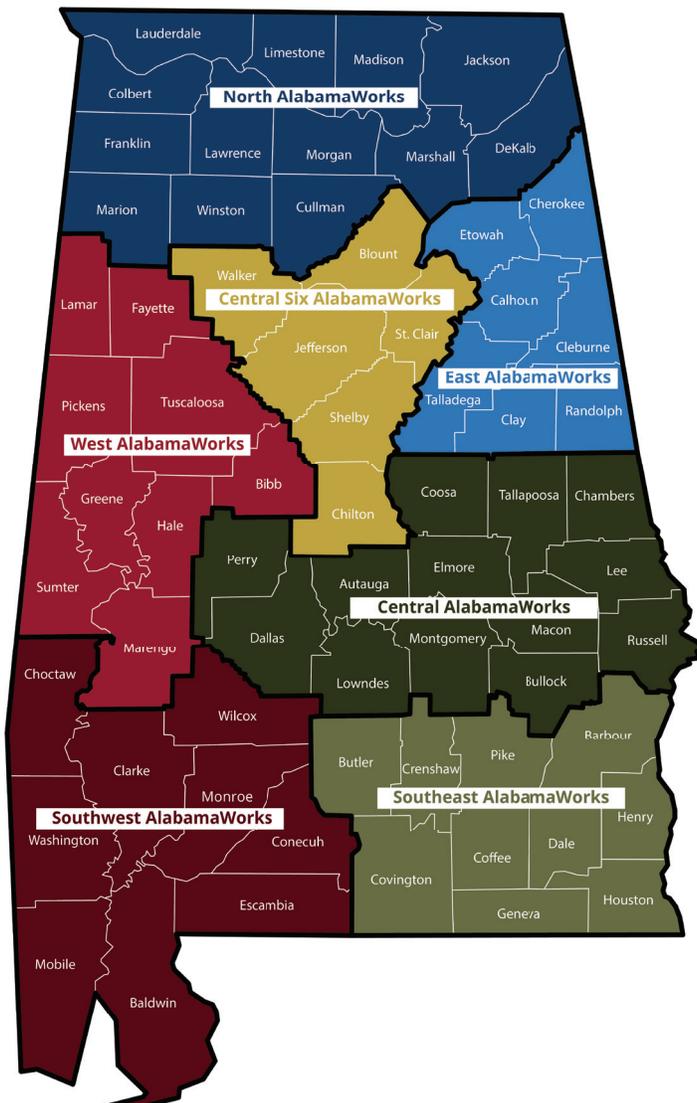


STATE OF WORKFORCE REPORT XIII:

Alabama

AUGUST 2019

Center for Business and Economic Research
Culverhouse College of Business
University of Alabama Center for
Economic Development
Institute for Social Science Research



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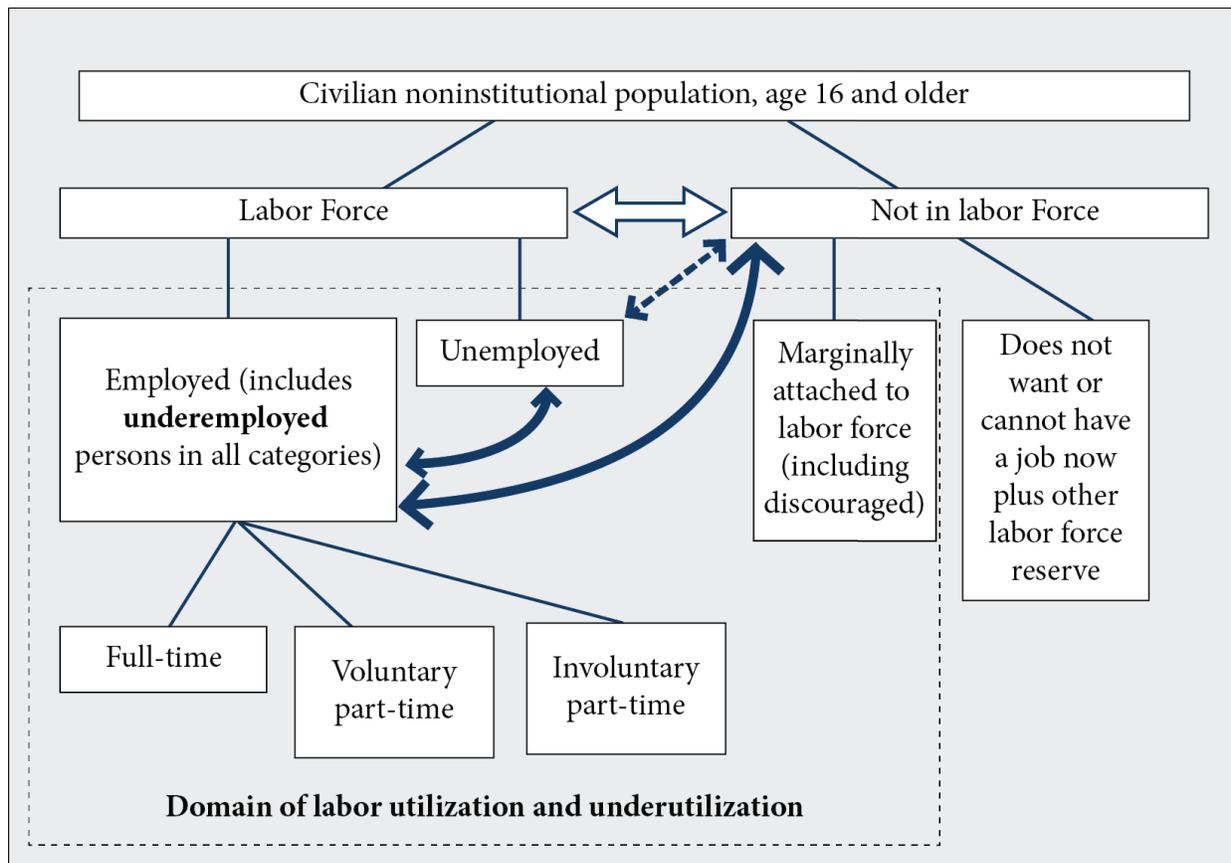
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Summary

- 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 3.8 percent in March 2019, with 83,865 unemployed. An underemployment rate of 22.8 percent for 2018 means that the state has a 574,914-strong available labor pool that includes 491,049 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 39,073 in 2015 but commute time and distance went down in 2018 from the previous year. This implies that congestion eased statewide. However, congestion is likely to persist especially in the major metro areas as the state economy and population grow and can slow the pace of economic development. Continuous maintenance and development of transportation infrastructure and systems is therefore important.
- By sector, the top five employers in the state are manufacturing, health care and social assistance, retail trade, accommodation and food services, and educational services. These five industries provided 1,094,679 jobs or 58.7 percent of the state total in the first quarter of 2018. The leading employers are not the highest paying sectors as only manufacturing had an average wage that is above the state average monthly wage of \$3,539. Economic development should aim to diversify and strengthen the state's economy by retaining, expanding, and attracting more high-wage providing industries. Workforce development should also focus on preparing workers for these industries.
- On average, 80,716 jobs were created per quarter from the second quarter of 2001 to the first quarter of 2018; quarterly net job flows averaged 7,671. 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 Laborers and Freight, Stock, and Material Movers, Hand; Team Assemblers; Customer Service Representatives; Heavy and Tractor-Trailer Truck Drivers; and Registered Nurses.
- The top five fast-growing occupations are Home Health Aides; Aircraft Mechanics and Service Technicians; Information Security Analysts; Physician Assistants; and Computer Numerically Controlled Machine Tool Programmers, Metal and Plastic.
- The top 50 high-earning occupations are in health, management, postsecondary education, science, and engineering fields and have a minimum salary of \$102,932. Nine of the top 10 are health occupations and one is in management.
- Of the top 40 high-demand, top 19 fast-growing, and top 50 high-earning occupations, two— Software Developers, Systems Software and Aerospace Engineers—are both high-demand and high-earning occupations. Eleven occupations are both high-demand and fast-growing. None are in all three occupations.

