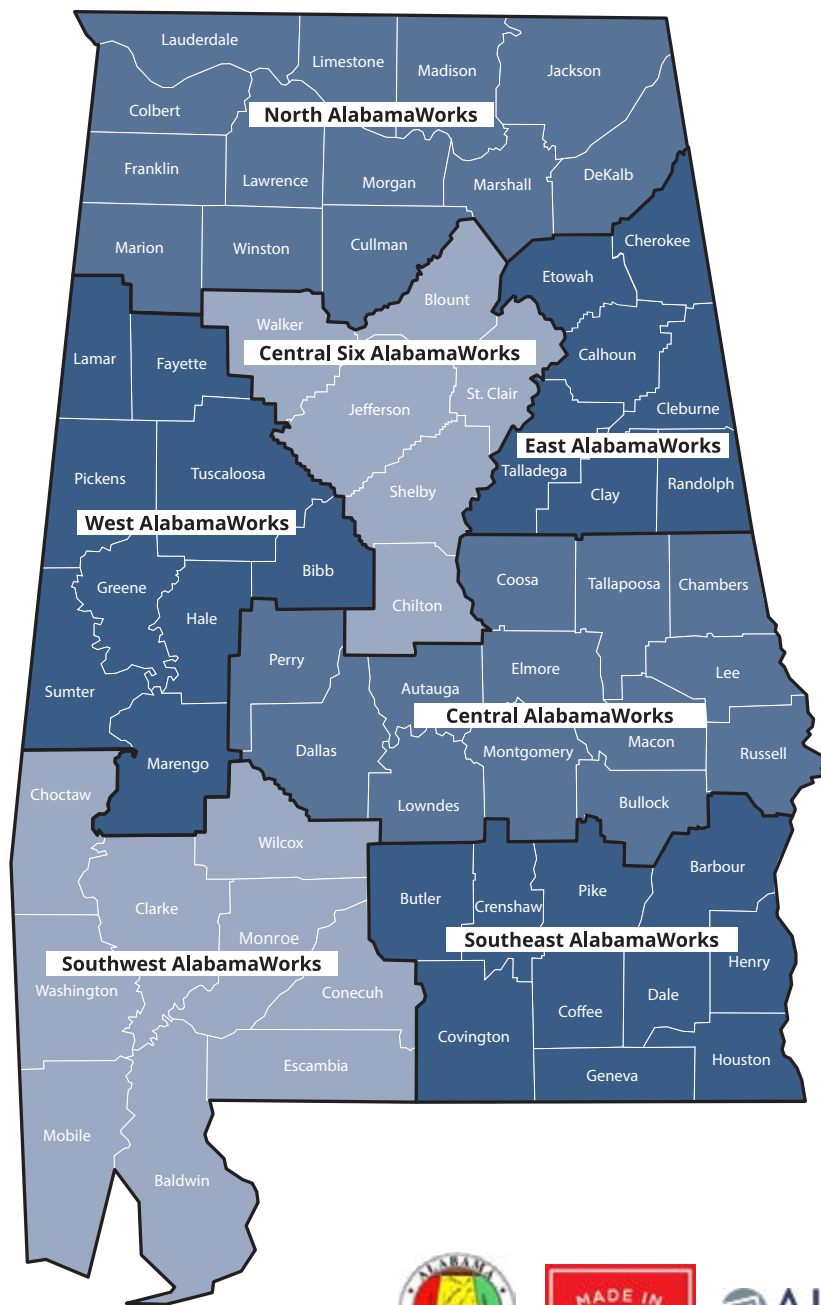


STATE OF THE WORKFORCE REPORT XIV: ALABAMA



THE UNIVERSITY OF
ALABAMA

November 2020

Produced by:

Samuel Addy, Ph.D., *Sr. Res. Economist & Assoc. Dean for Economic Development Outreach*

Kilungu Nzaku, Ph.D., *Assistant Research Economist*

Ahmad Ijaz, *Executive Director & Director of Economic Forecasting*

Stephanie Normanyo, *Economic Forecaster*

Nyesha Black, Ph.D., *Director of Socioeconomic Analysis & Demographics*

Susannah Robichaux, *Socioeconomic Analyst*

Viktoria Riiman, *Socioeconomic Analyst*

Shannon Murphy, Ph.D., *Socioeconomic Analyst*

Morgan Cordle, *Associate Director of Research & Outreach*

Katie Howard, *Senior Graphic Designer*

Center for Business and Economic Research

Culverhouse College of Business

The University of Alabama

Box 870221, Tuscaloosa, AL 35487-0221

Tel: (205) 348-6191 | Fax: (205) 348-2951

uacber@cba.ua.edu

Dissemination

Nisa Miranda, *Executive Director*, University of Alabama Center for Economic Development

Underemployment Survey

Debra McCallum, *Director & Senior Research Scientist*, Institute for Social Science Research

Michael Conaway, *Capstone Poll Project Coordinator*, Institute for Social Science Research

ACKNOWLEDGMENTS

The completion of this project was due to the timely contributions of many people. We are very grateful to the Labor Market Information (LMI) Division of the Alabama Department of Labor (ADOL). LMI provided significant staff time and this report would not have been possible without large amounts of data from LMI. AIDT, the Alabama Department of Commerce, and The University of Alabama provided funding for this project.

We also appreciate our colleagues at the Center for Business and Economic Research, the Capstone Poll, the Institute for Social Science Research, and the University Center for Economic Development for their help on various phases of this research project. Last, but not least, much gratitude is owed to the thousands of Alabamians who responded to the extensive survey on the state's workforce and related issues, as well as to the community and industry leaders whose work on these issues provides the critical data required to produce this comprehensive report.

CONTENTS

Acknowledgments.....	i
Summary	iii
Labor Utilization and Supply Flows	v
Workforce Supply	1
Labor Force Activity	1
Commuting Patterns	3
Population	4
Per Capita Income	6
Educational Attainment	6
Underemployment and Available Labor	7
Workforce Demand.....	11
Industry Mix.....	11
Job Creation and Net Job Flows.....	12
High-Demand, Fast-Growing, High-Earning, and Sharp-Declining Occupations.....	12
Skills and Skills Gap Analyses.....	17
Education and Training Issues	21
Implications and Recommendations.....	22

SUMMARY

This report analyzes Alabama workforce supply and demand issues using available metrics of workforce characteristics and presents implications and recommendations.

Alabama had an unemployment rate of 3.3 percent in March 2020, with 73,858 unemployed. An underemployment rate of 22.4 percent for 2019 means that the state has an available labor pool of 551,554 workers. This number also includes 477,696 underemployed workers who are looking for better jobs and are willing to commute farther and longer for such jobs.

Net out-commuting jumped from 20,196 in 2005 to 41,674 in 2017 and commute time and distance slightly rose in 2019 from the previous year implying that congestion worsened statewide. This might have changed in 2020 due to the COVID-19 pandemic but as the state economy recovers and normality returns, congestion is likely to be a challenge especially in the major metro areas. Continuous maintenance and development of transportation infrastructure and systems is therefore essential.

By sector, the top five sectors in the state are manufacturing, health care and social assistance, retail trade, accommodation and food services, and educational services. These five industries provided 1,108,597 jobs or 58.4 percent of the state total in the first quarter of 2019. Among these five sectors, only the manufacturing sector had an average wage that is above the state's average monthly wage of \$3,614 at \$4,638. Economic development should aim to diversify and strengthen the state's economy by retaining, expanding, and attracting more high-wage sectors. Workforce development should also focus on preparing workers for these industries.

On average, 80,847 jobs were created per quarter from the second quarter of 2001 to the first quarter of 2019; quarterly net job flows averaged 7,888. Job creation is the number of new jobs that are created either by new businesses or through expansion of existing firms. Net job flows reflect the difference between current and previous employment at all businesses.

The top five high-demand occupations are Combined Food Preparation and Serving Workers, Including Fast Food; Retail Salespersons; Laborers and Freight, Stock, and Material Movers, Hand; Assemblers and Fabricators, All Other, Including Team Assemblers; and Janitors and Cleaners, except Maids and Housekeeping Cleaners.

The top five fast-growing occupations are Occupational Therapy Assistants; Information Security Analysts; Computer Numerically Controlled Machine Tool Programmers, Metal and Plastic; Electrical and Electronics Installers and Repairers, Transportation Equipment; and Physician Assistants.

The top 50 high-earning occupations are in health, management, postsecondary education, science, and engineering fields and have a minimum average salary of \$106,086. Nine of the top 10 high-earning jobs are in health.

Of the top 40 high-demand, top 20 fast-growing, and top 50 high-earning occupations, no occupations fall into all three categories. Only two—General and Operations Managers and Financial Managers—are both high-demand and high-earning occupations. Four occupations are both high-demand and fast-growing.

Of the state's 796 occupations, 146 are expected to decline over the 10-year period from 2018-2028. Twenty occupations are expected to sharply decline in that period, dropping by a minimum of 160 jobs or at least 2.0 percent. Education and training for these 20 occupations should slow accordingly.

Educational requirements for jobs keep rising. This is especially true for high-demand, fast-growing, and high-earning occupations, which demonstrates the importance of education in developing tomorrow's workforce. In the future, more jobs will require postsecondary education and training.

The importance of basic skills for high-demand, high-growth, and high-earning jobs also indicates a strong need for training in these skills. The pace of training needs to increase for technical, basic, and systems skills, while the scale of training must be raised for basic and social skills. Ideally, all high school graduates should possess basic skills so that postsecondary and higher education can focus on other and more complex skills. Employers should be an integral part of planning for training as they can help identify future needs and any existing gaps.

