State of the Workforce Report VIII:
Alabama

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Alabama Department of Economic and Community Affairs

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Center for Business and Economic Research
Culverhouse College of Commerce

University of Alabama Center for Economic Development

Institute for Social Science Research

THE UNIVERSITY OF ALABAMA

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by

Samuel Addy, Ph.D., *Director and Research Economist*
Kilungu Nzaku, Ph.D., *Assistant Research Economist*
Ahmad Ijaz, *Associate Director* & *Director of Economic Forecasting*
Carolyn Trent, *Socioeconomic Analyst*
Sarah Cover, *Economic Forecaster*
Arben Skivjani, *Economic Forecaster*
Viktoria Riiman, *Socioeconomic Research Associate*
Gregg Bell, Ph.D., *Socioeconomic Research Associate*

Center for Business and Economic Research
Culverhouse College of Commerce
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, *Director*, University of Alabama Center for Economic Development
Underemployment Survey: Debra McCallum, *Research Social Scientist and Director of the Capstone Poll*
Michael Conaway, *Project Coordinator for the Capstone Poll*
Institute for Social Science Research

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Contents

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 5.7 percent in December 2013, with 120,307 unemployed. An underemployment rate of 23.1 percent for 2013 means that the state has a 579,098-strong available labor pool that includes 458,791 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 33,838 in 2011 and commute time and distance dropped slightly in 2013 from 2012. This implies that congestion may have eased somewhat although it remains a challenge and could be worsening in problematic areas. Congestion is likely to worsen as the economy recovers 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, educational services, and accommodation and food services. These five industries provided 1,032,943 jobs, 58.3 percent of the state total, in the fourth quarter of 2012. The leading employers are not the highest paying sectors; only manufacturing had wages that were above the state average monthly wage. 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 87,007 jobs were created per quarter from second quarter 2001 to four quarter 2012; quarterly net job flows averaged 6,473. 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 Registered Nurses; Home Health Aides; Licensed Practical and Licensed Vocational Nurses; Medical Assistants; and Personal and Home Care Aides.

- The top five fast-growing occupations are Personal and Home Care Aides; Home Health Aides; Occupational Therapist Assistants; Physical Therapist Assistants; and Metal-Refining Furnace Operators and Tenders.

- The top 50 high-earning occupations are in health, management, legal, engineering, computer, postsecondary education, and science fields and have a minimum salary of $90,490. Nine of the top 10 are health occupations.

- Of the top 40 high-demand, the top 20 fast-growing, and 50 high-earning occupations, only one occupation—Software Developers, Systems Software—belongs to all three categories. Eight occupations are both high-demand and high-earning while 11 occupations are both high-demand and fast-growing.

- Of the state's 785 occupations, 61 are expected to decline over the 2010 to 2020 period. Twenty occupations are expected to sharply decline by at least 10 percent, with each losing a minimum of 40 jobs. Education and training for these 20 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 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 is 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.

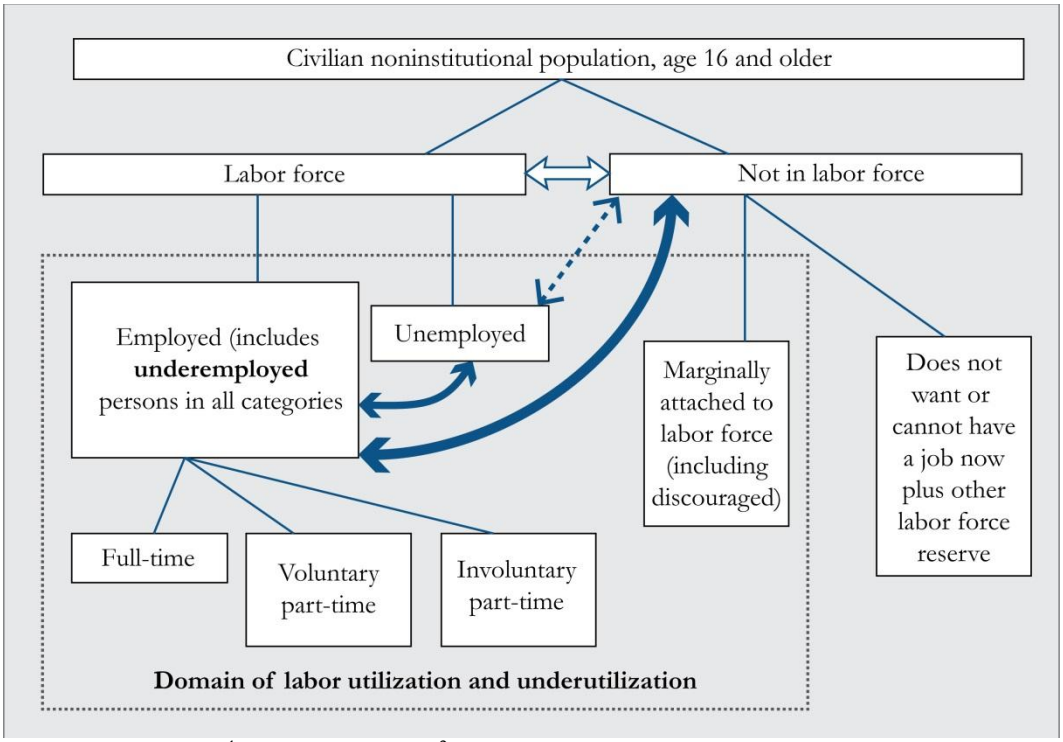
- From a 2010 base, worker shortfalls of 114,533 for 2020 and 218,904 for 2030 are expected. This will demand focusing on both skills and the expected shortfall as priorities through 2030. Worker shortfalls for critical occupations will need to be addressed continuously. Strategies to address skill needs 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, one cannot achieve success without the other.