- Of the state's 790 occupations, 114 are expected to decline over the 2016 to 2026 period. Nineteen occupations are expected to sharply decline by a minimum of 140 jobs, with each dropping by at least 7.0 percent. Education and training for these 19 occupations should slow accordingly.
- Skill and education requirements for jobs keep rising. Educational and training requirements of high-demand, fast-growing, and high-earning occupations demonstrate the importance of education in developing tomorrow's workforce. In the future, more jobs will require postsecondary education and training at a minimum.
- The importance of basic skills generally and for high-demand, high-growth, and high-earning jobs indicate 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 skill needs and any existing gaps.
- From a 2016 base, worker shortfalls of about 199,000 and 243,000 are expected for 2026 and 2030, respectively. Worker shortfalls are expected to rise to 273,000 in 2035 and reach 291,000 by 2040. This trend requires prioritizing on both skills and the expected shortfall through 2040. Worker shortfalls for critical occupations will need to be addressed continuously. Strategies to address skill needs and worker shortfalls might include: (1) improvements in education and its funding; (2) use of 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) continuation and enhancement of programs to assess, retrain, and place dislocated workers; (6) encouragement of older worker participation in the labor force; and (7) facilitation of 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 for 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 presents labor utilization and supply flows that explain labor market dynamics in view of recent study findings. 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; the unemployed 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, in 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 the disabled and discouraged workers). Table A.1 shows labor force information for Alabama and each of the state's seven AlabamaWorks regions for 2018 and in March 2019. 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.

Table A.1 AlabamaWorks Labor Force Information

	2018 Annual Average			
	Labor Force	Employed	Unemployed	Rate (%)
North	528,133	508,764	19,369	3.7
East	156,912	150,233	6,679	4.3
West	151,424	145,368	6,056	4.0
Central Six	536,202	517,292	18,910	3.5
Central	339,056	325,319	13,737	4.1
Southeast	158,136	151,399	6,737	4.3
Southwest	328,981	313,976	15,005	4.6
Alabama	2,198,837	2,112,347	86,490	3.9
United States	162,075,000	155,761,000	6,314,000	3.9

	March 2019			
	Labor Force	Employed	Unemployed	Rate (%)
North	537,159	518,284	18,875	3.5
East	159,457	152,921	6,536	4.1
West	154,840	149,113	5,727	3.7
Central Six	546,056	527,579	18,477	3.4
Central	343,823	330,580	13,243	3.9
Southeast	160,267	153,842	6,425	4.0
Southwest	334,099	319,517	14,582	4.4
Alabama	2,235,701	2,151,836	83,865	3.8
United States	162,823,000	156,441,000	6,382,000	3.9

Note: Not seasonally adjusted.

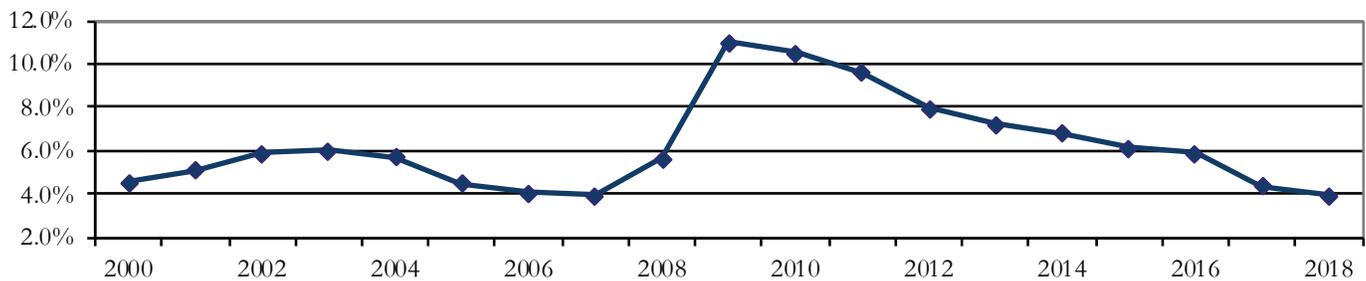
Source: Alabama Department of Labor and U.S. Bureau of Labor Statistics.

Unemployment rates for the state and all AlabamaWorks regions have declined since the end of the last recession. In 2018, regional unemployment rates ranged between 3.5 percent (Central Six AlabamaWorks) and 4.6 percent (Southwest), with a 3.9 percent annual average for the state. Alabama's unemployment rate was the same as the national rate. However, only two regions—Central Six and North AlabamaWorks—had lower unemployment rates than the state and national rates. In March 2019 unemployment rates declined and ranged from 3.4 percent (Central Six) to 4.4 percent (Southwest) for the

regions, with a 3.8 percent rate for the state, which was lower than 3.9 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 followed by East.

The statewide unemployment has been declining since 2009 when it rose to 11.0 percent due to the last 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, in 2017 the unemployment rate declined sharply to 4.4 percent. In 2018, the statewide unemployment rate dropped below pre-recession levels to a record low rate of 3.9 percent. Year-to-date monthly labor force data suggest a similar low state unemployment rate for 2019 as seen in 2018 as low unemployment draws more people back into the workforce and the state economy approaches full employment. In January 2019, the seasonally unadjusted unemployment rate was 4.4 percent before falling to 4.0 percent in February. By March, the unemployment rate fell to 3.8 percent, below the 3.9 percent national unemployment rate. Despite ongoing economic development efforts, the long-lasting effects of the latest recession and structural changes in the state’s economy are likely to continue being a challenge over the next few years, especially in poor, rural counties such as those in East, West, and Southeast AlabamaWorks.

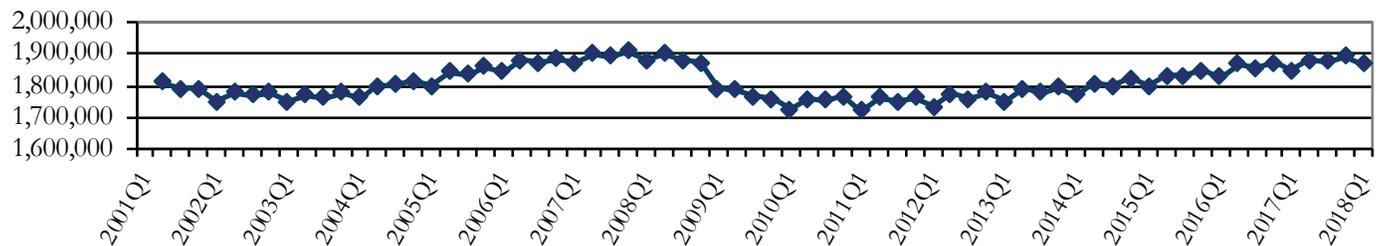
Figure A.1 Alabama Unemployment Rate



Source: Alabama Department of Labor.

