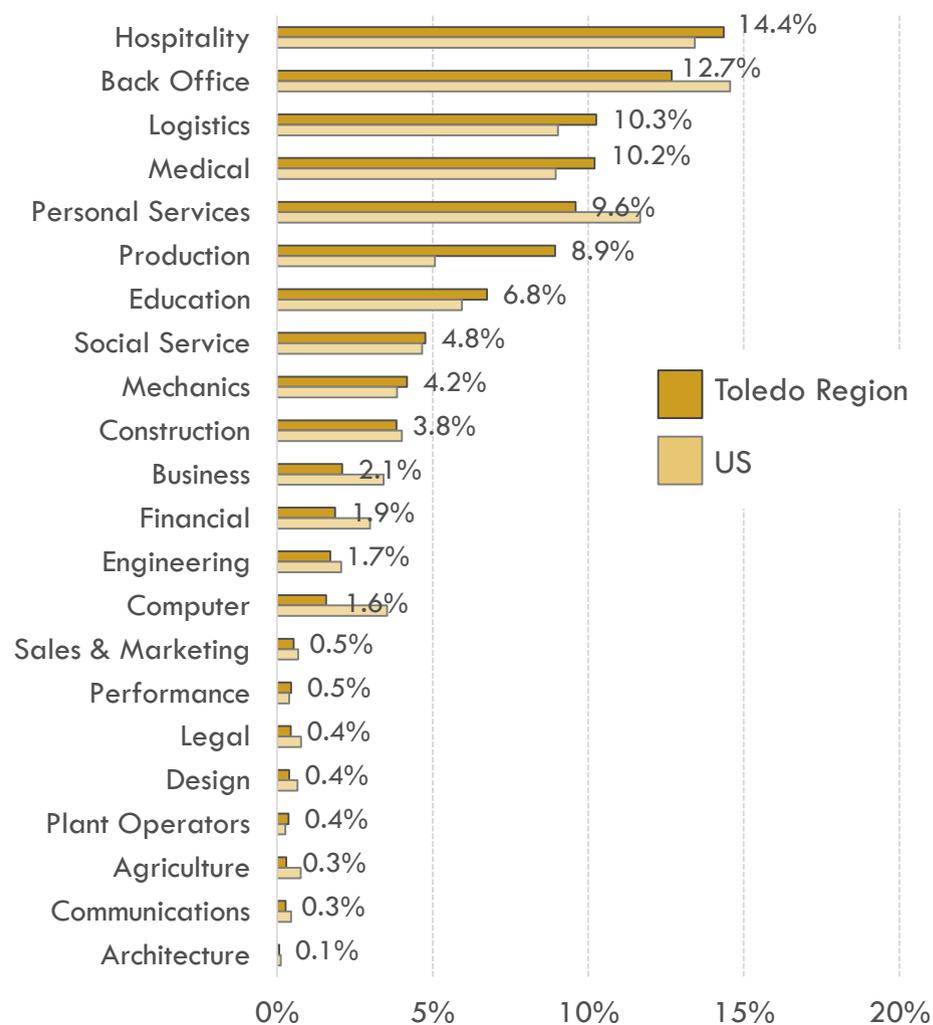
SOURCE: AVALANCHE CONSULTING ANALYSIS OF DATA FROM EMSI

Occupational Cluster Performance

Most of the Toledo region's large occupation clusters have experienced growth over the past 5 years, led by Construction, Logistics, Production, and Mechanics. Aligned with industry trends, Medical and Education occupations have declined slightly. Interestingly, Back Office also declined despite high growth in the Back Office/HQ industry cluster. This indicates that most growth in office employment is in higher skilled technical and management positions, not in admin/HR/financial support positions, insurance agents, and call center workers. **Further analysis on occupational demand will be conducted in the forthcoming Gap Analysis section in Report 2 of the Talent Alignment Strategy.**

Occupation Cluster Trends: Toledo Region
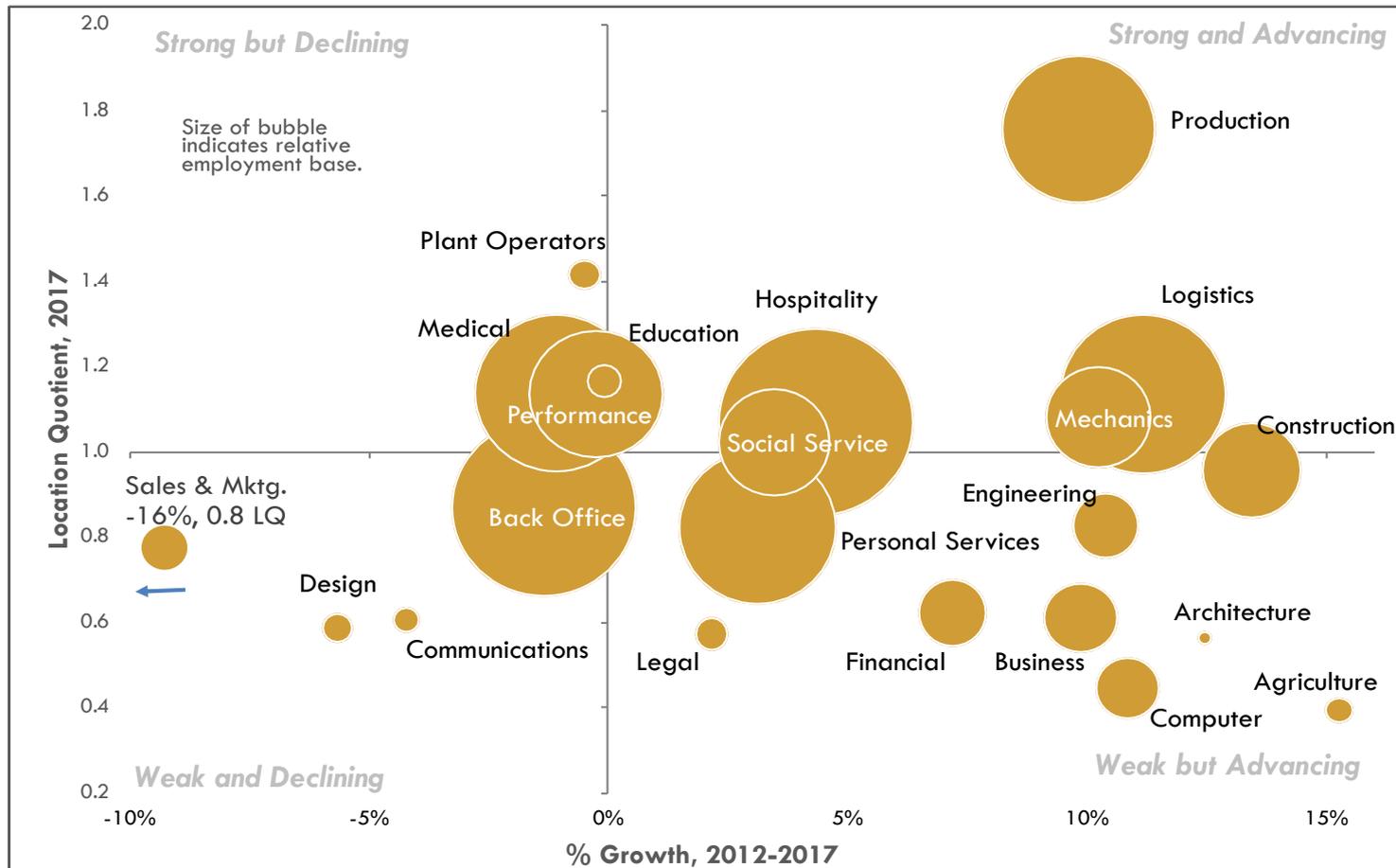
Source: Avalanche Consulting calculations; data from EMSI

05 | Talent Supply Analysis

About the Talent Supply Analysis

The Toledo region has numerous colleges and universities, but are these students pursuing the right degrees? Do they align with Toledo's target industry needs? Which technical degrees are the fastest growing and which ones might be under-represented given the target industry priorities? Our analysis will examine growth trends of degree clusters, their overall size of output, growth comparisons to the US, and "concentration quotients" to show the relative density of the degree group in the Toledo region.

This education trend data is to provide an overview of talent production within the Toledo region; for the purposes of the Talent Analysis in this report includes Lucas, Fulton, Ottawa and Wood counties.

WHY IS THIS IMPORTANT

Examining graduate output across the region, and at various credential levels that are aligned to industry and occupational clusters is foundational to understanding the talent supply produced in the region. In the Toledo region, the education system produces more Bachelor's degrees than any other credential level (Certificate, Associate's and Master's+ degrees). The highest areas of graduate growth is seen within Healthcare, Science & Engineering and Business, Finance and Economics. Growth has also occurred relating to more technical degree areas such as Skilled Trades, Construction and Transportation.

Mostly interestingly, the Toledo region produces more graduates at the Certificate level than national averages by five times and by nearly twice national education averages specifically in Healthcare and Construction. Associate's degree production is the largest for Healthcare, almost three times more graduates than the second largest area of Business. Bachelor's degrees are dominated by graduate output in Healthcare, Transportation and Science & Engineering. However, software baccalaureate output has declined by 50% in the past 10 years. Conversely, at the advanced degree levels (Master's and beyond), Healthcare is the most significant output, software graduates are increasing while Science & Engineering advanced degree output has declined.

All of this data points to an increased investment in Healthcare education within the region while also showing signs of a more highly middle skilled talent pool as evidenced by the Certificate production.

Note about the data

Data included within this section represents only information for post-secondary institutions and their 'for credit' student completions. Non-credit data, including short term technical training, industry recognized certifications and other workforce focused programs are not included in the analysis. Non-credit data will be included in Report 2: Supply and Demand Gap Analysis, along with a full overview of the education and training programming related to key industry and occupational clusters in the region. For the purposes of Report 2, and to determine the potential gaps within the talent production system in the region, institutions located within Monroe County, Michigan will also be included in the analysis.

College Graduate Output

The Toledo region produced over 12,000 graduates with degrees and certificates in 2016. The region produces far more Bachelor's graduates (6,000) than any other award level, a number that has held steady over the last ten years. Certificate* graduates now reach 1,500 and Associate's graduates now reach 2,100. Master's or above graduates surpass 2,500.