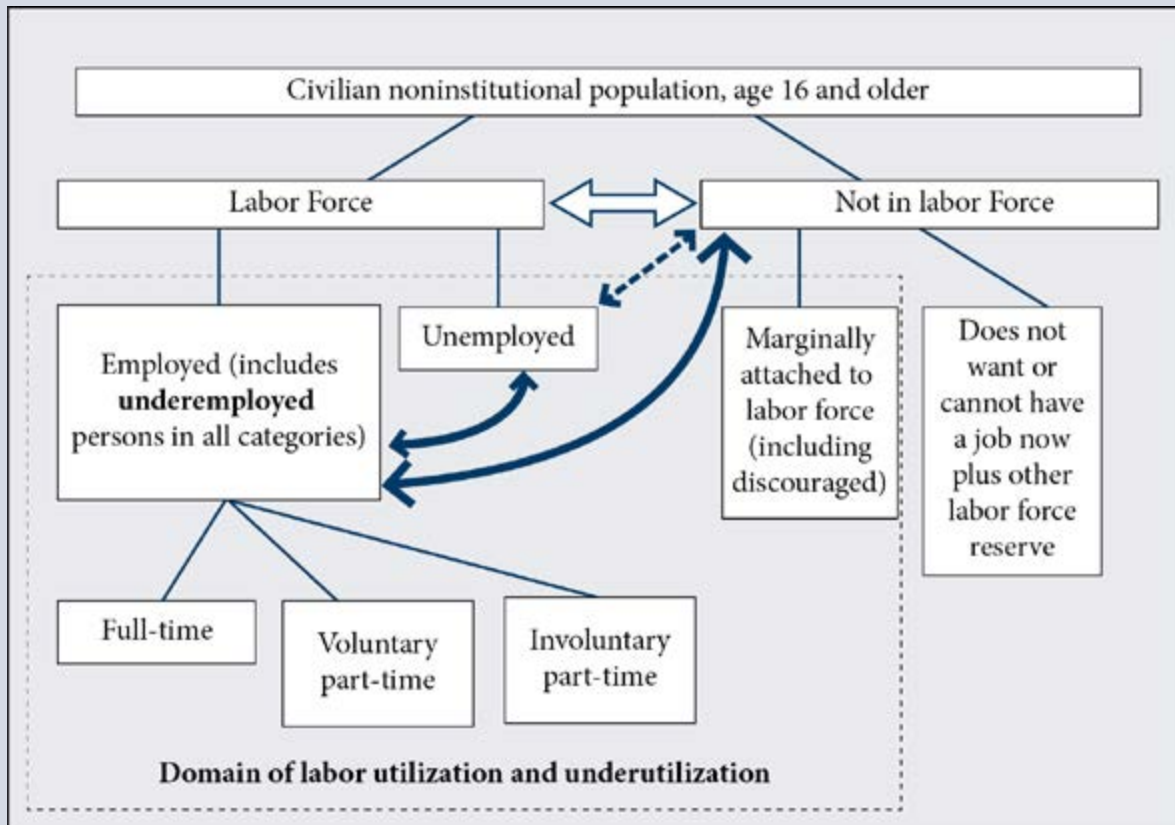
Worker shortfalls are projected to be 273,000 and 310,000 for 2028 and 2030, respectively. These shortfalls are projected to rise to 403,000 in 2035, and reach 459,000 by 2040. Knowing that there is a skill gap and expected worker shortfall through 2040, the state should prioritize these issues and worker shortfalls for critical occupations will need to be addressed continuously. Strategies to address skill needs and worker shortfalls might include: (1) improving education and its funding; (2) using economic opportunities to attract new residents; (3) focusing on hard-to-serve populations (e.g. out-of-school youth); (4) lowering the high school dropout rate; (5) continuing and enhancing programs to assess, retrain, and place dislocated workers; (6) encouraging older worker participation in the labor force; and (7) facilitating in-commuting.

Improving education is important because (i) a highly educated and productive workforce is a critical economic development asset, (ii) productivity rises with education, (iii) educated people are more likely to work, and (iv) it yields high private and social rates of return on investment. Workforce development must view all of education and other programs (e.g. adult education, career technical training, worker retraining, career readiness, etc.) as one system. Funding to support workforce development may require tax reform at state and local levels and should provide flexibility as workforce needs change over time and demand different priorities. Publicizing both private and public returns to education can encourage individuals to raise their own educational attainment levels, while also promoting public and legislative support for education.

Higher incomes that come with improved educational attainment and work skills will help to increase personal income for the state as well as raise additional tax revenues for the state and local (county and city) tax jurisdictions. This is especially important for a state that has low population and labor force growth rates as well as low per capita income.

Together, workforce development and economic development can build a strong, well-diversified Alabama economy. Indeed, we cannot achieve success in one without the other.

LABOR UTILIZATION AND SUPPLY FLOWS



Source: Addy et al¹ and Canon et al²

The chart above illustrates labor utilization and supply flows of labor market dynamics. The civilian noninstitutional population age 16 and above is comprised of participants in the labor force and nonparticipants. The labor force is made of employed and unemployed persons. Unemployed persons do not have a job but are actively searching for work. Employed persons include fully employed and underemployed persons in all categories of work (full-time, voluntary part-time, and involuntary part-time). Nonparticipants in the labor force include retirees (voluntary and involuntary), people who do not want to or cannot work for various reasons (e.g., disability, caring for family members, or school or training, etc.), discouraged workers, and other labor force reserves. It has been suggested that a subgroup of nonparticipants referred to as the “waiting group” is more likely than the rest of the nonparticipants to take a job if wages and conditions are satisfactory, but does not actively search for work. New evidence has shown that between January 2003 and August 2013, the flow of nonparticipants into employment is 1.6 times that of unemployed persons transitioning into employment, which may be due to the presence of the waiting group.^{1,2} Nonparticipant flows to employment are larger in services, management, and professional occupations while unemployed flows to employment are higher in physically intensive occupations such as construction workers and miners. Industry effects should vary by the type and number of occupations they contain. This finding enhances the common understanding of labor market dynamics and influences workforce availability and skills gap analyses.

¹Addy, S.N., Bonnal, M., and Lira, C. (2012). Towards a More Comprehensive Measure of Labor Underutilization: The Alabama Case, *Business Economics*, vol. 47(3).

²Canon, M.E., Kudlyak, M., and Reed, M. (2014). Not Everyone Who Joins the Ranks of the Employed was “Unemployed”, *The Regional Economist*, January.

WORKFORCE SUPPLY

Labor Force Activity

The labor force includes all persons in the civilian noninstitutional population who are age 16 and over and either have a job or are actively looking for one. Typically, those who have no job and are not looking for one are not included (e.g. students, retirees, and disabled and discouraged workers). Table A.1 shows labor force information for Alabama and each of the state's seven AlabamaWorks regions for 2019 and in March 2020. Alabama labor force information is available from the Labor Market Information (LMI) Division of the Alabama Department of Labor. LMI compiles data in cooperation with the U.S. Bureau of Labor Statistics.

In 2019, unemployment rates for the state and all AlabamaWorks regions declined to record levels since

the end of the recession that began in 2007. Regional unemployment rates in 2019 ranged between 2.7 percent (Central Six AlabamaWorks) and 3.6 percent (Southwest), with a 3.0 percent annual average for the state. Alabama's unemployment rate was below the national rate of 3.7 percent. All the regions' unemployment rates were below the national rate, but only two—Central Six and North AlabamaWorks—had lower unemployment rates than the state average. This pattern continued in January and February 2020 before the novel coronavirus disease of 2019 (COVID-19) pandemic forced the state and the nation to shelter in place in mid-March as the pandemic ravaged across the country. As a result, March 2020 unemployment rates rose and ranged from 3.0 percent (Central Six and

Table A.1 AlabamaWorks Labor Force Information

	2019 Annual Average			
	Labor Force	Employed	Unemployed	Rate (%)
North AlabamaWorks	542,780	527,779	15,001	2.8
East AlabamaWorks	157,851	152,579	5,272	3.3
West AlabamaWorks	155,550	150,888	4,662	3.0
Central Six AlabamaWorks	545,722	530,971	14,751	2.7
Central AlabamaWorks	343,318	332,733	10,585	3.1
Southeast AlabamaWorks	161,706	156,601	5,105	3.2
Southwest AlabamaWorks	334,825	322,936	11,889	3.6
Alabama	2,241,747	2,174,483	67,264	3.0
United States	163,538,666	157,538,083	6,000,583	3.7
	2020 March			
	Labor Force	Employed	Unemployed	Rate (%)
North AlabamaWorks	535,287	519,093	16,194	3.0
East AlabamaWorks	155,528	149,430	6,098	3.9
West AlabamaWorks	154,181	149,153	5,028	3.3
Central Six AlabamaWorks	535,551	519,431	16,120	3.0
Central AlabamaWorks	336,710	325,034	11,676	3.5
Southeast AlabamaWorks	158,629	153,132	5,497	3.5
Southwest AlabamaWorks	329,592	316,347	13,245	4.0
Alabama	2,205,479	2,131,621	73,858	3.3
United States	162,537,000	155,167,000	7,370,000	4.5

Note: Not seasonally adjusted.

Source: Alabama Department of Labor and Bureau of Labor Statistics.

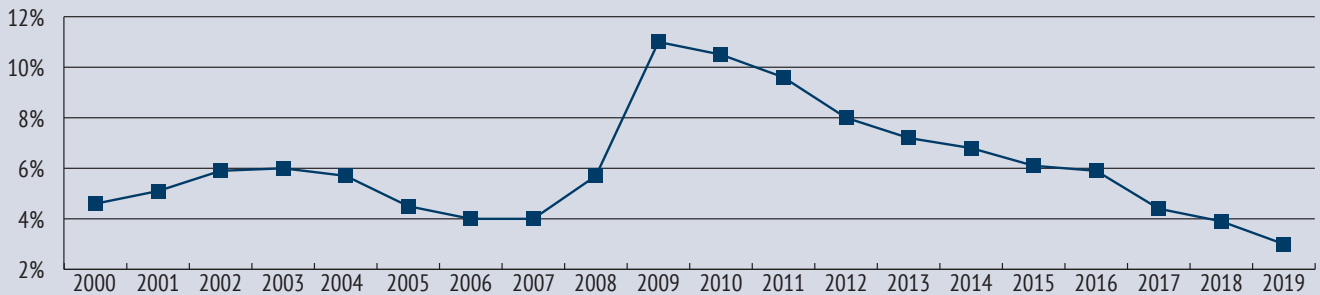
North) to 4.0 percent (Southwest) for the regions. Alabama's unemployment rate at this time was 3.3 percent, which was below the 4.5 percent for the nation. Central Six AlabamaWorks had the largest labor force followed by the North region; together, the two regions account for about 49 percent of Alabama's workforce. West AlabamaWorks had the smallest labor force, only about 7 percent of the state's workforce, followed closely by East.

The statewide unemployment declined to record lows in 2019 after peaking in double digits in 2009 due to the 2008 recession (Figure A.1). A slow economic recovery and shifts in the structure of the economy kept unemployment rates slightly above pre-recession levels for a prolonged period. However, by 2018 the unemployment rate declined to 3.9 percent, a rate below pre-recession levels. In 2019, the statewide unemployment rate dropped to a record low rate of 3.0 percent. Unfortunately, year-to-date monthly labor force data indicate significantly higher state unemployment rate for 2020 than seen in 2019 due to COVID-19, including the preliminary shutdown, massive job losses, and the overall persistence of the pandemic. In January 2020, the seasonally unadjusted unemployment rate was 3.2 percent

before falling to 2.9 percent in February. In mid-March, the unemployment rate rose to 3.3 percent as the US economy drastically contracted and entered into the current COVID-19-led recession. By April, the statewide unemployment reached 13.2 percent, the highest in decades, but it has since been declining. This is partly due to the much needed relief from Congress through the Coronavirus Aid, Relief, and Economic Security Act as well as improvements and availability of testing and personal protective equipment. In July and August, the statewide unemployment rate declined to 8.2 percent and 5.2 percent, respectively, but it rose to 6.4 percent in September. The long-lasting effects of the current pandemic-related recession and structural changes in the state's economy will remain a challenge over the next few years, especially in densely populated areas as well as in poor rural counties.