Nonagricultural employment of Alabama residents in the state averaged about 1.8 million from the second quarter of 2001 to the first quarter of 2018 (Figure A.2). The number of jobs in the state dropped from a high of 1.9 million in fourth quarter 2007 to a low of 1.7 million in the first quarter of 2011 due to the last recession. It is yet to reach pre-recession levels. Employment has been recovering gradually and is slightly below pre-recession levels. In the fourth quarter of 2017, employment reached 1,892,647 before dropping to 1,865,413 in the first quarter of 2018. At 57.2 percent, the state’s labor force participation rate was lower than the nation’s 62.9 percent in 2018. This is an improvement for Alabama as the rate had dropped to 56.8 percent in 2017.

Figure A.2 Alabama Nonagricultural Employment



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

Table A.2 shows worker distribution by age in Alabama for first quarter 2018. At 22.0 percent, older workers (age 55 and over) constitute a significant and growing part of total nonagricultural employment. The share of older workers age 55 and over across the workforce investment areas ranged from 20.7 percent for West AlabamaWorks to 23.3 percent for Southeast. To meet long term occupational projections for growth and replacement, labor force participation of younger residents must increase; additionally older workers may need to be incentivized to work longer.

**Table A.2 Workers by Age Group
(First Quarter 2018)**

Age Group	Nonagricultural Employment	
	Number	Percent
14-18	38,929	2.1
19-24	203,581	10.9
25-34	411,554	22.1
35-44	401,566	21.5
45-54	399,459	21.4
55-64	308,182	16.5
65+	102,143	5.5
55 and over total	410,325	22.0
Total all ages	1,865,414	100.0

Source: U.S. Census Bureau, Local Employment Dynamics Program.
Note: Rounding errors may be present. Nonagricultural employment is by place of work, not residence.

Commuting Patterns

In 2005, more Alabama residents commuted out of the state to work than nonresidents commuted in for work (Table A.3). Commuter outflow was 63,630 workers while inflow was at 43,434 workers. By 2015, the level of out-commuting increased by 66.2 percent to 105,775 and in-commuting rose by 53.6 percent to 66,702. Net out-commuting increased significantly from 20,196 to 39,073 workers. Most of the commuting involved Alabama's four neighboring states. The top destinations for the out-commuting Alabama residents in 2015 were Georgia (46,317), Mississippi (18,389), Florida (12,887), and Tennessee (12,086). Most of the in-commuting workers were from Georgia (19,228), Tennessee (13,342), Florida (13,098), and Mississippi (10,743).

Table A.3 also shows the one-way average commute time and distance for Alabama workers in the past four years. More workers reported shorter commute times and distances in 2018 compared to 2017, implying that

Table A.3 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	
Percent of Workers				
Average commute time (one-way)	2015	2016	2017	2018
Less than 20 minutes	49.2	50.1	48.7	48.7
20 to 40 minutes	28.9	27.2	28.3	28.0
40 minutes to an hour	10.3	10.3	10.5	10.2
More than an hour	3.6	3.7	4.4	3.3
Average commute distance (one-way)	2015	2016	2017	2018
Less than 10 miles	41.3	41.9	40.8	40.3
10 to 25 miles	33.6	33.2	32.6	34.2
25 to 45 miles	15.4	15.2	15.7	15.3
More than 45 miles	7.0	7.0	8.6	7.1

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.

congestion eased somewhat across the state. As the state economy and population continue to grow, congestion will increase and remain a challenge especially in troublesome and high-traffic areas. 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.

Population

The Alabama population count of almost 4.8 million for 2010 was 7.5 percent more than in 2000 (Table A.4). The state's population growth was lower than the nation's 9.7 percent. During that period, population grew faster for North and West AlabamaWorks regions than for the state. North AlabamaWorks had the highest population growth at 10.7 percent, followed by West with 7.6 percent, and Central Six at 7.1 percent. East AlabamaWorks had the lowest population growth

Table A.4 Population by Workforce Development Region

AlabamaWorks Region	1990 Census	2000 Census	2010 Census	2018 Estimate	Change 2000-2010	Percent Change	Change 2010-2018	Percent Change
North	876,519	996,565	1,103,284	1,149,346	106,719	10.7	46,062	4.2
East	355,387	370,774	383,099	373,625	12,325	3.3	-9,474	-2.5
West	286,383	305,545	328,717	336,242	23,172	7.6	7,525	2.3
Central Six	940,268	1,031,412	1,105,132	1,129,401	73,720	7.1	24,269	2.2
Central	622,805	695,681	741,877	755,801	46,196	6.6	13,924	1.9
Southeast	335,242	354,943	378,812	377,819	23,869	6.7	-993	-0.3
Southwest	623,983	692,180	738,815	765,637	46,635	6.7	26,822	3.6
Alabama	4,040,587	4,447,100	4,779,736	4,887,871	332,636	7.5	108,135	2.3
United States	248,709,873	281,421,906	308,745,538	327,167,434	27,323,632	9.7	18,421,896	6.0

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

Table A.5 Alabama Population by Age Group and 2040 Projections

Age Group	2000	2010	2016	2026	2030	2035	2040
0-19	1,256,169	1,276,312	1,223,109	1,250,621	1,249,603	1,254,405	1,270,221
20-24	306,865	335,322	333,330	347,004	349,780	355,521	357,752
25-29	301,196	311,034	332,135	310,478	313,626	318,888	325,249
30-34	301,819	297,888	305,352	312,549	316,473	321,663	327,898
35-39	340,300	308,430	301,057	302,066	314,418	321,007	327,293
40-44	345,212	311,071	294,656	311,625	302,017	318,873	326,737
45-49	315,173	346,369	312,055	299,973	316,131	304,581	322,735
50-54	285,036	347,485	331,963	302,483	296,454	317,643	306,746
55-59	225,450	311,906	338,734	301,234	301,784	295,426	317,527
60-64	190,082	276,127	306,358	320,311	296,330	298,356	292,975
65+	579,798	657,792	784,551	988,210	1,067,764	1,114,164	1,144,172
20-64 Total	2,611,133	2,845,632	2,855,640	2,807,723	2,807,013	2,851,958	2,904,912
Total Population	4,447,100	4,779,736	4,863,300	5,046,554	5,124,380	5,220,527	5,319,305
<i>Change from 2016</i>							
0-19				2.2%	2.2%	2.6%	3.9%
20-64				-1.7%	-1.7%	-0.1%	1.7%
Total Population				3.8%	5.4%	7.3%	9.4%

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

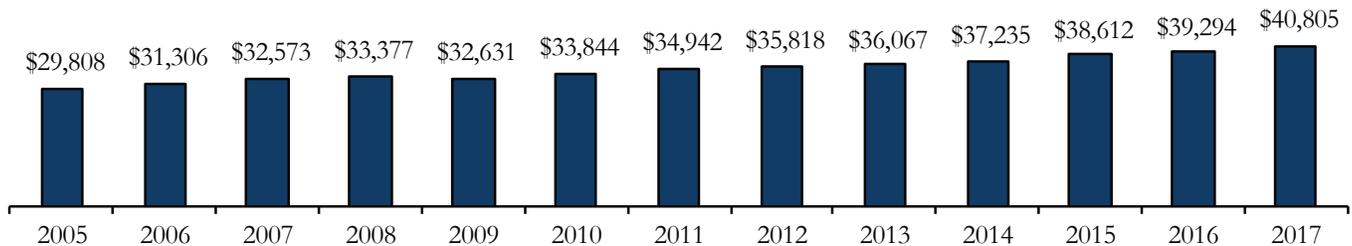
at 3.3 percent. The 2018 population estimates show a 2.3 percent population increase for the state since 2010 with much of the growth occurring in North and Southwest AlabamaWorks. The estimates indicate the population declined in East and Southeast AlabamaWorks but increased in the other five regions. East AlabamaWorks led in population decline.