TOTAL GRADUATES BY AWARD LEVEL
TOLEDO REGION, 2016

TOTAL GRADUATES BY AWARD LEVEL
TOLEDO REGION, 2006 - 2016

SOURCE: AVALANCHE CONSULTING ANALYSIS OF IPEDS
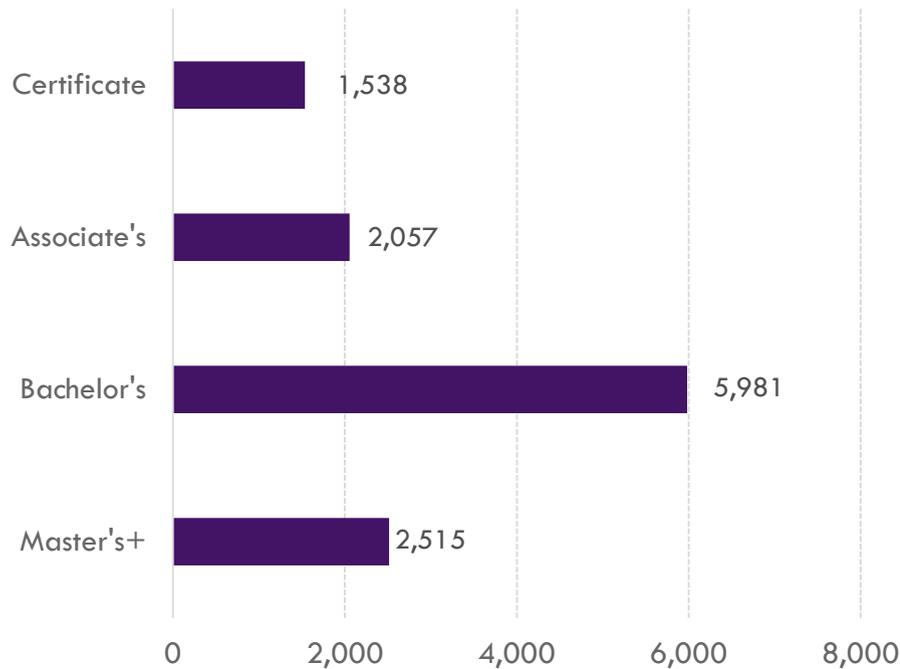
SOURCE: AVALANCHE CONSULTING ANALYSIS OF IPEDS

*Note: Certificate data in this section is based on FOR-CREDIT CERTIFICATES
From the US Department of Education. Non-credit programs are not included, but will be
added to the forthcoming Gap Analysis.
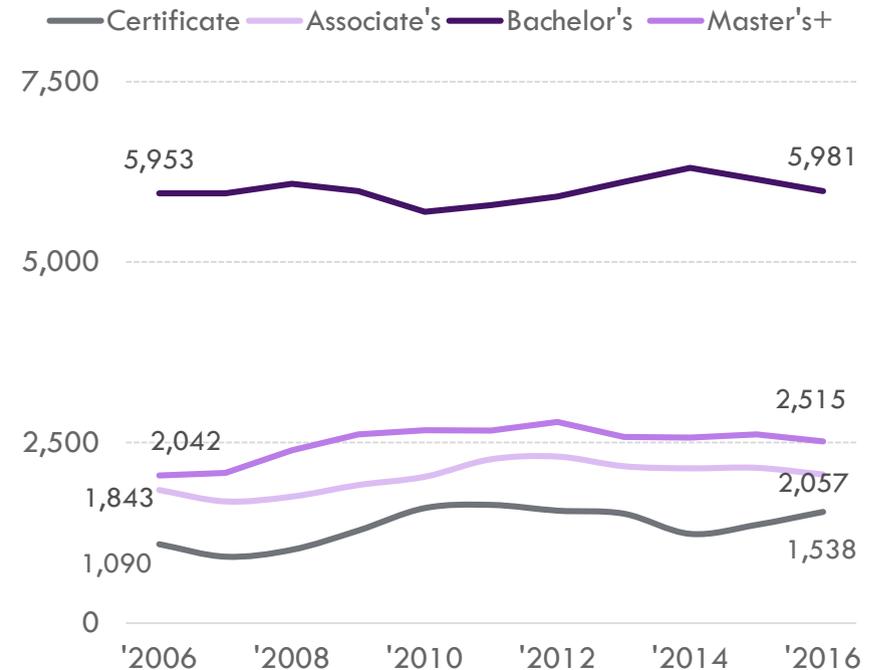
College Graduate Output Trends

For the Toledo region, job losses during the Great Recession (about 35,000) were met with significant growth in student enrollment and graduate output. The total number of all graduates over the past 10 years has increased 12%, with most growth occurring at the Certificate level (+41%) and Master's/PhD level (+23%). However, graduate output has leveled off and declined slightly since its peak in 2012.

GROWTH IN GRADUATE OUTPUT
2006 – 2016

GAINS IN GRADUATE OUTPUT
VS. EMPLOYMENT (INDEXED TO 2006 VALUES)
TOLEDO REGION, 2006 - 2016

SOURCE: AVALANCHE CONSULTING ANALYSIS OF IPEDS
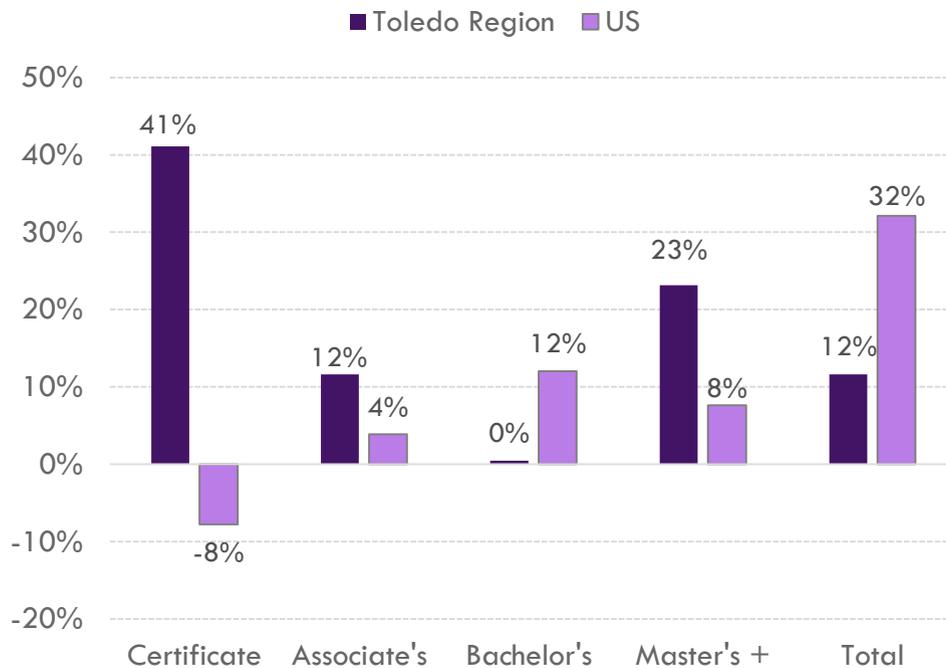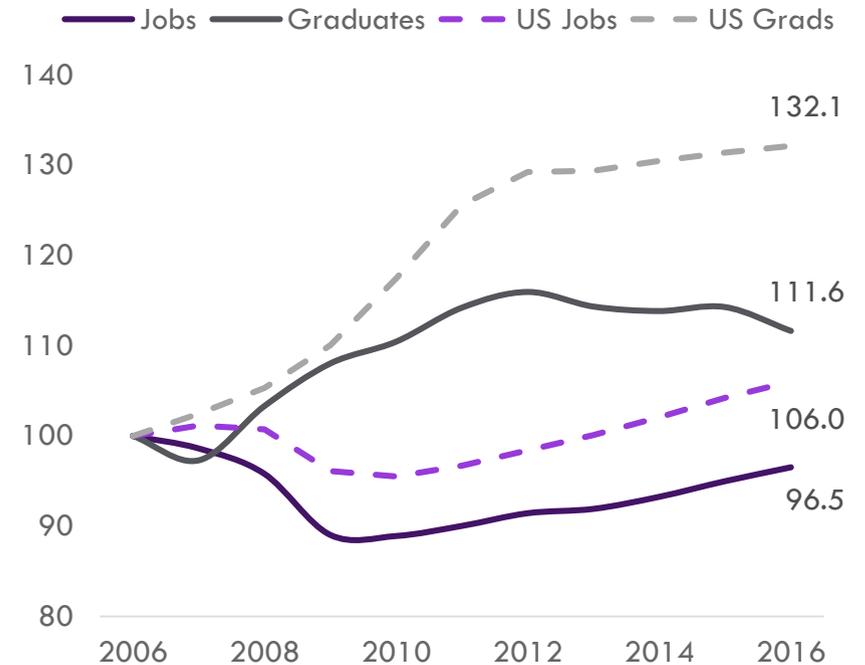
SOURCE: AVALANCHE CONSULTING / IPEDS / US BLS

*Certificates only include for-credit programs.

College Graduate Output Per Capita

The Toledo region produces more postsecondary graduates on a per capita basis than the US – nearly 20% more. This strong output is due to relatively high levels of graduates at the Bachelor's level and Master's/PhD level, which are 48% and 24% higher per capita than the US. Growth on a per capita basis has been highest at the Certificate and Master's/PhD levels. While the US has seen high levels of Bachelor's output growth, per capita levels have not increased in the Toledo region.

TOTAL GRADUATES PER 100K POPULATION TOLEDO REGION, 2016

Category	Toledo Region	US
Total	1,895	1,598
Certificate	238	303
Associate	318	338
Bachelor's	926	624
Master's+	389	313
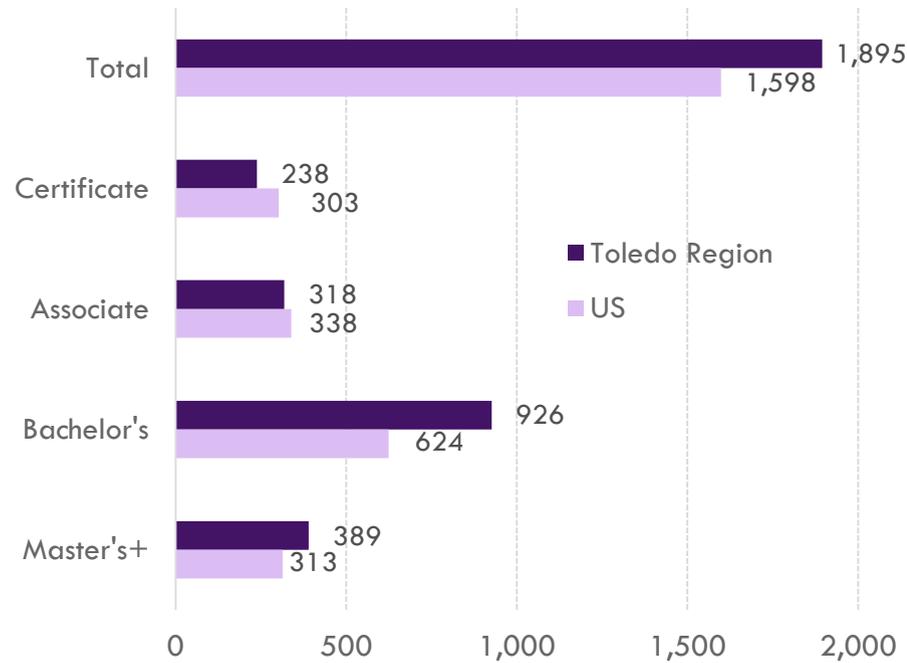
■ Toledo Region
■ US