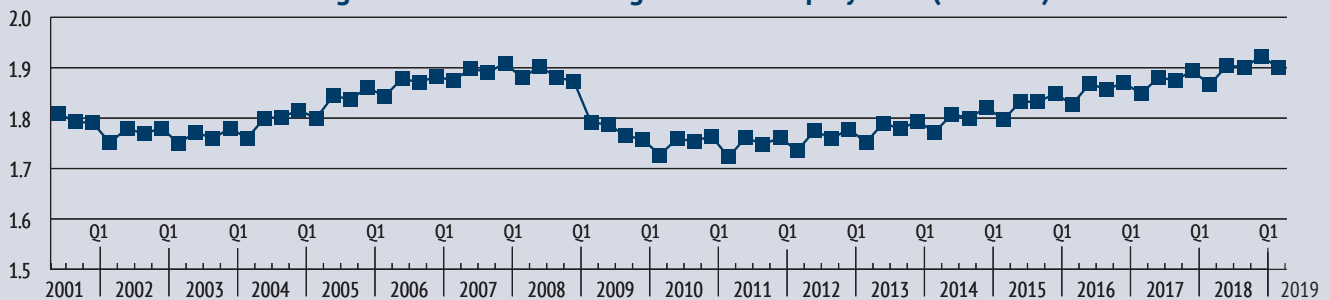
Nonagricultural employment of Alabama residents in the state averaged about 1.8 million from the second quarter of 2001 to the first quarter of 2019 (Figure A.2). The number of jobs in the state dropped from a high of 1.9 million in the fourth quarter 2007 to a low of 1.7 million in the first quarter of 2011 due to the 2008 recession. Employment has

Figure A.1 Alabama Unemployment Rate

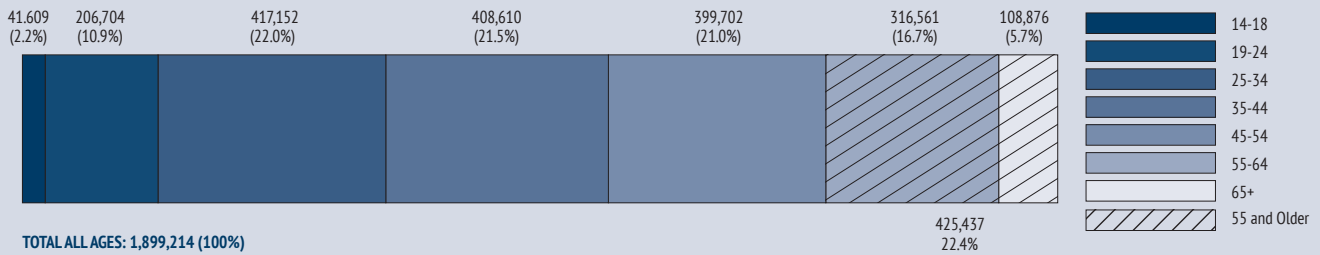


Source: Alabama Department of Labor.

Figure A.2 Alabama Nonagricultural Employment (Millions)



Source: Alabama Department of Labor and U.S. Census Bureau.

Figure A.3 Nonagricultural Employment - Workers by Age Group (First Quarter 2019)

Source: U.S. Census Bureau, Local Employment Dynamics Program.

Note: Rounding errors may be present. Nonagricultural employment is by place of work, not residence.

been recovering gradually since then and only surpassed pre-recession levels in the fourth quarter of 2018 when it reached 1,921,188 before dropping to 1,899,213 in the first quarter of 2019. Alabama's labor force participation rate improved from 2018 to 2019. In 2019, the state's labor force participation rate (58.0%) was lower than the nation's labor force participation rate (63.1%).

Figure A.3 shows worker distribution by age in Alabama for first quarter 2019. At 22.4 percent, older workers (age 55

and over) constitute a significant and growing part of total nonagricultural employment. The share of older workers, who are 55 and over, across the workforce investment areas ranged from 20.9 percent in West AlabamaWorks to 23.7 percent for Southeast AlabamaWorks. To meet long term occupational projections for growth and replacement, the labor force participation of younger residents must increase. Otherwise, older workers may have to work longer or in-state migration and in-commuting may need to grow.

Commuting Patterns

In 2005, more Alabama residents commuted out of the state to work than nonresidents who commuted in the state for work (Table A.2). Commuter outflow was 63,630 workers while inflow was at 43,434 workers. By 2017, the level of out-commuting increased by 77.6 percent to 112,982 and in-commuting rose by 64.2 percent to 71,308. Net out-commuting in that twelve-year period increased significantly from 20,196 in 2005 to 41,674 workers in 2017. Most of the commuting in-flows and out-flows were to and from Alabama's four neighboring states. The top destinations for the out-commuting Alabama residents in 2017 were Georgia (48,776), Mississippi (17,751), Florida (15,216), and Tennessee (14,549). Most of the in-commuting workers were from Georgia (20,445), Florida (14,294), Tennessee (13,355), and Mississippi (11,786).

Table A.2 also shows the one-way average commute time and distance for Alabama workers in the past five years. More workers reported slightly longer commute times and distances in 2019 compared to 2018, implying that congestion worsened somewhat across the state. Traffic is likely to lighten in 2020 as fewer workers commute due to the COVID-19 pandemic and the associated economic recession. However, as the state economy recovers and normality returns, congestion could pose challenges especially in troublesome and high-traffic areas such as the major metros. Congestion can delay or slow economic development by impeding the flow of goods and the mobility of workers. Thus, maintenance and development of transportation infrastructure and systems must continue.

Table A.2 Commuting Patterns in Alabama

Year	State Inflow		State Outflow		
2005	43,434		63,630		
2006	49,079		60,095		
2007	50,492		83,382		
2008	58,431		81,088		
2009	52,116		85,328		
2010	58,414		90,544		
2011	61,252		95,117		
2012	63,264		100,224		
2013	65,616		105,071		
2014	67,904		108,123		
2015	66,702		105,775		
2016	66,654		106,292		
2017	71,308		112,982		
	Percent of Workers				
Average commute time (one-way)	2015	2016	2017	2018	2019
Less than 20 minutes	49.2	50.1	48.7	48.7	47.7
20 to 40 minutes	28.9	27.2	28.3	28.0	28.8
40 minutes to an hour	10.3	10.3	10.5	10.2	10.1
More than an hour	3.6	3.7	4.4	3.3	4.0
Average commute distance (one-way)	2015	2016	2017	2018	2019
Less than 10 miles	41.3	41.9	40.8	40.3	40.3
10 to 25 miles	33.6	33.2	32.6	34.2	33.5
25 to 45 miles	15.4	15.2	15.7	15.3	14.7
More than 45 miles	7.0	7.0	8.6	7.1	8.7

Note: Rounding errors may be present.

Source: U.S. Census Bureau; Alabama Department of Labor; and Center for Business and Economic Research, The University of Alabama.

Population

The Alabama population count of almost 4.8 million for 2010 was 7.5 percent more than in 2000 (Table A.3). The state's population growth was lower than the nation's growth of 9.7 percent. During that period, population growth in the North and West AlabamaWorks regions were higher than the state's average. North AlabamaWorks had the highest population growth at 10.7 percent, followed by West (7.6 percent) and Central Six (7.1 percent). East AlabamaWorks had the lowest population growth at 3.3 percent. The 2019 population estimates show a 2.6 percent population increase for the state since 2010 with much of the growth occurring in the North and Southwest AlabamaWorks regions. The estimates indicate population declined in East AlabamaWorks and remained stagnant in the Southeast region, but increased in the other five regions.

Table A.4 shows Alabama's population decennial counts, estimates, and projections by age group. The population aged 65 and over is growing rapidly as the baby boomer generation ages. Consequently, growth of the prime working age group (20-64) and youth (0-19) is expected to lag that of the total population through 2040. From a 2018 base, prime working age population growth is expected to decline through 2030, but grow by 2.1 percent by 2040 as an exodus of baby boomers from the workforce will end. This poses a challenge for workforce development. If employment growth outpaces labor force growth as expected for the long term, communities that experience rapid job gains may need to consider investments in amenities and infrastructure to attract new residents and workers.

Table A.3 Population by Workforce Development Region

Region	1990 Census	2000 Census	2010 Census	2019 Estimate	Change, 2000-2010		Change, 2010-2019	
					Number	Percent	Number	Percent
North AlabamaWorks	876,519	996,565	1,103,284	1,160,778	106,719	10.7	57,494	5.2
East AlabamaWorks	355,387	370,774	383,099	372,914	12,325	3.3	-10,185	-2.7
West AlabamaWorks	286,383	305,545	328,717	335,838	23,172	7.6	7,121	2.2
Central Six AlabamaWorks	940,268	1,031,412	1,105,132	1,131,562	73,720	7.1	26,430	2.4
Central AlabamaWorks	622,805	695,681	741,877	754,365	46,196	6.6	12,488	1.7
Southeast AlabamaWorks	335,242	354,943	378,812	378,941	23,869	6.7	129	0.0
Southwest AlabamaWorks	623,983	692,180	738,815	768,787	46,635	6.7	29,972	4.1
Alabama	4,040,587	4,447,100	4,779,736	4,903,185	332,636	7.5	123,449	2.6
United States	248,709,873	281,421,906	308,745,538	328,239,523	27,323,632	9.7	19,493,985	6.3

Source: Center for Business and Economic Research, The University of Alabama and U.S. Census Bureau.

Table A.4 Alabama Population by Age Group and 2040 Projections

Age Group	2000	2010	2018	2028	2030	2035	2040
0-19	1,256,169	1,276,312	1,218,422	1,249,963	1,249,582	1,254,420	1,270,212
20-24	306,865	335,322	326,305	348,340	349,774	355,513	357,749
25-29	301,196	311,034	339,576	311,982	313,620	318,879	325,245
30-34	301,819	297,888	303,148	314,389	316,465	321,660	327,893
35-39	340,300	308,430	303,569	308,037	314,410	321,006	327,291
40-44	345,212	311,071	288,616	306,648	302,010	318,874	326,734
45-49	315,173	346,369	313,140	307,785	316,125	304,578	322,729
50-54	285,036	347,485	316,596	299,355	296,452	317,645	306,743
55-59	225,450	311,906	337,000	301,444	301,785	295,427	317,525
60-64	190,082	276,127	317,096	308,005	296,334	298,363	292,976
65+	579,798	657,792	821,512	1,026,475	1,067,823	1,114,162	1,144,208
20-64 Total	2,611,133	2,845,632	2,845,046	2,805,985	2,806,975	2,851,945	2,904,885
Total Population	4,447,100	4,779,736	4,884,980	5,082,423	5,124,380	5,220,527	5,319,305
Change from 2018							
0-19				2.6%	2.6%	3.0%	4.3%
20-64				-1.4%	-1.3%	0.2%	2.1%
Total Population				4.0%	4.9%	6.9%	8.9%

Source: Center for Business and Economic Research, The University of Alabama and U.S. Census Bureau.

