Land of Sky Regional Council

Labor shed and target industry analysis

Prepared by
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EY Economic Development Advisory Services

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Executive summary

Introduction

In December of 2021, the Ernst & Young LLP (EY US) Economic Development Advisory Services (EDAS) team began to assist the Land of Sky Regional Council (LOSRC) with developing a regional resiliency and strategic alignment plan to expand and accelerate economic and community development in the region. To inform the strategic alignment plan, our research included an assessment of the region's workforce and industries, as well as a study on the potential impacts of automation on the region's economy. The results of that research are shared in this report.

Another key component of this research process was a review of 20+ recent studies and strategies from across the five counties to identify areas of overlap and shared priorities. Community stakeholders were also engaged in the research process. Through a series of workshops and interviews with businesses, chambers of commerce, educators, economic and workforce development practitioners, and others, EY US gained on-the-ground insights to help shape the strategic alignment plan. In total, more than 50 leaders from the region provided input.

By aggregating qualitative insights with the quantitative research, a framework of programs, goals and possible initiatives will be provided in the forthcoming strategic alignment plan. That plan will establish a handful of priorities that is important to the future prosperity of the entire region, and provide guidance on ways that public, private and non-profit leaders can take action together to advance those priorities.

About this report

This report includes an executive summary of research findings followed by a comprehensive listing of research and data analysis conducted. The labor shed analysis identifies worker characteristics and economic trends. The data presented provides an overview of demographics, employment rates, migration patterns, educational attainment, prevalent occupations and disparities.

The target industry analysis includes our cluster analysis and highlights from our examination of leading industries in each of the five counties. In our review of reports and past strategies, we found that some industries are consistently targeted by economic developers across multiple counties. The industries that were consistently captured in existing plans are concentrated in the region and have experienced high growth within the region. Additionally, industries offered as potential economic development targets at the regional level reinforce the region's values and character and have strong future growth potential.

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Executive summary, continued

Finally, an automation impact assessment was conducted to discover potential impacts on jobs and industries resulting from technology changes. Occupations that are most likely to be at least partially performed by computers or machines have been outlined. Occupations that can be impacted by automation have the potential to be redistributed throughout the workforce to minimize the impacts of automation on the workforce.

Executive summary, continued

Project geography

The Asheville-Brevard Metropolitan Statistical Area (MSA) is located in the western part of the state of North Carolina at the heart of the Blue Ridge Mountains and part of the Southern Appalachians. The natural environment is a large part of the region's economy and culture. The Asheville-Brevard MSA is comprised of five counties: Buncombe, Haywood, Henderson, Madison and Transylvania. These five counties share geographic proximity, as well as common economic strengths and challenges. For the purposes of this report and project, the Asheville-Brevard MSA is referred to as "the region", "the metro area" or "the MSA".

Land of Sky region

Madison

Buncombe

Haywood

Henderson

Transylvania

Charlotte

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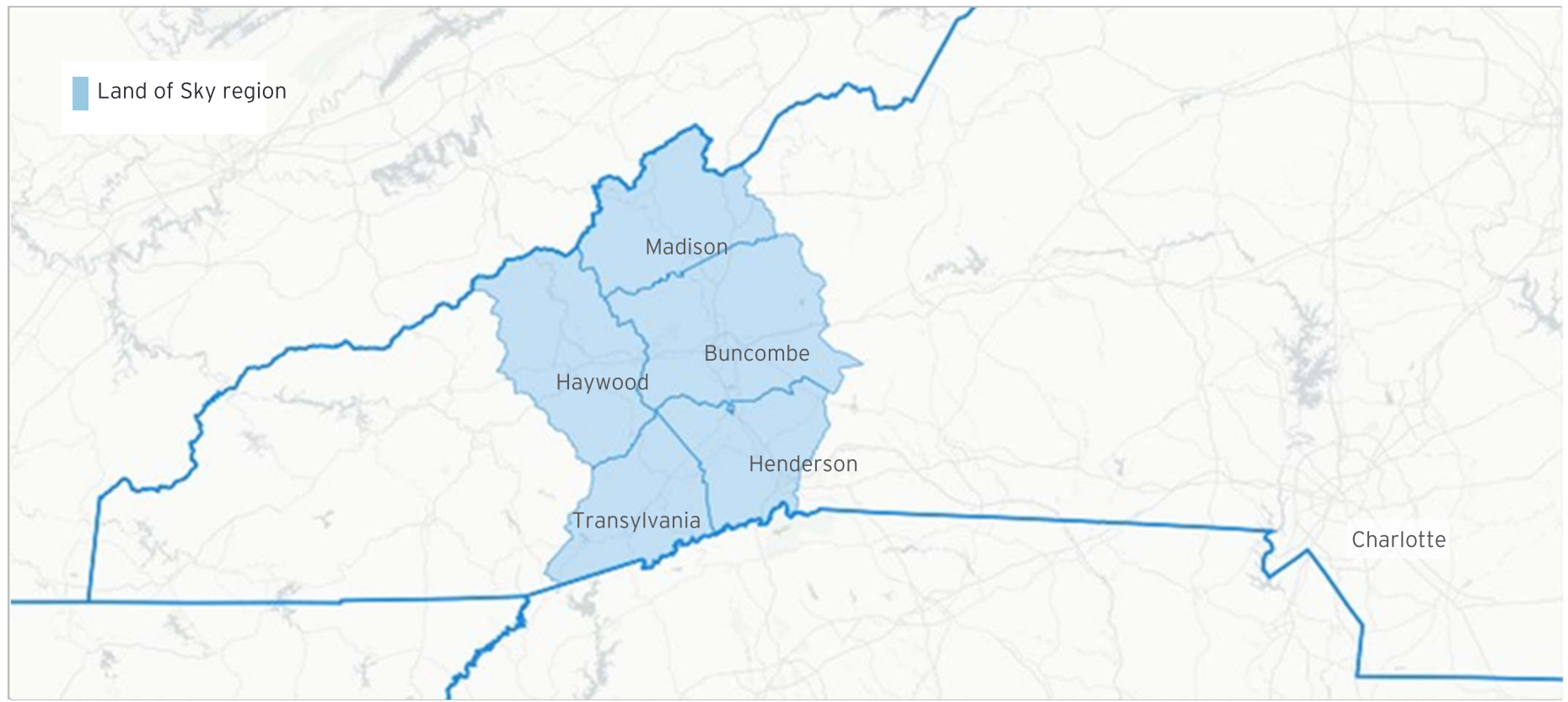
Executive summary, continued

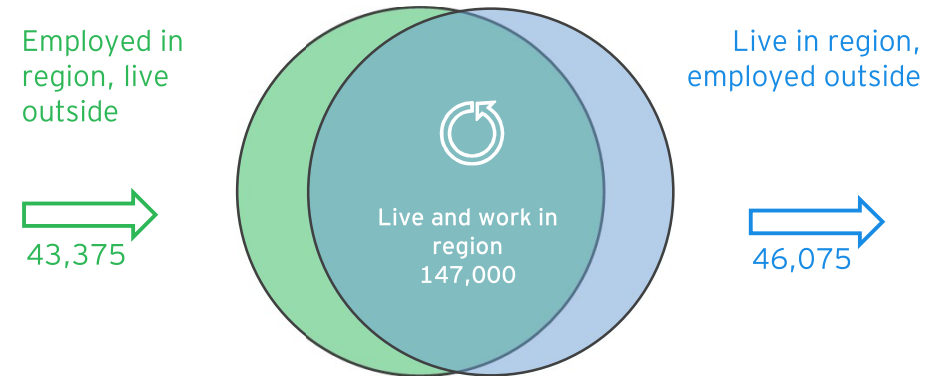## Labor shed insights: intra-regional migration

Workforce availability is a top determinant of where businesses locate, start up and expand. With more than 76% of the region's jobs being filled by residents, labor demand is largely satisfied by those who live and work in the region. However, there are many resident workers who commute across county lines within the region to work in a county that is not their jurisdiction of residence. Intra-regional talent flow is a workforce benefit for because it expands the metro area's labor draw.

However, the region relies on its broader labor shed when it comes to filling jobs and meeting growing employer demands. As of 2019, 23% of regional workers commute into the region for work from a county outside of the region. The counties that provide the highest levels of commuters tend to have rather seamless access to major transportation corridors, such as Interstate 26 and Interstate 40.

The import of labor from outside of the region tends to apply to industries such as Health Care & Social Assistance, Manufacturing, and Accommodation & Food Services. Conversely, the region tends to export workers in industries that tend to require higher education credentials, such as Public Administration & Finance and Insurance. This does not account for the approximately 9.3% of people working in the region who are remote workers, many of whom do not commute and are employed by firms outside of Western North Carolina (or work as small-business owners and independent contractors).

Overall, the inflow and outflow of workers in the region can be deemed positive. The Asheville-Brevard MSA has a growing population and sizable labor draw.

Regional workforce inflow/outflow dynamics, 2019

Employed in region, live outside

Live in region, employed outside

Live and work in region
147,000

43,375

46,075

Source: US Census Bureau

Regional labor shed

Asheville-Brevard metro region labor shed

0   15k
1.7k AVG

Asheville-Brevard MSA

Charlotte

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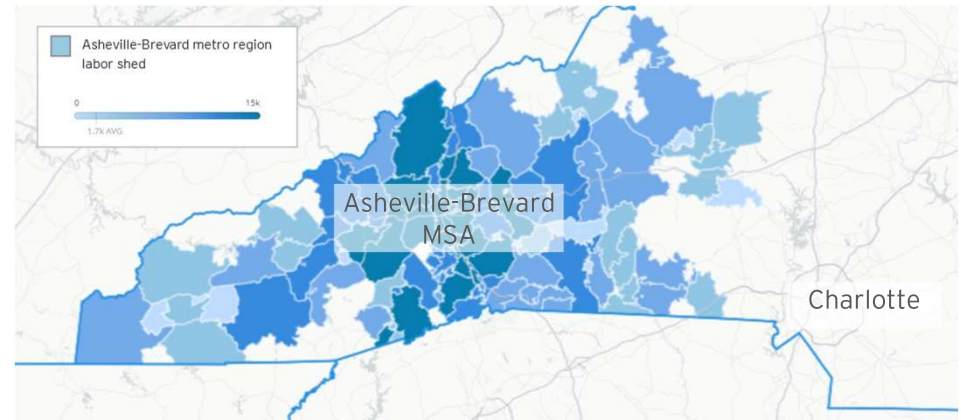
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Labor shed insights: worker demographics

A region's ability to attract and retain talent is closely linked to its competitiveness for business recruitment, expansion and entrepreneurship. A workforce that has diversity in terms of age distribution, education and skills, gender, race and ethnicity, and other differentiators can be an important factor for sustained economic growth.

Currently, the resident worker population within the region can be characterized as being older and above state and national percentages in terms of bachelor degree attainment. This analysis indicates that younger workers who tend to work in lower-wage roles are more likely to migrate into Land of Sky for employment. The region is a net importer of younger workers (under 30 years of age), as well as those workers earning less than $40,000 annually. On the other hand, the region is a net exporter of workers 30 years and older with the largest groups being those 55 years and older and those making more than $40,000 annually.

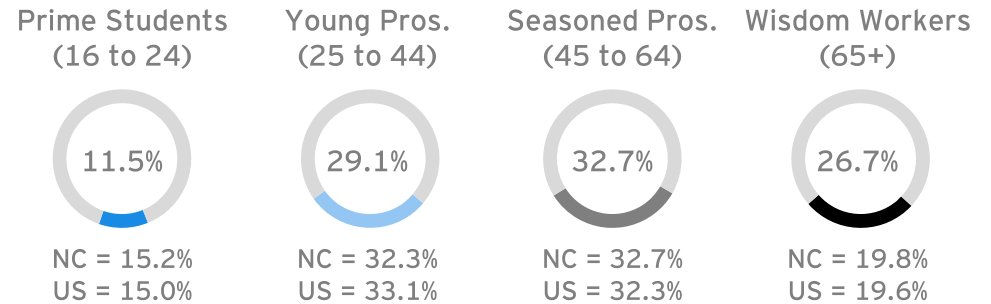The dynamism of the metro area's labor shed and workforce, along with regional assets such as a nationally connected airport, numerous institutions of higher learning, natural beauty and a desirable quality of life have contributed to the region's resilience in the face of recent economic, technological, demographic changes and viral disruptions. For increased resiliency, the region may need to expand its talent pipeline and generate a greater diversity of higher-wage jobs while addressing regional challenges such as housing supply and infrastructure.

Labor force by age (among residents 16 years and older) in region, 2019

Prime Students (16 to 24)	Young Pros. (25 to 44)	Seasoned Pros. (45 to 64)	Wisdom Workers (65+)
11.5%	29.1%	32.7%	26.7%
NC = 15.2% US = 15.0%	NC = 32.3% US = 33.1%	NC = 32.7% US = 32.3%	NC = 19.8% US = 19.6%

Source: US Census Bureau

Labor force by highest level of education (among residents 18 years and older) in region, 2019

High school	Associate degree	Bachelor's degree or higher
25.4%	9.4%	33.0%
NC = 26.4% US = 27.5%	NC = 9.1% US = 8.1%	NC = 28.7% US = 29.6%

Source: US Census Bureau

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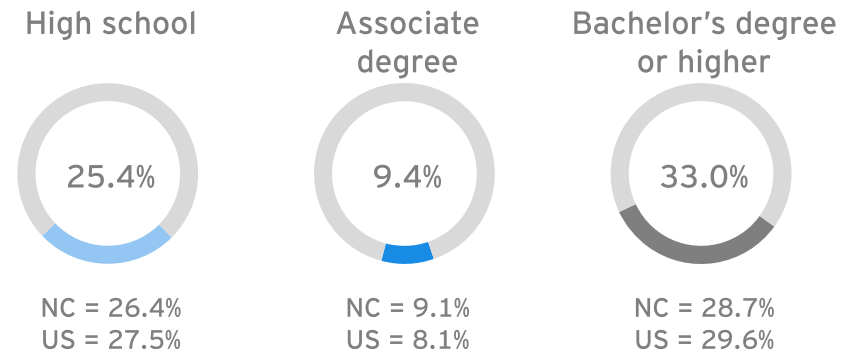
Executive summary, continued

Target industry insights: regional alignment

In the five years leading up to 2020, virtually every industry cluster in the region experienced employment gains. Economically, the strong employment growth experienced by the region reflects several notable trends. Perhaps most importantly, prior to the pandemic, employment growth in the region was distributed across a variety of industries and sectors.

As a whole, the metro area experienced employment growth above the US average, with Henderson, Buncombe and Transylvania counties leading the way.

The priorities of the strategic alignment plan start to emerge when considering the region's target industries. Targeting not only helps communities focus their business recruitment, expansion and entrepreneurship activities, but it also lends clarity into investments that will enhance the region's competitiveness for those industries, and others, to thrive.

Our review of more than 20 existing strategies and studies from all five counties included identifying and comparing each county's target industries, as illustrated on the right. Additional insights from our industry cluster analysis and stakeholder input helped inspire a potential aligned target industry list for the region.

Employment growth, 2014 - 2019

MSA: 12.7%
Buncombe: 13.3%
Haywood: 7.5%
Henderson: 14.1%
Madison: 4.9%
Transylvania: 12.8%
US: 8.4%
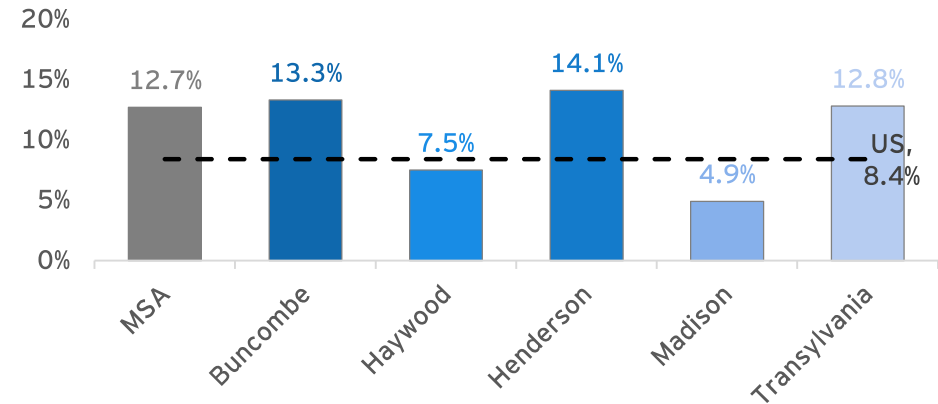
Source: EMSI

Industries identified in regional plans

Buncombe	Haywood	Henderson	Madison	Transylvania
Advanced Manufacturing*	Construction*	Agriculture*	Agriculture*	Advanced Manufacturing*
Climate Technology	Prof., Scientific & Technical Services*	Manufacturing*	Construction*	Beverages, Brewing & Distilling
Life Sciences	Tourism*	Tourism*	Education	Creative Services
Outdoor Products*			Manufacturing*	Food & Organics
Professional Services*			Tourism*	Outdoor Products*

* Denotes that the industry is a target for at least two counties

Source: Literature Review
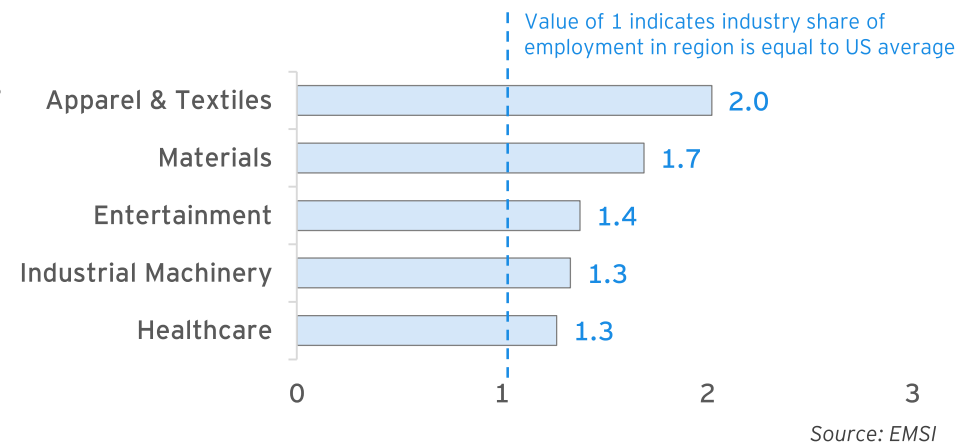
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Executive summary, continued

Target industry insights: current industry strengths

In 2019, the region was home to twice as many Apparel & Textiles jobs relative to the US and employed approximately 1,400 workers within the region. The Outdoor Products sector identified as a regional target is a subset of apparel and textiles manufacturing and retail. Beyond Manufacturing and Retail (along with Tourism & Recreation), Health & Life Sciences, including Health Care, is among the most concentrated industries in terms of employment and jobs.

Biomedical employment, which encompasses operations engaged in the manufacturing and wholesaling of medicine, pharmaceuticals, and medical equipment and includes medical and diagnostics laboratories, more than doubled between 2014 and 2019. Though the Biomedical cluster remains a relatively small share of total employment, it has grown at a fast pace compared to other major clusters. During this same period, regional employment in Aerospace, Agribusiness & Food, and Automotive all increased by more than 37%.

Geographically, the metro area is located at the intersection of two major interstates: I-40 and I-26. These are major freight and transportation corridors and provide access to ports, airports and major metro areas along the eastern coast of the US. These access points are vital for businesses and industry growth, but improvements to infrastructure, including transportation, water and sewer and broadband, are needed to keep pace with and advance economic and community development.

Location quotient of the region's five most concentrated industry clusters, 2019

Value of 1 indicates industry share of employment in region is equal to US average

Cluster	Location Quotient
Apparel & Textiles	2.0
Materials	1.7
Entertainment	1.4
Industrial Machinery	1.3
Healthcare	1.3

Source: EMSI

Five fastest-growing industry clusters in the region, 2014-2019

Cluster	Growth
Biomedical	121.9%
Aerospace	89.3%
Agribusiness & Food	82.7%
Automotive	37.3%
Construction	32.6%

Source: EMSI

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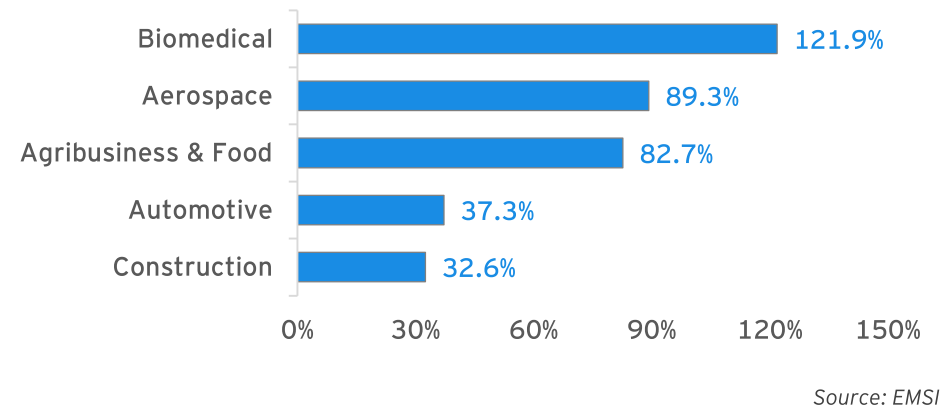
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Target industry insights: expanding and diversifying jobs in the region

Our target industry assessment revealed four clusters for the region that could galvanize collective business recruitment, entrepreneurship and expansion efforts in the region. The target clusters for consideration include Manufacturing; Tourism, Recreation & Retail; Health & Life Sciences; and Business & Professional Services. As shown in the accompanying graphic, each target contains several niche industries and sectors.

While each cluster has its own unique attributes, the clusters also share traits. Recent employment gains in all four target clusters have not only outperformed the region but have grown at a higher rate than the nation. Despite the pandemic and its lingering economic impact, all recommended target clusters are also projected to generate continued employment gains in the region.

In addition to strong employment performance, the target clusters also create high-wage opportunities for local workers. Growth in areas such as Outdoor Products, Component Manufacturing and Business Support Services can create new career paths for homegrown talent that might otherwise commute out of the region for employment.