% GROWTH IN TOTAL GRADUATES PER 100K POPULATION TOLEDO REGION, 2006-2016

Category	Toledo Region	US
Total	12%	32%
Certificate	42%	-8%
Associate	12%	4%
Bachelor's	1%	12%
Master's+	24%	8%
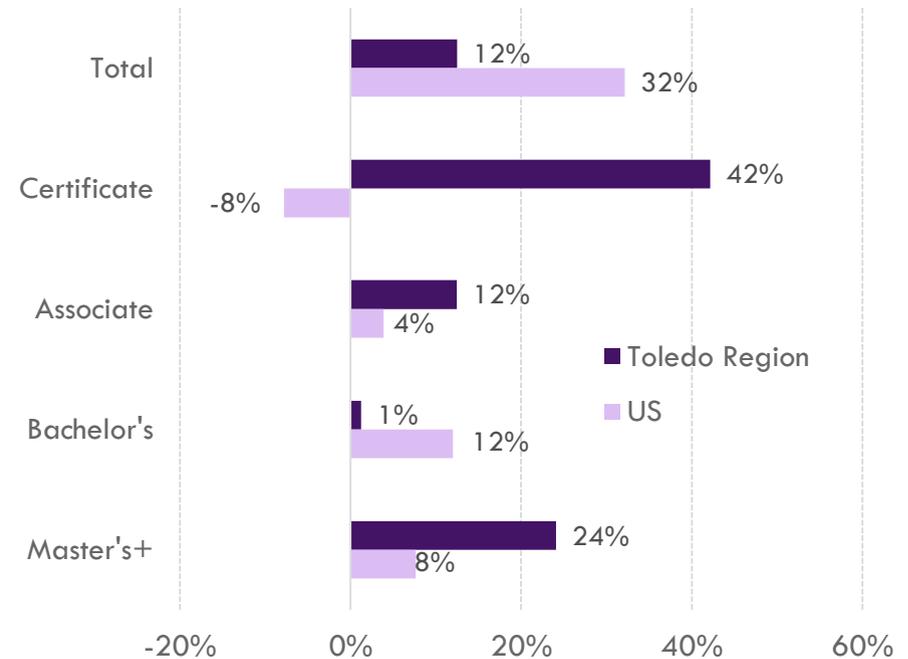
■ Toledo Region
■ US

SOURCE: AVALANCHE CONSULTING ANALYSIS OF IPEDS

Degree Cluster Trends

The Toledo region is a significant producer of graduates in Health Care (3,900), Science & Engineering (1,500), Business (1,400) and Education (1,400). Together these four degree groups comprise two-thirds of all graduates in the region. However since 2006, the largest growth in graduate output was in more technical/trade-related clusters like Construction, Personal Services/Hospitality, and Transportation Professionals. Health Care graduates increased 55% over ten years.

TOP DEGREE CLUSTERS BY ALL AWARD LEVELS TOLEDO REGION, 2016

Cluster	Value
Health Care	3,916
Science & Engineering	1,487
Business, Finance, Economics	1,414
Education	1,356
Liberal / Multicultural Studies	783
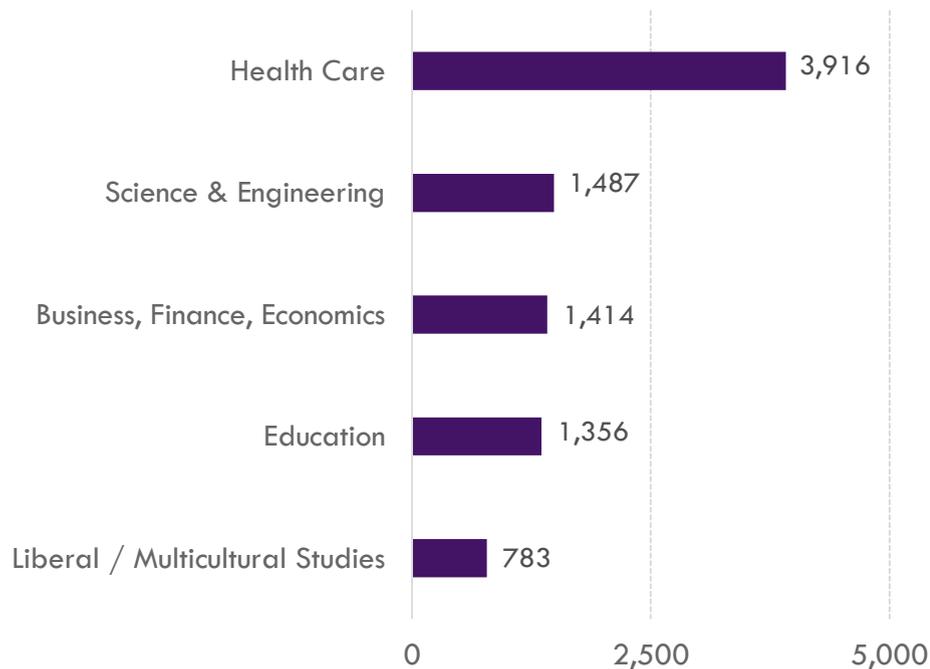
SOURCE: AVALANCHE CONSULTING ANALYSIS OF IPEDS DATA

FASTEST GROWING DEGREE CLUSTERS, ALL AWARD LEVELS TOLEDO REGION, 2006 - 2016

Cluster	Toledo Region
Construction	306%
Personal Services / Hospitality	281%
Transportation Professionals	105%
Health Care	55%
Family Development	30%
Science & Engineering	29%
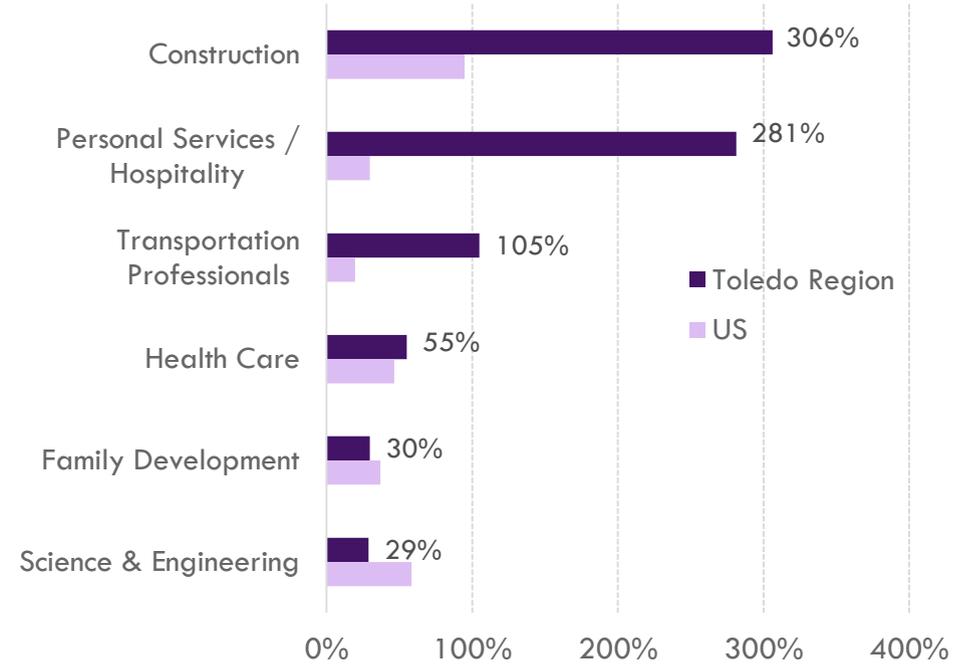
■ Toledo Region
■ US

SOURCE: AVALANCHE CONSULTING ANALYSIS OF IPEDS DATA

Certificate Trends

The Toledo region produces five times more Education certificate graduates as a share of all certificates than the US, and nearly twice as many in Health Care and Construction. The largest certificate clusters in the Toledo region are Healthcare (900 graduates in 2016), Personal Services (210), and Construction (180). There was significant growth over the past 10 years in Education, Construction, and Personal Services/Hospitality, as well as Mechanics. Business certificate graduates declined more than 50%.

Certificate Graduate Cluster Trends: Toledo Region

Bubble chart plotting Concentration Quotient, 2016 (y-axis, 0.0 to 2.0) against % Growth, 2006-2016 (x-axis, -100% to 200%). Quadrant labels: Strong but Declining (top left), Strong and Advancing (top right), Weak and Declining (bottom left), Weak but Advancing (bottom right). Size of bubble indicates number of graduates in 2016.

Clusters plotted:
- Health Care (large bubble, ~20% growth, ~1.68 CQ)
- Education (305%, 4.7 LQ)
- Construction (309%, 1.6 LQ)
- Personal Services / Hospitality (308%, 1.1 LQ)
- Science & Engineering (~-35% growth, ~0.9 CQ)
- Business, Finance, Economics (~-50% growth, ~0.37 CQ)
- Software and Computer Sciences (~-35% growth, ~0.17 CQ)
- Mechanics and Machine Repair (~100% growth, ~0.43 CQ)

Source: Avalanche Consulting calculations; data from US Dept. of Education (IPEDS)

Associate's Degree Trends

The Toledo region produces graduates two times the US average in Health Care, Education, and Agriculture Associate's degrees. Health Care produces by far the largest number of associate's graduates in the region – over 900. The next highest levels are 270 in Business and 210 in Liberal Arts (which includes a general Associates for students planning to transfer to a 4-year institution).