Per Capita Income

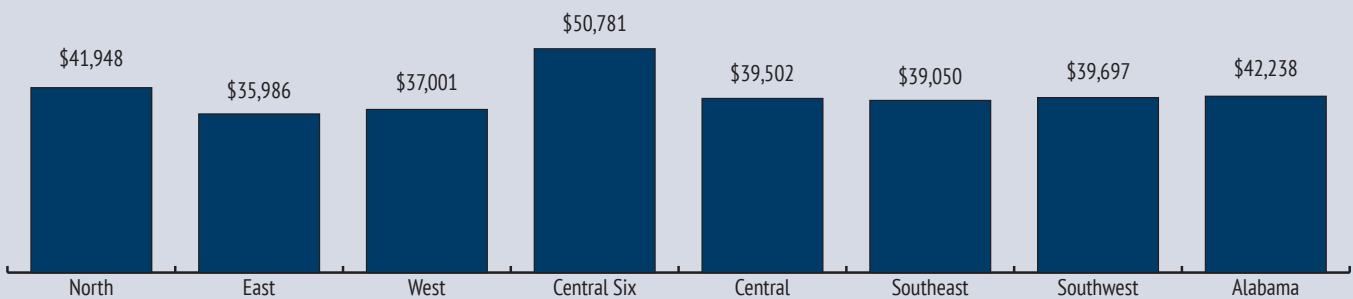
Per capita income (PCI) in Alabama was \$42,238 in 2018 (Figures A.4 and A.5), up 41.6 percent from 2005. Central Six AlabamaWorks had the highest PCI with \$50,781 followed by North with \$41,948 and Southwest with \$39,697. Only Central Six had a higher PCI than the state average. At \$35,986, East AlabamaWorks had the lowest PCI followed by West with \$37,001.

Figure A.4 Alabama Per Capita Income



Source: U.S. Bureau of Economic Analysis and Center for Business and Economic Research, The University of Alabama.

Figure A.5 Regional Per Capita Income, 2018



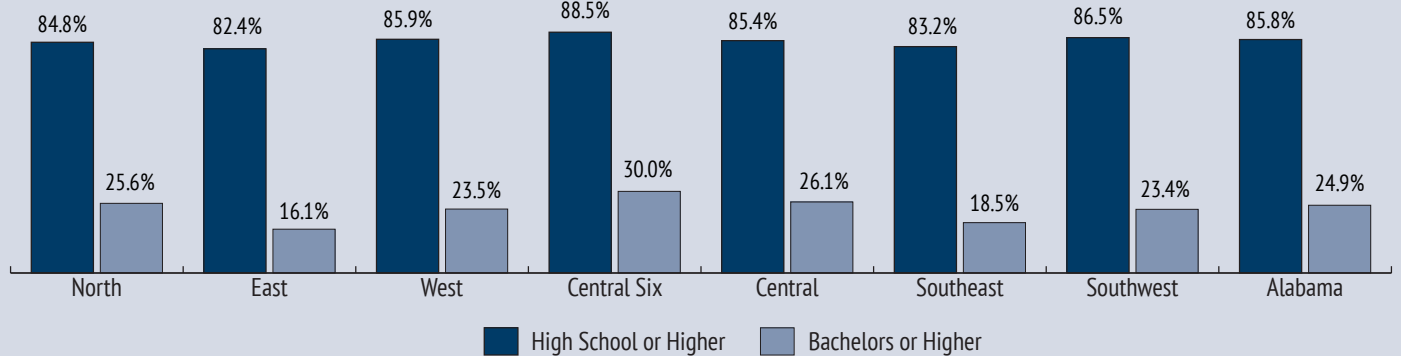
Source: U.S. Bureau of Economic Analysis and Center for Business and Economic Research, The University of Alabama.

Educational Attainment

Educational attainment of Alabama residents who were 25 years old and over are shown in Table A.5 and Figure A.6. The figures are based on the American Community Survey's 5-year estimates for 2014 through 2018. In that period, about 86 percent of Alabama's population had graduated from high school and 25 percent held a bachelor's or higher degree. Central Six AlabamaWorks had the highest educational attainment, followed by Southwest for high school graduate or higher, and Central for bachelor's degree or higher. East AlabamaWorks had the lowest

educational attainment, followed by Southeast. Central Six and Southwest AlabamaWorks had higher educational attainment for high school graduates than the state's average. Central Six, Central, and North AlabamaWorks had higher educational attainment for bachelor's degree or higher than the state. Educational attainment is important as skills rise with education, and high-wage jobs in the 21st century demand more skill sets.

Figure A.6 Educational Attainment 2014-2018



Source: Center for Business and Economic Research, The University of Alabama and U.S. Census Bureau, American Community Survey.

Table A.5 Educational Attainment of Population 25 Years and Over, 2014-2018

	North	East	West	Central Six	Central	Southeast	Southwest	Alabama
Total	781,109	261,393	216,794	767,246	495,991	258,189	519,236	3,299,958
No schooling completed	10,960	3,624	3,217	7,133	6,475	3,709	6,122	41,240
Nursery to 4th grade	4,597	1,409	663	2,139	1,850	1,388	1,440	13,486
5th and 6th grade	9,057	2,873	1,563	6,277	3,704	2,226	2,587	28,287
7th and 8th grade	18,889	7,667	3,946	12,109	9,246	6,247	8,275	66,379
9th grade	18,667	7,078	4,291	11,854	10,277	6,356	10,138	68,661
10th grade	22,881	9,879	5,208	16,735	14,702	8,363	15,488	93,256
11th grade	20,709	8,335	7,824	19,023	15,748	9,360	16,759	97,758
12th grade, no diploma	13,009	5,244	3,799	13,037	10,598	5,803	9,486	60,976
High school graduate/equivalent	233,888	89,302	74,526	214,307	146,648	86,435	175,066	1,020,172
Some college, less than 1 year	48,254	18,732	11,721	45,794	28,299	16,915	29,819	199,534
Some college, 1+ years, no degree	115,316	43,941	33,602	123,786	78,176	40,221	79,079	514,121
Associate degree	64,582	21,177	15,433	64,742	40,667	23,527	43,365	273,493
Bachelor's degree	126,480	25,036	31,280	144,772	77,365	30,527	79,983	515,443
Master's degree	57,566	12,232	13,882	56,334	37,897	13,043	30,888	221,842
Professional school degree	8,609	3,140	2,449	18,654	8,032	2,566	6,979	50,429
Doctorate degree	7,645	1,724	3,390	10,550	6,307	1,503	3,762	34,881

Source: Center for Business and Economic Research, The University of Alabama and U.S. Census Bureau, American Community Survey.

Underemployment and Available Labor

Labor force data is often limited to information on the employed and the unemployed that is available from government sources. However, this information is not complete from the perspective of employers. New or expanding employers are also interested in underemployment because current workers are potential

employees. In fact, experience requirements in job ads are evidence that many prospective employers look beyond unemployed persons for workers.

Workers in occupations that underutilize their experience, training, and skills are underemployed. These workers might look for other work because their current wages are below

what they believe they can earn or because they wish to not be underemployed. Underemployment occurs for various reasons including productivity growth, spousal employment and income, family constraints, or personal preferences. Underemployment is unique in different areas because of the confluence of economic, social, and geographic characteristics.

The existence of underemployment identifies economic potential that is not being realized. It is extremely difficult to measure this economic potential because of uncertainties regarding additional income that the underemployed can bring to an area. It is clear, however, that underemployment provides opportunities for selective job creation and economic growth. A business that needs skills prevalent among the underemployed could locate in AlabamaWorks regions with such workers regardless of those areas' unemployment rates. A low unemployment rate, which may falsely suggest limited labor availability, is therefore not necessarily a hindrance to employers.

The underemployed present a significant pool of labor because they tend to pursue better job opportunities that offer (i) higher income, (ii) more benefits, (iii) superior terms and conditions of employment, and (iv) a better match with skills, training, and experience. The underemployed also create opportunities for entry level workers as they leave lower-paying jobs for better-paying ones. Even if their previously-held positions are lost or not filled (perhaps due to low unemployment or adverse economic conditions), there is economic growth in gaining higher-paying jobs. Such income growth boosts consumption, savings, and tax collections. Quantifying the size of the underemployed workers is necessary for economic development, workforce training, and planning purposes. It is important to note that

underemployed persons can take on more responsibilities and earn more income, but they cannot be counted on to address possible future worker shortages as they are already employed.

The statewide underemployment rate was 22.4 percent in 2019. Applying this rate to March 2020 labor force data means that 477,696 employed Alabama residents were underemployed (Table A.6). Adding the unemployed to the underemployed gives a total available labor pool of 551,554 statewide. This is 7.5 times the number of unemployed workers and is a more realistic measure of the available labor pool in the state. Prospective employers must be able to offer the underemployed higher wages, better benefits or terms of employment, or some other incentives to induce them to change jobs. Underemployed workers are willing to commute farther and longer for a better job. For a one-way commute, 43.3 percent of the underemployed are prepared to add 20 or more minutes to their one-way commute and 33.4 percent are willing to add 20 or more extra miles for a better job. In contrast to the underemployed willingness to commute, only 37.9 percent of all employed workers are prepared to add more than 20 minutes and 30.1 percent are ready for extra 20 miles or more.

Underemployment rates for counties, AlabamaWorks regions, and the state were determined from an extensive survey of the state's workforce. A total of 7,347 complete responses were obtained across the state. About 52 percent (3,816 respondents) were employed, of whom 855 stated that they were underemployed. Among the regions, underemployment ranged from 19.7 percent in North AlabamaWorks region to 27.7 percent in West. At 131,797 underemployed or unemployed workers, Central Six has the largest available labor pool, followed by North with 118,455

Table A.6 Underemployed and Available Labor by AlabamaWorks Region

	Alabama	North	East	West	Central Six	Central	Southeast	Southwest
Labor force	2,205,479	535,287	155,528	154,181	535,551	336,710	158,629	329,592
Employed	2,131,621	519,093	149,430	149,153	519,431	325,034	153,132	316,347
Underemployment rate	22.4%	19.7%	22.7%	27.7%	22.3%	24.5%	20.9%	20.5%
Underemployed workers	477,696	102,261	33,861	41,330	115,677	79,666	31,959	64,788
Unemployed	73,858	16,194	6,098	5,028	16,120	11,676	5,497	13,245
Available labor pool	551,554	118,455	39,959	46,358	131,797	91,342	37,456	78,033

Note: Rounding errors may be present. Based on March 2020 labor force data and 2019/2020 underemployment rates.