Potential targets for regional economic development

Manufacturing
- EV Components
- Aerospace Components
- Electronic Manufacturing
- Outdoor Products

Tourism, Recreation & Retail
- Outdoor Recreation & Retail
- Breweries & Distilleries
- Creative Arts

Health & Life Sciences
- Regional Healthcare
- Health Technology & Innovation

Business & Professional Services
- Cybersecurity Data Analytics
- Software / IT
- Finance & Business Support Services

Land of Sky target clusters

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Executive summary, continued

Automation impact considerations

Technologies that automate functions historically performed by humans are transforming the labor market. Automation is displacing some 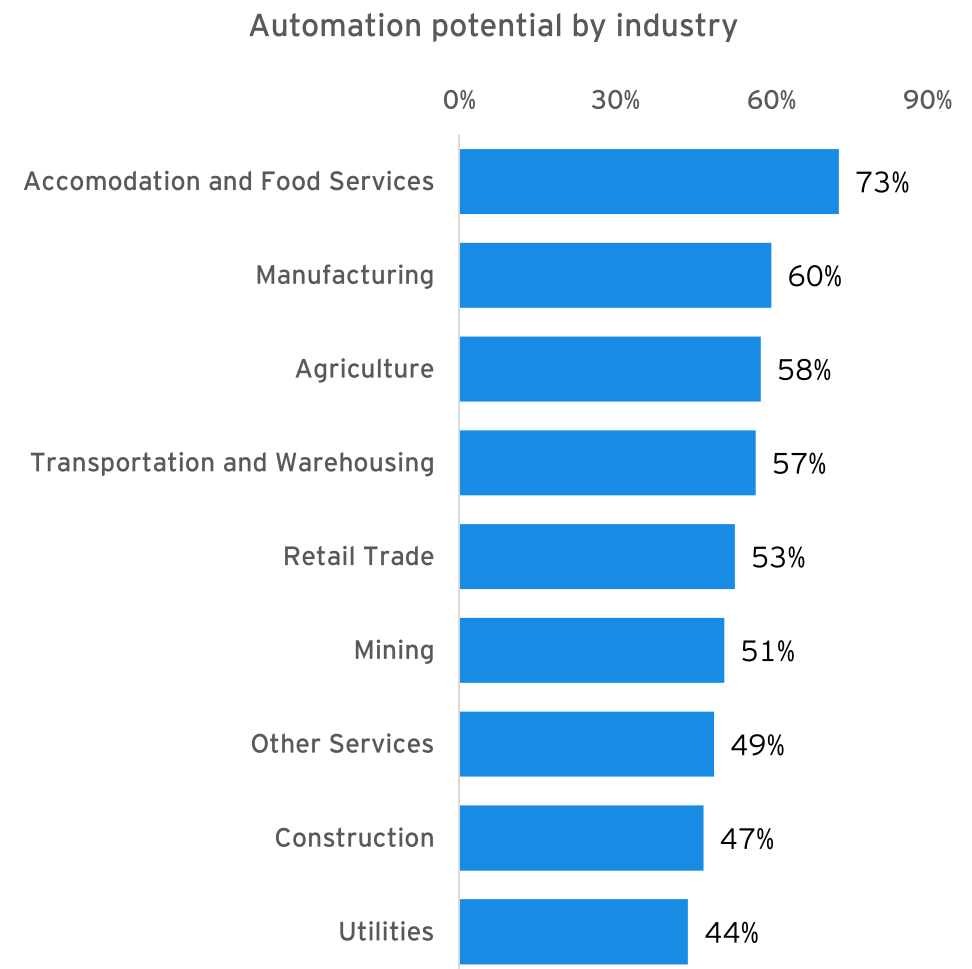jobs, and altering others, that have routine, standardized tasks. At the same time, it is fueling the creation of new occupations. While the rise of automation will help maintain US economic competitiveness, it will also spark significant disruptions for industry and talent.

Lower-skilled jobs with repetitive functions are at the highest risk of automation. Within the region, the jobs most at risk of automation are those requiring now formal education (87% of jobs at risk) or those that only require a high school diploma or equivalent credential (63%). Combined, nearly 119,000 people in these at-risk jobs are in the region.

An estimated 59% of all jobs (FTE) are at risk of automation in the metro area. Industries most at risk include Hospitality & Restaurants, Manufacturing, and Agriculture. Industries least susceptible to automation include Education, Management and Professional Services. These industries require significant customer interaction as well as specialized expertise. As technologies such as artificial intelligence and machine learning continue to evolve, higher-skilled roles may be impacted as well.

Automation is an ongoing trend that the region will grapple with. Understanding existing and potential industry disruptions can help inform business recruitment and expansion strategies. The jobs that may be displaced, as well as the new career paths that can result from technological advancements, have implications for current and future workforce development efforts.

Industries most prone to automation

Automation potential by industry

Industry	Automation potential
Accomodation and Food Services	73%
Manufacturing	60%
Agriculture	58%
Transportation and Warehousing	57%
Retail Trade	53%
Mining	51%
Other Services	49%
Construction	47%
Utilities	44%

Source: EY analysis of McKinsey

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Labor shed and target industry analysis report

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Labor shed analysis

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Labor shed analysis: intra-regional migration

While the region exports and imports talent, there remains significant overlap between those who live in the region and those who work within the community. Of the nearly 193,100 employed individuals residing in the region, approximately 24% are employed outside of the five-county region. At the same time, approximately 23% of workers employed in the region live elsewhere.

Regional workforce inflow/outflow dynamics, 2019

Employed in region, live outside

43,375

Live in region, employed outside

46,075

Live and work in region
147,000

Net outflow of workers
2,700

Total employment in region

190,375

22.8%	77.2%

76.1%	23.9%

Total employed workers living in region

193,075

Source: US Census Bureau

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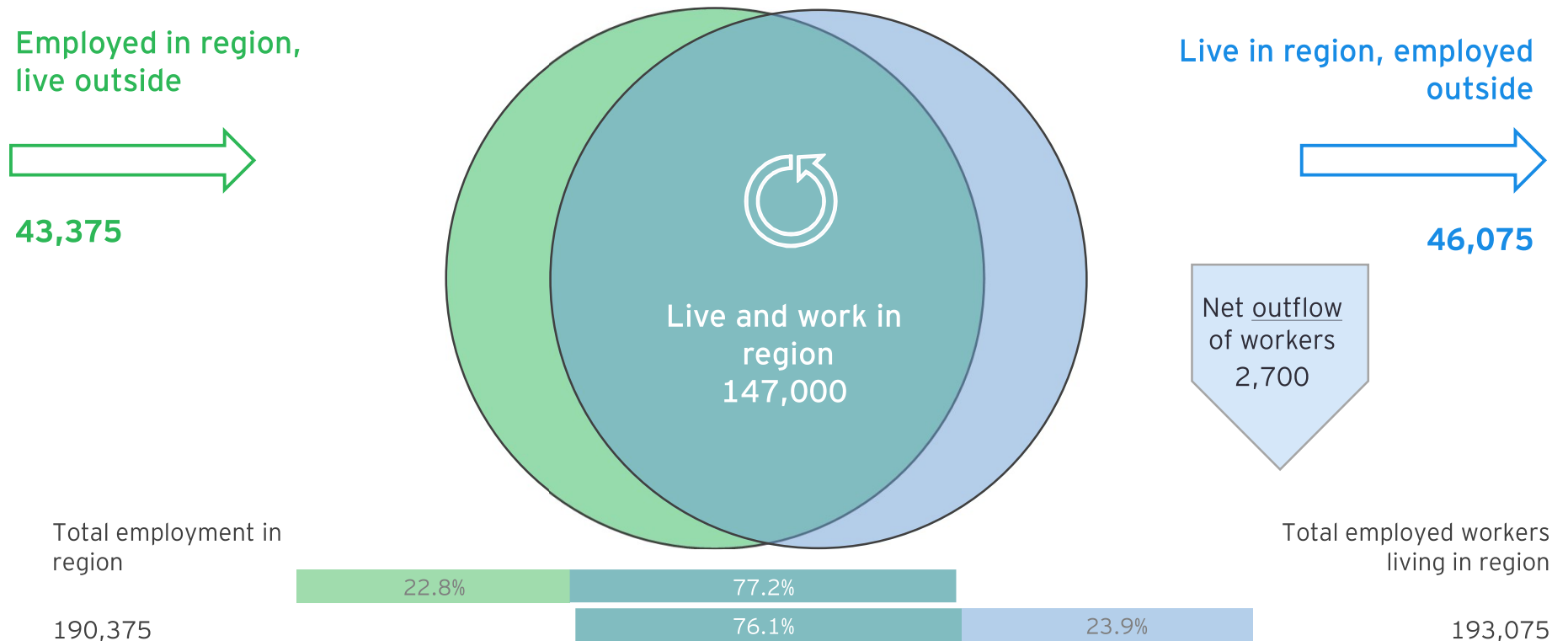
Labor shed analysis: worker origin

Nearly 23% of all individuals working in the metro area live outside of the region. These outsiders largely commute from adjacent areas within North Carolina. Given the unique location of the region, the workforce is also comprised of individuals who may commute from Tennessee, Georgia and South Carolina, though it is not as common.

Asheville-Brevard metro area

Source: US Census Bureau

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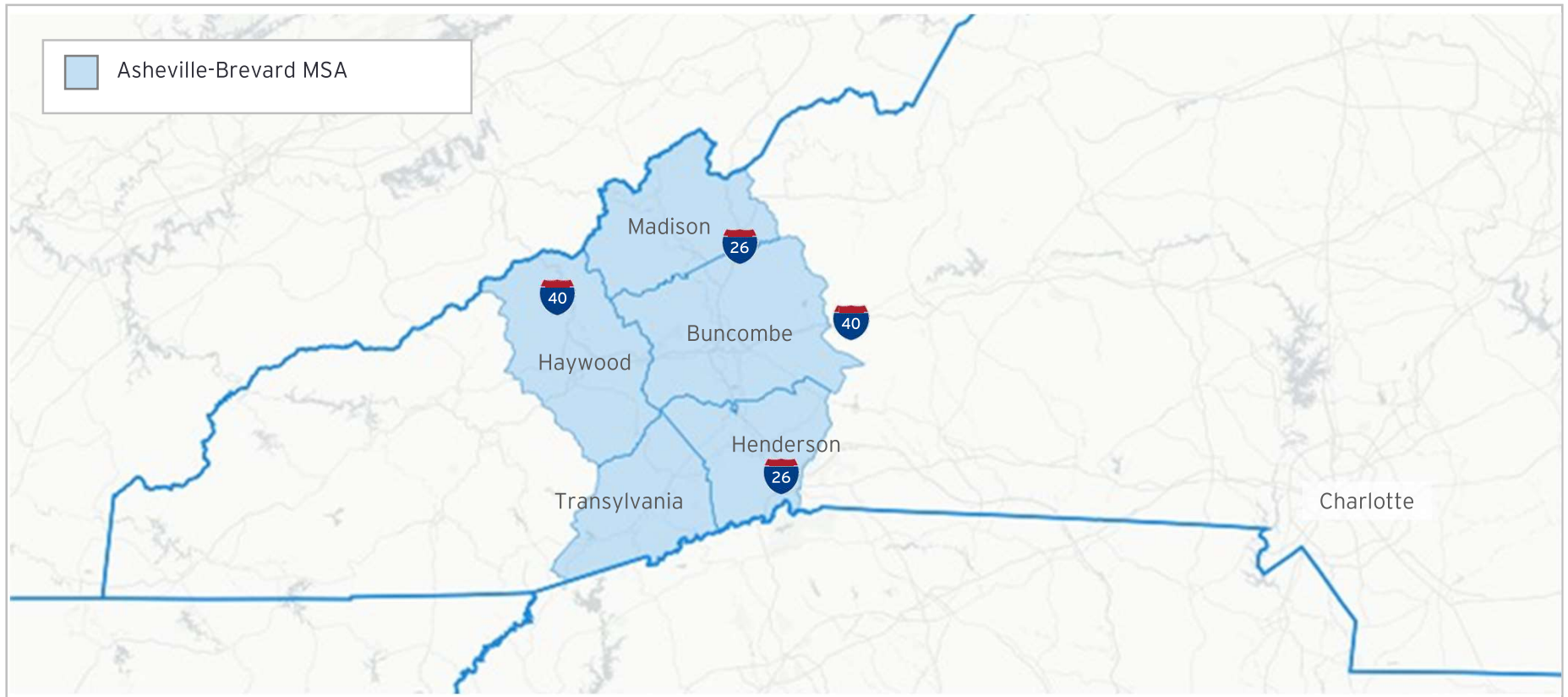
Labor shed analysis: regional geography

The geographical boundary of the five-county region is responsible for 89% of the workforce within the labor shed. The shaded area representing the labor shed for the region provides a total of 18,200 additional workers for the region and represents just 11% of the workforce presented within the highlighted portions of the map below.

Note: Each ZIP code region included in the labor shed provides at least 150 workers to the region and accounts for more than 85% of all workers.

Regional labor shed, 2019

Source: US Census Bureau

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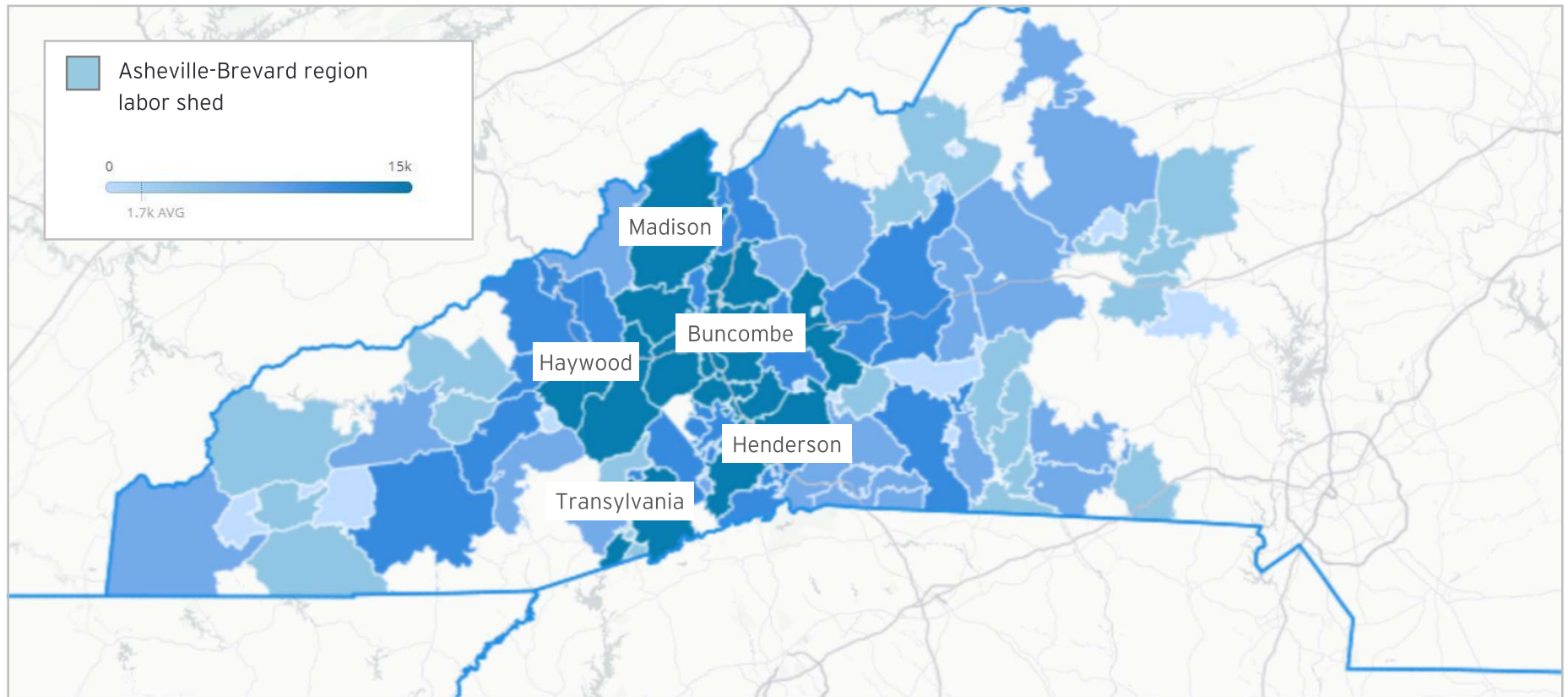
Labor shed analysis: commuting patterns across counties

Of the workers that live and work inside of the region, more than 54% of regional workers commute across a county border. With more than 68% of workers working within their home county, Buncombe County has the largest share of workers that both live and work within the same county. Henderson, Haywood and Transylvania counties retain 42% to 43% of their residents as workers. Madison County exports more than 78% of their residents to other counties within the region, primarily to Buncombe County.

Intra-regional resident and worker origin, 2019

Live & Work	Work					Lives and works in home county within MSA	Works in MSA, not in home county
	Buncombe County	Henderson County	Madison County	Transylvania County	Haywood County		
Buncombe County	**72,625**	7,392	892	636	1,957	68.4%	31.6%
Henderson County	12,120	**18,576**	100	1,210	531	43.0%	57.0%
Madison County	3,642	247	**1,744**	58	142	21.9%	78.1%
Transylvania County	1,558	1,411	16	**4,683**	161	42.0%	58.0%
Haywood County	5,602	929	57	207	**10,500**	42.9%	57.1%

Work in geo

Live

Live in geo

Source: US Census Bureau

EY

Labor shed analysis: population growth

Between 2015 and 2020, the region grew 4.9%, a faster rate than the national average (3.2%). Henderson County grew the fastest (6%) among counties in the region while Madison County grew the slowest (2.8%). The metro area's labor shed grew at a slower pace than the region and, instead, mirrored the national average during the same time.

Population and population growth, 2015-2020

Sources: US Census Bureau

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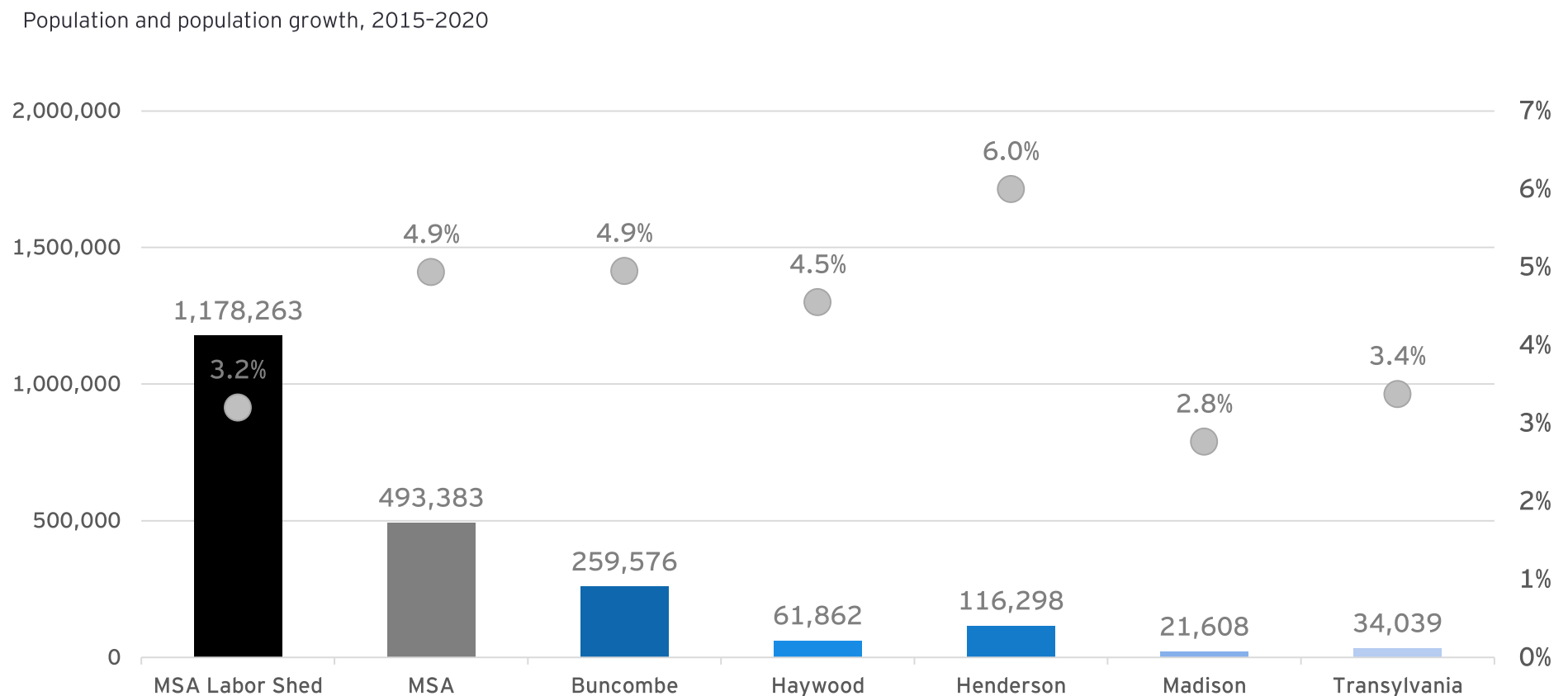
Labor shed analysis: employment growth

Between 2014 and 2019, overall employment growth was mixed within the region. Henderson, Buncombe and Transylvania counties grew at double-digit rates, outpacing the national average. Haywood grew slightly below the US average and Madison grew the least within the region.

Employment growth, 2014–2019

US, 8.4%

MSA Labor Shed	MSA	Buncombe	Haywood	Henderson	Madison	Transylvania
11.0%	12.7%	13.3%	7.5%	14.1%	4.9%	12.8%

Sources: EMSI

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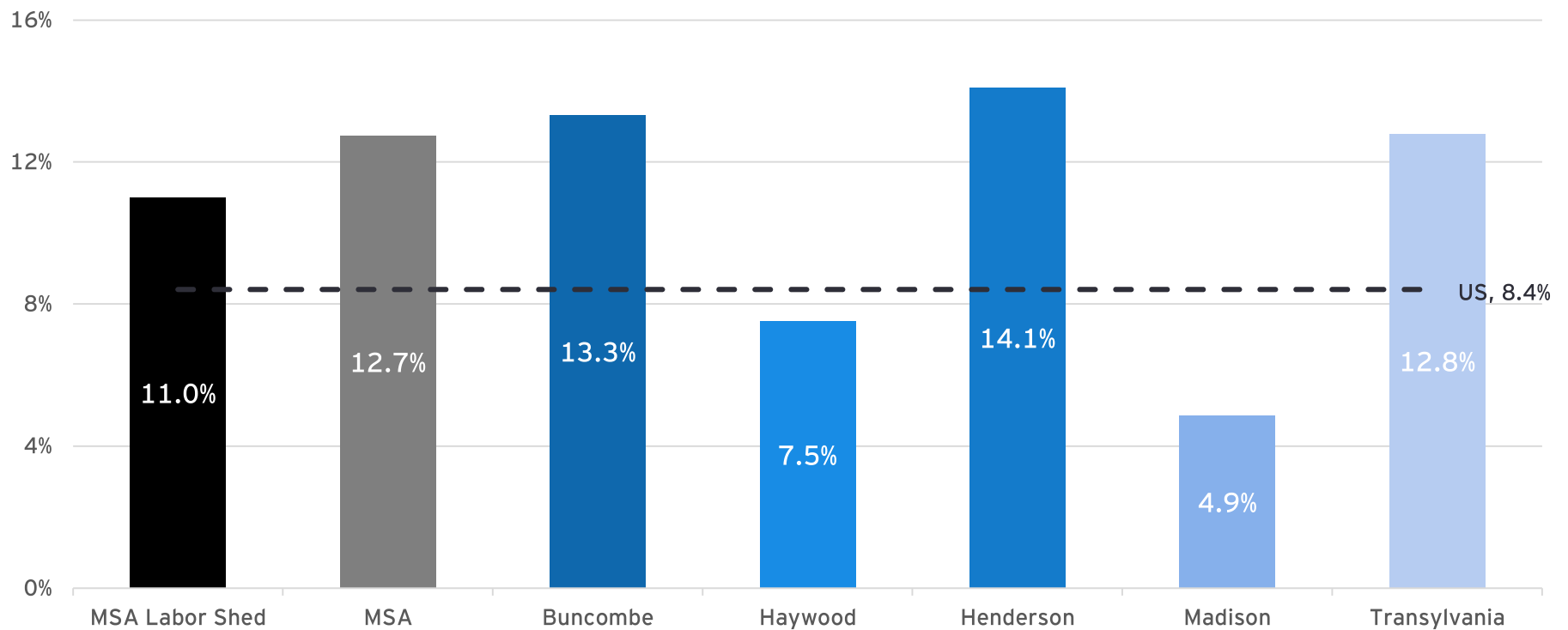
Labor shed analysis: remote workforce

Except for Haywood County, all counties within the region have larger shares of their workers working from home (WFH) than the US average as of 2020.