Table A.5 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 turns 65 and over. 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 2016 base, prime working population growth is expected to decline through 2035 but grow by 1.7 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 is expected for the long term, communities that experience rapid job gains may need to consider investments in amenities and infrastructure to attract new residents.

Per Capita Income

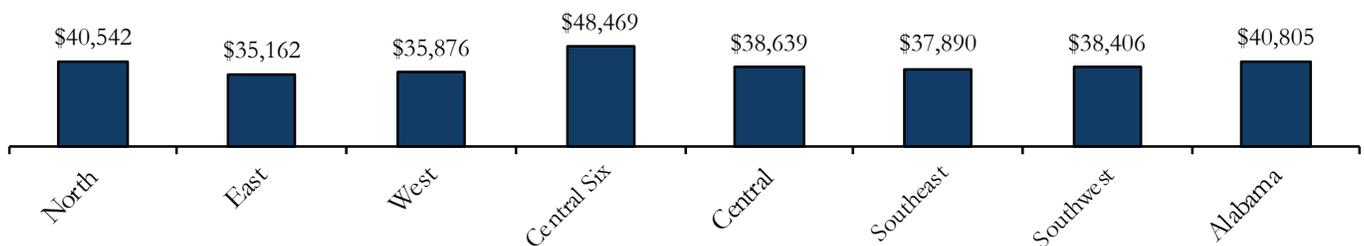
Per capita income (PCI) in Alabama was \$40,805 in 2017 (Figures A.3 and A.4), up 36.9 percent from 2005. Central Six AlabamaWorks had the highest PCI with \$48,469 followed by North with \$40,542 and Central with \$38,639. Only Central Six had a higher PCI than the state average. At \$35,162, East AlabamaWorks had the lowest PCI followed by West with \$35,876.

Figure A.3 Alabama Per Capita Income



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

Figure A.4 Regional Per Capita Income, 2017

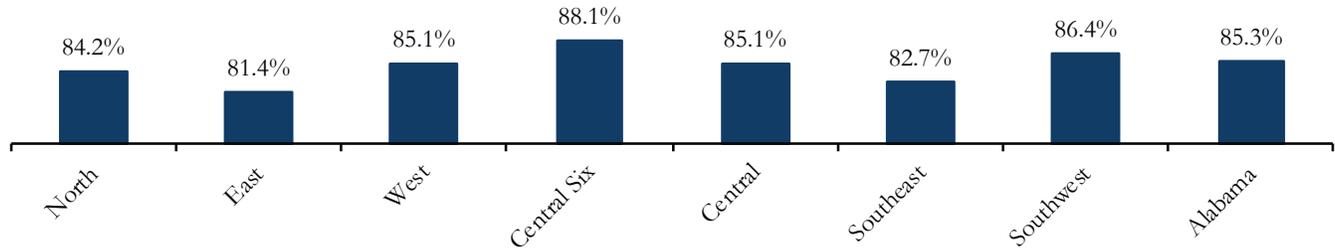


Source: U.S. Bureau of Economic Analysis and Center for Business and Economic Research, The University of Alabama.

Educational Attainment

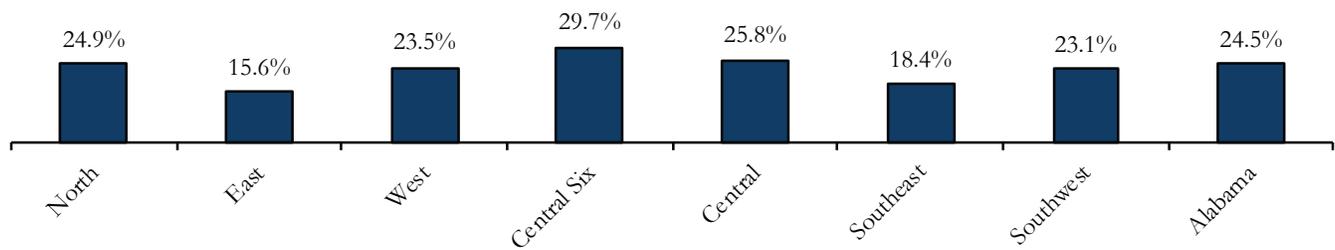
Educational attainment of Alabama residents who were 25 years old and over is shown in Table A.6 and Figures A.5 and A.6. These figures are based on the American Community Survey’s 5-year estimates for 2013 through 2017. In that period, over 85 percent of Alabama’s population had graduated from high 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. 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.5 High School Graduate or Higher, 2013-2017



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

Figure A.6 Bachelor's Degree or Higher, 2013-2017



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

Table A.6 Educational Attainment of Population 25 Years and Over, 2013-2017

	North	East	West	Central Six	Central	Southeast	Southwest	Alabama
Total	773,910	261,056	214,690	762,928	492,368	258,104	513,581	3,276,637
No schooling completed	11,283	3,731	3,009	7,094	5,993	3,783	6,225	41,118
Nursery to 4th grade	4,750	1,435	775	2,227	1,992	1,492	1,439	14,110
5th and 6th grade	9,463	3,126	1,476	6,072	4,222	2,541	2,742	29,642
7th and 8th grade	19,586	7,883	4,224	12,620	9,611	6,672	8,939	69,535
9th grade	18,718	7,902	4,861	12,027	10,685	6,703	9,642	70,538
10th grade	23,900	10,620	5,766	17,284	14,265	8,283	15,038	95,156
11th grade	21,302	8,743	7,782	19,980	15,991	9,276	16,538	99,612
12th grade, no diploma	13,073	5,140	4,034	13,403	10,771	5,775	9,152	61,348
High school graduate/equivalent	232,155	88,432	72,463	213,483	148,049	86,184	171,785	1,012,551
Some college, less than 1 year	47,891	18,411	11,567	44,619	28,828	17,000	30,137	198,453
Some college, 1+ years, no degree	114,791	44,084	33,312	124,936	77,149	39,996	79,483	513,751
Associate degree	64,510	20,845	15,073	62,536	37,599	22,890	43,792	267,245
Bachelor's degree	121,878	24,168	31,506	141,836	75,947	30,269	78,326	503,930
Master's degree	54,875	11,978	13,369	55,801	37,178	13,235	29,565	216,001
Professional school degree	8,395	2,923	2,473	18,572	7,504	2,475	7,110	49,452
Doctorate degree	7,340	1,635	3,000	10,438	6,584	1,530	3,668	34,195

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 are 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 the unemployed 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 (i) productivity growth, (ii) spousal employment and income, and (iii) family constraints or personal preferences. Underemployment is unique in different areas because of the various contributing factors combined with each area's 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 a hindrance to the business.