Associate's Graduate Cluster Trends: Toledo Region
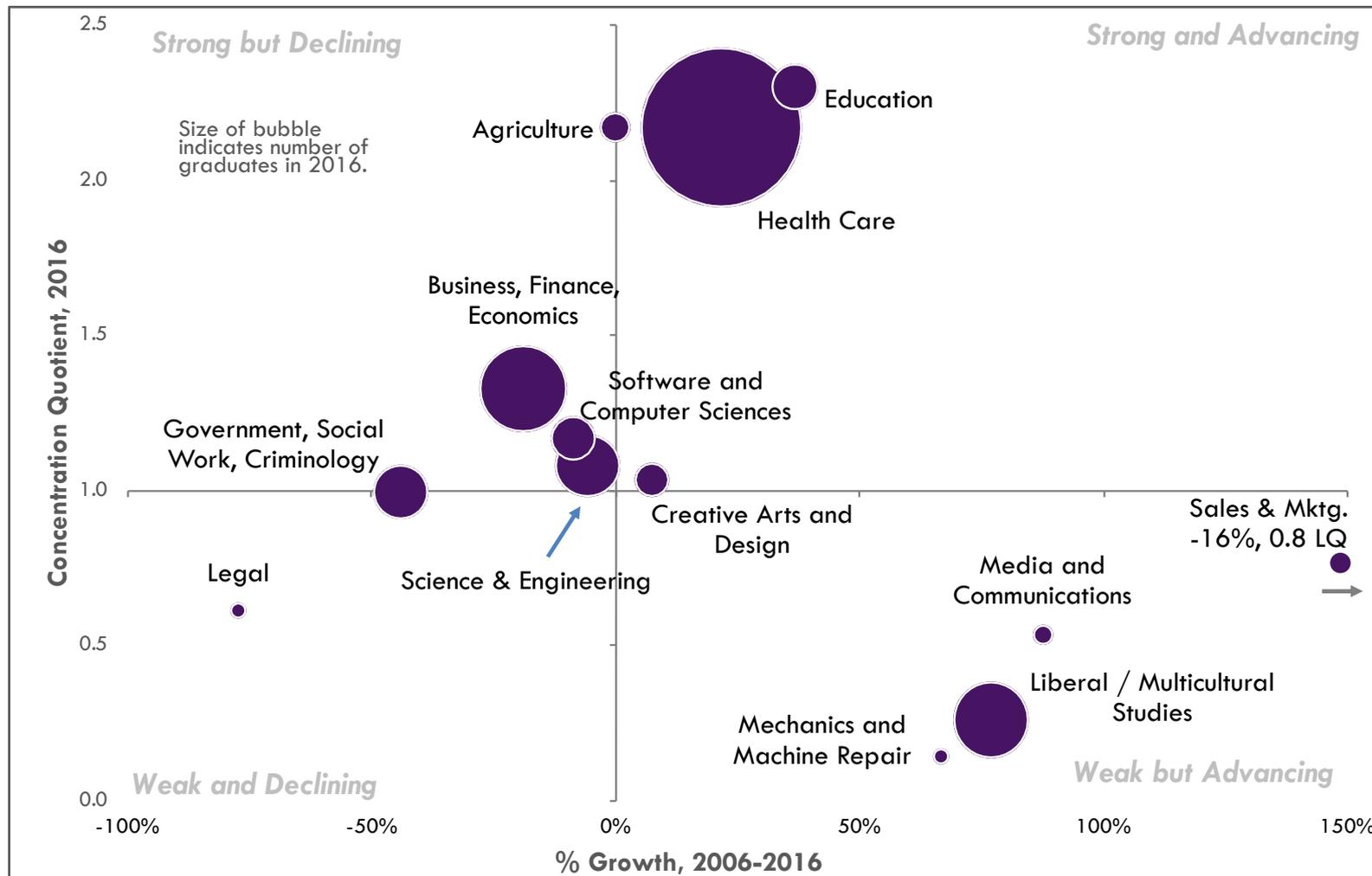
Source: Avalanche Consulting calculations; data from US Dept. of Education (IPEDS)

Bachelor's Degree Trends

The Toledo region's largest Bachelor's degree cluster, Health Care (1,300 graduates in 2016), is also one of the fastest growing (+64% in 10 years). Transportation Professionals is also high growth and highly concentrated in the region. Science & Engineering and Family Development grew about 30%. Education is highly concentrated in the region (nearly 3 times the US share) but declined 30% over the last 10 years. Business, Creative Arts, and Communications degrees also declined. Software graduates have fallen 50%.

Bachelor's Graduate Cluster Trends: Toledo Region

% Growth, 2006-2016

Strong but Declining

Strong and Advancing

Size of bubble indicates number of graduates in 2016.

Education

Transportation Professionals
103%, 4.3 LQ

Media and Communications

Architecture

Liberal / Multicultural Studies

Family Development

Health Care

Creative Arts and Design

Legal
-62%, 1.0 LQ

Science & Engineering

Mathematics

Software

Government, Social Work, Criminology

Agriculture

Business, Finance, Economics

Weak and Declining

Weak but Advancing

Concentration Quotient, 2016

Source: Avalanche Consulting calculations; data from US Dept. of Education (IPEDS)

Master's Degree & Higher Trends

Most Master's and PhD's are produced in Health Care in the Toledo region. Health is also one of the fastest growing at more than 200% over the last 10 years. Advanced degrees in Software/Computer Science are also extremely fast-growing. Other high-growth fields include Science & Engineering, Math, and Government/Social Work. Again, Education graduate output is in decline.

Master's, Professional, and PhD Graduate Cluster Trends: Toledo Region
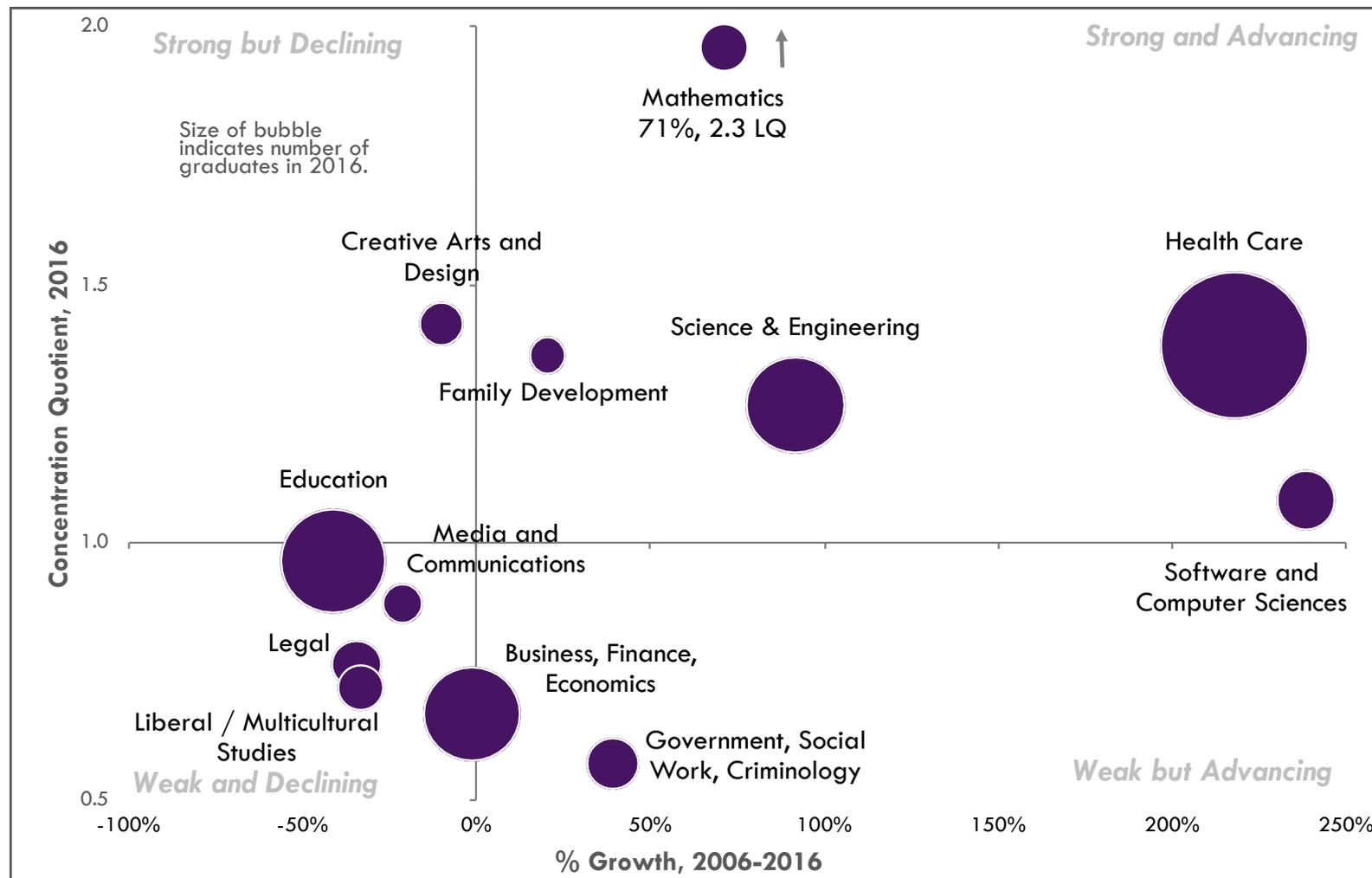
Source: Avalanche Consulting calculations; data from US Dept. of Education (IPEDS)

06 | Data Appendix

Population Trend by Age

TOLEDO REGION POPULATION BY WORKING AGE
2000 – 2017

Legend: 15-24, 25-34, 35-44, 45-54, 55-64
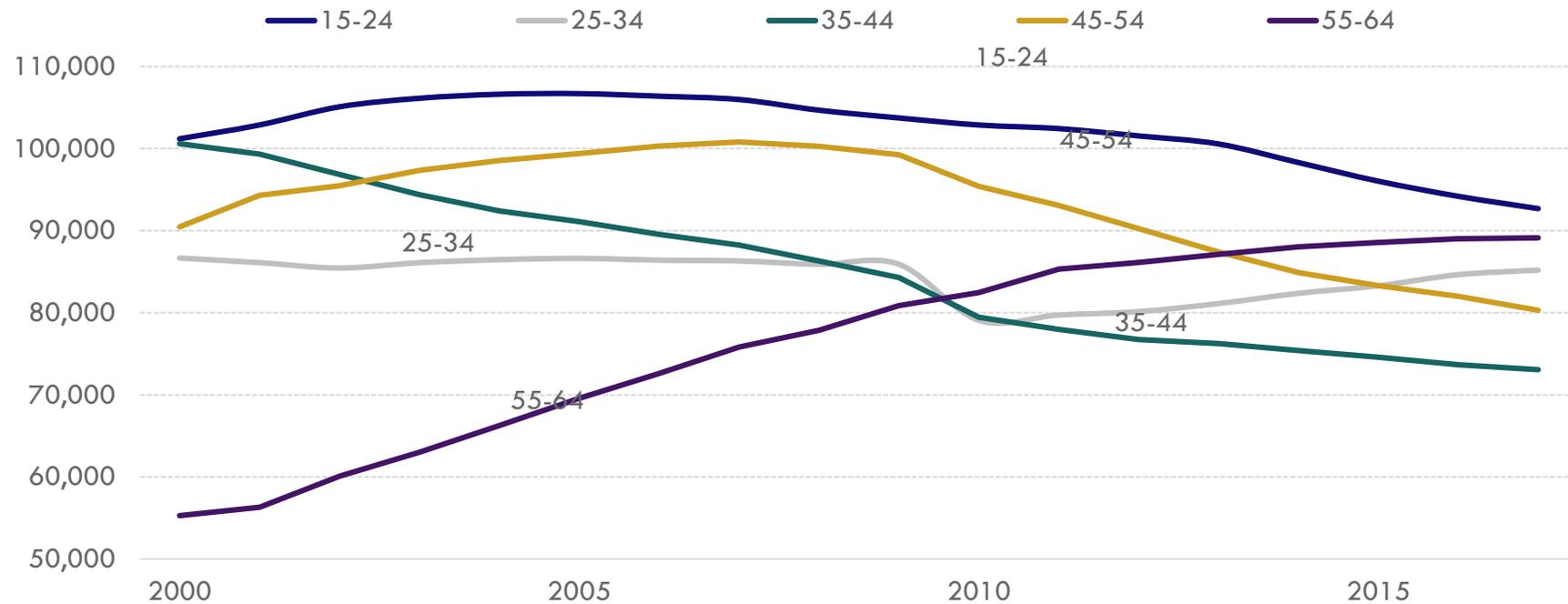
SOURCE: AVALANCHE CONSULTING / US CENSUS BUREAU POPULATION ESTIMATES