Number of remote workers as a percentage of total workforce, 2020

US, 7.3%

Sources: US Census Bureau

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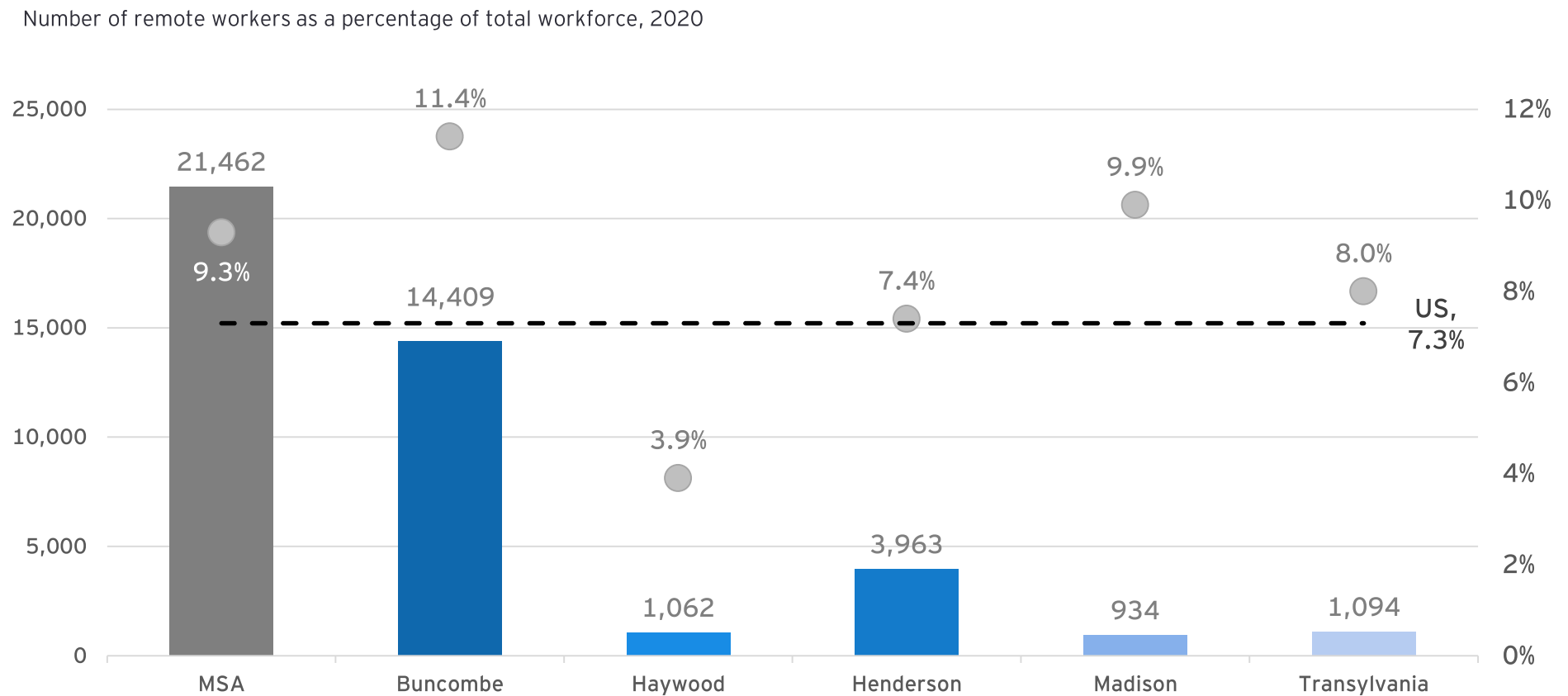
Labor shed analysis: age distribution within the region

The region is home to a slightly older labor force population as compared to North Carolina and the US. Nearly 60% of the metro area's resident worker population (those employed or seeking work that live in the region) are 45 years and older. Conversely, individuals between 16 and 44 represent a smaller proportion of the region's workforce overall. Individuals between 16 and 24 represent approximately one in eight workers, a figure that is less than half that of workers 65 and older.

Labor force by age (among residents 16 years and older) in the region, 2019

Prime Students (16 to 24)	Young Professionals (25 to 44)	Seasoned Professionals (45 to 64)	Wisdom Workers (65+)
11.5%	**29.1%**	**32.7%**	**26.7%**
NC = 15.2% US = 15.0%	NC = 32.3% US = 33.1%	NC = 32.7% US = 32.3%	NC = 19.8% US = 19.6%

Source: US Census Bureau

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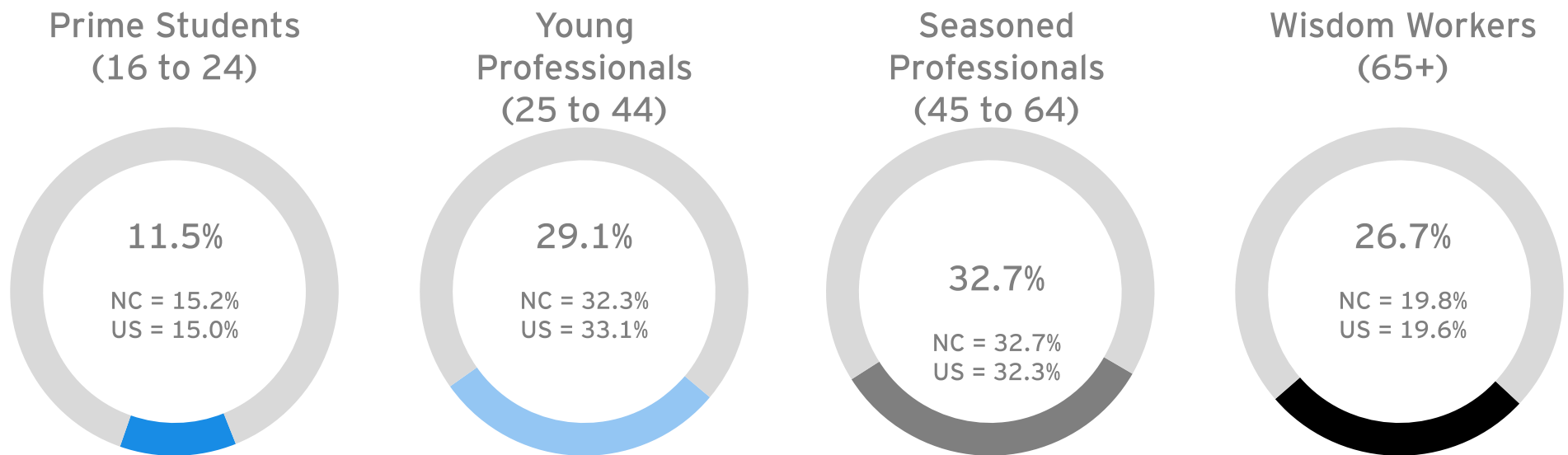
Labor shed analysis: age distribution within labor shed

Compared to the region, the region's labor shed is characterized by a younger labor force population. This is especially true for the Prime Student population, workers 16 to 24 years of age. While still higher than the national and state averages, individuals 65 and older are less prevalent in the labor shed's workforce as compared to the region.

Labor force by age (among residents 16 years and older) in the region's labor shed, 2019

Prime Students (16 to 24)

13.6%

NC = 15.2%
US = 15.0%

Young Professionals (25 to 44)

29.8%

NC = 32.3%
US = 33.1%

Seasoned Professionals (45 to 64)

33.8%

NC = 32.7%
US = 32.3%

Wisdom Workers (65+)

22.8%

NC = 19.8%
US = 19.6%

Source: US Census Bureau

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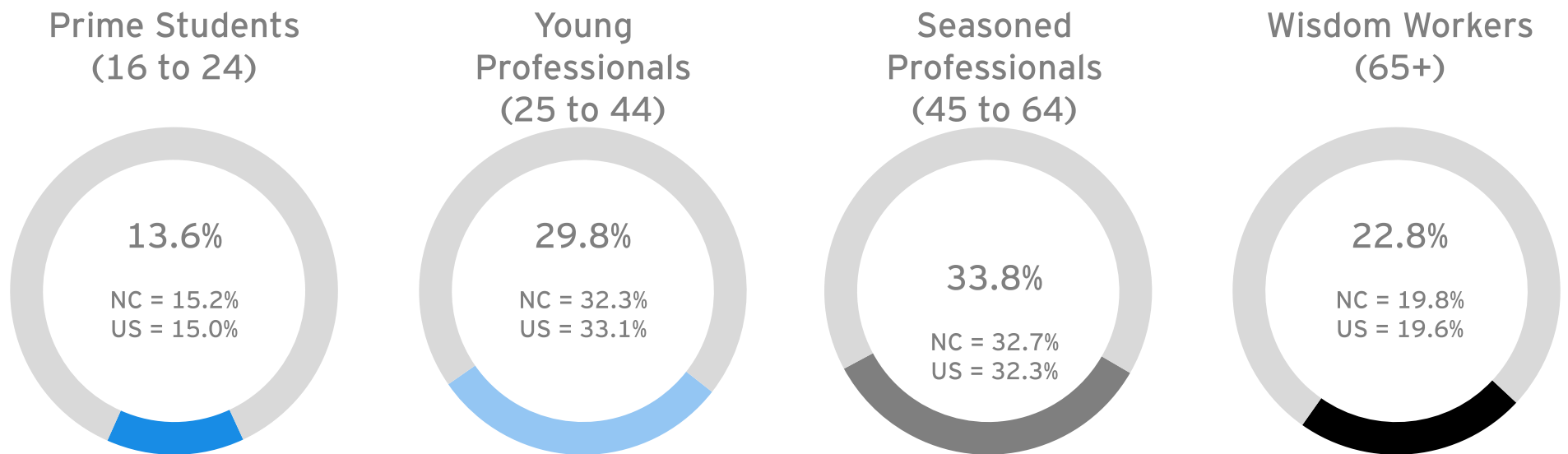
Labor shed analysis: age distribution by county

Differences in the age composition of counties within the region largely reflect a much older labor force in counties surrounding Buncombe. Thirty-three percent of workers in Buncombe are Young Professionals, 25 to 44, versus 22% in Madison and 26% in other counties. Wisdom Workers (those still working at 65+ years of age) comprise 30% or more in Madison and Henderson, but just 23% in Buncombe.

Labor force by age (among residents 16 years and older), 2019

	Buncombe County	Henderson County	Madison County	Transylvania County	Haywood County
Prime Students (16 to 24) NC = 15.2% US = 15.0%	11.9%	10.6%	14.9%	11.3%	10.8%
Young Professionals (25 to 44) NC = 32.3% US = 33.1%	32.5%	25.8%	26.3%	22.2%	26.3%
Seasoned Professionals (45 to 64) NC = 32.7% US = 32.3%	32.3%	33.1%	32.8%	31.5%	33.9%
Wisdom Workers (65+) NC = 19.8% US = 19.6%	23.3%	30.6%	26.0%	35.0%	28.9%

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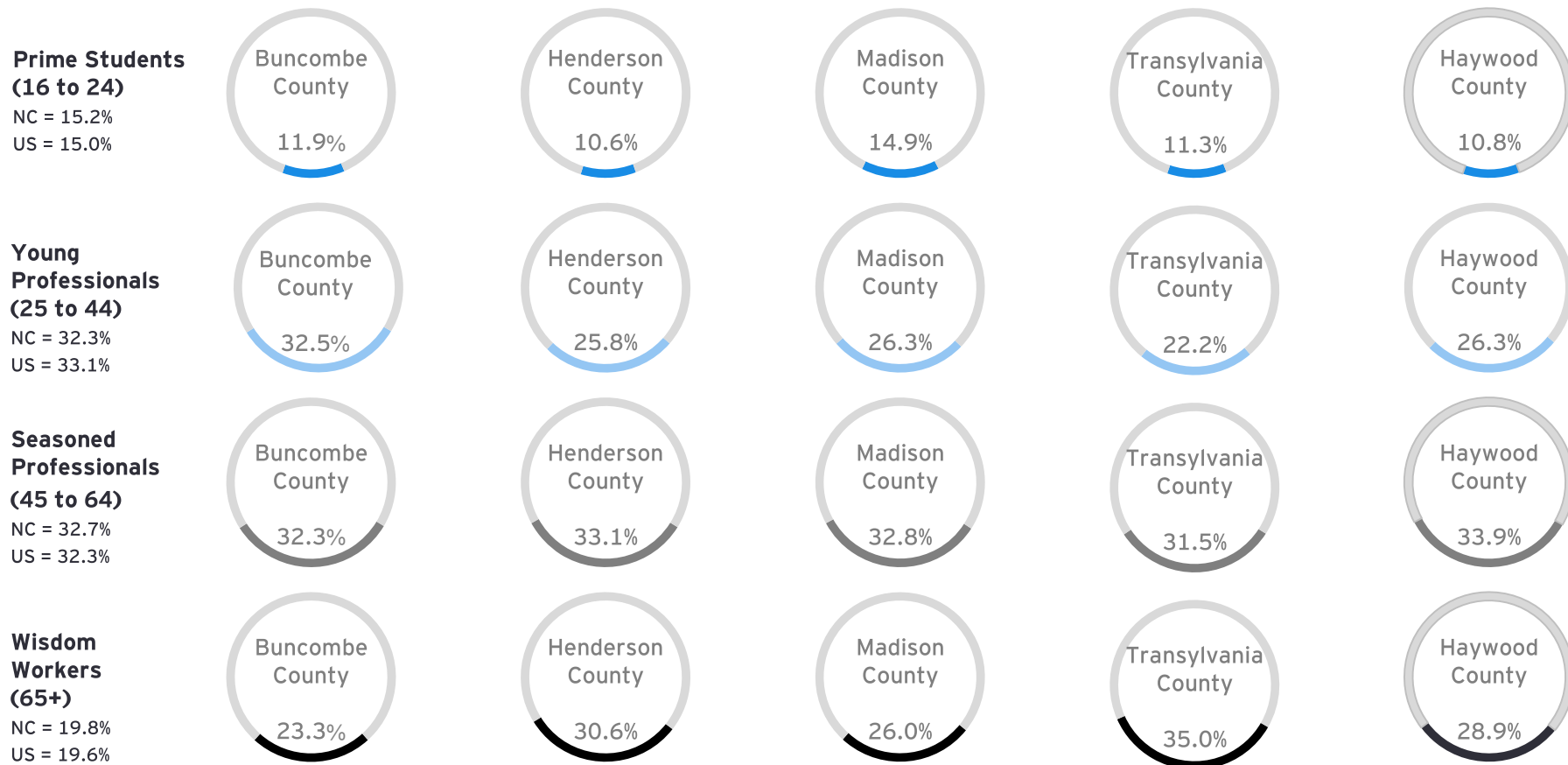
Labor shed analysis: educational attainment in the region

Workers living in the region have levels of educational attainment that largely mirror that of North Carolina. As of 2019, 33% of the region's residents 18 years and older possess a bachelor's degree or higher (versus 28.7% in NC and 29.6% in US). More than 9% of resident workers possess an associate degree (versus 8.1% in the US) as their highest level of educational attainment while more than 25% of residents possess a high school diploma or equivalent as their highest level of educational attainment.

Labor force by highest level of education (among residents 18 years and older) in the region, 2019

High school	Associate degree	Bachelor's degree or higher
25.4%	**9.4%**	**33.0%**
NC = 26.4% US = 27.5%	NC = 9.1% US = 8.1%	NC = 28.7% US = 29.6%

Source: US Census Bureau

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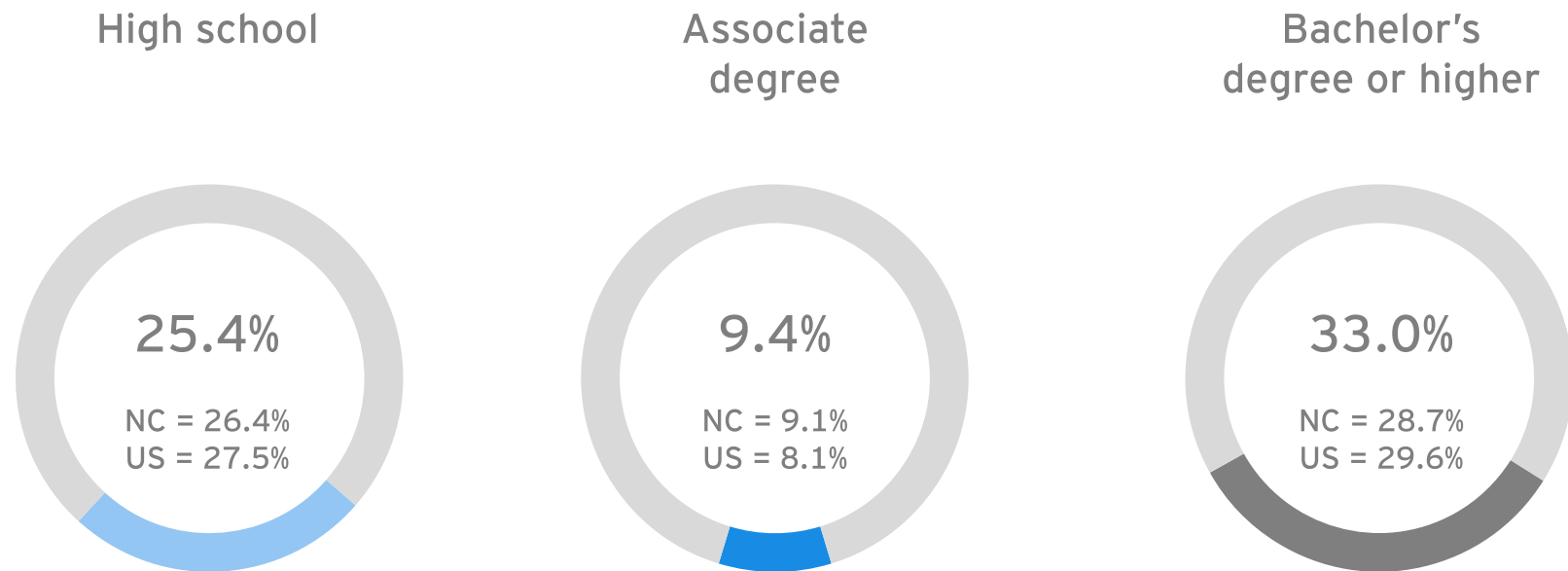
Labor shed analysis: educational attainment in labor shed

Workers living in the region's labor shed have educational attainment levels that more closely mirror that of North Carolina, as compared to the region. This is especially true when considering workers who possess a bachelor's degree or higher.

Labor force by highest level of education (among residents 18 years and older) in the region's labor shed, 2019

High school	Associate degree	Bachelor's degree or higher
26.2%	**9.7%**	**29.3%**
NC = 26.4%	NC = 9.1%	NC = 28.7%
US = 27.5%	US = 8.1%	US = 29.6%

Source: US Census Bureau

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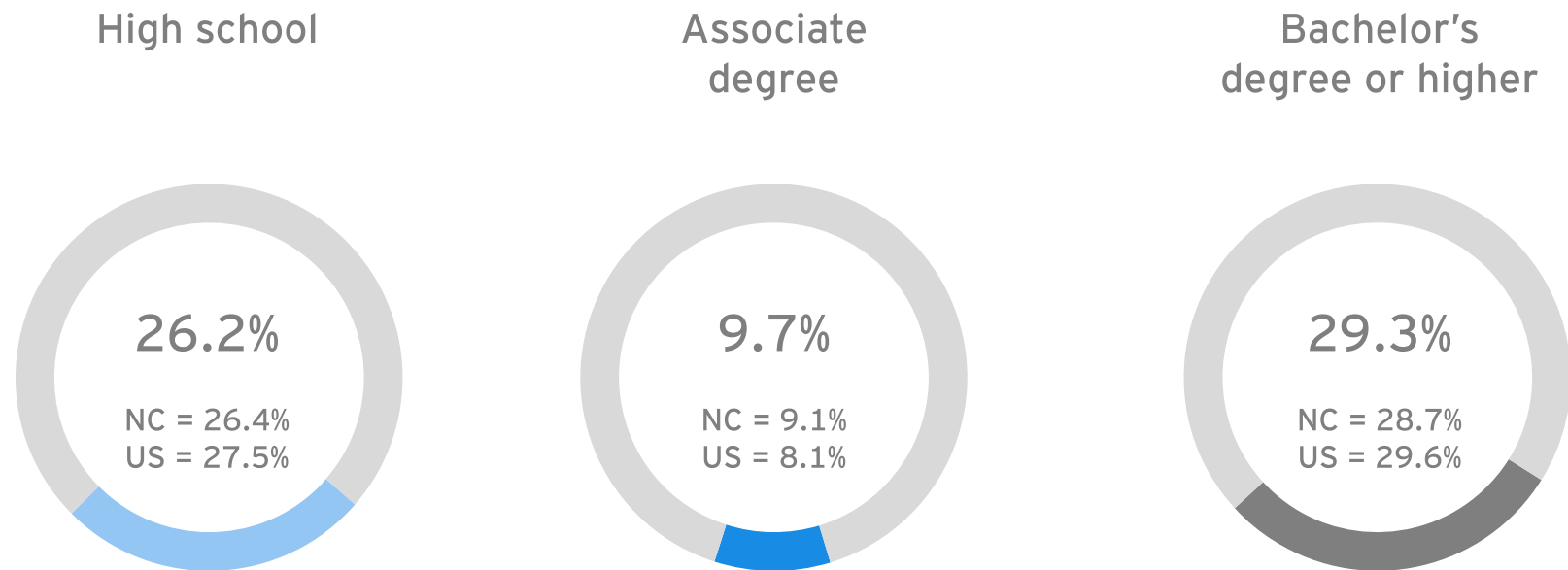
Labor shed analysis: educational attainment by county

As of 2019, Buncombe County has the largest share of their population possessing a bachelor's degree or higher while Haywood County has the lowest share among Land of Sky counties. Transylvania County has the largest share of the population with a high school diploma and the lowest share with an associate degree.