The underemployed present a significant pool of labor because they tend to respond to job opportunities that they believe are better for reasons that include (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 a necessary first step in considering this group for economic development, workforce training, planning, and other purposes. It is important to note that the underemployed 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 22.8 percent in 2018. Applying this rate to March 2019 labor force data means that 491,049 employed Alabama residents were underemployed (Table A.7). Adding the unemployed gives a total available labor pool of 574,914 statewide. This is 6.9 times the number of unemployed 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. The underemployed workers are willing to commute farther and longer for a better job. For one-way commute, 45.9 percent of the underemployed are prepared to add 20 or more minutes to their one-way commute and 34.6 percent are willing to add 20 or more extra miles for a better job. In contrast, 41.5 percent of all workers are prepared to add more than 20 minutes and 32.7 percent are ready for extra 20 miles or more.

Table A.7 Underemployed and Available Labor by AlabamaWorks Region

	Alabama	North	East	West	Central Six	Central	Southeast	Southwest
Labor force	2,235,701	537,159	159,457	154,840	546,056	343,823	160,267	334,099
Employed	2,151,836	518,284	152,921	149,113	527,579	330,580	153,842	319,517
Underemployment rate	22.8%	19.9%	26.0%	23.0%	21.6%	23.5%	24.2%	23.8%
Underemployed workers	491,049	102,931	39,714	34,356	114,010	77,620	37,184	76,173
Unemployed	83,865	18,875	6,536	5,727	18,477	13,243	6,425	14,582
Available labor pool	574,914	121,806	46,250	40,083	132,487	90,863	43,609	90,755

Note: Rounding errors may be present. Based on March 2019 labor force data and 2018 underemployment rates.

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

Underemployment rates for counties, AlabamaWorks regions, and the state were determined from an extensive survey of the state's workforce. A total of 8,845 complete responses were obtained. About 45 percent (4,022 respondents) were employed, of whom 918 stated that they were underemployed. Among the regions, underemployment ranged from 19.9 percent for North AlabamaWorks to 26.0 percent for East region. Central Six has the most available labor, followed by North. The two regions account for about 44 percent of the state's available labor pool. Among counties, Hale County had the highest rate of underemployment at 41.5 percent and Marshall had the lowest with 10.0 percent. Twenty-nine counties had underemployment rates above the state's 22.8 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, living too far from jobs, other family or personal obligations, owning a house in their area, other undisclosed reasons, and childcare responsibilities. Ongoing economic development efforts can help in this regard. Non-workers cite retirement, disability or other health concerns, social security limitations, low wages at available jobs, undisclosed reasons, and a lack of job opportunities in their area as reasons for their status. Such workers may become part of the labor force if their 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 and more of the part-timers prefer full-time work.
- More hold multiple jobs.
- They commute somewhat longer distances, but have shorter 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 support; food preparation and serving related; building and grounds cleaning and maintenance; personal care and service; sales and related; office and administrative support; construction and extraction; production; and transportation and material moving occupations.
- By industry, more are in manufacturing; wholesale trade; retail trade; real estate and rental and leasing; administrative and support and waste management and remediation services; educational services; arts, entertainment, and recreation; and accommodation and food 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, skills, and experience.
- More would leave their current jobs for higher income; 9.1 percent of the underemployed would leave for up to 5.0 percent more compared to 6.7 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 36 percent of underemployed versus 21 percent of all workers.
- They have higher educational attainment.
- Their median age, 51, is just a year younger than that of all employees.
- Fewer are married or male.
- More are African American or other nonwhite racial groups
- They are less likely to be Hispanic.⁴

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

⁴Hispanic can be of any race.

Table A.8 Job Satisfaction and Willingness to Train (Percent)

Job Satisfaction						
	Completely Dissatisfied	Dissatisfied	Neutral	Satisfied	Completely Satisfied	
Employed						
Overall	2.7	3.8	15.1	27.7	50.5	
Earnings	8.3	9.1	20.6	27.1	34.6	
Retention	2.9	3.3	9.6	18.4	64.8	
Work	1.0	2.3	8.6	24.2	63.7	
Hours	3.5	4.7	10.5	21.2	59.9	
Shift	2.7	3.2	8.5	17.6	67.6	
Conditions	2.4	4.4	11.7	24.9	56.3	
Commuting Distance	3.8	5.0	10.6	14.6	65.5	
Underemployed						
Overall	7.0	8.4	24.8	25.9	33.4	
Earnings	20.3	17.1	26.7	20.6	14.9	
Retention	7.3	5.2	19.9	19.9	51.1	
Work	2.4	4.7	15.6	28.8	48.5	
Hours	6.8	6.9	15.3	23.0	48.0	
Shift	5.0	5.8	9.5	21.0	58.2	
Conditions	4.6	9.3	16.3	27.5	42.1	
Commuting Distance	5.5	6.8	11.4	14.9	60.7	
Willingness to Train						
	Completely Unwilling	Unwilling	Neutral	Willing	Completely Willing	
Employed						
For a new or better job	22.5	5.7	15.6	11.9	43.2	
If paid by trainee	43.9	21.7	18.7	5.1	6.9	
If paid by trainee and government	14.0	13.5	32.7	20.5	16.5	
If paid by government	3.6	2.8	10.1	17.6	64.7	
Underemployed						
For a new or better job	15.0	4.6	12.7	12.2	54.6	
If paid by trainee	40.8	21.9	19.6	5.7	7.4	
If paid by trainee and government	11.6	10.6	33.1	22.8	18.5	
If paid by government	1.9	1.4	8.9	15.9	70.5	

Note: Rounding errors may be present.

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

Table A.8 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. Most workers (78.2 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 (59.4 percent). The underemployed are more dissatisfied with their earnings and most satisfied with their work shift.

Workers are generally willing to train for a new or better job, with the underemployed being much more willing (66.8 percent vs. 55.1 percent). However, the 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 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 even if they have to bear the full cost.

Workforce Demand

Industry Mix

The manufacturing sector was the leading employer in Alabama with 265,962 jobs in the first quarter of 2018 (Table A.9). Rounding out the top five industries by employment are health care and social assistance, retail trade, accommodation and food services, and educational services. These five industries provided 1,094,679 jobs, or 58.7 percent of the state total. The average monthly wage across all industries in the state was \$3,539. New hire monthly earnings averaged \$2,261 or 63.9 percent of the average monthly wage. The highest average monthly wages were for utilities at \$8,656; mining at \$6,445; professional, scientific, and technical services at \$5,781; finance and insurance at \$5,714; and management of companies and enterprises at \$4,982. Accommodation and food services paid the least at \$1,314. Mining had the highest average monthly new hire wage at \$5,463 followed by utilities at \$5,273 and professional, scientific, and technical services at \$4,602. Accommodation and food services paid newly hired workers the least at \$1,089.