Over the time period:
Teens (15-19): -7,500
College-age (20-24): -1,000

Over the time period:
Children (<15): -21,000
Retirees (65+): +20,000

Millennial Population Growth Rate – Top 100 Metros

CHANGE IN MILLENNIAL POPULATION (PEOPLE BORN 1981 TO 1996)

2006 – 2016

Austin-Round Rock, TX	42.9%	Jacksonville, FL	16.8%	Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	3.3%
Orlando-Kissimmee-Sanford, FL	37.7%	New Orleans-Metairie, LA	16.4%	North Port-Sarasota-Bradenton, FL	3.0%
Nashville-Davidson--Murfreesboro--Franklin, TN	37.6%	Phoenix-Mesa-Scottsdale, AZ	15.7%	Santa Maria-Santa Barbara, CA	2.9%
Denver-Aurora-Lakewood, CO	36.9%	Tampa-St. Petersburg-Clearwater, FL	15.2%	Omaha-Council Bluffs, NE-IA	2.8%
Fayetteville-Springdale-Rogers, AR-MO	35.4%	Richmond, VA	14.0%	Providence-Warwick, RI-MA	2.7%
San Francisco-Oakland-Hayward, CA	35.3%	Atlanta-Sandy Springs-Roswell, GA	13.7%	Albany-Schenectady-Troy, NY	2.2%
Seattle-Tacoma-Bellevue, WA	34.7%	Boston-Cambridge-Newton, MA-NH	13.6%	Greenville-Anderson-Mauldin, SC	0.7%
Raleigh, NC	33.0%	San Antonio-New Braunfels, TX	13.2%	Greensboro-High Point, NC	0.5%
Las Vegas-Henderson-Paradise, NV	30.3%	Miami-Fort Lauderdale-West Palm Beach, FL	12.3%	Pittsburgh, PA	0.1%
San Jose-Sunnyvale-Santa Clara, CA	28.4%	Louisville/Jefferson County, KY-IN	12.1%	Chicago-Naperville-Elgin, IL-IN-WI	-0.2%
Colorado Springs, CO	28.3%	Worcester, MA-CT	11.3%	Fresno, CA	-0.8%
Charlotte-Concord-Gastonia, NC-SC	27.7%	Lakeland-Winter Haven, FL	11.0%	Riverside-San Bernardino-Ontario, CA	-0.9%
Boise City, ID	27.1%	Harrisburg-Carlisle, PA	10.0%	Dayton, OH	-1.3%
Portland-Vancouver-Hillsboro, OR-WA	26.2%	New York-Newark-Jersey City, NY-NJ-PA	10.0%	Milwaukee-Waukesha-West Allis, WI	-1.9%
Urban Honolulu, HI	25.7%	Knoxville, TN	9.1%	St. Louis, MO-IL	-2.6%
Columbus, OH	24.4%	Ogden-Clearfield, UT	8.8%	Winston-Salem, NC	-2.8%
Lafayette, LA	24.0%	Lancaster, PA	8.8%	Cincinnati, OH-KY-IN	-2.8%
Salt Lake City, UT	23.6%	Virginia Beach-Norfolk-Newport News, VA-NC	8.7%	Rochester, NY	-2.9%
Washington-Arlington-Alexandria, DC-VA-MD-WV	23.4%	Birmingham-Hoover, AL	8.6%	Allentown-Bethlehem-Easton, PA-NJ	-3.3%
Charleston-North Charleston, SC	22.9%	Tucson, AZ	8.2%	Bridgeport-Stamford-Norwalk, CT	-3.4%
Houston-The Woodlands-Sugar Land, TX	21.9%	Augusta-Richmond County, GA-SC	8.2%	Salinas, CA	-3.6%
Cape Coral-Fort Myers, FL	21.6%	Wichita, KS	7.8%	Lansing-East Lansing, MI	-4.0%
Kansas City, MO-KS	21.2%	Provo-Orem, UT	7.7%	Akron, OH	-4.2%
Dallas-Fort Worth-Arlington, TX	20.5%	Baton Rouge, LA	7.2%	Hartford-West Hartford-East Hartford, CT	-4.8%
San Diego-Carlsbad, CA	20.3%	Baltimore-Columbia-Towson, MD	6.3%	Syracuse, NY	-4.9%
Little Rock-North Little Rock-Conway, AR	19.8%	Sacramento--Roseville--Arden-Arcade, CA	6.0%	Stockton-Lodi, CA	-5.7%
Indianapolis-Carmel-Anderson, IN	19.2%	El Paso, TX	5.6%	Oxnard-Thousand Oaks-Ventura, CA	-5.9%
Chattanooga, TN-GA	19.2%	Albuquerque, NM	5.3%	Buffalo-Cheektowaga-Niagara Falls, NY	-6.4%
Oklahoma City, OK	18.3%	Grand Rapids-Wyoming, MI	4.5%	Cleveland-Elyria, OH	-8.0%
Jackson, MS	18.2%	Los Angeles-Long Beach-Anaheim, CA	4.4%	Memphis, TN-MS-AR	-8.7%
Minneapolis-St. Paul-Bloomington, MN-WI	17.6%	Bakersfield, CA	3.6%	Toledo, OH	-10.0%
Spokane-Spokane Valley, WA	17.3%	New Haven-Milford, CT	3.3%	Detroit-Warren-Dearborn, MI	-10.4%
Anchorage, AK	16.9%	McAllen-Edinburg-Mission, TX	3.3%	Modesto, CA	-11.0%
				Springfield, MA	-19.2%

-10%

SOURCE: AVALANCHE CONSULTING / IPUMS-USA

High School Subject Proficiency, Algebra & Biology

High school students in the Toledo region perform better than their statewide peers across math, science, English and history tests, but algebra proficiency levels are lower than other subjects. Students in Ohio complete assessments in a variety of subjects throughout their K-12 education, and in high school subjects, these assessments are completed at the end of the specific course. In the most recent school year, 2017-18, districts in all four Toledo area counties bested the statewide average of 60.5% students at or above proficiency for Algebra I. Impressively, all four districts in Ottawa County were above this average, as were all but one district in Fulton County. In high school Biology, all four counties included districts above and below the statewide average of 73.7% proficiency, including five districts at or above 90% proficiency.

% OF STUDENTS AT OR ABOVE PROFICIENCY ON STATE END-OF-COURSE ASSESSMENT
2017/18, BY DISTRICT
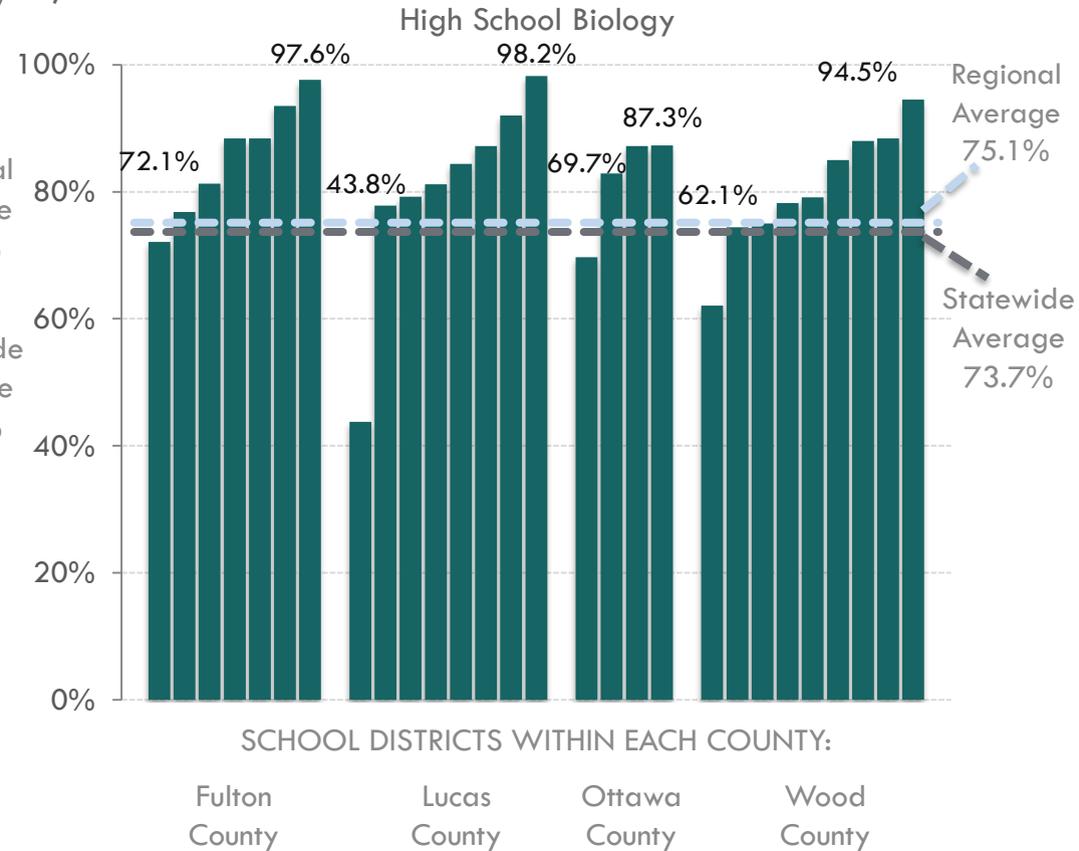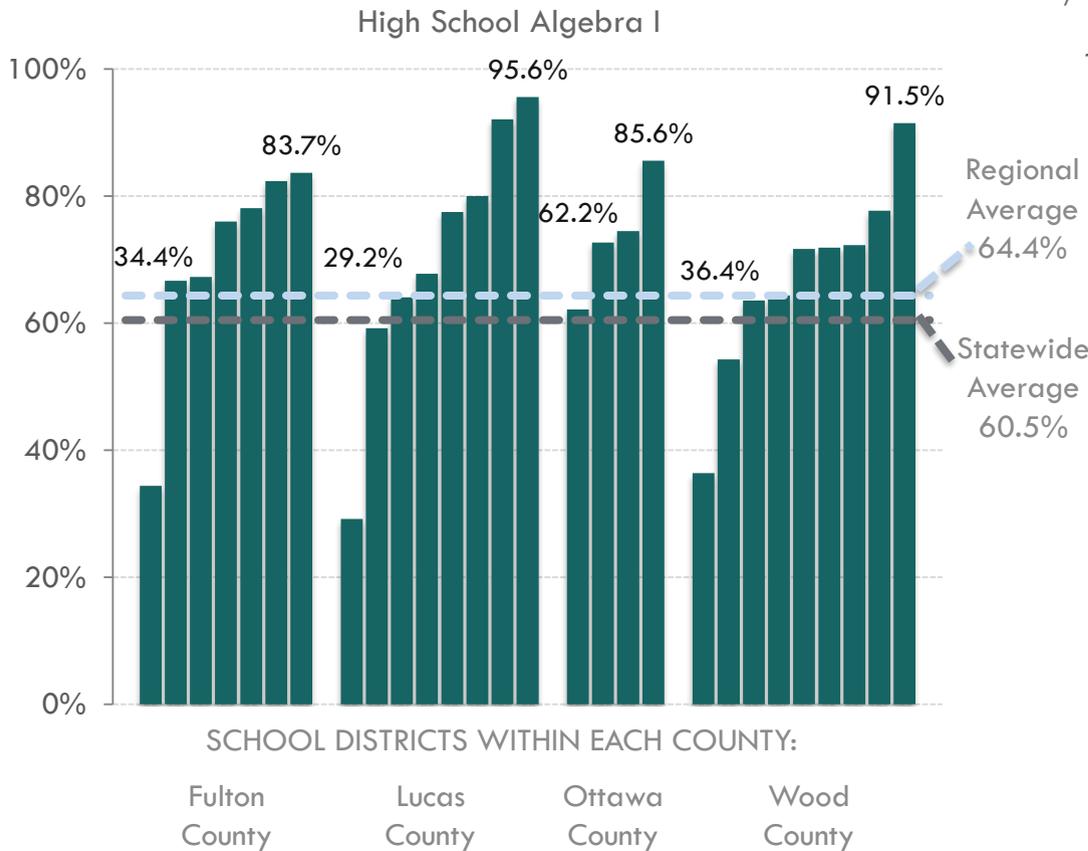
High School Algebra I