Educational attainment level (among residents 18 years and older), 2019

	Buncombe County	Henderson County	Madison County	Transylvania County	Haywood County
High school NC = 26.4% US = 27.5%	24.4%	25.2%	31.2%	26.9%	26.9%
Associate degree NC = 9.1% US = 8.1%	8.7%	10.1%	7.9%	8.0%	12.5%
Bachelor's degree or higher NC = 28.7% US = 29.6%	37.3%	29.9%	25.8%	25.8%	24.6%

Sources: US Census Bureau

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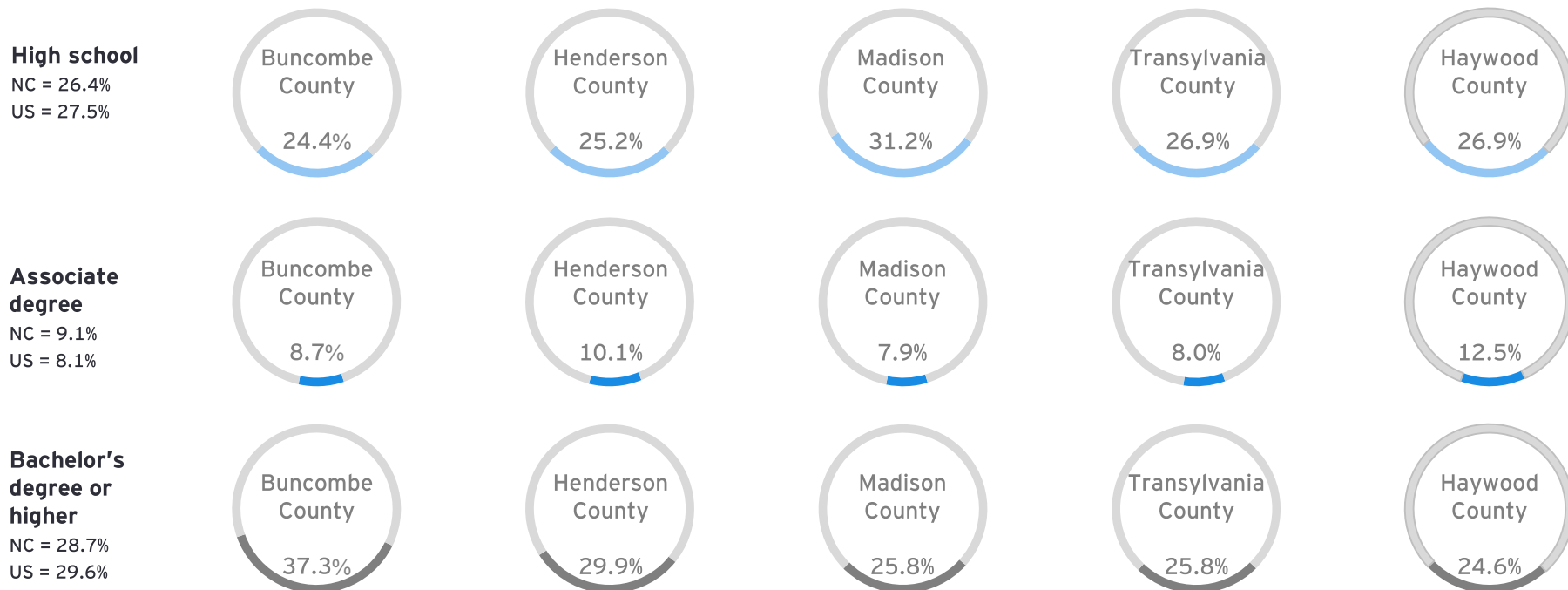
Labor shed analysis: pandemic impact on unemployment rate in the region

After an initial surge during the onset of the pandemic, the unemployment rate in the region has steadily declined. The unemployment rate was just 3.1% in January 2020 pre-pandemic (slightly lower than the US and NC), but unemployment surged to 17% in March, far exceeding North Carolina and US rates. Since then, the unemployment rate in the region has fallen steadily and remains below the US average since June 2020, and below the state average since January 2021.

Monthly unemployment rate, January 2020–December 2021
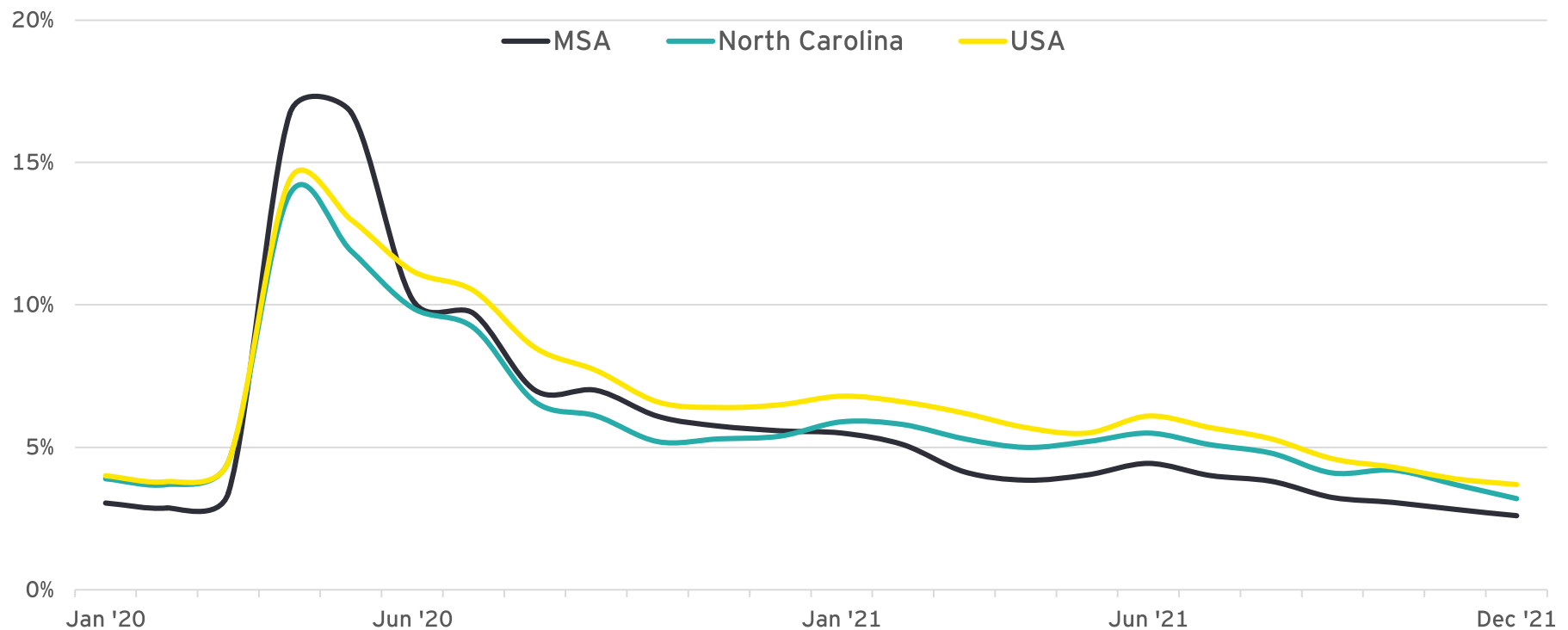
Sources: US Bureau of Labor Statistics

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Labor shed analysis: pandemic impact on unemployment rate by county

The counties that comprise the metro area enjoyed relatively low levels of unemployment prior to the onset of the pandemic. In April 2020, the unemployment within each county surged, with Buncombe County experiencing the highest levels of unemployment within the region.

Monthly unemployment rate, January 2020–December 2021

US = 4.0%

	Jan '20
MSA	3.1%
Bun.	2.9%
Hay.	3.4%
Hen.	3.1%
Mad.	3.4%
Tran.	3.4%

US = 13.0%

	May '20
MSA	16.8%
Buncombe	18.5%
Haywood	16.2%
Henderson	14.3%
Madison	14.0%
Transylvania	11.6%

US = 3.8%

	Mar. '22
MSA	2.9%
Bun.	2.9%
Hay.	3.0%
Hen.	2.8%
Mad.	3.0%
Tran.	3.0%

Sources: US Bureau of Labor Statistics

EY
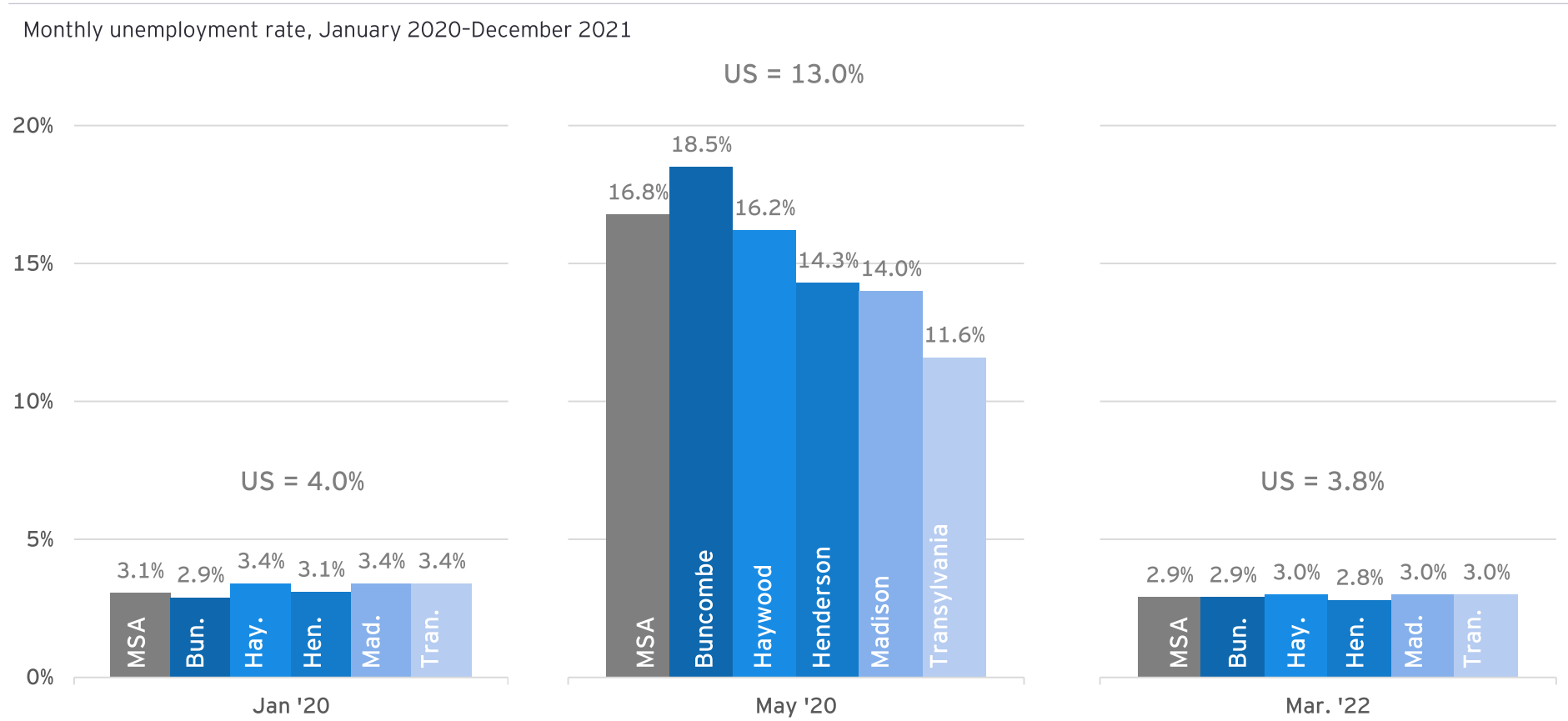
Labor shed analysis: changes in the workforce

Examining the changes in the workforce (residents either employed or looking for work) between January 2020 and December 2021 reveals that the region experienced a decline in the size of the labor force of 2%, or a total of more than 5,000 workers. This decline reflects the fact that many workers in the region appear to have dropped out of the labor force for various reasons. Transylvania experienced the largest decline in labor force, while Buncombe experienced the smallest.

Percent change in size of workforce by county January 2020 vs. December 2021 *(not seasonally adjusted)*

	MSA	Buncombe	Haywood	Henderson	Madison	Transylvania
	-2.0%	-1.6%	-2.2%	-2.2%	-2.3%	-4.3%

Sources: US Bureau of Labor Statistics

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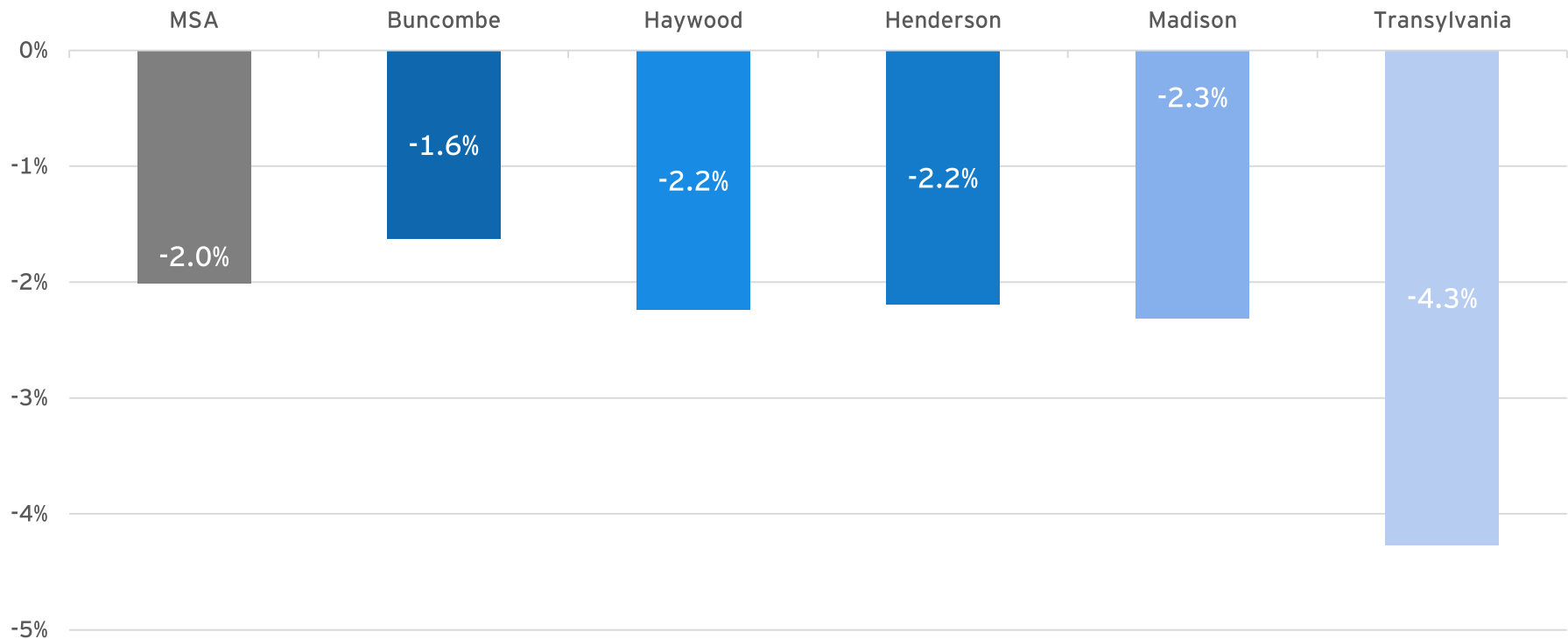
Labor shed analysis: average annual wages

In 2020, the average wage for workers in the region was approaching $46,800 annually. The average for workers within the greater labor shed was slightly lower at $43,021 annually. All other counties within the region are lower than the regional average for 2020. Notably, all counties within the region were significantly below annual average wages for the US in 2020.

Average annual wage, 2020

Sources: EMSI

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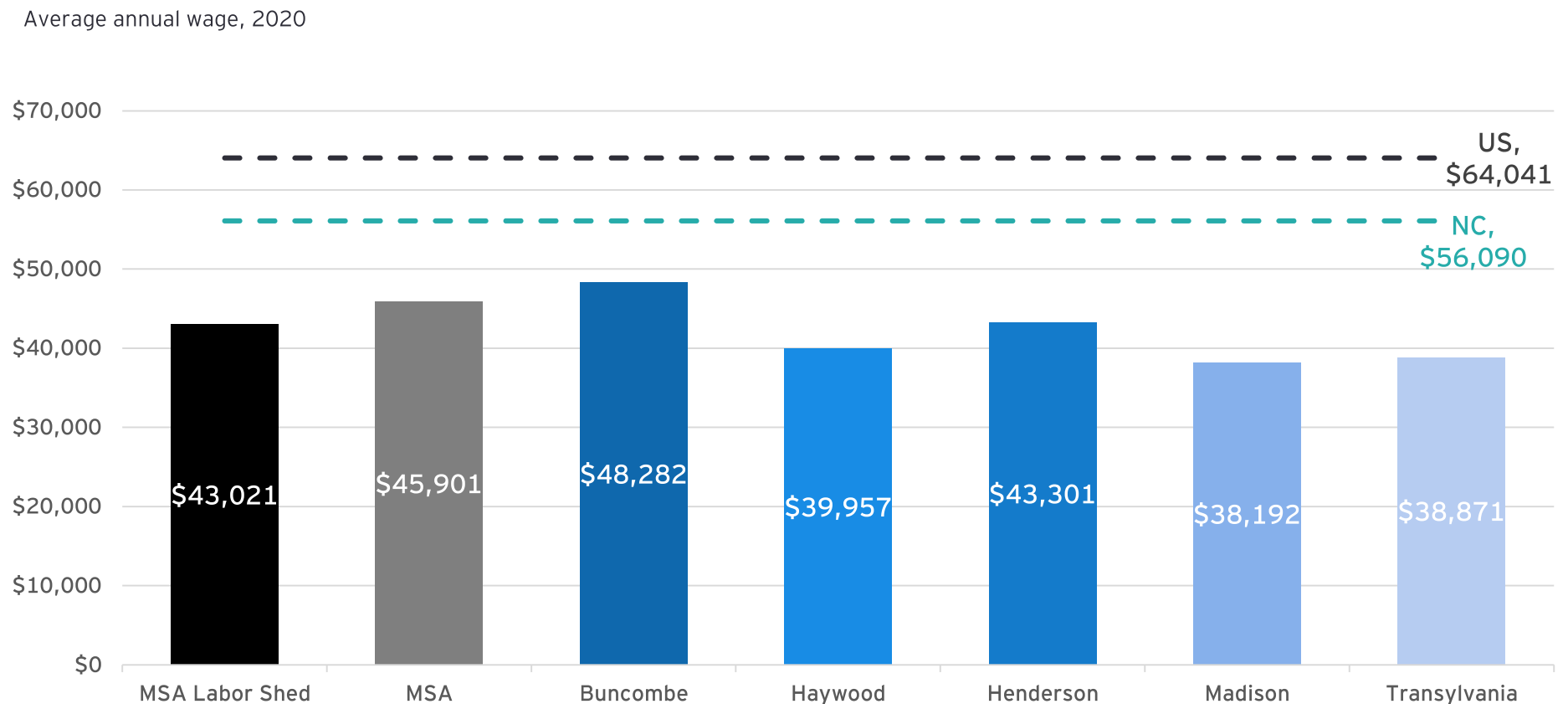
Labor shed analysis: median household income

Median household income for the region grew at an average of 18.5% between 2014 and 2019. Henderson County had the highest median household income while Madison County had the lowest. Haywood County experienced the largest growth in income (24%), while Transylvania County saw the smallest percent increase (14.2%).

Median household income and growth, 2014–2019

Legend: ■ Median HH Income   ● Change in Median HH Income, 2014–2019

County	Median HH Income	Change
Buncombe	$52,207	14.4%
Haywood	$51,659	23.6%
Henderson	$55,945	20.9%
Madison	$45,873	19.9%
Transylvania	$50,212	14.2%

Sources: US Census Bureau

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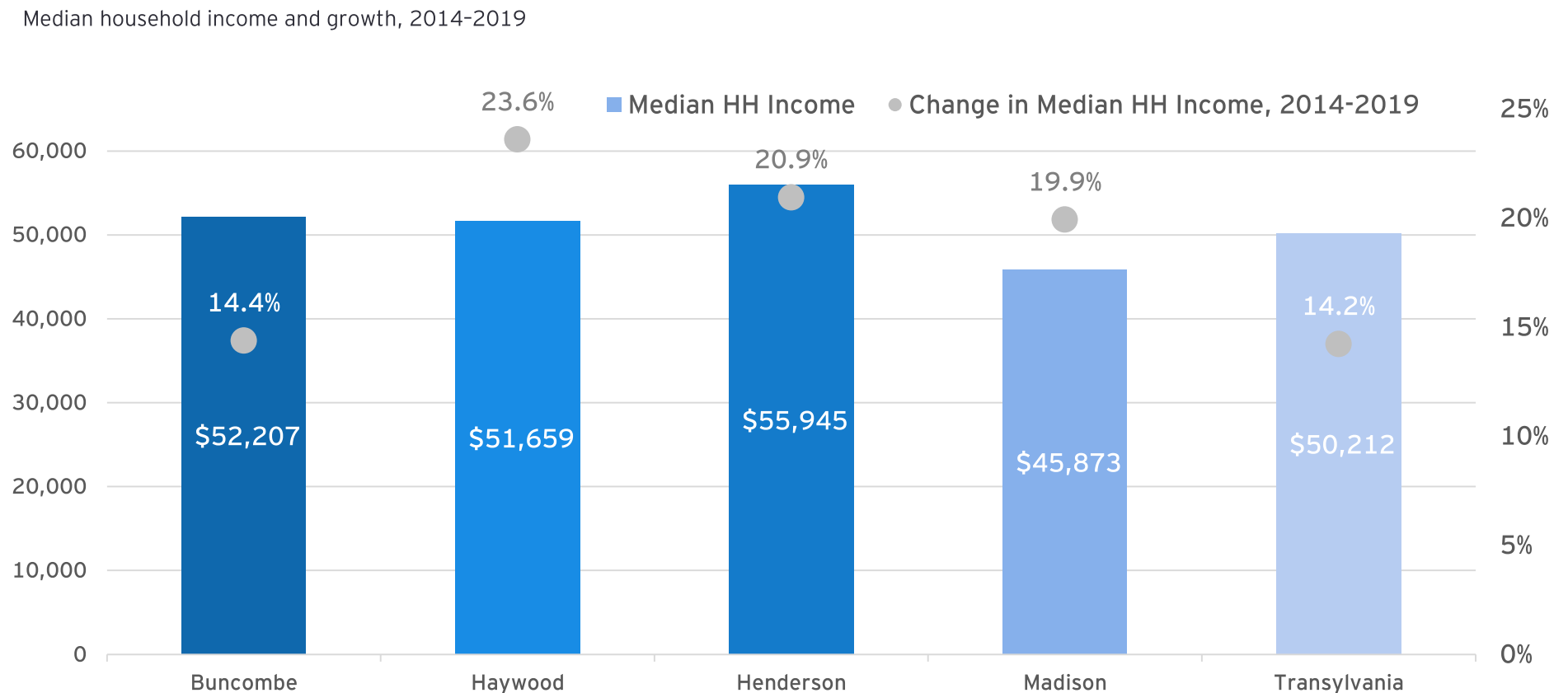
Labor shed analysis: poverty rate

While strong employment growth can help drive down poverty, increased levels of prosperity elude many within the region. Haywood, Madison and Transylvania counties have higher levels of poverty as compared to the regional and national averages. Henderson and Buncombe Counties have lower poverty levels in comparison to the region.