Table A.9 Industry Mix (First Quarter 2018)

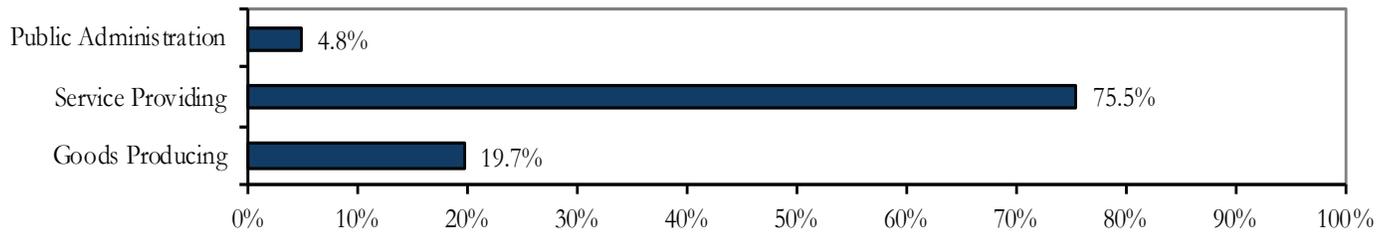
Industry by 2-digit NAICS Code	Total Employment	Share	Rank	Average Monthly Wage	Average Monthly New Hire Earnings
11 Agriculture, Forestry, Fishing and Hunting	11,766	0.6%	19	\$3,126	\$2,619
21 Mining	5,862	0.3%	20	\$6,445	\$5,463
22 Utilities	20,763	1.1%	17	\$8,656	\$5,273
23 Construction	83,147	4.5%	9	\$3,867	\$3,190
31-33 Manufacturing	265,962	14.3%	1	\$4,561	\$3,191
42 Wholesale Trade	72,040	3.9%	11	\$4,978	\$3,620
44-45 Retail Trade	233,806	12.5%	3	\$2,289	\$1,497
48-49 Transportation and Warehousing	63,073	3.4%	12	\$3,609	\$2,721
51 Information	21,836	1.2%	16	\$4,809	\$2,962
52 Finance and Insurance	72,534	3.9%	10	\$5,714	\$3,635
53 Real Estate and Rental and Leasing	24,342	1.3%	14	\$3,463	\$2,707
54 Professional, Scientific, and Technical Services	102,756	5.5%	7	\$5,781	\$4,602
55 Management of Companies and Enterprises	16,408	0.9%	18	\$4,982	\$2,747
56 Administrative and Support and Waste Management and Remediation Services	118,394	6.3%	6	\$2,069	\$1,768
61 Educational Services	160,171	8.6%	5	\$3,461	\$1,555
62 Health Care and Social Assistance	257,277	13.8%	2	\$3,425	\$2,477
71 Arts, Entertainment, and Recreation	22,334	1.2%	15	\$1,696	\$1,141
72 Accommodation and Food Services	177,463	9.5%	4	\$1,314	\$1,089
81 Other Services (Except Public Administration)	45,499	2.4%	13	\$2,986	\$2,088
92 Public Administration	89,980	4.8%	8	\$3,541	\$2,460
ALL INDUSTRIES	1,865,413	100.0%		\$3,539	\$2,261

Note: Rounding errors may be present.

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

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 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 75.5 percent of total state jobs in the first quarter of 2018 (Figure A.7). Goods producing industries were next with 19.7 percent, and public administration accounted for 4.8 percent. This distribution is for all nonagricultural jobs across the state and there is significant variation by AlabamaWorks regions.

Figure A.7 Alabama Employment Distribution (First Quarter 2018)



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

Job Creation and Net Job Flows

The state's job creation and net job flows are presented in Figures A.8 and A.9. Quarterly job creation averaged 80,716 from the second quarter of 2001 to the first quarter of 2018. Both job creation and net job flows have fluctuated significantly with highs in second quarters and lows in third quarters. Job creation have somewhat improved since 2009 when it was at its lowest, while job flows have reached pre-recession levels. Quarterly net job flows averaged 7,671 and ranged from a loss of 30,854 in the fourth quarter of 2008 to a gain of 28,996 in the second quarter of 2005. Job creation refers to 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.

Figure A.8 Job Creation in Alabama

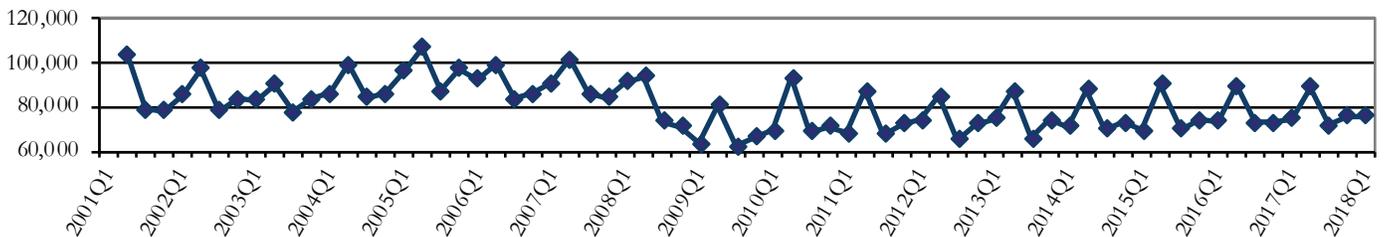
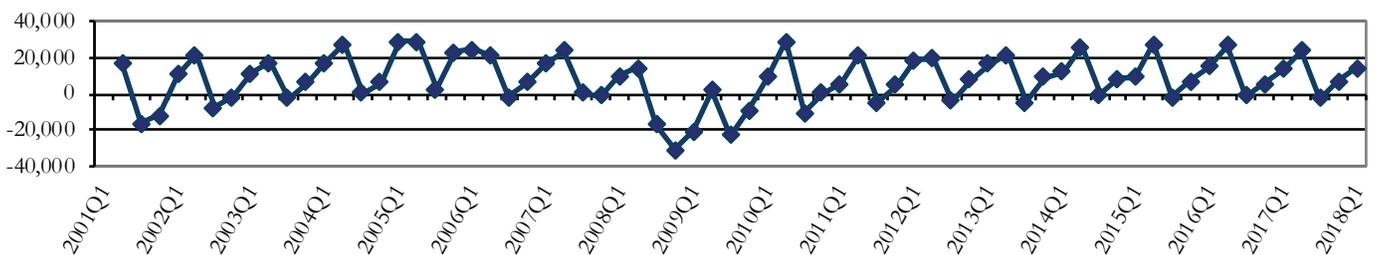


Figure A.9 Alabama Net Job Flows



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

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

There are 790 single occupations in Alabama. Table A.10 shows the top 40 occupations that are expected to be in high-demand, ranked by projected average annual job openings over the 2016 to 2026 period. Many of these occupations occur in health care, social assistance 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 Laborers and Freight, Stock, and Material Movers, Hand; Team Assemblers; Customer Service Representatives; Heavy and Tractor-Trailer Truck Drivers; and Registered Nurses. Eleven of the high-demand occupations are also fast-growing. This means that these 11 occupations have a minimum annual growth rate of 2.18 percent, thrice the statewide occupational growth rate of 0.67 percent. Two of the high-demand occupations—Aerospace Engineers and Software Developers, Systems Software—are also high-earning occupations.

The 19 fastest growing occupations ranked by projected growth of employment are listed in Table A.11. Half of the top fast-growing occupations are health-related. The top five fast-growing occupations are Home Health Aides; Aircraft Mechanics and Service Technicians; Information Security Analysts; Physician Assistants; and Computer Numerically Controlled Machine Tool Programmers, Metal and Plastic. Two of the top five fast-growing occupations are health-related occupations.