High School Biology

SOURCE: AVALANCHE CONSULTING / OHIO SCHOOL REPORT CARDS
NOTE: Averages are weighted based on the size of the high school graduating class.

High School Subject Proficiency, English & History

During the 2017-18 school year, students in high school English I had a statewide average of 68.9% proficiency, and all four districts in Ottawa County had proficiency levels above this. Fulton, Lucas, and Wood Counties all had districts reporting proficiency rates both above and below the average, while 22 districts total in the four counties were above the statewide average. In high school history, 21 districts in the area bested the statewide proficiency rate of 75.7%, with eight of those districts leading the way with over 90% proficiency rates. All four counties in the area had at least one district that fell below the statewide average.

% OF STUDENTS AT OR ABOVE PROFICIENCY ON STATE END-OF-COURSE ASSESSMENT
2017/18, BY DISTRICT

High School English I

High School History
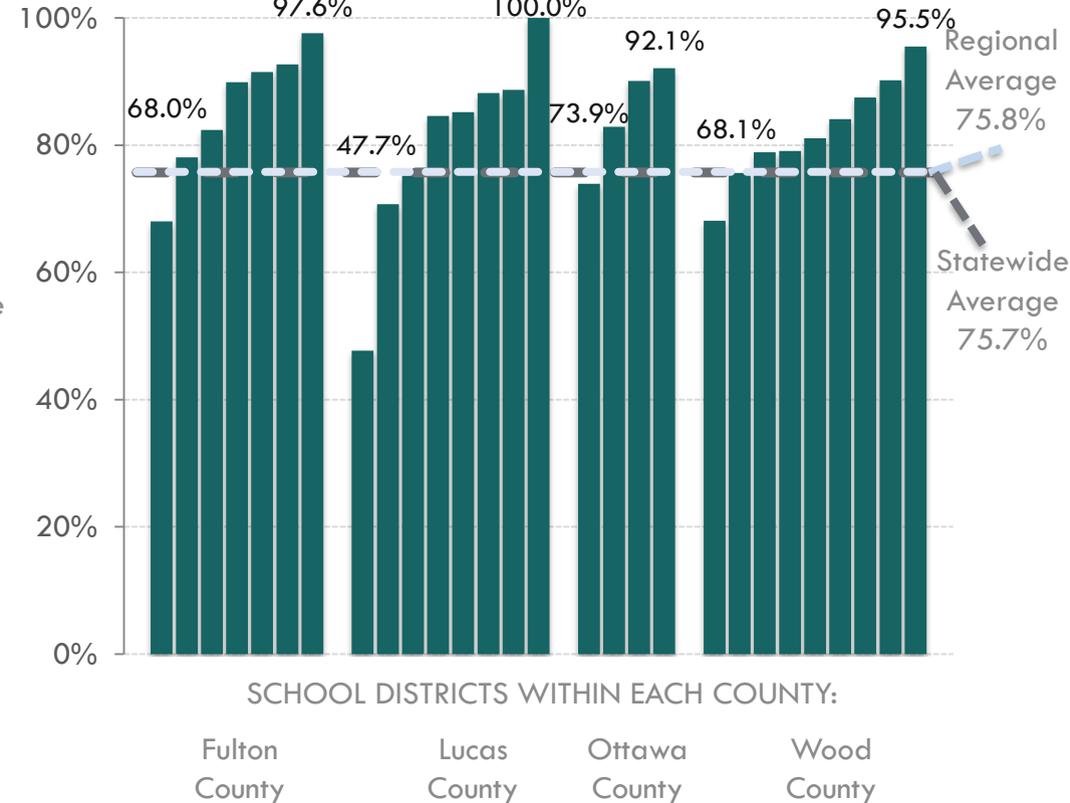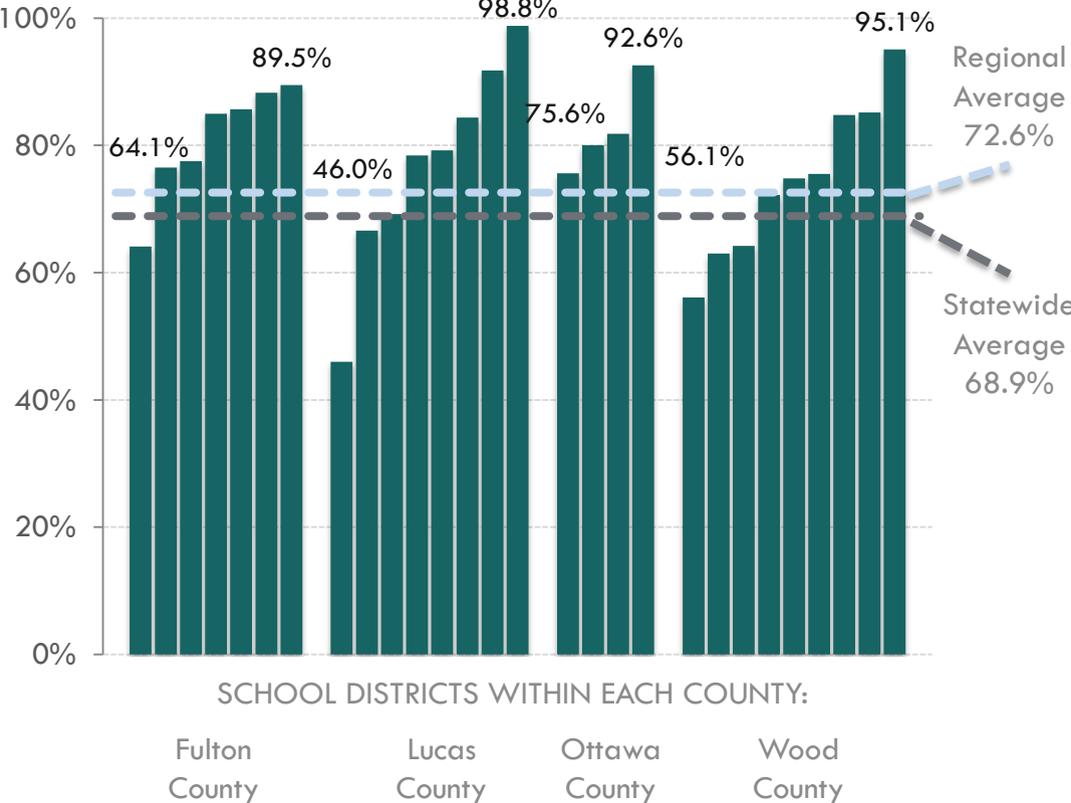
SCHOOL DISTRICTS WITHIN EACH COUNTY:

Fulton County   Lucas County   Ottawa County   Wood County

SOURCE: AVALANCHE CONSULTING / OHIO SCHOOL REPORT CARDS
NOTE: Averages are weighted based on the size of the high school graduating class.

Industry Cluster Descriptions

Aerospace: Operations engaged in research, design, and manufacturing aerospace and space technology, products, and parts, including commercial aircraft, military craft, and unmanned aerial vehicles (UAVs).

Agribusiness & Food: Operations engaged in raising, harvesting, processing, and manufacturing crops, food, and beverage products. Operations include farming, dairy, ranching, hunting, fishing, and all support activities, such as pesticide manufacturing. Also includes manufacture of tobacco and processed food products, such as sugar, flour, and canned goods.

Apparel & Textiles: Operations engaged in processing natural products such as cotton and leather into consumer textiles and apparel products. These include fabric mills, textile mills, and cut and sew apparel manufacturing.

Back Office: Operations engaged in support activities for the day-to-day operations of other businesses, including office administration, facilities support, employment services, and business support.

Biomedical Supplies & Labs: Operations engaged in manufacture and wholesale of medicine, pharmaceuticals, and medical equipment. Also includes medical and diagnostics laboratories.

Construction: Operations engaged in construction of buildings and engineering projects, such as highways and utility systems. Also includes operations manufacturing products related to construction, such as lumber, clay, glass, cement, and lime.

Consumer Goods Mfg.: Operations engaged in manufacture of household appliances and other miscellaneous nondurable goods for consumers.