Poverty rate, 2020

	MSA	Buncombe	Haywood	Henderson	Madison	Transylvania
	11.7%	11.5%	12.2%	10.5%	14.3%	14.4%

NC, 14.0%
US, 12.8%

Sources: US Census Bureau

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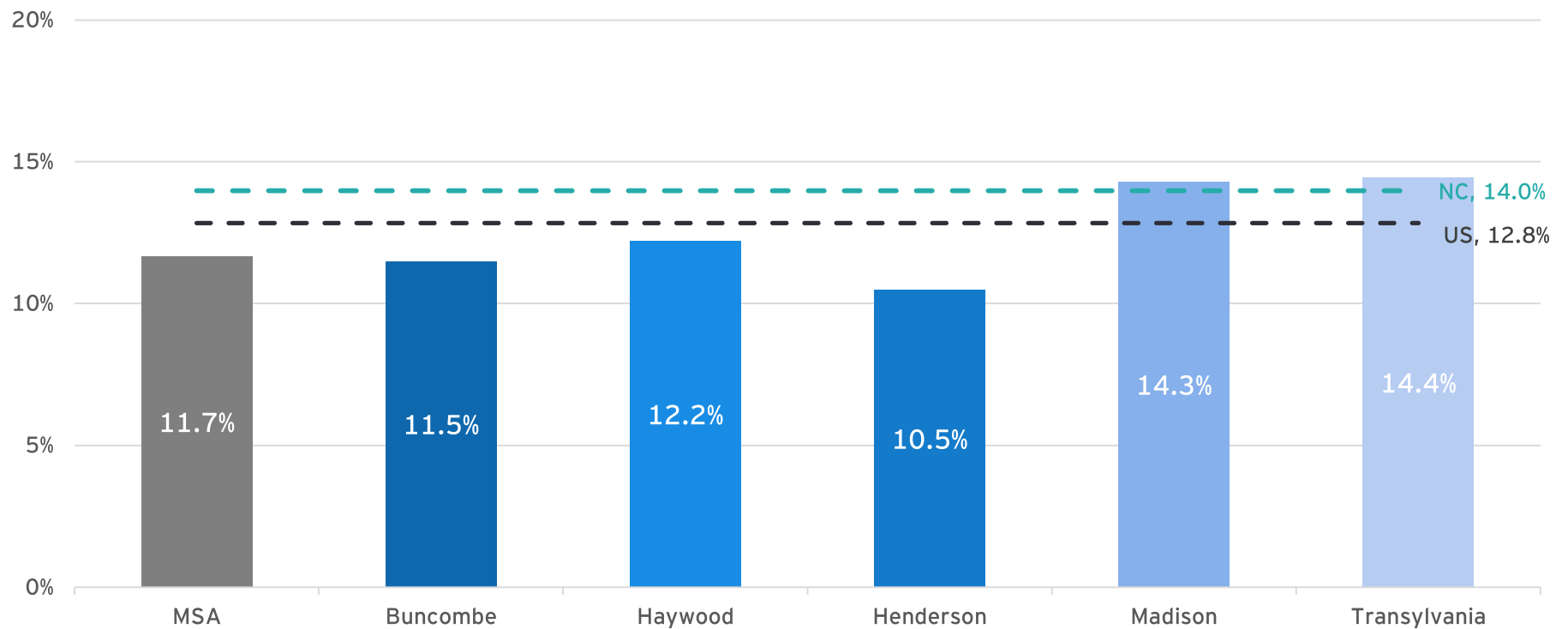
Labor shed analysis: net commuters by age and earnings

The net flow of workers illustrates the number of workers commuting in and out of the region. The region has a net outflow of 2,700 workers. More than 3,000 workers earning more than $40,000 annually commute out of the region for work. The region imports more than 500 workers with annual earnings of less than $40,000. More experienced workers, age 30 and older, also commute outside of the region for work. Workers age 29 or younger are imported on a net basis.

Net flow of workers into region by age, 2019
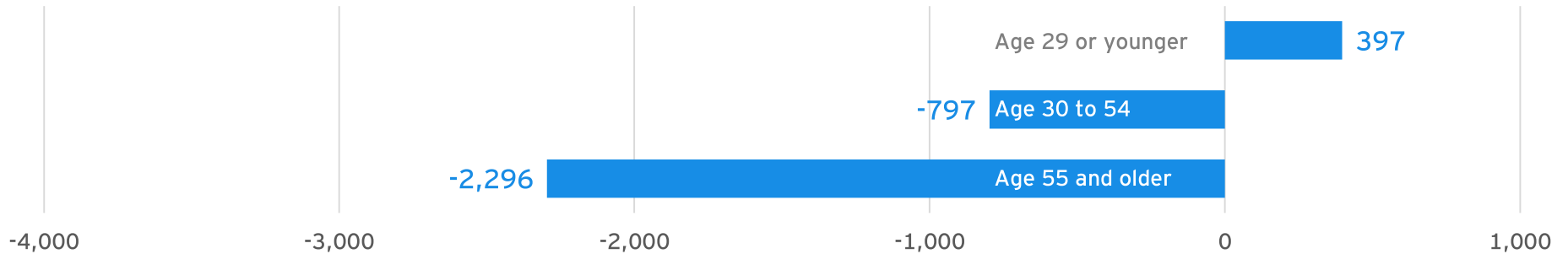
Net flow of workers into region by earnings, 2019

Source: US Census Bureau

EY
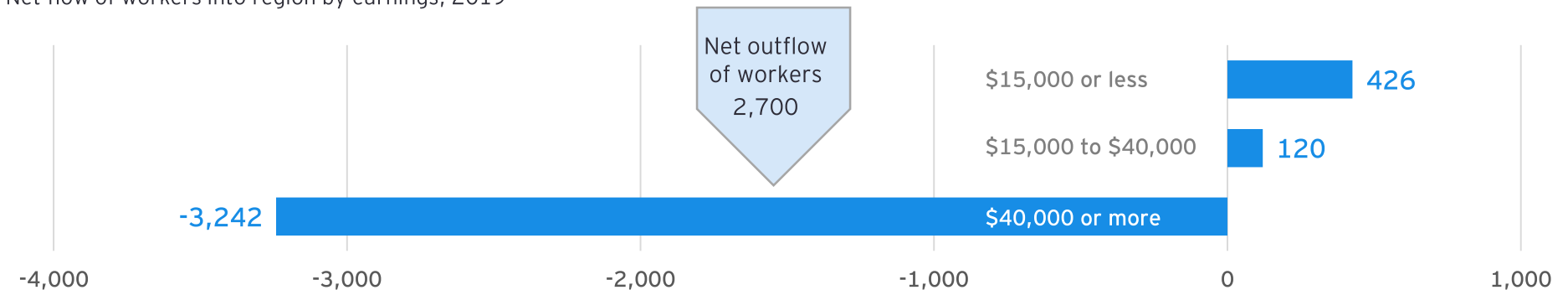
Labor shed analysis: net inflow of workers by age and earnings, Buncombe County

Buncombe County is a net importer of talent at all age and earning brackets. While the county does export some talent, the county imports more talent than it exports. Buncombe County has a net inflow of over 18,000 workers.

Net flow of workers into Buncombe County by age, 2019

Age 29 or younger	4,846
Age 30 to 54	10,271
Age 55 and older	3,749
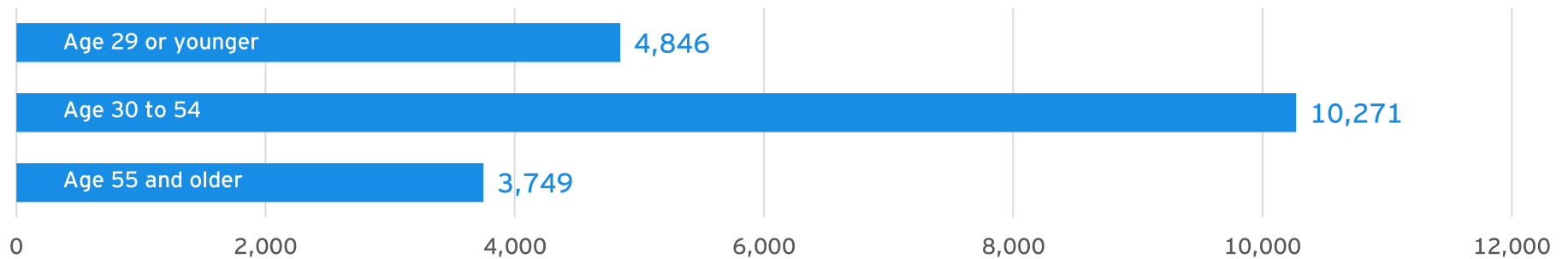
Net flow of workers into Buncombe County by earnings, 2019

$15,000 or less	3,876
$15,000 to $40,000	8,252
$40,000 or more	6,738

Net inflow of workers
18,865

Source: US Census Bureau

EY
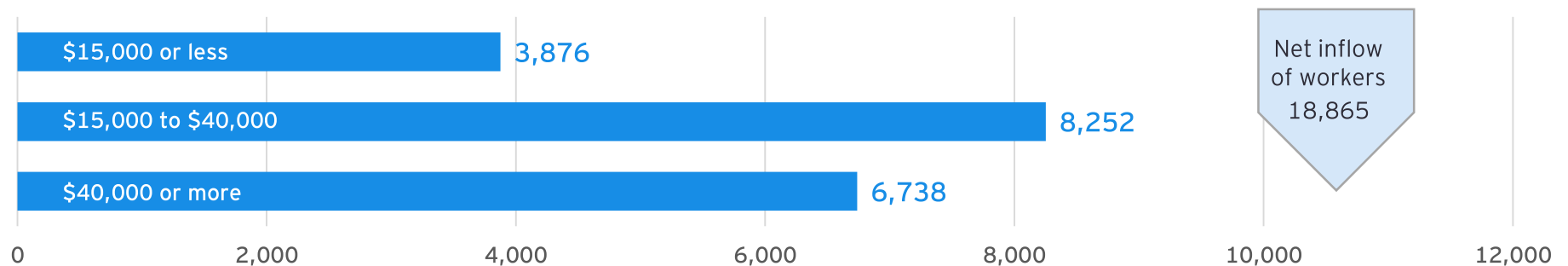
Labor shed analysis: net commuters of workers by age and earnings, Madison, Henderson, Transylvania and Haywood counties

The remaining counties that comprise the metro area, when combined, are net exporters of talent. Combined, the counties have a net outflow of more than 20,000 workers across all working age groups and salary bands.

Net inflow of workers by age, 2019

-4,449	Age 29 or younger
-11,068	Age 30 to 54
-6,045	Age 55 and older

-12,000   -9,000   -6,000   -3,000   0

Net inflow of workers by earnings, 2019

Net outflow of workers 21,560

-3,450	$15,000 or less
-8,132	$15,000 to $40,000
-9,980	$40,000 or more

-12,000   -9,000   -6,000   -3,000   0

Source: US Census Bureau

EY
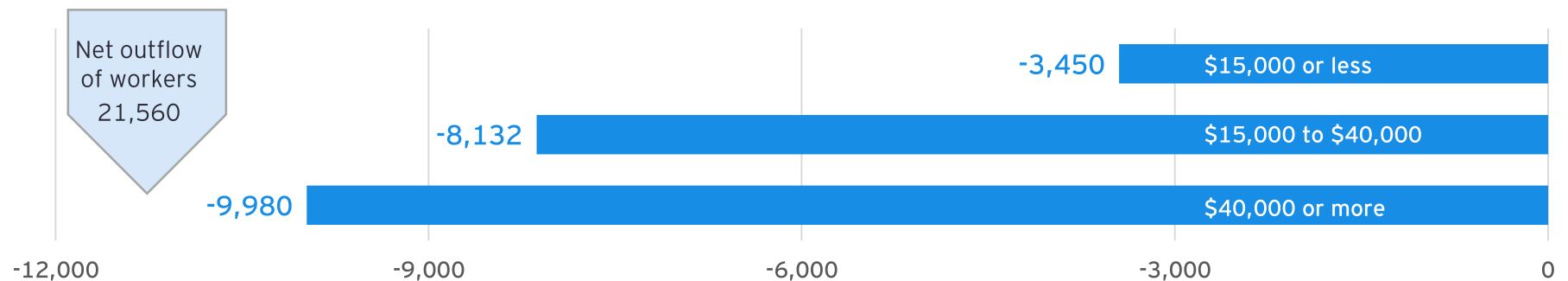
Labor shed analysis: net inflow of workers by industry

Workers in Health Care and Social Assistance and Tourism and Services jobs are imported and tend to have lower-wages. Exported talent includes more higher-wage industries such as Information, Management, and Finance and Insurance. Manufacturing is one of the industries that draws workers into the region, likely due to higher wages.

Net flow of workers into region by industry composition, 2019

Industry	Net flow
Health Care and Social Assistance	2,324
Manufacturing	580
Accommodation and Food Services	540
Other Services	238
Retail Trade	132
Agriculture	73
Mining, Oil and Gas Extraction	-57
Real Estate and Rental and Leasing	-79
Utilities	-103
Information	-250
Construction	-283
Transportation and Warehousing	-286
Educational Services	-472
Management	-502
Arts, Entertainment, and Recreation	-578
Professional and Technical Services	-582
Administration & Support	-635
Wholesale Trade	-677
Finance and Insurance	-897
Public Administration	-1,182

Inflow of workers
3,887

Outflow of workers
6,583

Sources: US Census Bureau

EY

Labor shed analysis: net inflow of workers by industry, Buncombe County

The net flow of workers into and out of Buncombe County varies widely by industry. Largely an importer of talent, the county only exports talent in Agriculture, Mining and Management industries. Buncombe County is especially dependent on imported talent to support its Health Care and Social Assistance, Accommodation and Food Services, and Retail sectors. While the region tends to import workers in industries characterized by limited educational attainment requirements, there are higher-paying positions with advanced educational requirements in industries such as Health Care and Social Assistance.

Net flow of workers into Buncombe County by industry composition, 2019

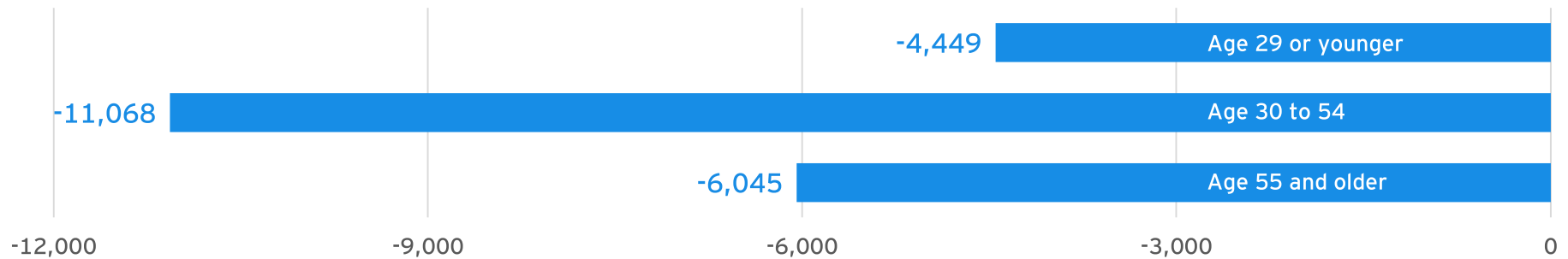| Industry	Net flow
Health Care and Social Assistance	6,083
Accommodation and Food Services	2,657
Retail Trade	2,291
Manufacturing	1,530
Construction	1,052
Administration & Support, Waste Management and Remediation	937
Public Administration	924
Transportation and Warehousing	910
Other Services (excluding Public Administration)	758
Professional, Scientific, and Technical Services	649
Educational Services	512
Arts, Entertainment, and Recreation	425
Real Estate and Rental and Leasing	243
Information	82
Wholesale Trade	73
Utilities	64
Mining, Quarrying, and Oil and Gas Extraction	-21
Finance and Insurance	-31
Agriculture, Forestry, Fishing and Hunting	-100
Management of Companies and Enterprises	-172

Net inflow of workers 18,865

Sources: US Census Bureau

EY

Labor shed analysis: net inflow of workers by industry, Madison, Henderson, Transylvania and Haywood counties

Examining the four-county region that includes Henderson, Madison, Transylvania and Haywood counties, the net flow of workers is largely an outflow of workers, except for workers in the Agriculture industry, which are imported. The four-county region exports the largest number of workers in the Health Care and Social Assistance, Retail, and Accommodation and Food Services sectors.

Net flow of workers into four-county region (not Buncombe) by industry composition, 2019

Industry	Net flow
Agriculture	173
Mining, Oil and Gas Extraction	-36
Utilities	-167
Real Estate and Rental and Leasing	-322
Management	-330
Information	-332
Other Services	-520
Wholesale Trade	-750
Finance and Insurance	-866
Manufacturing	-950
Educational Services	-984
Arts, Entertainment, and Recreation	-1,003
Transportation and Warehousing	-1,196
Professional and Technical Services	-1,231
Construction	-1,335
Administration & Support	-1,572
Public Administration	-2,106
Accommodation and Food Services	-2,117
Retail Trade	-2,159
Health Care and Social Assistance	-3,759

Net outflow of workers 21,560

Sources: US Census Bureau

EY

Target industry analysis

EY

Target industry analysis: identifying regional clusters

Regional target industry selection

EY US conducted a cluster analysis for the region that highlights industry growth trends and concentrations. Target cluster selection is an iterative process that integrates quantitative and qualitative information. Through a combination of data analysis and local insights, target clusters and supporting niche sectors are identified and tailored to each community's needs and opportunities.

Target cluster selection is driven by four primary questions that serve as filters in the selection process:

- ▶ What is the regional and national growth trajectory of the cluster?
- ▶ What clusters have an existing local/regional presence?
- ▶ Which clusters are best positioned to leverage the region's assets in the face of industry change?
- ▶ Which clusters align with the region's aspirations?

Based on the answers to these questions, potential target industries are identified and profiled. Profiles include information on regional differentiators, national and international trends impacting the industry; and site selection criteria. The profiles will help area economic developers with crafting marketing messages, preparing for change and determining investments that would help the region become a more competitive location.

Each target contains several niche clusters with multiple target clusters sharing overlapping competencies and competitive assets. As a result, individual niche sectors may lie at the intersection of broader target clusters. Medical device manufacturing, for example, leverages the region's production prowess with its emerging life sciences strengths.

EY

Target industry analysis: industry clusters
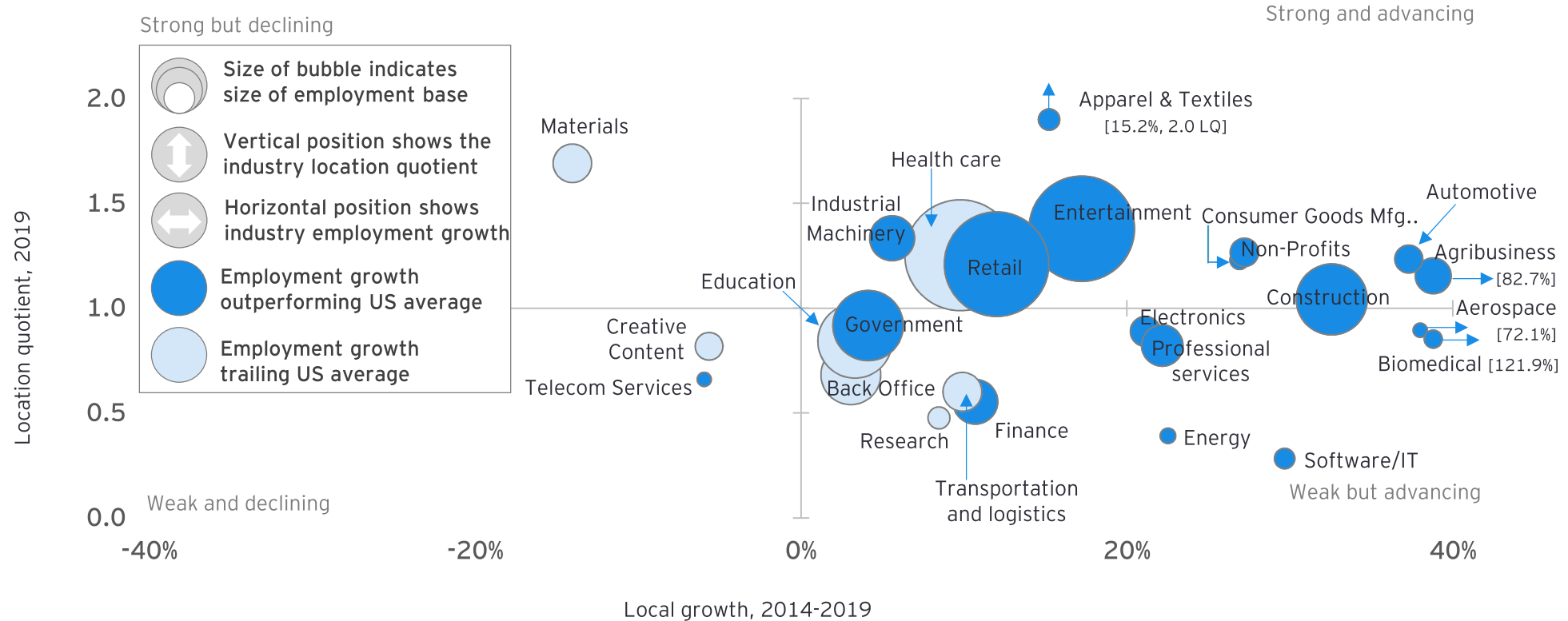
The chart on the following page combines location quotients (LQs), growth and relative size to illustrate a snapshot of the region's industry cluster performance. The analysis provides a more granular view of employment dynamics than traditional federal definitions (as seen in the preceding section). The horizontal axis displays employment growth of each cluster from 2014 through 2019. The vertical axis shows the LQ. An LQ is the ratio of local share of industry employment relative to the national share of industry employment. For example, an LQ greater than 1 indicates that local industry employment is greater than the US average. The size of each bubble indicates the number of local jobs in the cluster. Clusters can generally be grouped into four categories as described in the map below.

Higher concentration (high LQ)

Top left – strong but declining

Contains clusters that are more concentrated in the region but are declining (negative employment growth). Over time, these clusters may fall to the bottom left as job losses eventually lead to declining concentration.

Top right – strong and advancing

Contains clusters that are more concentrated in the region and are growing. These clusters are usually built on highly competitive local assets and are also experiencing strong national and international growth.

Negative growth (job losses) ←→ **Positive growth (job gains)**

Bottom left – weak and declining

Contains clusters that are underrepresented in the region (low concentration) and are also losing jobs. In general, clusters in this quadrant reveal a lack of competitiveness.