Source: Center for Business and Economic Research, The University of Alabama and Alabama Department of Labor.

workers. The two regions account for over 45 percent of the state's available labor pool. Among counties, Tallapoosa County had the highest rate of underemployment at 37.5 percent and Morgan had the lowest with 8.8 percent. Thirty-three counties had underemployment rates above the state's 22.4 percent.

From most important to the least, the main reasons for being underemployed are: low wages at available jobs; a lack of job opportunities in their area; other family or personal obligations; living too far from jobs; owning a house in their area; childcare responsibilities; being on retirement; and taking care of someone else other than a child. Ongoing economic development efforts can help in this regard to get underemployed workers into jobs they would prefer. Non-workers have a very different set of reasons they cite as the main reasons for their status including: retirement, disability or other health concerns, and social security limitations. Such workers may become part of the labor force if these problems can be addressed. Indeed, a recent study found that the flow of labor force nonparticipants to employment status was 60 percent more than that of unemployed workers who gain employment.³ This implies that the state's available labor pool could be larger than estimated in this report.

A comparison of underemployed workers to the overall state workforce shows that:

- Fewer work full-time, though more of those working part-time would prefer full-time work.
- They commute somewhat shorter distances and travel times.
- They are more likely to have occupations in community and social services; education, training, and library; arts, design, entertainment, sports, and media; healthcare practitioners and technical; healthcare support; protective service; food preparation and serving related; building and grounds cleaning and maintenance; personal care and service; sales and related; production; and transportation and material moving occupations.
- By industry, more are in retail trade; educational services; health care and social assistance; arts,

entertainment, and recreation; accommodation and food services; and other services.

- They earn less and have shorter job tenure.
- Fewer believe their jobs fit well with their education and training, skills, and experience.
- More believe they are qualified for a better job based on their education and training.
- More would leave their current jobs for higher income; 13.3 percent of the underemployed would leave for up to 5.0 percent more compared to 8.1 percent of all workers.
- More are willing to commute more than 20 additional minutes and over 20 additional miles for a better job.
- Fewer are satisfied with their current jobs and more are willing to train for a better job even if they have to pay the full cost.
- More have sought better jobs in the preceding quarter; about 32 percent of underemployed workers versus 18 percent of all workers.
- They have slightly lower educational attainment.
- Their median age, 53, is just a year younger than that of all employees.
- Fewer are married or male.
- More are African American or other nonwhite racial groups.

Table A.7 shows the detailed survey results on job satisfaction and willingness to train. Responses measuring overall job satisfaction as well as various aspects of the job were obtained. Within the overall state workforce, most workers (80.0 percent) are satisfied or completely satisfied with their jobs. Workers are most satisfied with the work that they do and least satisfied with the earnings they receive. Fewer underemployed workers are satisfied with their jobs (62.7 percent). The underemployed are more dissatisfied with their earnings and most satisfied with their work shift.

³Canon, M.E., Kudlyak, M., and Reed, M. (2014). Not Everyone Who Joins the Ranks of the Employed was "Unemployed", *The Regional Economist*, January.

Table A.7 2019 Job Satisfaction and Willingness to Train (Percent)

	Job Satisfaction				
	Completely Dissatisfied	Dissatisfied	Neutral	Satisfied	Completely Satisfied
Employed					
Overall	2.8	3.4	13.3	25.4	54.6
Earnings	6.9	7.9	20.1	26.4	38.3
Retention	2.4	3.2	8.4	16.8	67.9
Work	1.0	1.7	7.3	23.0	66.7
Hours	2.6	3.9	10.4	19.4	63.4
Shift	2.3	2.9	7.3	15.5	71.6
Conditions	2.9	4.0	11.0	23.1	58.6
Commuting Distance	3.6	4.5	10.9	14.7	66.2
Underemployed					
Overall	6.4	7.6	22.8	25.3	37.4
Earnings	16.7	15.9	26.3	20.9	19.5
Retention	5.4	6.7	18.4	18.4	53.7
Work	2.7	3.5	12.5	26.1	54.7
Hours	6.4	6.3	12.9	20.1	53.5
Shift	5.2	4.8	11.4	16.8	61.6
Conditions	6.8	9.0	16.3	24.3	42.7
Commuting Distance	5.9	6.2	11.7	14.7	61.4
	Willingness to Train				
	Completely Unwilling	Unwilling	Neutral	Willing	Completely Willing
Employed					
For a new or better job	23.0	6.0	16.7	11.3	41.2
If paid by trainee	44.8	20.7	19.1	5.0	6.9
If paid by trainee and government	14.7	12.3	32.9	19.4	16.6
If paid by government	4.9	3.5	10.1	16.0	63.8
Underemployed					
For a new or better job	16.2	3.8	16.0	10.6	51.6
If paid by trainee	41.5	20.4	17.8	7.3	8.7
If paid by trainee and government	11.4	10.8	31.5	21.8	20.1
If paid by government	1.6	2.2	7.2	13.6	73.8

Note: Rounding errors may be present.

Source: Center for Business and Economic Research, The University of Alabama.

Workers are generally willing to train for a new or better job, with the underemployed being much more willing (62.2 percent vs. 52.5 percent). However, their willingness to train is strongly influenced by who pays for the cost of training. Workers typically do not wish to pay for the training and so their willingness is highest when the cost is fully borne by the government and lowest when the trainee must pay the

full costs. This suggests that workers expect the government to bear at least part of the training cost. This expectation may result from worker awareness of government workforce programs that provide such assistance. The underemployed workers are more willing to train for the new or better job irrespective of who bears the cost burden.

WORKFORCE DEMAND

Industry Mix

In 2019, the manufacturing sector was the leading employer in Alabama with 271,018 jobs in the first quarter (Table A.8). The top five industries by employment are manufacturing; health care and social assistance; retail trade; accommodation and food services; and educational services. These five industries provided 1,108,597 jobs, or 58.4 percent of the state total employment. The average monthly wage across all industries in the state was \$3,614. New hire monthly earnings averaged \$2,361 or 65.3 percent of the average monthly wage. The highest average monthly wages were for utilities (\$8,728); mining

(\$6,505); professional, scientific, and technical services (\$5,895); finance and insurance (\$5,825); and management of companies and enterprises (\$5,322). Accommodation and food services paid the least at \$1,359. Utilities had the highest average monthly new hire wage at \$5,171, followed by mining (\$4,915) and professional, scientific, and technical services (\$4,551). Accommodation and food services paid newly hired workers the least at \$1,136.

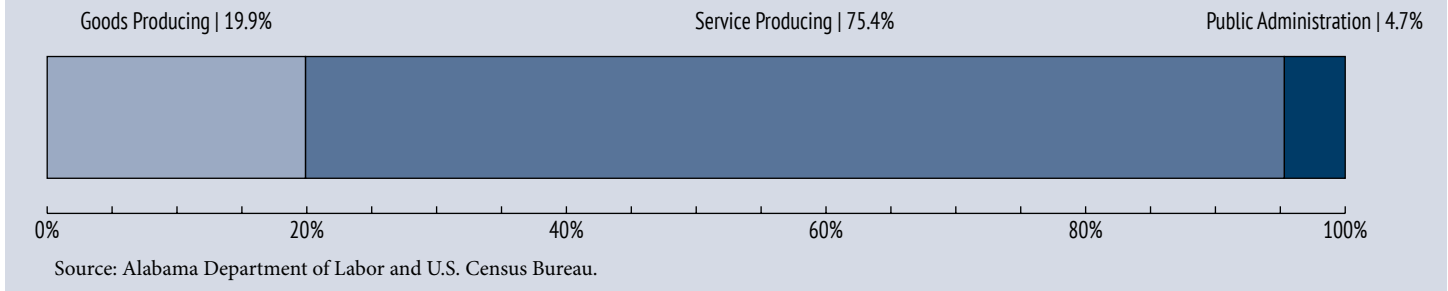
The leading employers were not the highest paying sectors. Of the top five employers, only manufacturing paid wages above the state average. The highest wages

Table A.8 Industry Mix (First Quarter 2019)

Industry by 2-digit NAICS Code	Total Employment	Share	Rank	Average Monthly Wage	Average Monthly New Hire Earnings
11 Agriculture, Forestry, Fishing and Hunting	12,185	0.6%	19	\$3,269	\$2,888
21 Mining	6,187	0.3%	20	\$6,505	\$4,915
22 Utilities	20,745	1.1%	17	\$8,728	\$5,171
23 Construction	87,999	4.6%	9	\$4,004	\$3,476
31-33 Manufacturing	271,018	14.3%	1	\$4,638	\$3,260
42 Wholesale Trade	72,206	3.8%	10	\$5,164	\$3,651
44-45 Retail Trade	235,007	12.4%	3	\$2,343	\$1,580
48-49 Transportation and Warehousing	66,748	3.5%	12	\$3,663	\$3,169
51 Information	22,122	1.2%	16	\$5,023	\$3,032
52 Finance and Insurance	71,778	3.8%	11	\$5,825	\$3,675
53 Real Estate and Rental and Leasing	24,806	1.3%	14	\$3,606	\$2,806
54 Professional, Scientific, and Technical Services	105,698	5.6%	7	\$5,895	\$4,551
55 Management of Companies and Enterprises	17,216	0.9%	18	\$5,322	\$3,282
56 Administrative and Support and Waste Management and Remediation Services	123,667	6.5%	6	\$2,113	\$1,892
61 Educational Services	161,237	8.5%	5	\$3,537	\$1,600
62 Health Care and Social Assistance	262,091	13.8%	2	\$3,494	\$2,544
71 Arts, Entertainment, and Recreation	22,374	1.2%	15	\$1,734	\$1,270
72 Accommodation and Food Services	179,244	9.4%	4	\$1,359	\$1,136
81 Other Services (Except Public Administration)	46,745	2.5%	13	\$3,073	\$2,286
92 Public Administration	90,142	4.7%	8	\$3,449	\$2,321
ALL INDUSTRIES	1,899,213	100.0%		\$3,614	\$2,361

Note: Rounding errors may be present.

Source: Alabama Department of Labor and U.S. Census Bureau.

Figure A.7 Alabama Employment Distribution (First Quarter 2019)

were in smaller employers such as utilities; mining; professional, scientific, and technical services; finance and insurance; management of companies; wholesale trade; and information. By broad industry classification, service providing industries generated 75.4 percent of

total state jobs in the first quarter of 2019 (Figure A.7). Goods producing industries were next with 19.9 percent, and public administration accounted for 4.7 percent. This distribution is for all nonagricultural jobs across the state and there is significant variation by AlabamaWorks regions.

Job Creation and Net Job Flows

The state's job creation and net job flows are presented in Figure A.8. Quarterly job creation averaged 80,847 from the second quarter of 2001 to the first quarter of 2019. Both job creation and net job flows fluctuate significantly throughout the year with highs in second quarters and lows in third quarters. Job creation has somewhat improved since 2009 when it was at its lowest, while job flows have reached pre-recession levels. From the second quarter of

2001 to the first quarter of 2019, net job flows averaged 7,888 per quarter and ranged from a loss of 30,853 in the fourth quarter of 2008 to a gain of 28,995 in the second quarter of 2005. Job creation is the number of new jobs that are created either by new businesses or through the expansion of existing firms. Net job flows reflect the difference between current and previous employment at all businesses.