Creative Content: Operations engaged in creative and information sectors such as movie and music production, radio and television programming, newspaper and magazine production, and internet publishing.

Education: Operations engaged in privately-owned education institutions, including elementary and secondary schools, colleges, universities, professional schools, trade schools, and educational support services. Public school districts and colleges are found in Government.

Electronics: Operations engaged in manufacture, wholesale, and repair of electronic equipment, including computers, televisions, semiconductors, and other electronic components.

Industry Cluster Descriptions

Energy: Operations engaged in all vertically aligned elements of the energy sector, including oil extraction, coal mining, pipeline transportation of oil and gas, and electric power generation, transmission, and distribution.

Entertainment: Operations engaged in leisure and accommodation, including hotels, restaurants, bars, casinos, museums, performing arts, and sporting facilities. Also includes independent performers, artists, and direct tourist activities.

Finance: Operations engaged in financial, insurance, and real estate activities, such as banks, insurance carriers, and real estate brokers.

Furniture: Operations engaged in manufacture and wholesale of household, office, and commercial furniture and cabinets.

Government: Operations of federal, state, and local government agencies (including public school districts and colleges), waste collection and management, and water treatment.

Healthcare: Operations engaged in direct provision of healthcare and social services, including private hospitals, doctor offices, elderly care, child day care, family services, and home nursing care.

Industrial Machinery: Operations engaged in manufacture and wholesale of industrial application machinery, including agricultural and mining equipment, HVAC systems, metalworking machinery, turbines, lighting, and other equipment.

Mining & Logging: Operations engaged in forestry, logging, and mining: not including oil, gas, and coal extraction.

Materials: Operations engaged in design, wholesale, and manufacture of traditional and complex materials, including paper, chemicals, plastics, rubber, and other advanced materials.

Metalworking: Operations engaged in processing minerals into metal products and manufacture of components and products from metal. This includes steel mills, foundries, fabricated metal and structural metal manufacturing, and hand-tool manufacturing.

Non-Profits: Operations engaged in non-profit activities, including churches, social advocacy, and civic and professional associations.

Professional Services: Operations engaged in architecture, engineering, legal, accounting, management, and other technical services.

Industry Cluster Descriptions

Research: Operations engaged in scientific research and development and scientific consulting services.

Retail: Operations engaged in retail sale of goods and services to consumers, including car dealers, grocery stores, clothing stores, gas stations, auto repair, personal care, and equipment rental.

Shipbuilding: Operations engaged in construction of ships and boats.

Software / Information Technology: Operations engaged in information technology sectors, including software publishing, internet service providers, computer system design, data processing and hosting, and other information services.

Telecom Services: Operations engaged in wired, wireless, and satellite telecommunications, including cell phone and cable providers.

Transportation & Logistics: Operations engaged in transportation of goods and individuals; warehousing and storage of goods; and delivery of post and packages. This includes commercial, personal, and tourism transportation on air, rail, water, and roads.

Occupation Cluster Descriptions

Agriculture: Includes farm, fishing, and forestry labor, as well as farm management and agricultural production occupations. Most Agriculture occupations do not require any post-secondary educational attainment.

Architecture: Includes residential, commercial, industrial, and landscape architects. Architecture occupations require a bachelor's degree.

Back Office: Encompasses a variety of business support occupations, including clerks, human resource professionals, and office administration staff in a variety of industries. Most Back Office occupations require at least a high school diploma and a significant number require a bachelor's degree.

Business: Includes chief executives, managers, and analysts. Virtually all Business occupations require at least bachelor's degree and several occupations require a master's degree.

Communications: Includes advertising and public relations occupations, as well supporting writers, editors, and analysts. Nearly all Communications occupations require a Bachelor's degree.

Computer: Encompasses electrical engineers, hardware engineers, network support specialists, software and web-based developers, and related computer programmers and security analysts. The majority of Computer occupations require a bachelor's degree.

Construction: Includes construction managers and laborers, equipment operations, and specialized trade contractors. Most construction occupations require a high school diploma and an apprenticeship or some on-the-job training.

Design: Includes artists and animators, graphic and industrial designers, and audiovisual production professionals. Educational requirements within the Design cluster vary widely.

Education: Includes teachers, related administrators, and library science professionals. Virtually all Education occupations require a bachelor's degree and a significant number require a master's degree.

Engineering: Includes virtually all engineers, with the exception of those directly related to computers. The majority of engineering occupations require a bachelor's degree.

Financial: Includes financial advisors and analysts, accountants, loan officers, and real estate professionals. Most Financial occupations require a bachelor's degree.

Occupation Cluster Descriptions

Geology: Includes operators of oil, gas, and mining equipment. The majority of Geology occupations require a high school diploma, with remaining occupations only requiring on-the-job training.

Hospitality: Includes food related occupations such as cooks and wait staff, as well as laborers and maintenance workers in industries such as gaming and lodging. Hospitality occupations typically require a high school diploma or some on-the-job training.

Legal: Includes lawyers, judges, paralegals and related support staff. Educational requirements within the Legal cluster vary widely.

Logistics: Includes air passenger and cargo workers, drivers, laborers in the shipping and rail industries, and transportation-related machine operators. Most Logistics occupations do not require a post-secondary education.

Math: A narrow occupation cluster involving actuaries, mathematicians, and statisticians. Math occupations require at least a bachelor's degree.

Mechanics: Includes technicians and repair personnel for a host of industries, including automotive, aircraft, telecommunications, electrical, and electronic products. Most Mechanics occupations do not require a post-secondary education.

Medical: Includes doctors, nurses, aids and attendants, equipment technicians, and therapists (both physical and psychological). Medical occupations also include veterinarians as well as dentists and related workers. Educational requirements within the Medical cluster vary widely.

Performance: Includes occupations involved with athletic, dance, musical, televised, and theatrical performances. Performance occupations typically require at least a high school diploma.

Personal Services: Includes personal appearance professionals, childcare providers, and retail salespersons, clerks, and cashiers. Most Personal Service occupations require either a high school diploma or postsecondary non-degree award.

Political: Includes occupations typically related to public policy, including urban planners, geographers, and political scientists. The majority of Political occupations require a master's degree.

Plant Operators: Includes operators of large-scale chemical, gas, nuclear, and water systems.

Production: Includes assembly workers, machinists, and equipment operators in a variety of manufacturing-oriented industries.

Occupation Cluster Descriptions

Sales & Marketing: Includes sales and marketing managers. These positions typically require a bachelor's degree.

Social Service: Include public safety workers such as firefighters and police officers as well as postal workers and religious officials. Social Service occupations typically require at least a high school diploma.

Industry Clusters

Toledo Region   **United States**

Cluster	2012	2017	Net New	% Growth	LQ '17	'17 Shr	% Growth	'17 Shr
Aerospace	201	243	41	20.6%	0.24	0.1%	-2.1%	0.3%
Agribusiness & Food	3,260	2,796	-464	-14.2%	0.56	0.9%	11.0%	1.6%
Apparel & Textiles	473	362	-111	-23.5%	0.32	0.1%	-4.9%	0.4%
Automotive	10,756	15,511	4,755	44.2%	5.44	5.1%	17.9%	0.9%
Back Office	20,033	23,586	3,553	17.7%	1.03	7.7%	13.5%	7.4%
Biomedical	658	1,115	457	69.5%	0.65	0.4%	4.8%	0.6%
Construction	20,817	22,612	1,795	8.6%	1.11	7.4%	20.6%	6.6%
Consumer Goods Mftg	678	826	147	21.7%	0.58	0.3%	2.5%	0.5%
Creative Content	3,845	3,117	-728	-18.9%	0.69	1.0%	0.2%	1.5%
Education	27,452	26,634	-817	-3.0%	0.93	8.7%	4.1%	9.3%
Electronics	3,299	3,606	307	9.3%	0.68	1.2%	-0.1%	1.7%
Energy	3,617	3,310	-308	-8.5%	1.13	1.1%	-10.8%	1.0%
Entertainment	34,124	35,818	1,694	5.0%	1.04	11.7%	15.6%	11.2%
Finance	8,923	9,020	96	1.1%	0.56	2.9%	7.6%	5.2%
Furniture	2,404	3,098	694	28.9%	2.90	1.0%	12.6%	0.3%
Government	18,158	18,160	2	0.0%	0.76	5.9%	1.7%	7.8%
Healthcare	48,664	49,222	558	1.1%	1.19	16.1%	14.6%	13.5%
Industrial Machinery	7,069	7,594	525	7.4%	1.17	2.5%	-0.1%	2.1%
Materials	5,201	5,575	375	7.2%	1.43	1.8%	4.4%	1.3%
Metalworking	6,281	6,193	-88	-1.4%	1.61	2.0%	-1.0%	1.3%
Mining & Logging	229	287	58	25.1%	0.66	0.1%	1.1%	0.1%
Non-Profits	3,269	3,338	69	2.1%	1.15	1.1%	3.1%	1.0%
Professional Services	8,019	7,856	-163	-2.0%	0.87	2.6%	7.5%	3.0%
Research	1,483	1,341	-142	-9.6%	0.31	0.4%	16.5%	1.4%
Retail	38,857	38,889	33	0.1%	0.97	12.7%	4.4%	13.1%
Software / Info. Tech.	1,183	1,373	190	16.0%	0.21	0.4%	29.2%	2.1%
Telecom Services	1,414	1,537	122	8.7%	0.93	0.5%	-9.1%	0.5%
Transportation & Logistics	10,471	12,365	1,894	18.1%	1.19	4.0%	19.0%	3.4%
Total	**291,605**	**306,303**	**14,698**	**5.0%**	**1.00**	**100.0%**	**9.2%**	**100.0%**