Table A.12 shows the 50 highest earning occupations. In general, these occupations are in health, management, 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 high-earning salary is \$102,932 for Airline Pilots, Copilots, and Flight Engineers and the highest is \$297,673 for Anesthesiologists. The high-earning occupations are generally not fast-growing or in high-demand. Only two high-earning occupations are also high-demand (Table A.10 and Table A.12).

Of the state's 790 specific occupations, 114 are expected to decline over the 2016 to 2026 period. Employment in the 19 sharpest-declining occupations will decline by at least seven percent, with each losing a minimum of 140 jobs over the period (Table A.13). No efforts should be made to sustain these occupations because they are declining due to structural changes in the state economy.

Table A.10 Selected High-Demand Occupations (Base Year 2016 and Projected Year 2026)

Occupation	Average Annual Job Openings		
	Total	Due to Growth	Due to Separations
Laborers and Freight, Stock, and Material Movers, Hand	6,470	380	6,090
Team Assemblers	5,330	745	4,585
Customer Service Representatives	4,340	210	4,130
Heavy and Tractor-Trailer Truck Drivers	4,055	220	3,835
Registered Nurses	3,275	635	2,640
Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	2,755	190	2,565
Landscaping and Groundskeeping Workers	2,290	145	2,140
Accountants and Auditors	1,735	155	1,580
Maintenance and Repair Workers, General	1,735	125	1,610
Welders, Cutters, Solderers, and Brazers	1,345	160	1,185
Industrial Truck and Tractor Operators	1,335	125	1,210
Industrial Machinery Mechanics	1,225	225	1,000
Construction Laborers	1,215	80	1,135
Medical Assistants*	1,055	180	875
Home Health Aides*	960	215	740
Machinists	745	70	675
Medical Secretaries	695	95	600
Heating, Air Conditioning, and Refrigeration Mechanics and Installers	655	80	580
Plumbers, Pipefitters, and Steamfitters	650	60	595
Management Analysts	590	85	505
Software Developers, Applications*	565	180	385
Computer User Support Specialists	545	80	460
Bus and Truck Mechanics and Diesel Engine Specialists	505	45	455
Industrial Engineers*	500	145	355
Market Research Analysts and Marketing Specialists	420	70	345
Software Developers, Systems Software	365	75	295
Electrical Engineers	360	60	300
Aircraft Mechanics and Service Technicians*	355	105	250
Phlebotomists*	340	65	270
Aerospace Engineers	335	60	270
Emergency Medical Technicians and Paramedics	335	75	265
Physical Therapist Assistants*	325	60	265
Mechanical Engineers	320	75	245
Computer Systems Analysts	295	40	255
Computer-Controlled Machine Tool Operators, Metal and Plastic	255	40	215
Nurse Practitioners*	235	85	150
Physical Therapists*	180	65	115
Respiratory Therapists	180	55	125
Industrial Engineering Technicians*	140	35	105
Information Security Analysts*	110	35	75

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.11 Selected Fast-Growing Occupations (Base Year 2016 and Projected Year 2026)

Occupation	Employment		Percent Change	Annual Growth (Percent)	Average Annual Job Openings
	2016	2026			
Home Health Aides*	5,590	7,750	39	3.32	960
Aircraft Mechanics and Service Technicians*	2,770	3,820	38	3.27	355
Information Security Analysts*	940	1,290	37	3.22	110
Physician Assistants	710	970	37	3.17	70
Computer Numerically Controlled Machine Tool Programmers, Metal and Plastic	610	830	35	3.13	90
Avionics Technicians	560	760	37	3.10	70
Fiberglass Laminators and Fabricators	750	1,010	35	3.02	130
Software Developers, Applications*	5,230	7,010	34	2.97	565
Occupational Therapy Assistants	500	660	31	2.82	85
Physical Therapist Assistants*	1,950	2,550	31	2.72	325
Operations Research Analysts	850	1,110	31	2.70	85
Industrial Engineering Technicians*	1,080	1,410	31	2.70	140
Nurse Practitioners*	2,760	3,600	30	2.69	235
Industrial Engineers*	4,850	6,310	30	2.67	500
Personal Care Aides	15,870	20,570	30	2.63	3,020
Phlebotomists*	2,390	3,040	27	2.43	340
Medical Assistants*	7,360	9,180	25	2.23	1,055
Physical Therapists*	2,620	3,260	24	2.21	180
Molders, Shapers, and Casters, Except Metal and Plastic	540	670	26	2.18	75

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.12 Selected High-Earning Occupations (Base Year 2016 and Projected Year 2026)

Occupation	Employment		Annual Growth (Percent)	Average Annual Job Openings	Mean Annual Salary (\$)
	2016	2026			
Anesthesiologists	690	770	1.10	25	297,673
Orthodontists	NA	NA	1.18	5	289,736
Surgeons	500	560	1.14	20	280,329
Internists, General	380	410	0.76	15	264,865
Physicians and Surgeons, All Other	5,780	6,210	0.72	195	247,609
Obstetricians and Gynecologists	170	190	1.12	5	244,837
Pediatricians, General	390	430	0.98	15	228,489
Family and General Practitioners	650	730	1.17	25	208,397
Chief Executives	1,910	1,830	-0.43	125	207,087
Dentists, All Other Specialists	50	50	0.00	0	193,052
Dentists, General	1,250	1,460	1.57	55	181,239

Table A.12 (continued)

Nurse Anesthetists	1,750	2,020	1.45	115	166,951
Psychiatrists	420	470	1.13	15	166,544
Podiatrists	100	110	0.96	5	155,616
Law Teachers, Postsecondary	180	190	0.54	15	145,865
Architectural and Engineering Managers	2,530	2,800	1.02	210	139,104
Physicists	230	260	1.23	20	134,525
Financial Managers	5,320	6,270	1.66	515	130,980
Petroleum Engineers	130	150	1.44	10	128,156
Sales Managers	2,790	2,990	0.69	260	126,629
Health Specialties Teachers, Postsecondary	2,860	3,870	3.07	350	126,115
Administrative Law Judges, Adjudicators, and Hearing Officers	120	120	0.00	5	124,356
Compensation and Benefits Managers	100	110	0.96	5	124,270
Personal Financial Advisors	2,740	3,060	1.11	245	124,238
Computer and Information Systems Managers	3,380	3,790	1.15	300	123,790
Training and Development Managers	160	180	1.18	15	123,452
Marketing Managers	590	640	0.82	55	123,432
Engineering Teachers, Postsecondary	620	690	1.08	55	122,889
Pharmacists	5,400	5,550	0.27	245	122,026
General and Operations Managers	27,840	30,510	0.92	2610	120,726
Economics Teachers, Postsecondary	140	160	1.34	15	118,200
Lawyers	6,860	7,400	0.76	350	117,637
Aerospace Engineers*	4,340	4,960	1.34	335	116,002
Nuclear Engineers	190	180	-0.54	10	114,986
Engineers, All Other	3,430	3,600	0.48	240	113,700
Mathematicians	NA	NA	0.00	0	112,694
Natural Sciences Managers	NA	NA	0.57	15	112,584
Physical Scientists, All Other	180	180	0.00	15	111,301
Purchasing Managers	970	1,080	1.08	90	109,201
Electronics Engineers, Except Computer	2,280	2,510	0.97	170	108,233
Computer Hardware Engineers	1,460	1,610	0.98	110	108,090
Optometrists	600	700	1.55	30	108,005
Chemical Engineers	590	650	0.97	45	106,640
Education Administrators, Postsecondary	2,330	2,500	0.71	195	106,505
Human Resources Managers	1,410	1,560	1.02	130	105,673
Agricultural Sciences Teachers, Postsecondary	230	240	0.43	20	104,159
Medical and Health Services Managers	3,170	3,660	1.45	310	103,656
Software Developers, Systems Software*	4,260	5,020	1.66	365	103,376
Ship Engineers	120	120	0.00	15	103,342
Airline Pilots, Copilots, and Flight Engineers	290	300	0.34	25	102,932

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 2017 release of the Occupational Employment Statistics (OES) combined employment and wage file. Estimates for specific occupations may include imputed data.