High-Demand, Fast-Growing, High-Earning, and Sharp-Declining Occupations

There are 796 single occupations in Alabama. Table A.10 shows the top 40 occupations that are expected to be in high-demand over the 2018 to 2028 period, ranked by projected average annual job openings. Many of these occupations occur in healthcare and manufacturing which are among the five largest employment sectors identified earlier (Table A.9). Thus, these sectors will continue to dominate employment in Alabama.

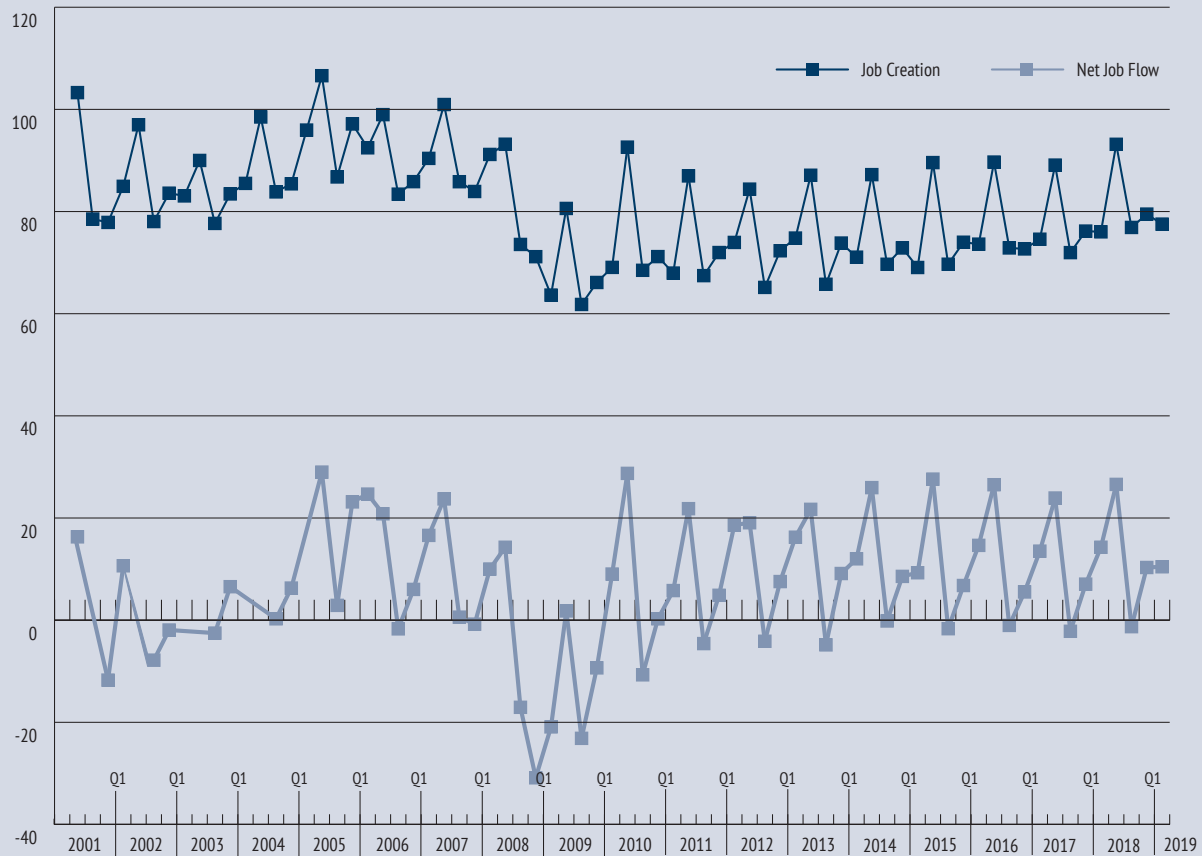
The top five high-demand occupations are Combined Food Preparation and Serving Workers, Including Fast Food; Retail Salespersons; Laborers and Freight, Stock, and Material Movers, Hand; Assemblers and Fabricators, All Other, Including Team Assemblers; and Janitors and Cleaners, Except Maids and Housekeeping Cleaners. Four of the high-demand occupations are also fast-growing. These four occupations have a minimum annual growth rate of

2.03 percent, which is four times the statewide occupational growth rate of 0.48 percent. Two of the high-demand occupations—General and Operations Managers and Financial Managers—are also high-earning occupations.

The 20 fastest growing occupations ranked by projected growth of employment are listed in Table A.10. Many of the top fast-growing occupations are health-related. The top five fast-growing occupations are Occupational Therapy Assistants; Information Security Analysts; Computer Numerically Controlled Machine Tool Programmers, Metal and Plastic; Electrical and Electronics Installers and Repairers, Transportation Equipment; and Physician Assistants. Three of the top five fast-growing occupations are health-related occupations.

Table A.11 shows the 50 highest earning occupations. In general, these occupations are in health, management,

Figure A.8 Alabama Job Creation and Net Job Flows



Source: Alabama Department of Labor and U.S. Census Bureau.

postsecondary education, science, and engineering fields. Nine of the top 10 are health occupations. However, any discussion of earnings must consider that wages vary with experience, and occupations with the highest average wages may not necessarily have the highest entry level wages. The lowest mean salary of these 50 high-earning occupations is \$106,086 for Advertising and Promotions Managers and the highest salary is \$287,553 for Obstetricians and Gynecologists. The high-earning occupations are generally not fast-growing or in high-demand. Only two high-demand occupations are also high-earning: General and Operations Managers and Financial Managers (Table A.9 and Table A.11).

Of the state's 796 specific occupations, 146 are expected to decline over the 2018 to 2028 period. Employment in the 20 sharpest-declining occupations will decline by at least seven percent, with each losing a minimum of 160 jobs over the period (Table A.12). No efforts should be made to sustain these occupations because they are declining due to structural changes in the state economy.

Table A.9 Selected High-Demand Occupations (Base Year 2018 and Projected Year 2028)

Occupation	Average Annual Job Openings		
	Total	Due to Growth	Due to Separations
Combined Food Preparation and Serving Workers, Including Fast Food	12,655	820	11,840
Retail Salespersons	9,500	100	9,395
Laborers and Freight, Stock, and Material Movers, Hand	6,140	240	5,900
Assemblers and Fabricators, All Other, Including Team Assemblers	4,935	305	4,630
Janitors and Cleaners, Except Maids and Housekeeping Cleaners	4,800	215	4,590
Heavy and Tractor-Trailer Truck Drivers	4,265	205	4,060
Registered Nurses*	3,495	540	2,955
Stock Clerks and Order Fillers	3,100	105	2,995
Helpers--Production Workers	3,000	310	2,690
General and Operations Managers	2,935	235	2,700
Nursing Assistants	2,885	130	2,750
First-Line Supervisors of Food Preparation and Serving Workers	2,880	110	2,770
Personal Care Aides	2,785	330	2,455
Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	2,645	145	2,500
Cooks, Restaurant	2,535	255	2,280
Landscaping and Groundskeeping Workers	2,400	130	2,265
Receptionists and Information Clerks	2,045	70	1,970
Light Truck or Delivery Services Drivers	1,935	80	1,850
Accountants and Auditors	1,855	125	1,730
Construction Laborers	1,775	120	1,650
Maintenance and Repair Workers, General	1,765	105	1,660
First-Line Supervisors of Production and Operating Workers	1,620	145	1,475
First-Line Supervisors of Construction Trades and Extraction Workers	1,435	105	1,330
Industrial Machinery Mechanics	1,385	195	1,185
Medical Assistants	1,305	190	1,115
Welders, Cutters, Solderers, and Brazers	1,265	110	1,155
Electricians	1,250	80	1,170
Industrial Truck and Tractor Operators	1,180	70	1,110
Plumbers, Pipefitters, and Steamfitters	910	75	835
Medical Secretaries	815	85	730
Home Health Aides*	810	135	675
Management Analysts	760	100	665
Heating, Air Conditioning, and Refrigeration Mechanics and Installers	710	70	640
Software Developers, Applications*	705	180	530
Computer User Support Specialists	630	75	555
Industrial Engineers*	565	130	435
Market Research Analysts and Marketing Specialists	565	85	480
Financial Managers	530	90	445
Taxi Drivers and Chauffeurs	490	75	415
Nurse Practitioners	320	90	230

Note: Occupations are growth- and wages weighted and data are rounded to the nearest 5. Occupations in bold are also high-earning.

* Qualify as both high-demand and fast-growing occupations.

Source: Alabama Department of Labor and Center for Business and Economic Research, The University of Alabama.

Table A.10 Selected Fast-Growing Occupations (Base Year 2018 and Projected Year 2028)

Occupation	Employment		Percent Change	Annual Growth (Percent)
	2018	2028		
Occupational Therapy Assistants	NA	NA	44	3.73
Information Security Analysts	1,190	1,620	36	3.13
Computer Numerically Controlled Machine Tool Programmers, Metal and Plastic	460	620	35	3.05
Electrical and Electronics Installers and Repairers, Transportation Equipment	220	290	33	2.89
Physician Assistants	780	1,040	32	2.85
Orthotists and Prosthetists	160	210	30	2.67
Speech-Language Pathologists	1,710	2,190	28	2.50
Operations Research Analysts	650	830	27	2.46
Software Developers, Applications*	6,580	8,370	27	2.43
Statisticians	200	250	27	2.39
Counselors, All Other	150	190	26	2.35
Physical Therapist Assistants	1,920	2,410	26	2.32
Biological Science Teachers, Postsecondary	NA	NA	26	2.32
Home Health Aides*	5,370	6,700	25	2.23
Nurse Practitioners*	3,800	4,720	24	2.19
Physical Therapist Aides	1,080	1,330	23	2.09
Computer and Information Research Scientists	NA	NA	23	2.07
Industrial Engineers*	5,740	7,040	23	2.06
Athletic Trainers	570	700	23	2.05
Transportation Inspectors	NA	NA	22	2.03

Note: Employment data are rounded to the nearest 10 and job openings are rounded to the nearest 5. Occupations in bold are also high-earning.

* Qualify as both high-demand and fast-growing occupations.

Source: Alabama Department of Labor and Center for Business and Economic Research, The University of Alabama.