Occupation Clusters

Toledo Region   **United States**

Code	Cluster	2012	2017	Net New	% Growth	LQ '17	'17 Share	% Growth	'17 Share
AG	Agriculture	803	926	123	15.3%	0.40	0.3%	9.4%	0.8%
ARCH	Architecture	192	216	24	12.5%	0.57	0.1%	18.1%	0.1%
BACK	Back Office	39,372	38,842	-530	-1.3%	0.87	12.7%	4.1%	14.6%
BIZ	Business	5,840	6,416	576	9.9%	0.61	2.1%	16.6%	3.4%
COMM	Communications	874	837	-37	-4.2%	0.61	0.3%	8.1%	0.5%
COMP	Computer	4,359	4,831	472	10.8%	0.45	1.6%	16.0%	3.5%
CONS	Construction	10,364	11,757	1,392	13.4%	0.96	3.8%	18.1%	4.0%
DESI	Design	1,252	1,181	-71	-5.6%	0.59	0.4%	17.1%	0.7%
ED	Education	20,733	20,678	-55	-0.3%	1.14	6.8%	5.1%	5.9%
ENG	Engineering	4,741	5,234	493	10.4%	0.83	1.7%	6.9%	2.1%
FIN	Financial	5,323	5,706	383	7.2%	0.62	1.9%	10.5%	3.0%
GEO	Geology	27	49	23	85.2%	0.12	0.0%	-26.1%	0.1%
HOSP	Hospitality	42,153	43,987	1,834	4.4%	1.07	14.4%	10.6%	13.4%
LEGA	Legal	1,332	1,361	29	2.2%	0.57	0.4%	6.9%	0.8%
LOGI	Logistics	28,268	31,425	3,156	11.2%	1.14	10.3%	13.3%	9.0%
MATH	Math	94	115	21	22.3%	0.31	0.0%	37.1%	0.1%
MECH	Mechanics	11,597	12,784	1,187	10.2%	1.08	4.2%	9.1%	3.9%
MED	Medical	31,623	31,275	-348	-1.1%	1.14	10.2%	9.4%	9.0%
MFTG	Plant Operators	1,151	1,145	-6	-0.5%	1.42	0.4%	3.0%	0.3%
MKTG	Sales & Marketing	1,948	1,634	-315	-16.2%	0.79	0.5%	1.8%	0.7%
PERF	Performance	1,387	1,385	-1	-0.1%	1.17	0.5%	5.3%	0.4%
POLI	Political	90	87	-3	-3.2%	0.32	0.0%	8.1%	0.1%
PROD	Production	24,923	27,368	2,445	9.8%	1.76	8.9%	6.1%	5.1%
SERV	Personal Services	28,512	29,399	887	3.1%	0.82	9.6%	10.5%	11.7%
SOCI	Social Service	14,125	14,613	487	3.4%	1.02	4.8%	7.3%	4.7%
TOT	**All Occupations**	**291,605**	**306,303**	**14,698**	**5.0%**	**1.00**	**100.0%**	**9.2%**	**100.0%**

College Graduate Output by Award Level

Graduate Clusters by Award Level
Toledo Region

Cluster	2016 Graduates				
	Certificate	Associate's	Bachelor's	Master's +	Total
Agriculture	1	35	47	0	83
Architecture	0	0	45	5	50
Business, Finance, Economics	49	271	761	330	1,414
Creative Arts and Design	8	43	288	73	414
Construction	184	15	0	0	199
Education	81	78	750	399	1,356
Science & Engineering	49	147	930	347	1,487
Family Development	3	7	351	53	428
Government, Social Work, Criminology	0	104	396	103	604
Health Care	879	919	1,290	785	3,916
Legal	8	10	13	91	124
Mathematics	0	1	33	60	94
Media and Communications	0	15	409	59	490
Mechanics and Machine Repair	57	10	0	0	67
Liberal / Multicultural Studies	1	207	484	78	783
Personal Services / Hospitality	208	120	0	0	328
Software and Computer Sciences	10	74	60	132	276
Transportation Professionals	0	1	124	0	125
Total	**1,538**	**2,057**	**5,981**	**2,515**	**12,238**

College Graduate Output by Degree Cluster

Graduate Clusters - All Degree Levels

Toledo Region

Cluster	2006	2016	Net New	% Growth	LQ '16	U.S. % Growth
Agriculture	69	83	14	20.3%	0.53	43.7%
Architecture	62	50	-12	-19.4%	1.11	9.9%
Business, Finance, Economics	1,721	1,414	-307	-17.8%	0.76	22.0%
Creative Arts and Design	494	414	-80	-16.2%	1.15	9.0%
Construction	49	199	150	306.1%	0.95	94.7%
Education	1,874	1,356	-518	-27.6%	1.84	-12.1%
Science & Engineering	1,154	1,487	333	28.9%	1.25	58.4%
Family Development	330	428	98	29.7%	1.21	58.2%
Government, Social Work, Criminology	664	604	-60	-9.0%	0.71	37.0%
Health Care	2,524	3,916	1,392	55.2%	1.42	46.6%
Legal	245	124	-121	-49.4%	0.78	-6.9%
Mathematics	60	94	34	56.7%	1.04	68.0%
Media and Communications	588	490	-98	-16.7%	1.02	12.7%
Mechanics and Machine Repair	34	67	33	97.1%	0.24	27.0%
Liberal / Multicultural Studies	690	783	93	13.5%	0.46	43.3%
Personal Services / Hospitality	86	328	242	281.4%	0.80	29.7%
Software and Computer Sciences	258	276	18	7.0%	0.58	32.7%
Transportation Professionals	61	125	64	104.9%	1.26	19.5%
Total	**10,963**	**12,238**	**1,275**	**11.6%**	**1.00**	32.1%

College Graduate Output by Degree Cluster (Certificates)

Graduate Clusters - Certificates

Toledo Region

Cluster	2006	2016	Net New	% Growth	LQ '16	U.S. % Growth
Agriculture	0	1	1		0.10	8.3%
Architecture	0	0	0		0.00	-4.8%
Business, Finance, Economics	106	49	-57	-53.8%	0.38	31.6%
Creative Arts and Design	7	8	1	14.3%	0.47	-19.1%
Construction	45	184	139	308.9%	1.57	21.8%
Education	20	81	61	305.0%	4.68	4.9%
Science & Engineering	74	49	-25	-33.8%	0.89	20.2%
Family Development	0	3	3		0.08	21.0%
Government, Social Work, Criminology	3	0	-3	-100.0%	0.00	18.6%
Health Care	715	879	164	22.9%	1.68	-30.9%
Legal	26	8	-18	-69.2%	1.07	-20.5%
Mathematics	0	0	0		0.00	149.3%
Media and Communications	0	0	0		0.00	14.9%
Mechanics and Machine Repair	28	57	29	103.6%	0.44	-11.9%
Liberal / Multicultural Studies	0	1	1		0.01	100.7%
Personal Services / Hospitality	51	208	157	307.8%	1.05	-10.0%
Software and Computer Sciences	15	10	-5	-33.3%	0.17	23.7%
Transportation Professionals	0	0	0		0.00	6.8%
Total	**1,090**	**1,538**	**448**	**41.1%**	**1.00**	**-7.8%**

College Graduate Output by Degree Cluster (Associate's)

Graduate Clusters - Associate's Degrees

Toledo Region

Cluster	2006	2016	Net New	% Growth	LQ '16	U.S. % Growth
Agriculture	35	35	0	0.0%	2.17	20.4%
Architecture	0	0	0		0.00	-16.3%
Business, Finance, Economics	334	271	-63	-18.9%	1.33	-11.0%
Creative Arts and Design	40	43	3	7.5%	1.03	-6.2%
Construction	4	15	11	275.0%	0.68	5.6%
Education	57	78	21	36.8%	2.30	-25.8%
Science & Engineering	156	147	-9	-5.8%	1.08	11.9%
Family Development	10	7	-3	-30.0%	0.20	-3.2%
Government, Social Work, Criminology	186	104	-82	-44.1%	1.00	-4.6%
Health Care	754	919	165	21.9%	2.18	-3.2%
Legal	44	10	-34	-77.3%	0.61	-30.3%
Mathematics	1	1	0	0.0%	0.17	84.4%
Media and Communications	8	15	7	87.5%	0.54	36.1%
Mechanics and Machine Repair	6	10	4	66.7%	0.14	-11.8%
Liberal / Multicultural Studies	117	207	90	76.9%	0.26	24.2%
Personal Services / Hospitality	10	120	110	1100.0%	2.06	-9.0%
Software and Computer Sciences	81	74	-7	-8.6%	1.17	-21.3%
Transportation Professionals	0	1	1		0.24	-49.3%
Total	**1,843**	**2,057**	**214**	**11.6%**	**1.00**	**3.9%**

College Graduate Output by Degree Cluster (Bachelor's)

Graduate Clusters - Bachelor's Degrees

Toledo Region

Cluster	2006	2016	Net New	% Growth	LQ '16	U.S. % Growth
Agriculture	34	47	13	38.2%	0.38	28.0%
Architecture	62	45	-17	-27.4%	1.63	-9.6%
Business, Finance, Economics	947	761	-186	-19.6%	0.66	1.8%
Creative Arts and Design	366	288	-78	-21.3%	1.00	-0.7%
Construction	0	0	0		0.00	-34.9%
Education	1,111	750	-361	-32.5%	2.75	-16.7%
Science & Engineering	743	930	187	25.2%	1.11	29.4%
Family Development	276	351	75	27.2%	1.30	29.4%
Government, Social Work, Criminology	400	396	-4	-1.0%	0.72	8.7%
Health Care	787	1,290	503	63.9%	1.19	42.6%
Legal	36	13	-23	-63.9%	0.99	-3.7%
Mathematics	24	33	9	37.5%	0.47	32.5%
Media and Communications	505	409	-96	-19.0%	0.94	-0.3%
Mechanics and Machine Repair	0	0	0		0.00	45.2%
Liberal / Multicultural Studies	453	484	31	6.8%	0.91	-10.8%
Personal Services / Hospitality	25	0	-25	-100.0%	0.00	15.6%
Software and Computer Sciences	123	60	-63	-51.2%	0.26	44.7%
Transportation Professionals	61	124	63	103.3%	4.32	33.0%
Total	**5,953**	**5,981**	**28**	**0.5%**	**1.00**	**12.0%**

College Graduate Output by Degree Cluster (Master's+)

Graduate Clusters - Master's, Professional, and Doctorate Degrees
Toledo Region

Cluster	2006	2016	Net New	% Growth	LQ '16	U.S. % Growth
Agriculture	0	0	0		0.00	18.6%
Architecture	0	5	5		0.23	3.0%
Business, Finance, Economics	334	330	-4	-1.2%	0.67	0.3%
Creative Arts and Design	81	73	-8	-9.9%	1.42	10.8%
Construction	0	0	0		0.00	31.6%
Education	676	399	-277	-41.0%	0.97	-18.9%
Science & Engineering	181	347	166	91.7%	1.27	28.1%
Family Development	44	53	9	20.5%	1.36	21.8%
Government, Social Work, Criminology	74	103	29	39.2%	0.57	16.9%
Health Care	247	785	538	217.8%	1.38	30.7%
Legal	139	91	-48	-34.5%	0.76	-11.2%
Mathematics	35	60	25	71.4%	2.26	37.8%
Media and Communications	75	59	-16	-21.3%	0.88	-8.5%
Mechanics and Machine Repair	0	0	0		0.00	302.3%
Liberal / Multicultural Studies	117	78	-39	-33.3%	0.72	-2.6%
Personal Services / Hospitality	0	0	0		0.00	0.6%
Software and Computer Sciences	39	132	93	238.5%	1.08	81.2%
Transportation Professionals	0	0	0		0.00	0.5%
Total	**2,042**	**2,515**	**473**	**23.2%**	**1.00**	**7.6%**