Bottom right – weak but advancing

Contains clusters that are underrepresented in the region but are growing. If growth continues, these clusters will eventually move into the top-right quadrant. These are generally considered "emerging" clusters.

Lower concentration (low LQ)

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Target industry analysis: industry composition

Between 2014 and 2019, a majority of industry clusters in the region posted employment growth. At the same time, the growth rate of most industry clusters in the region exceeded the national average for that sector. The rise of higher-wage industries, such as Automotive, Aerospace, Biomedical, and Software/IT in the region during this period is especially noteworthy. On a net basis, the employment increased by approximately 23,300 between 2014 and 2019.

Regional industry cluster analysis

Strong but declining

Strong and advancing

	Size of bubble indicates size of employment base
	Vertical position shows the industry location quotient
	Horizontal position shows industry employment growth
	Employment growth outperforming US average
	Employment growth trailing US average

Location quotient, 2019

2.0

1.5

1.0

0.5

0.0

Materials

Apparel & Textiles
[15.2%, 2.0 LQ]

Health care

Industrial Machinery

Entertainment

Consumer Goods Mfg..

Automotive

Retail

Non-Profits

Agribusiness
[82.7%]

Education

Construction

Aerospace

Government

Electronics

Creative Content

Professional services

Telecom Services

Biomedical [121.9%]

Back Office

Finance

Research

Energy

Software/IT

Transportation and logistics

Weak and declining

Weak but advancing

-40%   -20%   0%   20%   40%

Local growth, 2014-2019

Source: EMSI (only clusters with more than 500 jobs are shown).

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Target industry analysis: industry composition, *continued*

Although recent employment growth in the region has been varied by industry, the region's economy boasts several standout strengths. The region possesses numerous relatively concentrated clusters. At twice the relative concentration of the US, Apparel & Textiles is the most concentrated industry in the region. Other notable industries with strong concentration that are also manufacturing-oriented include Materials, Industrial Machinery, Automotive and Consumer Goods Manufacturing. Entertainment has a notable concentration within the region as well. The region is also home to several smaller but fast-growing innovative-rich sectors, including Biomedical, Aerospace, and Agribusiness & Food.

Regional industry cluster performance

| Cluster	Employment (2019)	Employment growth (2014-2019)	Location quotient (2019)	Cluster	Employment (2019)	Employment growth (2014-2019)	Location quotient (2019)
Aerospace	664	89.3%	0.9	Government	14,450	4.1%	0.9
Agribusiness & Food	3,867	82.7%	1.2	Health Care	35,454	9.8%	1.3
Apparel & Textiles	1,430	15.2%	2.0	Industrial Machinery	5,998	5.6%	1.3
Automotive	2,387	37.3%	1.2	Materials	4,422	-14.0%	1.7
Back Office	10,473	3.1%	0.7	Metalworking	1,516	9.6%	0.6
Biomedical	1,029	121.9%	0.9	Mining & Logging	199	29.7%	0.7
Construction	14,713	32.6%	1.0	Non-Profits	2,463	27.2%	1.3
Consumer Goods Mftg.	1,166	26.9%	1.2	Professional Services	5,095	22.2%	0.8
Creative Content	2,340	-5.6%	0.8	Research	1,503	8.5%	0.5
Education	16,035	3.3%	0.8	Retail	31,562	12.0%	1.2
Electronics	2,740	21.1%	0.9	Software/Info. Tech.	1,311	29.7%	0.3
Energy	781	22.5%	0.4	Telecom Services	657	-5.9%	0.7
Entertainment	32,077	17.2%	1.4	Transportation & Logistics	4,525	9.9%	0.6
Finance	5,950	10.7%	0.6	**Total**	**206,095**	**12.7%**	**1.0**
Furniture	508	52.8%	0.7				

Source: EMSI

EY

Target industry analysis: cluster evaluation and selection

Target cluster selection is an iterative process that integrates quantitative and qualitative information. Through a combination of data analysis and local insights, target clusters and supporting niche sectors are identified and tailored to each community's needs and opportunities.
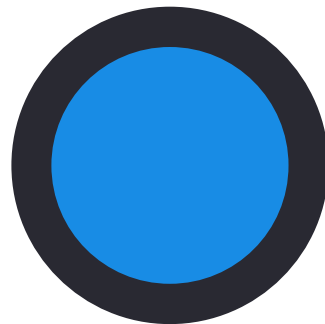
Target cluster selection is driven by four primary questions that serve as filters in the selection process:
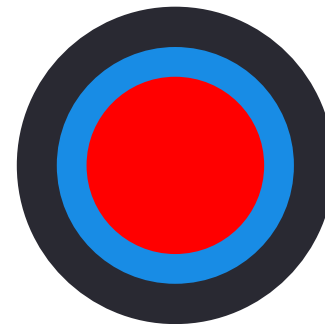
Target selection process
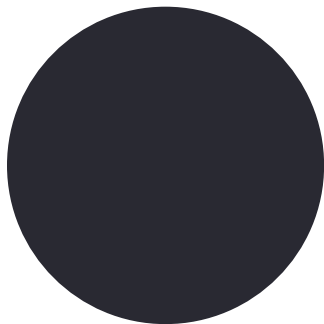
1. What is the regional and national growth trajectory of the cluster?

Examining growth trends helps understand if the target cluster will continue to grow and create opportunities throughout the region.

2. What clusters have an existing local/regional presence?

Clusters with an existing concentration in the region reflect local competitive strengths and present some of the best opportunities for expansion, recruitment and startup growth.

3. Which clusters are best positioned to leverage the region's assets in the face of industry change?

The ability of regional assets to support cluster ecosystems and expanded activity is a critical factor in the cluster selection process.
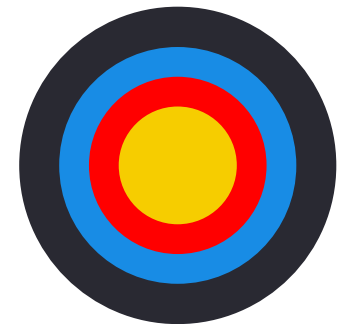
4. Which clusters align with the region's aspirations?

Cluster strategies can only be successful if they reflect local goals and values.

EY

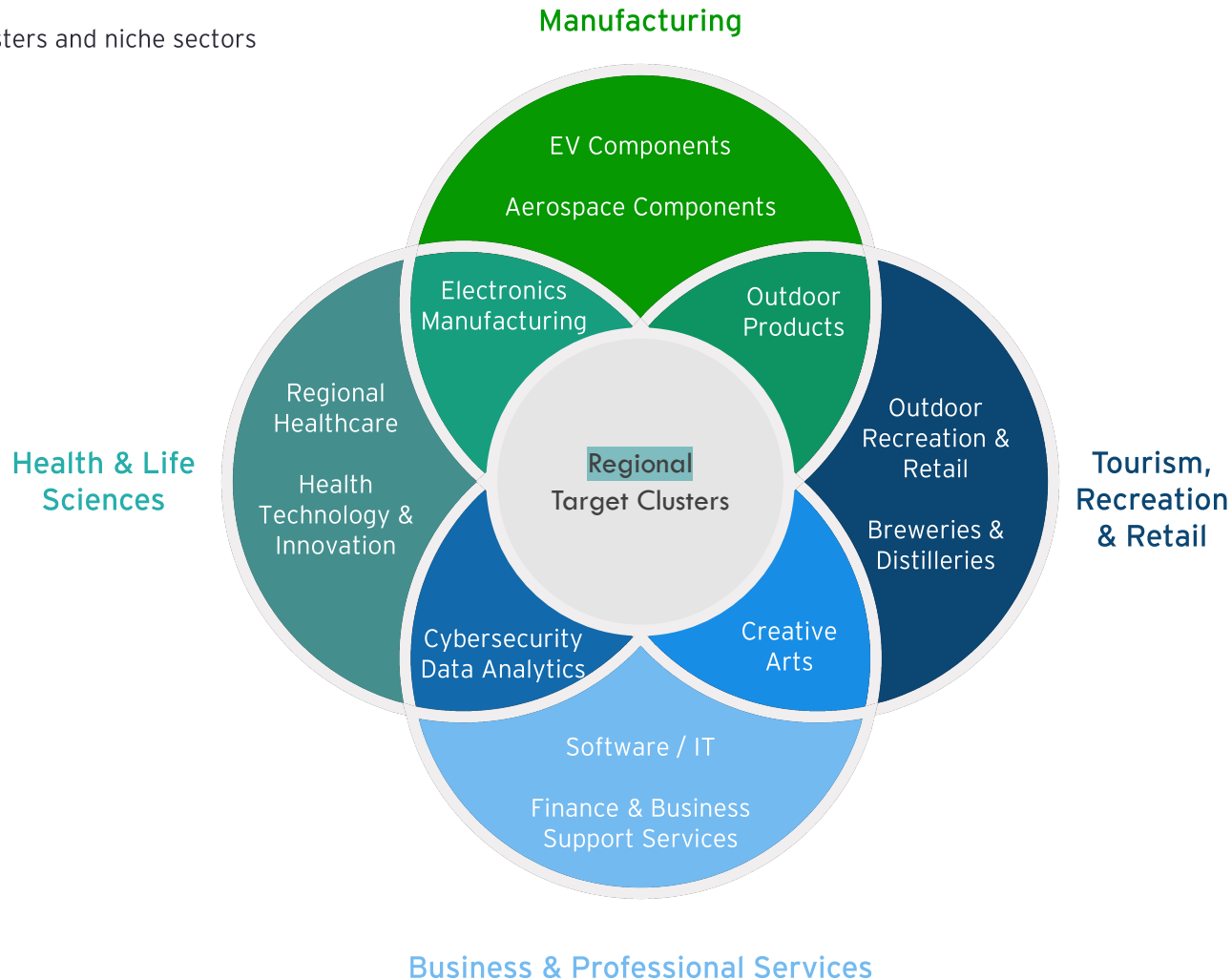# Target industry analysis: cluster evaluation and selection

Following the review and selection process outlined in this report, the following four target clusters are recommended for future economic development efforts in the region – Manufacturing; Tourism, Recreation & Retail; Business & Professional Services; and Health & Life Sciences. Also, all four target industries not only experienced steady employment gains in the five years prior to the pandemic, but regional employment growth outpaced the national average. The selected target industries are also characterized by relatively high wages.

	National performance	Regional performance	Industry disruption	Avg. wage > regional avg.
Manufacturing				
Tourism, Recreation & Retail				
Business & Professional Services				
Health & Life Sciences				

Key   Less aligned   ○   ◎ More aligned

EY
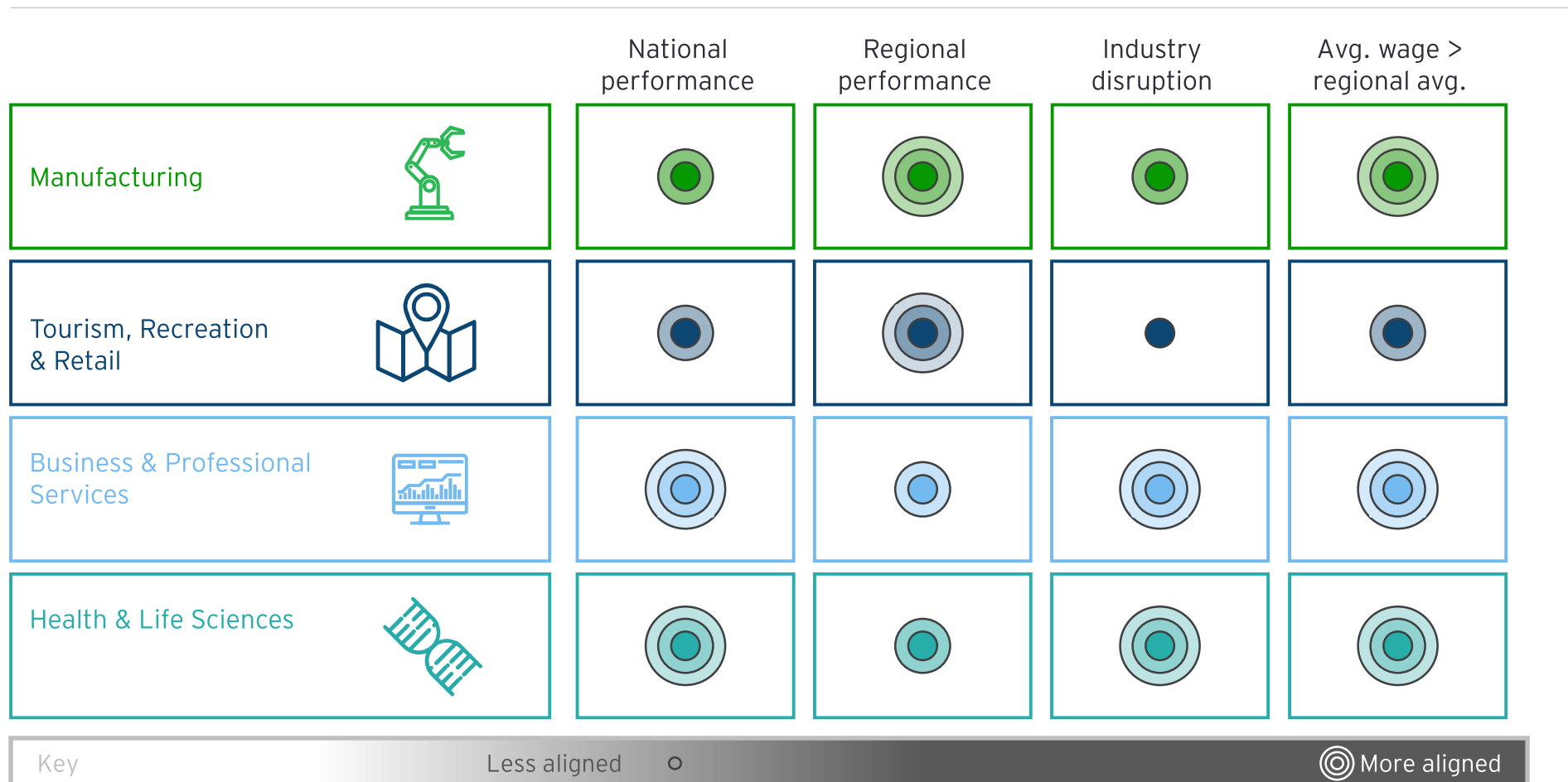
Target industry analysis: uncovering prevalent and emerging clusters

Each target contains several niche clusters. At the same time, multiple target clusters share overlapping competencies and competitive assets. As a result, individual niche sectors may lie at the intersection of broader target clusters.

Recommended target clusters and niche sectors

Manufacturing

EV Components

Aerospace Components

Electronics Manufacturing

Outdoor Products

Regional Healthcare

Health & Life Sciences

Health Technology & Innovation

Regional Target Clusters

Outdoor Recreation & Retail

Breweries & Distilleries

Tourism, Recreation & Retail

Cybersecurity Data Analytics

Creative Arts

Software / IT

Finance & Business Support Services

Business & Professional Services

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Industry profile
(including drivers and disruptors)

EY

Industry profile: drivers and disruptors descriptions

For each of the industry profiles in this section, we have included certain drivers and disruptors that are impacting the given industry cluster. These are factors that may contribute to the growth and/or significant changes within the industry or sector.

Additive manufacturing. Additive layer manufacturing (ALM) or 3D printing, production of small-scale objects that need limited production or difficult to produce in a traditional manufacturing line.

An aging America. More than 10,000 Baby Boomers turn 65 every day, a dynamic that reflects the overall aging of the US population. This "silver tsunami" will have two substantial impacts on the US workforce in coming years. Perhaps most visibly, a rapidly aging population will contribute to continued growth in the health care industry and other sectors that disproportionately serve the elderly (see the Health care monolith for more details). At the same time, other industries such as manufacturing that are characterized by a relatively older workforce are likely to experience a significant exodus of workers in the decades ahead. Both dynamics have significant implications for future workforce development efforts.

Automation advances. Technologies that automate functions currently performed by workers promise to fundamentally transform the labor market. In professions such as accounting and other business services, advanced digital processes such as artificial intelligence and machine learning may increasingly displace human labor. In other industries such as logistics and distribution, increasingly sophisticated robotics may take the place of existing workers. Already, Amazon utilizes approximately 350,000 robots in its existing fulfillment centers globally. At the same time, automation is also contributing to growth in aligned occupations. According to projections by the Bureau of Labor Statistics, for example, statisticians and data scientists will be among the 10 fastest-growing jobs through the end of the decade.

Cost of living | The rent (and mortgage) is too darn high. In the decade prior to the pandemic, 20 metropolitan areas accounted for half of all employment gains nationally. Such concentrated job growth produced a sharp rise in home prices in many of these regions. While locales such as San Francisco and San Jose have long wrestled with issues around housing affordability, the issue now impacts many traditionally affordable regions. In Denver, for example, median home values jumped by more than 150% during the past decade. Meanwhile, average annual wages in the region rose by less than 50%. As a result of these twin dynamics, a growing number of prospective homebuyers risk being permanently priced out of the market.

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Industry profile: drivers and disruptors descriptions

Electrification of automobiles. A century after Henry Ford revolutionized personal transportation with the introduction of the assembly line, the automobile industry is on the verge of another seismic change: electrification. While electric vehicles currently represent just a tiny fraction of automobiles sold each year, this figure is expected to rise substantially in the coming decade. As a result, automakers are racing to pivot from the internal combustion engine to electric drivetrains. The transition has enormous implications for the automobile supply chain and the communities that support these suppliers. Electric vehicles, for example, have far fewer parts than traditional automobiles. At the same time, increased demand for batteries and other electric motor technologies may help offset these declines. Helping local automotive suppliers transition to these new technologies is likely to emerge as a pressing task for many communities in the coming years.

Environmental, Social and Governance (ESG) goals. As numerous governments and major companies have set goals to reduce carbon emissions, manufacturers will seek locations that reduce their carbon footprint. Green energy sourcing, reduced transportation costs and reducing emissions will be ongoing trends.

Everything is connected. Historically, talk of automation has often focused on the risk of worker displacement. The pandemic and resulting labor shortages, however, highlight the two-way nature of the relationship between automation and workers. With talent scarce, employers are increasingly embracing automation technologies. Mass deployment of these systems is also helping fuel the emergence of an increasingly powerful Internet of Things (IoT) ecosystem. In an era in which nearly any activity can be measured, advances in predictive analytics, competencies in aligned areas such as machine learning, artificial intelligence and cybersecurity will be increasingly necessary to help us make sense of the data generated by our environment and securely store it. IoT technologies are also likely to become increasingly vital to a host of industries from manufacturing to logistics. Mass deployment of autonomous vehicles, for example, is likely to require that cars communicate with one another as well as the built environment.

Federal policy. Several new federal government actions will bolster demand for US-based manufacturers or entice supply chains back into the US. President Biden's executive order modifying the Buy American program aims to ensure the government buys more US-sourced goods. Another executive order directs federal Commerce, Energy, Defense and Health agencies to evaluate supply chain risks.

EY

Industry profile: drivers and disruptors descriptions

Federal spending surges. The global health pandemic spurred a massive increase in federal spending. Elevated levels of federal spending are likely to be sustained in the years ahead as current US political leadership looks to boost investment in a host of areas. The proposed infrastructure bill, for example, envisions trillions of dollars in spending on roadways, bridges and internet access. Other proposed programs, including the US Innovation and Competition Act, may provide hundreds of billions of dollars in new funding for technologies critical to national security including semiconductor manufacturing and artificial intelligence. If they become reality, these initiatives promise to serve as engines of local job growth for years to come.

FinTech/blockchain/cryptocurrency. The FinTech niche sector includes firms involved in design and development of innovative technologies that support the banking and financial services sector. Two emerging financial technologies that are gaining traction are blockchain and cryptocurrency. Blockchains are digital systems that can be used for securing, recording and transmitting data. While this technology is commonly associated with cryptocurrency, it has a variety of uses that can be applied across industries, such as the storing and sharing of private data. Cryptocurrency involves the mining of, trade and investment of digital currencies and assets, typically via blockchains. As digital transactions become more prominent, the demand for quality cybersecurity software and services is expected to grow as well.

Help wanted. During the initial months of COVID-19, US employers shed millions of jobs as consumer demand collapsed in the face of a rapidly spreading pandemic. By 2022, as the economy has reopened, the US labor market is tight and is characterized by hiring difficulties. Overall, by March 2022, the US economy had recouped 95% of the 22.4 million jobs lost in March and April 2020. In March 2022, job openings exceeded the number of unemployed by 5.6 million. Despite hopes that worker shortages would lessen as school resumed, daycare became more widely available/dependable and enhanced unemployment benefits ended, labor availability continues to be a challenge.

Industry 4.0. Automation relies on big data, sensor technologies, artificial intelligence and predictive maintenance modeling – forming an Internet of Things (IoT) architecture across systems, processes, and people. A more technically advanced workforce will be required from the manufacturing floor to operations.

EY

Industry profile: drivers and disruptors descriptions

Labor shortages. Ongoing labor shortages are driven by wage competition from other sectors (e.g., retail, warehousing) and lack of technical worker training in middle skills keep manufacturers struggling to operate increasingly complex machinery.

Rising foreign wages. As foreign wages have risen and fewer workers are needed, cost calculations for US-based manufacturing have improved.

Supply chain and reshoring. Ongoing shortages have exposed new risks to supply chains that will likely bring production closer to end-user markets. More stockpiling is likely, which will drive demand for more warehouse space.

Tariffs. Countries continue to play games with tariffs, prioritize new critical industries or retaliate. In the future, border carbon tariffs in Europe may force laggard countries (and their manufacturers) to pay higher tariffs on their exports (the European Union has discussed these tools).

The health care monolith. Pandemic aside, the Health Care industry is seemingly immune to the dynamics of the broader economy. During boom times, health care employment rises. During downturns, the health care industry keeps adding jobs. With the average lifespan of Americans continuing to rise, significant increases in health care employment are virtually assured in the years ahead. The need for support services for a growing elderly population will fuel demand in specific health care occupations. An increased elderly population, for example, will require more nurse practitioners, personal care aides and physician assistants. Already, the federal government projects that health care will represent 6 of the 10 fastest-growing professions during the next decade.

The hunt for value. Although metropolitan areas have largely outperformed rural areas in recent years, a select number of regions have enjoyed especially strong employment gains. Regional success in places such as Austin and Denver, however, has fueled escalating housing costs and increasingly congested roadways. Despite these issues, however, these regions remained attractive due to the abundance of economic opportunity they offered current and prospective residents. The pandemic, and the dramatic rise in telecommuting it helped unleash, may have permanently changed this equation. Migration from high-cost large metropolitan areas to smaller and lower-cost locales, for example, increased significantly during the first year of the pandemic. While it remains to be seen if this trend proves permanent, the dominance of "rock star" metros is no longer assured.

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Industry profile: drivers and disruptors descriptions

The retail revolution. While online shopping has steadily increased during the past decade, e-commerce activity sharply accelerated at the onset of the pandemic. Despite strong growth, however, there remains significant room for additional gains – more than 85% of all retail sales still occur at physical locations. The continued migration of retail dollars to online platforms is likely to require sustained spending on supporting infrastructure such as fulfillment centers and air cargo facilities. At the same time, much of the country's existing retail infrastructure such as the traditional shopping center may no longer be viable. Repurposing old, enclosed malls, for example, is likely to become a more frequent topic of local redevelopment activities.