Table A.11 Selected High-Earning Occupations (Base Year 2018 and Projected Year 2028)

Occupation	Employment		Annual Growth (Percent)	Average Annual Job Openings	Mean Annual Salary (\$)
	2018	2028			
Obstetricians and Gynecologists	210	200	-0.20	5	287,553
Anesthesiologists	NA	NA	0.20	5	279,939
Surgeons	610	600	-0.15	15	263,456
Family and General Practitioners	850	920	0.70	30	240,945
Pediatricians, General	450	440	-0.13	10	218,653
Internists, General	250	240	-0.24	5	218,212
Physicians and Surgeons, All Other	5,540	5,870	0.58	200	200,726
Chief Executives	2,390	2,270	-0.51	155	197,595
Psychiatrists	170	180	0.65	5	171,826
Nurse Anesthetists	1,290	1,500	1.53	90	160,688
Dentists, General	1,300	1,370	0.56	50	160,296
Law Teachers, Postsecondary	90	100	0.83	10	154,487
Physicists	160	170	0.48	15	146,256
Podiatrists	100	100	0.61	5	146,146
Architectural and Engineering Managers	2,320	2,510	0.80	195	145,799

Table continued on page 16

Table A.11 cont.

Dentists, All Other Specialists	40	40	0.00	N/A	133,753
Computer and Information Systems Managers	3,410	3,880	1.30	330	132,872
Petroleum Engineers	90	90	0.00	5	132,145
Financial Managers*	5,310	6,180	1.54	530	132,081
Economics Teachers, Postsecondary	130	140	0.60	10	132,038
Administrative Law Judges, Adjudicators, and Hearing Officers	110	110	0.09	5	130,949
Pharmacists	5,010	4,970	-0.07	220	130,103
Physical Scientists, All Other	130	130	0.31	10	123,112
Aerospace Engineers	4,090	4,510	0.99	320	122,368
Personal Financial Advisors	2,850	3,040	0.66	240	121,711
Actuaries	90	110	1.82	10	120,986
General and Operations Managers*	29,940	32,280	0.76	2,935	120,063
Natural Sciences Managers	140	150	0.42	15	120,028
Engineers, All Other	3,670	3,820	0.42	275	119,864
Marketing Managers	950	1,030	0.82	95	119,153
Optometrists	540	590	0.91	20	117,790
Area, Ethnic, and Cultural Studies Teachers, Postsecondary	10	10	0.74	N/A	117,753
Lawyers	7,670	8,150	0.61	430	116,603
Engineering Teachers, Postsecondary	530	580	0.91	50	115,540
Sales Managers	2,740	2,910	0.61	270	114,529
Computer Hardware Engineers	1,170	1,270	0.77	95	113,796
Electronics Engineers, Except Computer	1,740	1,830	0.52	125	112,722
Industrial Production Managers	3,610	4,060	1.19	325	112,319
Computer Network Architects	NA	NA	1.01	85	112,008
Education Administrators, Postsecondary	2,410	2,560	0.59	205	111,121
Human Resources Managers	1,350	1,450	0.74	130	111,028
Training and Development Managers	160	170	0.61	15	110,544
Purchasing Managers	860	930	0.89	85	110,238
Compensation and Benefits Managers	60	60	0.00	5	109,678
Airline Pilots, Copilots, and Flight Engineers	290	300	0.20	30	108,978
Managers, All Other	9,540	9,970	0.44	780	108,937
Business Teachers, Postsecondary	840	970	1.48	90	108,693
Chemical Engineers	490	570	1.55	40	107,995
Health Specialties Teachers, Postsecondary	1,960	2,390	2.01	225	106,908
Advertising and Promotions Managers	80	80	-0.26	10	106,086

Note: Employment and salaries data are rounded to the nearest 10; job openings to the nearest 5. The salary data provided are based on the May 2019 release of the Occupational Employment Statistics (OES) combined employment and wage file. Estimates for specific occupations may include imputed data.

Occupations in bold are also fast-growing. *Qualify as both high-earning and high-demand occupations. NA – Not available due to disclosure restrictions.

Source: Center for Business and Economic Research, The University of Alabama and Alabama Department of Labor.

Table A.12 Selected Sharp-Declining Occupations (Base Year 2018 and Projected Year 2028)

Occupation	Employment		Net Change	Percent Change
	2018	2028		
Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	51,170	46,750	-4,420	-9
Office Clerks, General	33,320	31,790	-1,530	-5
Cashiers	65,730	64,290	-1,440	-2
Inspectors, Testers, Sorters, Samplers, and Weighers	11,550	10,420	-1,130	-10
Bookkeeping, Accounting, and Auditing Clerks	24,870	23,950	-920	-4
Tellers	9,730	8,840	-890	-9
Cooks, Fast Food	6,190	5,410	-780	-13
Executive Secretaries and Executive Administrative Assistants	3,980	3,240	-740	-19
Legal Secretaries	3,950	3,250	-700	-18
Computer Programmers	8,210	7,640	-570	-7
Postal Service Mail Carriers	5,490	5,020	-470	-8
Telemarketers	1,930	1,530	-400	-21
Correctional Officers and Jailers	5,240	4,870	-370	-7
Textile Winding, Twisting, and Drawing Out Machine Setters, Operators, and Tenders	2,320	1,960	-360	-16
Structural Metal Fabricators and Fitters	2,930	2,570	-360	-12
Data Entry Keyers	1,660	1,310	-350	-21
Telecommunications Equipment Installers and Repairers, Except Line Installers	4,000	3,670	-330	-8
Switchboard Operators, Including Answering Service	1,140	840	-300	-26
Forging Machine Setters, Operators, and Tenders, Metal and Plastic	1,400	1,200	-200	-15
Textile Knitting and Weaving Machine Setters, Operators, and Tenders	1,010	850	-160	-16

Note: Employment data are rounded to the nearest 10.

Source: Alabama Department of Labor and Center for Business and Economic Research, The University of Alabama.

Skills and Skills Gap Analyses

In order to perform well in the workplace, jobholders must have the relevant skills. Table A.13 shows skill types and definitions as provided by O*NET Online, which offers skill sets for all occupations ranked by the degree of importance. High-earning occupations typically require skills that are obtained in the pursuit of the relevant higher education. Lower earning occupations require more basic skill sets. Some occupations have no minimum skill set requirements (e.g. dishwashers and maids).

Table A.14 shows the percentage of selected occupations in Alabama that list a particular skill as primary. We define primary skills as the 10 most important skills in the required skill set for an occupation. It is important to note that a particular skill may be more important and more extensively used in one occupation than another. Table A.14 does not address such cross-occupational skill importance comparisons. In general, basic skills are most frequently

listed as primary, which means that they are important for practically all jobs.

High-earning occupations require more active learning, active listening, critical thinking, learning strategies, reading comprehension, science, speaking, writing, complex problem solving, management of both financial and personnel resources, negotiation, judgment and decision making, and operations analysis skills than both high-demand and fast-growing jobs. Some of these skills require long training periods and postsecondary education. However, high-earning jobs require less technical and social skills in general. In contrast, high-demand occupations require more technical and resource management skills than fast-growing and high-earning occupations. Fast-growing occupations require more basic, complex problem solving, and systems skills than high-demand occupations.

Table A.13 Skill Types and Definitions

Basic Skills: Developed capacities that facilitate learning or the more rapid acquisition of knowledge.

Active Learning – Understanding the implications of new information for both current and future problem-solving and decision-making.

Active Listening – Giving full attention to what other people are saying, taking time to understand the points being made, asking questions as appropriate, and not interrupting at inappropriate times.

Critical Thinking – Using logic and reasoning to identify the strengths and weaknesses of alternative solutions, conclusions, or approaches to problems.

Learning Strategies – Selecting and using training/instructional methods and procedures appropriate for the situation when learning or teaching new things.

Mathematics – Using mathematics to solve problems.

Monitoring – Monitoring / Assessing performance of yourself, other individuals, or organizations to make improvements or take corrective action.

Reading Comprehension – Understanding written sentences and paragraphs in work-related documents.

Science – Using scientific rules and methods to solve problems.

Speaking – Talking to others to convey information effectively.

Writing – Communicating effectively in writing as appropriate for the needs of the audience.

Complex Problem Solving Skills: Developed capacities used to solve novel, ill-defined problems in complex, real-world settings.

Complex Problem Solving – Identifying complex problems and reviewing related information to develop and evaluate options and implement solutions.

Resource Management Skills: Developed capacities used to allocate resources efficiently.

Management of Financial Resources – Determining how money will be spent to get the work done and accounting for these expenditures.

Management of Material Resources – Obtaining and seeing to the appropriate use of equipment, facilities, and materials needed to do certain work.

Management of Personnel Resources – Motivating, developing, and directing people as they work, identifying the best people for the job.

Time Management – Managing one's own time and the time of others.

Social Skills: Developed capacities used to work with people to achieve goals.

Coordination – Adjusting actions in relation to others' actions.

Instructing – Teaching others how to do something.

Negotiation – Bringing others together and trying to reconcile differences.

Persuasion – Persuading others to change their minds or behavior.

Service Orientation – Actively looking for ways to help people.

Social Perceptiveness – Being aware of others' reactions and understanding why they react as they do.

Systems Skills: Developed capacities used to understand, monitor, and improve socio-technical systems.

Judgment and Decision Making – Considering the relative costs and benefits of potential actions to choose the most appropriate one.

Systems Analysis – Determining how a system should work and how changes in conditions, operations, and the environment will affect outcomes.

Systems Evaluation – Identifying measures or indicators of system performance and the actions needed to improve or correct performance, relative to the goals of the system.

Technical Skills: Developed capacities used to design, set-up, operate, and correct malfunctions involving application of machines or technological systems.

Equipment Maintenance – Performing routine maintenance on equipment and determining when and what kind of maintenance is needed.

Equipment Selection – Determining the kind of tools and equipment needed to do a job.

Installation – Installing equipment, machines, wiring, or programs to meet specifications.

Operation and Control – Controlling operations of equipment or systems.

Operation Monitoring – Watching gauges, dials, or other indicators to make sure a machine is working properly.

Operations Analysis – Analyzing needs and product requirements to create a design.

Programming – Writing computer programs for various purposes.

Quality Control Analysis – Conducting tests and inspections of products, services, or processes to evaluate quality or performance.

Repairing – Repairing machines or systems using the needed tools.

Technology Design – Generating or adapting equipment and technology to serve user needs.

Troubleshooting – Determining causes of operating errors and deciding what to do about it.

Source: O*NET Online (<http://online.onetcenter.org/skills/>).