* Qualify as both high-earning and high-demand occupations. NA - Not available due to disclosure limitations.

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

Table A.13 Selected Sharp-Declining Occupations (Base Year 2016 and Projected Year 2026)

Occupation	Employment		Net Change	Percent Change
	2016	2026		
Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	50,990	47,310	-3,680	-7
Tellers	9,140	8,170	-970	-11
Executive Secretaries and Executive Administrative Assistants	4,010	3,290	-720	-18
Legal Secretaries	4,020	3,330	-690	-17
Telecommunications Equipment Installers and Repairers, Except Line Installers	4,200	3,690	-510	-12
Correctional Officers and Jailers	5,760	5,260	-500	-9
Postal Service Mail Carriers	5,170	4,670	-500	-10
Sewing Machine Operators	3,340	2,960	-380	-11
Data Entry Keyers	1,710	1,350	-360	-21
Textile Winding, Twisting, and Drawing Out Machine Setters, Operators, and Tenders	1,990	1,630	-360	-18
Bill and Account Collectors	4,450	4,120	-330	-7
Switchboard Operators, Including Answering Service	1,310	1,000	-310	-24
Structural Metal Fabricators and Fitters	2,650	2,350	-300	-12
Photographers	1,460	1,160	-300	-20
Electrical and Electronic Equipment Assemblers	2,810	2,580	-230	-8
Computer Operators	760	570	-190	-24
Textile Knitting and Weaving Machine Setters, Operators, and Tenders	900	740	-160	-18
Advertising Sales Agents	1,660	1,500	-160	-9
Postal Service Mail Sorters, Processors, and Processing Machine Operators	1,000	860	-140	-14

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

Jobs require skill sets and it is necessary that jobholders have the relevant skills. Table A.14 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 higher education that such jobs require. Lower earning occupations require more basic skill sets. Some occupations have no minimum skill set requirements (e.g. dishwashers and maids).

Table A.15 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.15 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, mathematics, reading comprehension, science, speaking, writing, complex problem solving, management of both financial and personnel resources, negotiation, persuasion, and judgment and decision making 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. High-demand occupations in general require more technical skills than fast-growing and high-earning occupations. Fast-growing occupations require more basic, complex problem solving, time management, and systems skills than high-demand occupations.

Table A.14 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.15 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	38	47	56
Active Listening	73	84	88
Critical Thinking	80	89	90
Learning Strategies	3	0	16
Mathematics	10	11	18
Monitoring	58	79	56
Reading Comprehension	73	79	84
Science	8	5	34
Speaking	68	84	86
Writing	33	37	54
Complex Problem Solving Skills			
Complex Problem Solving	50	58	70
Resource Management Skills			
Management of Financial Resources	0	0	2
Management of Material Resources	0	0	0
Management of Personnel Resources	0	0	12
Time Management	25	32	10
Social Skills			
Coordination	38	32	26
Instructing	10	21	16
Negotiation	3	0	10
Persuasion	8	5	10
Service Orientation	28	42	12
Social Perceptiveness	38	47	40
Systems Skills			
Judgment and Decision Making	40	68	80
Systems Analysis	10	16	6
Systems Evaluation	10	16	2
Technical Skills			
Equipment Maintenance	13	11	2
Equipment Selection	8	0	0
Installation	0	0	0
Operation and Control	23	11	4
Operation Monitoring	23	21	4
Operations Analysis	10	5	8
Programming	3	11	0
Quality Control Analysis	13	16	0
Repairing	10	11	2
Technology Design	0	0	0
Troubleshooting	13	11	2

Note: Rounding errors may be present.

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

Table A.16 shows skill gap indexes for all 35 skills in Table A.14 based on 2016 to 2026 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, 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, basic, 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. Over 85 percent of Alabamians age 25 and over have graduated from high school, compared to 87 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 31 percent. Skill and education requirements for jobs keep rising. This highlights a strong need to raise educational attainment in the state.

Table A.17 shows the number of selected occupations in Alabama for which a particular education category is most common. In general, high-earning occupations require high educational attainment levels. Forty-nine (98.0 percent) of the top 50 high-earning occupations require a bachelor's or higher degree. Seventeen (42.5 percent) of the 40 high-demand occupations require an associate degree at the minimum and 14 (35.0 percent) require a bachelor's or higher degree. Eleven (57.9 percent) of the 19 fast-growing occupations require an associate degree at the minimum and seven (36.8 percent) require a bachelor's or higher degree.

Table A.16 Skills Gap Indexes (Base Year 2016 and Projected Year 2026)

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 2016 to 2026 occupation projections.

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

Table A.17 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	1	1	22
Master's Degree	1	2	3
Bachelor's Degree	12	4	24
Associate Degree	3	4	0
Postsecondary Non-Degree	0	4	1
Some College, no Degree	1	0	0
High School Diploma or Equivalent	12	4	0
No Formal Educational Credential	10	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 2016 base, worker shortfalls of about 199,000 are expected in 2026. The projected worker shortfalls are expected to grow to about 243,000 and 273,000 in 2030 and 2035, respectively. By 2040, worker shortfalls of about 291,000 are expected (Table A.18). The state must therefore focus on worker skills and the projected shortfalls as the top priorities through 2040.

Table A.18 Expected Worker Shortfall

	2016-2026	2016-2030	2016-2035	2016-2040
Total population growth (percent)	3.8	5.4	7.3	9.4
Age 20-64 growth (percent)	-1.7	-1.7	-0.1	1.7
Job growth (percent)	8.0	10.2	13.2	15.9
Worker shortfall (percent)	9.7	11.9	13.3	14.2
Worker shortfall (number)	199,132	243,315	273,404	291,441

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

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) improvements in education and its funding; (2) continuation and enhancement of programs to assess, retrain, and place dislocated workers; (3) focus on hard-to-serve populations (e.g. out-of-school youth); (4) lowering the high school dropout rate; (5) use of economic opportunities to attract new residents; (6) encouragement of older worker participation in the labor force; and (7) facilitation of 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 is also 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 skill needs and any existing gaps. Education and training for the 19 sharp-declining occupations in Table A.13 should slow accordingly.

Another very important reason to improve education is that more educated people are more likely to work; 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 be continued and 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.

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 (Table A.5), 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 falling
- Defined contribution plans are replacing pensions
- There are fewer employer-paid retiree health insurance programs
- Social security reforms affecting those born after that 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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