The rise of remote work. The COVID-19 pandemic produced a massive increase in the proportion of Americans telecommuting to their place of employment. Though it remains to be seen how durable this shift might be, remote work is almost certain to be a much more common behavior than it was prior to the pandemic. The rise of remote work has substantial implications for communities throughout the country. For the past 20 years, the proportion of Americans who moved in any given year has steadily fallen. If a growing number of workers has the option of living anywhere, this trend may finally reverse itself. As highlighted earlier, there is already some evidence that this dynamic has benefited rural, more affordable locales. At the same time, the prospect of reduced demand for office space represents a significant threat to the economic vibrancy and fiscal health of more urban locations.

The triumph of the region. During much of the 20th century, one of the dominant themes of US economic development was the convergence of prosperity. Broadly speaking, American dynamism was fueled by both urban industrial centers and rural agricultural-based communities. In recent decades, however, virtually all domestic employment and population growth has been captured by metropolitan areas. Although these regions are typically anchored by a traditional urban core, growth is often propelled by outlying suburban communities. In the most dynamic metropolitan areas, individual communities collaborate to promote their collective strengths while also coordinating policy development to ensure that regional issues such as transportation are effectively managed.

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Industry profile: Manufacturing

About the industry

The Manufacturing sector comprises establishments engaged in the mechanical, physical or chemical transformation of materials, substances or components into new products. Small, Light Manufacturing, Niche-Product Manufacturing focuses primarily on modern manufacturing subsectors that are both cleaner and leaner than traditional manufacturing. These subsectors tend to operate out of smaller shops and produce a range of components, materials and final products, including plastics, chemicals, pesticides, machined metal components, electronics, sporting goods, food and beverage products, medical devices, and many other products.

Manufacturing is among the most heavily recruited industrial sectors thanks to its capital-intensive nature and its ability to support high-wage employment opportunities. As a result, large-scale, more advanced manufacturing projects often command substantial incentive packages when exploring new locations. Incentives alone, however, are not typically sufficient to secure manufacturing operations. Many facilities have substantial site infrastructure and labor requirements. Proximity to infrastructure such as interstates, seaport, cargo airports, and/or rail lines are also important in connecting manufacturing firms to customers, suppliers and raw materials. Other important considerations include access to reliable and affordable energy supplies and the capacity of water and wastewater systems. Access to abundant, competitively priced labor is critical, especially for advanced manufacturing operations, which require a highly skilled workforce with specialized machinery training. As a result, advanced manufacturing businesses usually benefit from locations with a strong community college and other training systems in place.

Site selection considerations

- Available site inventory
- Infrastructure access
- Affordable and available utility
- Available and affordable skilled workforce
- Proximity to supply chain
- Incentives
- Workforce training programs

Drivers and disruptors

- Additive manufacturing
- Automation advances
- Electrification of automobiles
- Environmental, social and governance goals
- Sensors | IoT | Plant digitization
- Federal policy | Federal spending surges

- Help wanted | Labor shortages
- Industry 4.0
- Rising foreign wages
- Supply chain and reshoring
- Tariffs

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Industry profile: Manufacturing

Niche targets

EV Components. Electric vehicles (EVs) are radically simpler in mechanical terms as compared to traditional internal combustion engines and have fewer traditional component parts. However, EV components are critical to high-value parts including the battery components, powertrain and electrical systems. Traditional automotive skills, such as those in metalworking, computer systems and circuitry, will remain in demand. Electric vehicles are also driving greater adoption of technology in the personal vehicle and will require traditional inputs, such as semiconductor chips, but will also drive demand for newer skills, such as technology and programming, as more over-the-air updates are incorporated into vehicles.

Aerospace and other OEM Support and Parts Manufacturing. This sector includes smaller operations that manufacture components for original equipment manufacturers (OEMs) in a range of products, including airplanes, automobile, oil and gas extraction equipment, computers, and many more. Modern OEMs often rely on smaller suppliers to produce a variety of components for their finished product. Component manufacturing firms in this sector often provide a combination of skills in metalworking and technology such as computer systems and circuitry. Aerospace and other components range from specialized engine pieces to electrical system frameworks. These smaller, component manufacturers are a strong fit for the Land of Sky region.

Electronics Manufacturing. Electronics Manufacturing includes the manufacture, design, development, assembly and servicing of electronics and components featuring integrated circuits. Companies in this industry must invest substantial resources into research and development to constantly improve parts and products, and the processes to improve them, specifically to keep up with the demand for new technologies and green/energy-efficient products. Key areas of future growth include automotive, mobile devices, health care, communications and data processing.

Outdoor Products. Apparel and equipment includes the design, testing and manufacture of outdoor technical gear and apparel. Companies in this industry are beginning to place particular importance on sustainability and corporate social responsibility, especially those whose target demographic includes Gen X, Millennial and Gen Z consumers. Along the supply chain, there are several subsectors such as plastics manufacturing, machined metal manufacturing and textile manufacturing shared between the region's target industries. This niche is complementary to the Outdoor Recreation and Retail industry, which is a strong economic driver due to the natural resources and climate found in the Land of Sky region.

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Industry profile: Tourism, Recreation & Retail

About the industry

The Tourism, Recreation & Retail industry describes a range of operations focused on providing entertainment, lodging, shopping, dining, and other recreational activities to residents of a community and visitors, including residents of nearby communities and out-of-state tourists.

The location of Tourism, Recreation & Retail businesses often depends on the unique characteristics of a community. Assets for the industry may include natural resources, historic sites and architecture, organized events, and sports teams, among others. The Tourism sector grows where there are attractions for visitors and the infrastructure necessary to support access. Depending on the characteristics of a Tourism destination, these infrastructure requirements may include international airports, roads and rail, hotels, marinas, bike paths, hiking trails, and more.

Employers in this industry tend to need employees with proficient interpersonal and problem-solving skills and often provide on-the-job training for skills required for specific positions. The sector could benefit from supportive culinary and hospitality training programs that could help with developing talent with both "soft" and technical skills. The health of the Tourism, Recreation & Retail industry in a local economy is ultimately dependent on distinctive natural, cultural, recreational, shopping and other experiences that attract visitors and appeal to residents.

Site selection considerations

- Abundance of natural resources
- Historical or other attractions
- Quality-of-life amenities
- Access to airports and highway infrastructure
- Available and affordable soft-skilled workforce
- Distinct culture and brand awareness
- Vibrant sense of place

Drivers and disruptors

- Business and international travel
- COVID-19 pandemic
- Cost of living
- Environmental, social and governance goals
- Inflation
- Federal spending surges
- Help wanted | Labor shortages

- The retail revolution
- The rise of remote work
- Transportation and infrastructure
- The triumph of the region

EY

Industry profile: Tourism, Recreation & Retail

Niche targets

Outdoor Recreation and Retail. This sector encompasses sectors involved in providing services that address the physical, mental and recreational wellbeing of individuals. Outdoor Recreation includes recreationally oriented tours and activities that take place in natural settings, such as camp sites, trails and lakes. Outdoor recreational activities such as camping, hiking, biking, paddling, hunting, fishing and wildlife-watching can contribute greatly to a community's wellbeing and attractiveness to tourists. In many locales, Outdoor Recreation is a powerful economic driver. Related niche targets can also include Outdoor Apparel & Equipment and Experiential Vacations.

Breweries & Distilleries. This sector includes the production and sales of beer, liquor and other alcoholic beverages. Breweries & Distilleries represents the more creative side of the beverage industry, encompassing the development and production of unique beers and spirits, from small-scale startups to large organizations.

Creative Arts. This sector is a challenging industry to capture using official government industry classifications and job numbers because it incorporates a range of less quantifiable, private activities and home-based entrepreneurs. As a target industry for the region, Creative Arts includes a range of artistic organizations and individuals, including painters, sculptors, writers, filmmakers, theaters, musicians and others. These activities are also typically homegrown and successful in communities with public and private support for the arts through non-profits, major events, cooperatives and other collective organizations, and physical space such as galleries, theaters and music venues. This sector enhances local quality of life but also benefits from a strong visitor economy, drawing non-residents into the community.

The above niche targets serve as attractors for visitors and residents, along with the appeal of the Land of Sky's natural landscape. The region's businesses and geography contribute to a vibrant tourism industry that provides career opportunities and recreational options.

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Industry profile: Business & Professional services

About the industry

Business & Professional Services encompasses a variety of technical and business-related sectors, including accounting, architecture, advertising, consulting, engineering and information technology. Business & Professional Services typically clusters in regions rich with talent and potential clients.

Unlike other industry clusters such as Advanced Manufacturing, Business & Professional Services firms typically have minimal infrastructure requirements beyond office space, educated workers, broadband availability and access to a major airport. Because workforce is a primary location factor for Business & Professional Services, these firms are often drawn to communities that offer quality of life and cultural amenities that attract young professionals to secure the workers necessary to maintain and expand operations.

Among the industries where telecommuting is possible, Business & Professional Services represents a particular opportunity for the region and its growth.

Site selection considerations

- Available site inventory
- Infrastructure access and reliability
- Available and affordable skilled workforce
- Proximity to supply chain
- Incentives
- Workforce training programs
- Available talent and talent pipeline
- Affordable cost of doing business
- Quality of life

Drivers and disruptors
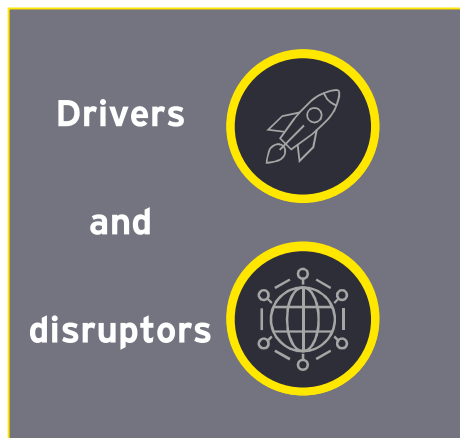
- Internet of Things
- Environmental, social and governance goals
- Fintech/blockchain/cryptocurrency
- Federal policy
- Federal spending surges
- Help wanted | Labor shortages
- Mergers & Acquisitions

- The hunt for value
- The rise of remote work
- The triumph of the region

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Industry profile: Business & Professional services

Niche targets

Software & Information Technology. Software & IT includes organizations and individuals in software design and publishing, custom computer programming, computer systems design and data processing facilities management. Data storage and utilization and cybersecurity are some of the major growth areas for this sector as the amount and sensitivity of data online increases exponentially. Availability of cost-efficient and reliable utilities, especially broadband internet, will continue to be a driver for this subsector as its geographic footprint expands outside of primary urban areas.

Finance. Finance operations are engaged in financial, insurance and real estate activities, such as banks, insurance carriers and real estate brokers. The financial industry facilitates financial transactions such as taking deposits, issuing securities and incurring liabilities. The financial industry serves consumers, businesses and governments.

Back Office Support Services. Back Office Support Services provides administrative, accounting and information technology support to larger organizations in a variety of industries. Back Office Support Services operations may involve internal departments tasked with handling specific functions within larger firms or third-party entities that serve external clients. Specifically, Back Office Support Services looks for communities with favorable real estate costs; an affordable, moderately skilled workforce; and a supportive regulatory environment.

Cybersecurity. Cybersecurity remains an emerging sector dedicated to securing computers, computer networks and digital data from malicious actors. Cybersecurity threats include digital assaults that seek to disable computer networks, such as denial of service attacks, as well as hacks aimed at stealing sensitive or proprietary information. Cybersecurity is of increasing importance across industries but particularly in the Finance sector as businesses seek to protect their client's data and financial information. The continued growth of the IoT as well as cloud computing will drive future expansion in the cybersecurity sector. With everything from security cameras to refrigerators now connected to the internet, the number of devices at risk from cyber threats continues to increase. This sector is emerging but presents an immediate opportunity for development based on local education and workforce strengths. Site availability may limit growth.

Data Analytics. The expansion of technology has correlated with an increasing demand for data analytics capabilities. Data management and analysis is needed to inform business decisions around a range of business operations, including planning and scheduling, product development and customer service optimization. Data analytics, like technology, is not only a vertical industry, but also a horizontal sector that has a presence across industries. The are numerous data analytics specializations, such as climate analytics and health informatics that could support industry needs and help to understand and resolve larger community challenges related to environmental impact and public health.

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Industry profile: Health & Life Sciences

About the industry

The Health & Life Sciences industry spans everything from hospital medical care to assisted living and in-home care to outpatient care to urgent care. The industry can further encompass a range of technology, products and services such as the research and development of new drugs and medical technologies, manufacturing of medical devices, and the study of diagnostics, nutrition, and other related sciences that promote well-being.

Technological innovation and an aging population continue to drive innovation in medical fields across the nation. Research plays a prominent role in Bioscience. Hospitals, clinics, nursing facilities, and doctors' offices – the primary providers of health care services – are typically located near substantial patient populations. Other factors such as public budgets and insurance systems may also play a role in the location of these operations. Other Health & Biomedical functions, including clinical trials, drug development and technology development, often concentrate in proximity to large hospital networks and universities with extensive research capabilities.

Site selection considerations

- ▸ Access to skilled scientific talent
- ▸ Proximity to patient populations
- ▸ Higher education and world-class research institutions
- ▸ Industry expertise and ecosystems
- ▸ Proximity to supply chain

Drivers and disruptors

- ▸ An aging America
- ▸ Automation advances
- ▸ Federal policy
- ▸ Federal spending surges
- ▸ Help wanted | Labor shortages

- ▸ Supply chain and reshoring
- ▸ The health care monolith

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Industry profile: Health & Life Sciences

Niche targets

Health Technology & Innovation. The Health Technology & Innovation cluster includes industries engaged in researching, manufacturing or processing a broad range of biological and medical products. This cluster includes research and development activity that occurs at the intersection of private enterprise and higher education, as well as commercialization and production biomedical, pharmaceutical, and other health and life sciences products. Health tech and innovation includes jobs, such as laboratory research, information technology, data analytics, medical engineering, cybersecurity and other specialized roles that require highly educated and skilled talent.

Regional Health Care. This industry covers the hospital systems, home health care services, diagnostic laboratories, independent physician offices and other ambulatory health care services based in a central location but servicing a broader regional population. Regional health care service providers often offer specialty treatment centers unavailable to smaller local medical centers. By serving a population larger than their local residents, these regional health care service providers are often able to offer specialty treatment centers unavailable at smaller medical centers. The presence of specialty treatment centers and availability of physicians in multiple specialties often make these centers destinations for patients even further from the immediate region. This sector is the largest in the region based on total employment, and economic development activities could focus on helping existing employers maintain and expand operations.

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Automation impact assessment

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Automation impact assessment

Understanding the impact of automation on jobs and industries

The automation assessment identifies those occupations that are most at risk for automation, and displacement due to automation, through 2030. The assessment highlights the risks specific to manufacturing operations and other major industry clusters within the region.

Technologies that automate functions currently performed by humans are poised to revolutionize the labor market. Automation will eliminate and/or fundamentally transform jobs that are routine and follow formal operating rules. At the same time, it will fuel the creation of new occupations. While the rise of automation will help maintain US economic competitiveness, it will also create significant disruptions in the labor market.

This supplemental section, Automation Impact Assessment, identifies occupations that are most at risk for automation in the region. The assessment will also highlight the risks to occupations for each of the target industry clusters, showing which occupations are most at-risk, as well as least at-risk of automation. A relative comparison of automation risk of the Asheville-Brevard metro against other metros is also included. In addition, we begin with an overview of artificial intelligence and its current and future impacts on the economy and Land of Sky's target industry clusters.

Common automation terms

Automation. Technology that performs human-like tasks.

Chatbots. Software that mimics conversations with humans.

Deep learning. Algorithms inspired by the structure and function of the brain that learn to recognize patterns in digital representations of sounds, images and other data.

Intelligent process automation. Technology that combines robotic process automation and machine learning; mimics human activities and learns from them to improve without needing human intervention.

Robotic process automation. Software or robotics that mimic the actions of a human.

Machine learning. Algorithms programmed to learn for themselves using data.

Natural language processing. Software that understands, analyzes and synthesizes natural language and speech.

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Automation impact assessment: AI-related technologies

Today, most forms of AI are characterized in terms of machine learning, natural language processing, deep learning and computer vision. AI is used for predictive analytics, visual analytics (of images), process optimization and customer experience (such as chatbots).

AI technologies

Technology	Value
Machine Learning	578
Natural Language Processing	393
Deep Learning	368
Computer Vision	270
Machine Reasoning	20

Horizontal use cases

Use case	Value
Predictive Analytics	353
Visual Analytics	307
Process Optimization	269
Customer Experience	178
Text Analysis	167

Industries served by machine learning

Industry	Value
Financial Services	247
Healthcare	239
Business Services	236
Cross Industry	233
Retail	186
Manufacturing	148
Information Technology	122
Public Sector	103
Transportation	95
Media & Entertainment	94

Regional presence of AI

Region	Value
North America	%62
Western Europe	%19
Oceana, Eastern & South-Eastern Asia	%8
Middle East	%4
Central & Southern Asia	%4

Source: Omdia

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Automation impact assessment: automation risk by occupation

Oxford's analysis utilized machine learning to assess the likelihood of automation risk for over 700 occupations. Due to its use of SOC codes from 2010, EY US extended the assessment to new or changed occupation codes through 2020 SOC taxonomy changes. Below is a graph that shows all occupations according to their "computerizable" index from 0% to 100%. Important: Data shows <u>how</u> much of a job could be automated. Higher automation potential implies either job losses and/or significant use new technologies to boost productivity.

Potential for automation of jobs tasks

Half of all SOC codes have 62% or more of their job duties at risk of automation

All 750+ SOC occupations

Source: EY using data from Oxford University
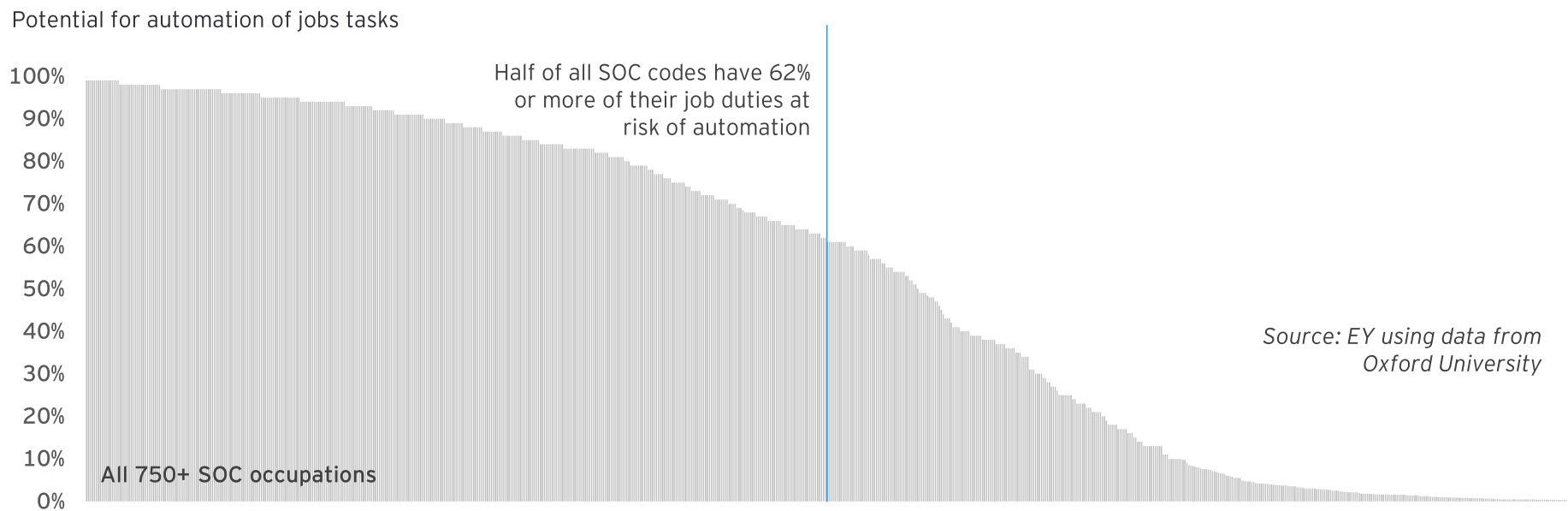
Top occupations for <u>highest</u> automation risk:
- Account Clerks
- Data entry Keyers
- Librarians and library technicians
- Insurance Underwriters
- Tax preparers
- Financial and Investment analysts

Top occupations for <u>lowest</u> automation risk:
- Recreational Therapists
- Emergency Management directors
- Supervisors of Mechanics
- Mental Health workers
- Occupational Therapists
- Orthotists and Prosthetists
- Health Care social workers

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Automation impact assessment: workforce automation impact

Specific to the region, EY US produced an analysis of occupation clusters that uses Oxford's automation risk factor for individual occupations. We aggregated the risk factors by occupation cluster to provide a weighted index to show where automation is most likely to occur. Large clusters in the region, such as Hospitality, Back Office, Personal Services, Logistics, Manufacturing (Mfg.)/Production, Financial and Agricultural occupations (not industries) show the highest risk of automation. The fastest-growing occupation clusters, such as Engineering, Business and Computer, have below-average automation risk.