Table A.14 Percentage of Selected Occupations for Which Skill Is Primary

	Selected High-Demand Occupations	Selected Fast-Growing Occupations	Selected High-Earning Occupations
Basic Skills			
Active Learning	28	65	66
Active Listening	68	85	86
Critical Thinking	60	85	86
Learning Strategies	0	10	16
Mathematics	5	20	12
Monitoring	50	65	44
Reading Comprehension	48	85	86
Science	3	15	26
Speaking	63	80	86
Writing	23	50	62
Complex Problem Solving Skills			
Complex Problem Solving	30	60	72
Resource Management Skills			
Management of Financial Resources	0	0	2
Management of Material Resources	0	0	0
Management of Personnel Resources	8	0	12
Time Management	28	10	16
Social Skills			
Coordination	38	20	18
Instructing	13	20	18
Negotiation	8	0	10
Persuasion	8	10	10
Service Orientation	28	35	10
Social Perceptiveness	40	45	38
Systems Skills			
Judgment and Decision Making	25	55	76
Systems Analysis	8	25	10
Systems Evaluation	5	15	8
Technical Skills			
Equipment Maintenance	10	5	0
Equipment Selection	5	0	0
Installation	3	0	0
Operation and Control	20	0	2
Operation Monitoring	15	10	2
Operations Analysis	3	5	6
Programming	3	15	0
Quality Control Analysis	3	5	0
Repairing	8	5	0
Technology Design	0	0	0
Troubleshooting	10	0	0

Note: Rounding errors may be present.

Source: O*NET Online and Center for Business and Economic Research, The University of Alabama

Table A.15 Skills Gap Indexes (Base Year 2018 and Projected Year 2028)

Geography		Statewide AlabamaWorks		
Projection Horizon		2018-2028		
Skill	Skill Type	Total Openings (Projected Demand)	Skills Gap Index	Replacement Index
Active Listening	Basic	196,285	77	94
Speaking	Basic	191,880	75	94
Monitoring	Basic	167,080	65	93
Critical Thinking	Basic	153,515	60	94
Coordination	Social	150,435	59	93
Social Perceptiveness	Social	148,350	58	94
Service Orientation	Social	143,905	56	95
Reading Comprehension	Basic	136,180	53	94
Time Management	Resource	126,680	49	93
Judgment and Decision Making	Systems	108,515	42	93
Writing	Basic	83,695	33	93
Active Learning	Basic	82,250	32	91
Complex Problem Solving	Complex	79,395	31	91
Persuasion	Social	70,245	27	93
Instructing	Social	60,410	24	90
Negotiation	Social	50,690	20	94
Learning Strategies	Basic	43,645	17	89
Mathematics	Basic	42,625	17	95
Operation Monitoring	Technical	40,950	16	94
Management of Personnel Resources	Resource	37,445	15	92
Systems Analysis	Systems	37,390	15	91
Operation and Control	Technical	35,655	14	94
Quality Control Analysis	Technical	34,660	14	92
Systems Evaluation	Systems	33,905	13	90
Troubleshooting	Technical	21,760	9	93
Equipment Maintenance	Technical	15,600	6	93
Repairing	Technical	11,880	5	92
Operations Analysis	Technical	11,375	4	86
Management of Financial Resources	Resource	10,250	4	92
Equipment Selection	Technical	8,925	3	91
Management of Material Resources	Resource	7,520	3	91
Science	Basic	6,325	2	82
Installation	Technical	4,080	2	95
Programming	Technical	1,920	1	86
Technology Design	Technical	1,485	1	75

Note: These are annualized skills indexes based on 2018 to 2028 occupation projections.

Source: Center for Business and Economic Research, The University of Alabama, Alabama Department of Labor, and O*Net Online

Table A.15 shows skill gap indexes for all 35 skills in Table A.14 based on 2018 to 2028 occupation projections. Skills gap indexes range up to 100 and are standardized measures of the gap between current supply and projected job openings. The index does not provide any information about current or base year skill supply. It focuses on the projection period and identifies critical skill needs. The index essentially ranks expected training needs. The higher the index the more critical the skill over the projection period.

For policy and planning purposes, skill gap indexes have to be considered together with replacement indexes, which are the expected shares of job openings due to replacement. Replacement is necessary because of turnover and people

leaving the labor force. The smaller the replacement index, the larger the share of job openings due to job growth, which in turn implies a need to increase the pace of skill training. Skill gap indexes demonstrate the need to ramp up the scale of skill training while replacement indexes address the pace of training.

By skill type, the skill gap indexes show that basic skills are most critical followed by social, resource management, complex problem solving, and technical skills. The importance of basic skills generally and for high-demand, high-growth, and high-earning jobs indicates a strong need for training in these skills. The pace of training needs to increase for technical, and systems skills, while the scale of training should be raised for basic and social skills.

Education and Training Issues

Alabama's educational attainment is low compared to the nation as a whole. About 86 percent of Alabamians age 25 and over have graduated from high school, compared to 88 percent for the United States. Of the total population over age 25, about 25 percent in Alabama have a bachelor's or higher degree, which is lower than the nation's 32 percent. Skill and education requirements for jobs keep rising. This highlights a strong need to raise educational attainment in the state.

Table A.16 shows the number of selected occupations in Alabama for which a particular education category is most common. In general, high-earning occupations require high levels of educational attainment. All top 50 high-earning occupations require a bachelor's or higher degree. Nine

(22.5 percent) of the 40 high-demand occupations require an associate, a bachelor's, or higher degree at the minimum. Among the fastest growing occupations, 15 (75.0 percent) of the 20 fast-growing occupations require at least an associate's degree, and 13 (65.0 percent) require at least a bachelor's degree.

The 2018 to 2028 occupational projections indicate that future jobs will require a minimum of postsecondary education and training. Current job ads are increasingly requiring more than a high school diploma or GED. Of the state's 796 occupations, 146 are expected to decline over the period, therefore education and training for these should slow accordingly.

Table A.16 Number of Selected Occupations by Education/Training Requirement

Most Common Education/Training Requirements Categories	Selected High-Demand Occupations	Selected Fast-Growing Occupations	Selected High-Earning Occupations
Doctoral Degree or First Professional Degree	0	1	22
Master's Degree	1	7	2
Bachelor's Degree	8	5	26
Associate Degree	0	2	0
Postsecondary Non-Degree	4	2	0
Some College, no Degree	1	0	0
High School Diploma or Equivalent	17	3	0
No Formal Educational Credential	9	0	0

Source: O*NET Online; Center for Business and Economic Research, The University of Alabama; and Alabama Department of Labor.

IMPLICATIONS AND RECOMMENDATIONS

Alabama's job growth is projected to be faster than labor force growth. From a 2018 base, worker shortfalls of about 273,000 are expected in 2028. The projected worker shortfalls are expected to grow to about 310,000 and 403,000 in 2030 and 2035, respectively. By 2040, worker shortfalls of about 459,000 are expected (Table A.17). The state must therefore prioritize developing worker skills and addressing the projected shortfalls through 2040.

Employment is critical to economic development, so strategies to address any potential shortfalls must be adopted and implemented. Such strategies should aim at increasing labor force participation, encouraging in-migration, and raising worker productivity. Efforts to address the need for higher labor force participation, higher productivity, and faster labor force growth to meet workforce demand must include: (1) improving education and its funding; (2) using economic opportunities to attract new residents; (3) focusing on hard-to-serve populations (e.g. out-of-school youth); (4) lowering the high school dropout rate; (5) continuing and enhancing programs to assess, retrain, and place dislocated workers; (6) encouraging older worker participation in the labor force; and (7) facilitating in-commuting.

Improving education is vital because a highly educated and productive workforce is a critical economic development asset. The educational and training requirements of high-demand, fast-growing, and high-earning occupations show the significance of education in developing the workforce of the future. The importance of basic skills in general and for high-demand, high-growth, and high-earning jobs demonstrates a strong need for training in these skills. The pace of training needs to increase for technical, basic, and systems skills, while the scale of training must also be raised for basic and social skills. Ideally, all high school

graduates should possess basic skills so that postsecondary and higher education can focus on other and more complex skills while enhancing these basic skills. Employers should be an integral part of planning for training as they can help identify future needs and any existing gaps. Education and training for the 20 sharp-declining occupations in Table A.12 should slow accordingly.

Another very important reason to improve education is that people with more education are more likely to be employed; data on worker participation and educational attainment show that labor force participation increases with worker education. Productivity also rises with education, which yields high private and social returns. Workforce development must view all of the education and other programs (e.g. adult education, career technical training, worker retraining, career readiness, etc.) as one system. Funding to support workforce development may require tax reform at state and local levels and must provide for flexibility as workforce needs change over time and demand different priorities.

Programs to assess, retrain, and place dislocated workers—especially those affected by outsourcing and structural changes in the economy—should continue and be enhanced because they can improve the labor force participation rate. Hard-to-serve populations include persons in poverty, those receiving welfare, residents of sparsely populated areas, and those on active parole. These populations are often outside of the mainstream economy and are in poverty. They usually have difficulty finding work because they have low levels of educational attainment, lack occupational skills, or face geographic or other barriers. They are a potential human resource, but investment in training, transportation, child care, infrastructure, etc. may be needed to tap this resource.

Table A.17 Expected Worker Shortfall

	2018-2028	2018-2030	2018-2035	2018-2040
Total population growth (percent)	4.0	4.9	6.9	8.9
Age 20-64 growth (percent)	-1.4	-1.3	0.2	2.1
Job growth (percent)	12.6	14.5	20.8	25.5
Worker shortfall (percent)	13.9	15.8	20.5	23.4
Worker shortfall (number)	273,342	309,951	403,036	459,496

Source: Center for Business and Economic Research, The University of Alabama.

In-migration is one way of growing the labor force, as it helps population growth. The state's population growth rate is low and may hinder its ability to meet the expected job demand barring future economic slowdowns. Higher employment demand could be partially served by in-commuting. However, new residents can be attracted using the high-paying job opportunities from the state's numerous economic development successes. Investment in amenities and infrastructure may be needed to support such growth. In-migration is generally more beneficial to the state than in-commuting since it grows the economy faster and adds to the tax base.

Policies that facilitate and encourage older worker participation are needed as older workers could help meet the state's workforce challenges. Such policies could be related to income taxation, job flexibility, and retirement programs. As the share of older people in the population is projected to increase, it becomes even more important that they be active in the workforce. Older worker participation has been rising nationally since the early 1990s. This has been attributed to reasons including:

- older workers can work longer because they are healthier,
- the number of physically demanding jobs is declining,
- defined contribution plans are replacing pensions,
- there are fewer employer-paid retiree health insurance programs, and
- social security reforms affecting those born after 1938 (i) gradually raised the full retirement age from 65 to 67, (ii) increased the rate at which monthly payments rise with delayed benefits, and (iii) eliminated the reduction in benefits for those working beyond the full retirement age.

Diversifying the state's economy will strengthen it. This demands that economic development must also focus on retaining, expanding, and attracting businesses that provide more high-earning jobs. Current workers—including the underemployed—would welcome higher-earning opportunities. An economic development focus on diversification would require that workforce development pay attention to postsecondary and higher educational systems to ensure a ready and available workforce for new and expanding businesses. The higher incomes earned by graduates of these institutions would help raise personal income for the state and provide additional tax revenue for the state and local (county and city) tax jurisdictions. Raising personal income by improving educational attainment and technological skills for a state that has low population and labor force growth rates is an effective economic development strategy. Together, workforce development and economic development can build a strong, well-diversified economy. Indeed, one cannot achieve success without the other.



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