Regional occupation cluster analysis for automation risk
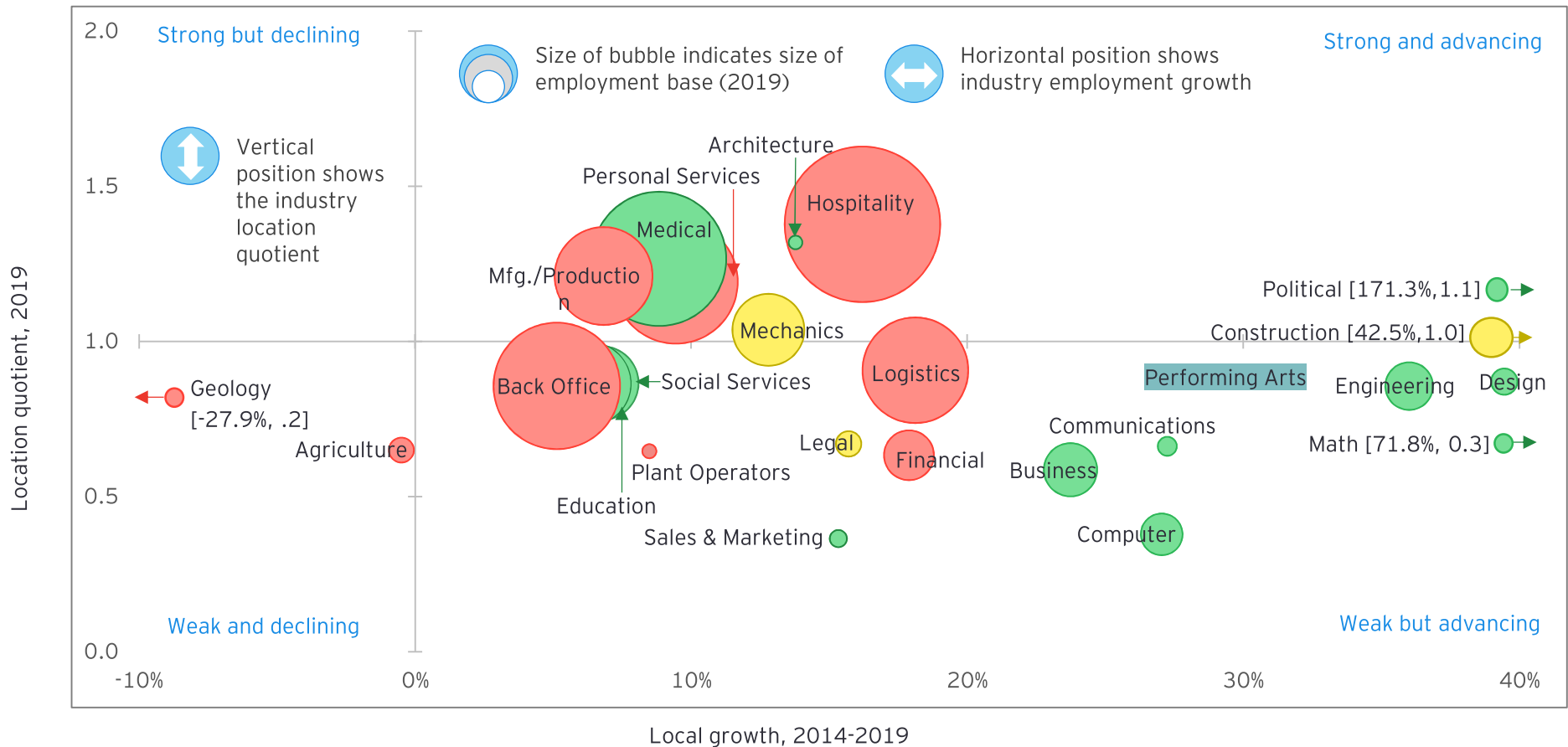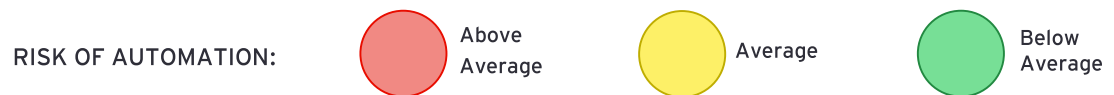
Automation impact assessment: workforce automation impact

The data in the following table reflects the previous slide's bubble chart:

Workforce automation impact on regional workers

Cluster	Employment ('19)	Employment growth ('14-'19)	LQ ('19)	% Risk of automation	Cluster	Employment ('19)	Employment growth ('14-'19)	LQ ('19)	% Risk of automation
Agriculture	1,049	-0.5%	0.7	74.9%	Legal	1,085	15.7%	0.7	47.1%
Architecture	338	13.8%	1.3	23.1%	Logistics	17,645	18.1%	0.9	67.8%
Back Office	25,203	5.1%	0.9	71.6%	Math	90	71.8%	0.3	18.6%
Business	4,573	23.7%	0.6	23.2%	Mechanics	8,245	12.8%	1.0	58.3%
Communications	626	27.2%	0.7	18.7%	Medical	28,354	8.8%	1.3	23.4%
Computer	2,837	27.0%	0.4	15.5%	Performing Arts	359	8.5%	0.6	77.2%
Construction	8,553	42.5%	1.0	54.6%	Personal Services	519	15.3%	0.4	19.8%
Design	1,154	39.4%	0.9	24.3%	Plant Operators	721	31.7%	0.9	8.2%
Education	10,872	6.3%	0.9	14.7%	Political	211	171.3%	1.1	17.7%
Engineering	3,678	36.0%	0.9	18.8%	Production	15,161	6.8%	1.2	76.1%
Financial	4,019	17.9%	0.6	66.6%	Sales & Marketing	24,112	9.4%	1.2	73.7%
Geology	75	-27.9%	0.2	81.1%	Social Service	8,672	6.8%	0.9	35.6%
Hospitality	37,957	16.2%	1.4	77.6%	**Total**	**206,095**	**12.7%**	**1.0**	**55.8%**

Sources: EY, EMSI, Oxford University

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Automation impact assessment: top at-risk occupations by education

Below, we provide the occupations with the 1) highest number of FTE jobs at risk and 2) have 80% or more of their job tasks that are prone to automation. For example, while high school diploma jobs employ 80,000 people in the Land of Sky region, its 63% automation risk factor results in a full-time equivalent of 50,600 jobs at risk to automation.

Total jobs at risk within the region by education level

| No formal educational credential | High school diploma or equivalent | Cer... | Ba... | Associ... | S... c... |

High School Diploma: 50,660 Jobs at Risk

Office Clerks, General, 96%, 4k

Receptionists and Information Clerks, 96%, 3k

Secretaries and Admin. Assistants, 96%, 2k

Misc. Assemblers and Fabricators, 97%, 2k

Sales Reps., Wholesale and Manuf., 85%, 2k

Sales Reps. of Services, 99%, 1k

Shipping, Receiving, & Inventory Clerks, 98%, 1k

Electrical, Electromechanical Assemblers, 95%, 1k

Passenger Vehicle Drivers, 89%, 1k

Inspectors, Testers, and Weighers, 98%, 1k

Hotel, Motel, and Resort Desk Clerks, 94%, 1k

Driver/Sales Workers, 98%, 1k

Machine Operators and Tenders, 98%, 1k

Medical and Admin. Assistants, 81%, 1k

Pharmacy Technicians, 92%, 1k

Some College: 3,890 Jobs at Risk

Bookkeeping, Clerks, 98%, 2500

Order Clerks, 98%, 90

No Education: 51,110 Jobs at Risk

Fast Food and Counter Workers, 96%, 7k

Retail Salespersons, 92%, 7k

Cashiers, 97%, 6k

Waiters and Waitresses, 94%, 5k

Cooks, Restaurant, 96%, 3k

Freight, Stock, and Material Movers, 85%, 3k

Landscaping and Groundskeeping, 95%, 1k

Food Preparation Workers, 87%, 1k

Hosts and Hostesses, 97%, 1k

Cooks, Fast Food, 81%, 1k

Construction Laborers, 88%, 1k

Ind. Truck and Tractor Operators, 93%, 1k

Counter and Rental Clerks, 97%, 1k

Dining Attendants and Bar Helpers, 91%, 1k

Cooks, Institution and Cafeteria, 83%, 1k

Associate's: 1,760 Jobs at Risk

Paralegals, 94%, 460

HR Assistants, 90%, 110

Electronic Technologists and Technicians, 84%, 70

Legal Support Workers, Misc., 94%, 40

Bachelor's: 5,050 Jobs at Risk

Accountants and Auditors, 94%, 860

Human Resources Specialists, 95%, 510

Loan Officers, 98%, 350

Edu. Instruction and Library Workers, 99%, 190

Financial & Investment Analysts, 99%, 190

Librarians & Media Collections Spec. 99%, 170

Property Appraisers and Assessors, 90%, 50

Certificate: 6,090 Jobs at Risk

Medical Transcriptionists, 89%, 140

Tool and Die Makers, 84%, 100

Prepress Technicians and Workers, 97%, 90

Library Technicians, 99%, 70

Manicurists and Pedicurists, 95%, 50

Barbers, 80%, 20

Insurance Appraisers, Auto Damage, 98%, 20

Advanced: 200 Jobs at Risk

No occupations are above 80% threshold

Source: EY analysis of Oxford and EMSI data

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Automation impact assessment: AI industry integration

AI technologies are too numerous to list but are already integrated into the daily lives of most people, oftentimes without people knowing they are interacting with AI. It can be as simple as helping us fill in our Internet searches to complex tasks such as helping doctors identify cancer in X-rays. Much has been touted about the future of AI-powered autonomous vehicles (with billions of dollars spent on research) but many instances of AI are more augmentation to assist workers such as identifying pallets in transport or risks in mortgage applications. Some sample use cases of AI include:

MANUFACTURING

Sample use cases:

- Robots
- Industry 4.0
- Inventory management
- Energy reduction

TOURISM, RECREATION AND RETAIL

- Augmented reality
- Big data analytics
- Customer service/ chatbots

BUSINESS & PROFESSIONAL SERVICES

- FinTech
- Big data analytics
- High-volume loan approvals
- Customer service/ chatbots

HEALTH & LIFE SCIENCES

- Drug discovery
- Health monitoring
- Diagnostics

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Appendix: Industry cluster performance by county, and industry and occupational descriptions

Industry composition: region

Although recent employment growth in the metro area has been varied by industry, the region's economy boasts several standout strengths. Nearly all industry clusters are growing, and the region possesses numerous relatively concentrated clusters. At twice the relative concentration of the US, Apparel & Textiles is the most concentrated industry in the region. Other notable industries with strong concentration that are also manufacturing-oriented include Materials, Entertainment, Industrial Machinery, Automotive and Consumer Goods Manufacturing. The region is also home to several smaller but fast-growing innovative-rich sectors, including Biomedical, Aerospace, and Agribusiness & Food.

Regional industry cluster performance

Cluster	Employment (2019)	Employment growth (2014-2019)	Location quotient (2019)	Cluster	Employment (2019)	Employment growth (2014-2019)	Location quotient (2019)
Health care	35,454	9.8%	1.3	Transportation & Logistics	4,525	9.9%	0.6
Entertainment	32,077	17.2%	1.4	Electronics	2,740	21.1%	0.9
Retail	31,562	12.0%	1.2	Metalworking	1,516	9.6%	0.6
Construction	14,713	32.6%	1.0	Research	1,503	8.5%	0.5
Industrial Machinery	5,998	5.6%	1.3	Software/Info. Tech.	1,311	29.7%	0.3
Agribusiness & Food	3,867	82.7%	1.2	Biomedical	1,029	121.9%	0.9
Non-Profits	2,463	27.2%	1.3	Energy	781	22.5%	0.4
Automotive	2,387	37.3%	1.2	Aerospace	664	89.3%	0.9
Apparel & Textiles	1,430	15.2%	2.0	Furniture	508	52.8%	0.7
Consumer Goods Mftg	1,166	26.9%	1.2	Mining & Logging	199	29.7%	0.7
Education	16,035	3.3%	0.8	Materials	4,422	-14.0%	1.7
Government	14,450	4.1%	0.9	Creative Content	2,340	-5.6%	0.8
Back Office	10,473	3.1%	0.7	Telecom Services	657	-5.9%	0.7
Finance	5,950	10.7%	0.6	**Total**	**206,095**	**12.7%**	**1.0**
Professional Services	5,095	22.2%	0.8				

Strong & Advancing	Weak but Advancing	Strong but Declining	Weak & Declining

EY

Industry composition: Buncombe County

Buncombe County experienced strong employment growth between 2014 and 2019 with all but five industry clusters experiencing growth. The Automotive and Aerospace clusters experienced the largest percentage increase in the number of jobs while Industrial Machinery and Apparel & Textiles represented the highest concentration of workers among industry clusters. Health Care, Entertainment and Retail are the largest industry clusters within the county and are also more concentrated as compared to the US.

Buncombe County industry cluster performance

Cluster	Employment (2019)	Employment growth (2014-2019)	Location quotient (2019)	Cluster	Employment (2019)	Employment growth (2014-2019)	Location quotient (2019)
Health Care	24,343	12.9%	1.3	Research	1,131	1.4%	0.5
Entertainment	22,618	19.2%	1.5	Software/Info. Tech.	975	48.1%	0.3
Retail	19,898	9.9%	1.2	Metalworking	951	16.0%	0.6
Construction	9,098	42.8%	1.0	Automotive	843	184.7%	0.7
Industrial Machinery	4,917	4.1%	1.7	Biomedical	669	64.9%	0.8
Materials	2,382	48.2%	1.4	Energy	468	27.5%	0.4
Non-Profits	1,771	21.0%	1.4	Furniture	219	85.8%	0.5
Consumer Goods Mftg	792	43.4%	1.3	Mining & Logging	116	32.6%	0.6
Apparel & Textiles	719	29.7%	1.6	Creative Content	1,819	-14.3%	1.0
Aerospace	664	90.2%	1.4	Back Office	7,079	-1.7%	0.7
Government	9,635	3.5%	0.9	Transportation & Logistics	3,389	-0.8%	0.7
Education	9,439	5.6%	0.8	Electronics	1,000	-32.5%	0.5
Finance	4,181	15.8%	0.6	Telecom Services	365	-6.2%	0.6
Professional Services	3,648	14.4%	0.9	**Total**	**135,002**	**13.3%**	**1.0**
Agribusiness & Food	1,584	53.8%	0.7				

| Strong & Advancing | Weak but Advancing | Strong but Declining | Weak & Declining |

Source: EMSI

EY

Industry composition: Henderson County

Among the counties that comprise the metro region, Henderson County experienced the largest growth in employment between 2014 and 2019. Of the industry clusters that were included in the analysis, the Biomedical cluster experienced that fastest growth in employment. Health Care, Retail and Entertainment were the largest clusters in terms of overall employment and were responsible for over 44% of total employment. The Automotive, Apparel & Textile, and Agribusiness & Food industry clusters are between two and four times more concentrated as compared to the US, indicating that the county has demonstrated strengths within each industry cluster.

Henderson County industry cluster performance, 2014-2019

Cluster	Employment (2019)	Employment growth (2014-2019)	Location quotient (2019)	Cluster	Employment (2019)	Employment growth (2014-2019)	Location quotient (2019)
Health Care	6,679	6.4%	1.2	Creative Content	384	141.5%	0.7
Retail	6,425	22.0%	1.3	Non-Profits	327	57.7%	0.9
Entertainment	4,693	12.3%	1.0	Software/Info. Tech.	231	20.6%	0.3
Construction	3,168	22.5%	1.2	Research	228	55.3%	0.4
Automotive	1,518	6.6%	4.1	Telecom Services	166	8.6%	0.9
Agribusiness & Food	1,440	67.0%	2.2	Energy	155	44.5%	0.4
Electronics	611	88.1%	1.0	Biomedical	123	257.8%	0.5
Metalworking	539	3.9%	1.1	Mining & Logging	30	20.2%	0.5
Furniture	168	8.4%	1.2	Materials	807	-42.5%	1.6
Back Office	2,360	18.2%	0.8	Apparel & Textiles	529	-18.2%	3.9
Government	1,991	9.9%	0.7	Consumer Goods Mftg	330	-1.6%	1.8
Professional Services	905	66.5%	0.8	Education	2,902	-1.6%	0.8
Transportation & Logistics	896	85.6%	0.6	Finance	868	-1.5%	0.4
Industrial Machinery	744	7.4%	0.9	**Total**	**39,899**	**14.1%**	**1.0**

Strong & Advancing	Weak but Advancing	Strong but Declining	Weak & Declining

Aerospace was not included due to lack of industry presence in the county

Source: EMSI

EY

Industry composition: Transylvania County

Transylvania County experienced the emergence of several employment clusters between 2014 and 2019, leading to several industry clusters demonstrating impressive growth. Specifically, the Biomedical industry cluster went from having zero employment in 2014 to having 163 workers as of 2019. Similar growth was seen in the Automotive cluster with Agribusiness & Food posting significant gains during the same time. Entertainment, Health Care, Education and Retail were the top clusters for employment in 2019, accounting for more than 56% of total employment.

Transylvania County industry cluster performance, 2014-2019

Cluster	Employment (2019)	Employment growth (2014-2019)	Location quotient (2019)	Cluster	Employment (2019)	Employment growth (2014-2019)	Location quotient (2019)
Entertainment	1,520	13.1%	1.4	Back Office	270	21.9%	0.4
Health Care	1,430	3.4%	1.1	Professional Services	153	14.2%	0.5
Education	1,188	11.4%	1.4	Research	98	25.7%	0.7
Retail	1,180	0.3%	1.0	Transportation & Logistics	42	18.6%	0.1
Construction	919	31.7%	1.4	Furniture	13	6.0%	0.4
Government	844	2.4%	1.2	Automotive	12	1,200.0%	0.1
Electronics	375	28.7%	2.7	Software/Info. Tech.	36	-33.4%	0.2
Non-Profits	227	36.0%	2.6	Industrial Machinery	22	-53.7%	0.1
Agribusiness & Food	178	1564.8%	1.2	Materials	10	-80.4%	0.1
Biomedical	163	16,300.0%	3.0	Creative Content	15	-84.4%	0.1
Telecom Services	76	37.3%	1.7	**Total**	**9,379**	**12.8%**	**1.0**
Finance	308	23.7%	0.6				

Strong & Advancing	Weak but Advancing	Strong but Declining	Weak & Declining

Aerospace, Apparel & Textiles, Consumer Goods Manufacturing, Energy, Metalworking, and Mining & Logging were not included due to lack of industry presence in the county

Source: EMSI

EY

Industry composition: Madison County

Madison County has the smallest presence of industry clusters within the region and the smallest growth in employment. Education, Health Care, Entertainment and Government are the largest clusters in the county and are responsible for nearly 60% or total employment in 2019. Madison County experienced the emergence of several employment clusters between 2014 and 2019, leading to several industry clusters demonstrating impressive growth. Specifically, the Furniture and Professional Services industry clusters emerged within the county. The Mining & Logging, Education, Agribusiness & Food, and Materials industry clusters are all at least twice as concentrated in Madison County as compared to the US.

Madison County industry cluster performance, 2014-2019

Cluster	Employment (2019)	Employment growth (2014-2019)	Location quotient (2019)	Cluster	Employment (2019)	Employment growth (2014-2019)	Location quotient (2019)
Health Care	581	8.9%	1.1	Professional Services	20	2,000.0%	0.2
Entertainment	516	11.8%	1.1	Education	808	-6.9%	2.2
Agribusiness & Food	142	72.6%	2.2	Government	492	-3.1%	1.6
Non-Profits	42	27.3%	1.1	Materials	104	-39.9%	2.0
Mining & Logging	26	46.7%	4.5	Electronics	72	-18.9%	1.2
Furniture	25	2,500.0%	1.9	Energy	49	-9.5%	1.3
Retail	426	1.7%	0.8	Back Office	73	-47.6%	0.2
Construction	187	21.4%	0.7	Finance	37	-12.9%	0.2
Transportation & Logistics	49	251.2%	0.3	Software/Info. Tech.	11	-32.3%	0.1
Industrial Machinery	45	57.2%	0.5	**Total**	**4,003**	**4.9%**	**1.0**

Strong & Advancing	Weak but Advancing	Strong but Declining	Weak & Declining

Aerospace, Apparel & Textiles, Automotive, Biomedical, Consumer Goods Manufacturing, Creative Content, Metalworking, Research, and Telecom Services were not included due to lack of industry presence in the county

Source: EMSI

EY

Industry composition: Haywood County

Between 2014 and 2019, Haywood County experienced a significant percentage change in employment in several industry clusters, including Electronics, Apparel & Textiles, Agribusiness & Food, and Biomedical. Despite a decrease in employment, the Materials cluster is nearly five times more concentrated in Haywood County as compared to the US. The Apparel & Textiles and Electronics clusters are more than twice as concentrated in the county as compared to the US. While there has been growth in higher-wage industry clusters, the county's three largest clusters account for more than 47% of total employment and include the Retail, Entertainment and Health Care clusters.

Haywood County industry cluster performance, 2014-2019

Cluster	Employment (2019)	Employment growth (2014-2019)	Location quotient (2019)	Cluster	Employment (2019)	Employment growth (2014-2019)	Location quotient (2019)
Retail	3,410	12.5%	1.5	Energy	78	0.3%	0.5
Entertainment	2,642	12.0%	1.3	Biomedical	69	366.7%	0.7
Government	1,482	4.2%	1.1	Non-Profits	53	6.6%	0.3
Construction	1,260	6.3%	1.0	Consumer Goods Mftg	30	74.7%	0.4
Electronics	638	1,035.0%	2.4	Health Care	2,369	-5.9%	1.0
Agribusiness & Food	491	420.2%	1.7	Education	1,658	-1.5%	1.0
Apparel & Textiles	151	810.3%	2.5	Materials	1,096	-41.4%	4.8
Furniture	62	63.0%	1.0	Finance	496	-4.8%	0.5
Back Office	653	14.3%	0.5	Telecom Services	50	-40.4%	0.6
Professional Services	348	21.3%	0.6	Software/Info. Tech.	44	-41.9%	0.1
Industrial Machinery	240	71.1%	0.6	Research	28	-21.3%	0.1
Transportation & Logistics	100	8.5%	0.2	**Total**	**17,812**	**7.5%**	**1.0**
Creative Content	83	40.7%	0.3				

Strong & Advancing	Weak but Advancing	Strong but Declining	Weak & Declining

Source: EMSI

EY

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 the 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 the 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 Manufacturing: Operations engaged in the 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 education institutions, including elementary and secondary schools (government and private), colleges, universities, professional schools, trade schools, and educational support services.

EY

Industry cluster descriptions

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

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 the manufacture and wholesale of household, office and commercial furniture and cabinets.

Government: Operations of federal, state and local government agencies, waste collection and management, and water treatment. Military employment is not included in these numbers.

Health Care: Operations engaged in direct provision of health care 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.

EY

Industry cluster descriptions

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.

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.

EY

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 post-secondary educational attainment.

Architecture: Includes residential, commercial, industrial, and landscape architects. Architecture occupations require a bachelor's degree and may require additional certifications depending on the position.

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 executives, managers, analysts, and various other roles. Many Business occupations require at least some post-secondary education and some require a master's degree.

Communications: Includes advertising, public relations, digital media and other related occupations, as well as writers, editors, and analysts. Many 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 or other post-secondary training.

Construction: Includes construction managers and laborers, equipment operations, and specialized trade contractors. Most Construction occupations require a high school diploma and an apprenticeship and/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. Most Education occupations require a bachelor's degree and a significant number require a master's degree.

EY

Occupation Cluster Descriptions

Engineering: Includes engineers, with the exception of those in positions that primarily involving computer hardware or software development. The majority of Engineering occupations require a bachelor's degree.

Financial: Includes financial advisors and analysts, accountants, loan officers, and other roles. Most Financial occupations require a bachelor's degree and/or specialized certifications.

Geology: Includes operators of oil, gas, and mining equipment. The majority of Geology occupations require a high school diploma, with some 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. Many legal positions require a Bachelor's or graduate degree, with some roles only requiring a high school diploma or other post-secondary credential.

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 typically require a minimum of 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 from on-the-job training without a high-school diploma to advanced doctorate degrees.

EY

Occupation Cluster Descriptions

Performing Arts: Includes occupations involved with athletic, dance, musical, televised, and theatrical performances. Performing Arts occupations typically require at least a high school diploma and/or specialized training.

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 and/or planning, including urban planners, geographers, political scientists and legislative staff. Many Political occupations require a bachelor's degree or above.

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

Production: Includes assembly workers, machinists, and equipment operators in a variety of manufacturing-oriented industries. Requirements may include a high school diploma, along with an apprenticeship and/or other on-the-job training.

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.

EY