Labor Utilization and Supply Flows



Source: Addy et al[1] and Canon et al[2]

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 comprises 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 do 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. 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.

[1] Addy, S.N., Bonnal, M., and Lira, C. (2012). Towards a More Comprehensive Measure of Labor Underutilization: The Alabama Case, *Business Economics*, vol. 47(3) .
[2] Canon, 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 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 Workforce Development Region (WDR) in the state for 2013 and for December 2013. 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 Alabama Labor Force Information

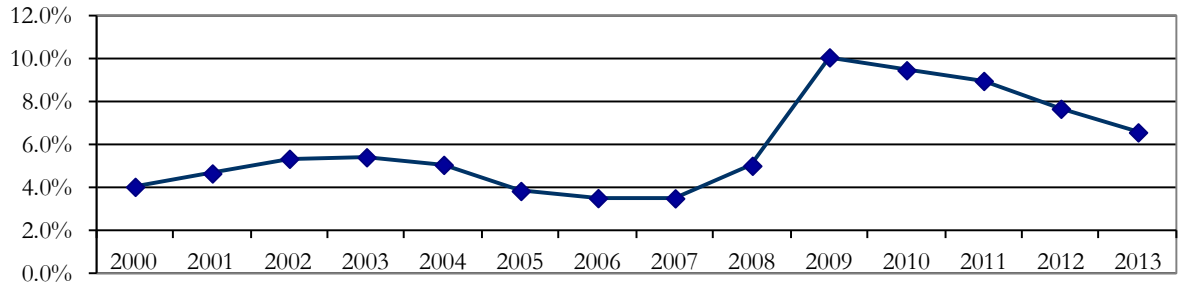
	2013 Annual Average			
	Labor Force	Employed	Unemployed	Rate (%)
WDR 1	117,889	109,589	8,300	7.0
WDR 2	397,318	373,700	23,618	5.9
WDR 3	131,906	123,351	8,555	6.5
WDR 4	518,475	488,580	29,895	5.8
WDR 5	188,514	175,297	13,217	7.0
WDR 6	32,566	28,738	3,828	11.8
WDR 7	184,096	171,385	12,711	6.9
WDR 8	118,739	110,957	7,782	6.6
WDR 9	316,967	293,414	23,553	7.4
WDR 10	143,774	134,015	9,759	6.8
Jefferson County	303,678	285,058	18,620	6.1
Mobile County	186,417	172,324	14,093	7.6
Alabama	2,150,224	2,008,995	141,229	6.6
United States	155,389,000	43,929,000	11,460,000	7.4
	December 2013			
	Labor Force	Employed	Unemployed	Rate (%)
WDR 1	115,954	108,829	7,125	6.1
WDR 2	389,393	369,364	20,029	5.1
WDR 3	130,732	123,471	7,261	5.6
WDR 4	510,238	484,803	25,435	5.0
WDR 5	185,900	174,531	11,369	6.1
WDR 6	31,500	28,295	3,205	10.2
WDR 7	181,150	170,212	10,938	6.0
WDR 8	117,215	110,448	6,767	5.8
WDR 9	309,236	288,985	20,251	6.5
WDR 10	139,773	131,416	8,357	6.0
Jefferson County	298,707	282,855	15,852	5.3
Mobile County	182,040	170,119	11,921	6.5
Alabama	2,110,725	1,990,418	120,307	5.7
United States	154,408,000	144,423,000	9,984,000	6.5

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

The recession that began in December 2007 raised unemployment rates for the state and all WDRs but the rates have been slowly declining. Unemployment rates in 2013 ranged between 5.8 percent and 11.8 percent for the WDRs, with a 6.6 percent annual average for the state. In December 2013 unemployment rates ranged from 5.0 percent (WDR 4) to 10.1 percent (WDR 6) for the regions, with a 5.7 percent rate for the state. WDR 4 had the largest labor force and WDR 6 had the smallest.

The unemployment rate has been declining continuously since 2009 when it was highest due to the recent recession (Figure A.1). A slow economic recovery has kept unemployment rates above pre-recession levels. Year-to-date monthly labor force data point to a lower state unemployment rate for 2014 as monthly unemployment rates are below the corresponding 2013 rates. In December 2013 the state unemployment rate was at 5.7 percent, far below the 6.5 percent national unemployment rate. Preliminary indicators point to slightly higher rates for the first quarter of 2014 and lower later in the year. Despite ongoing economic development efforts, the long-lasting effects of the latest recession will likely keep unemployment gradually declining over next several years.

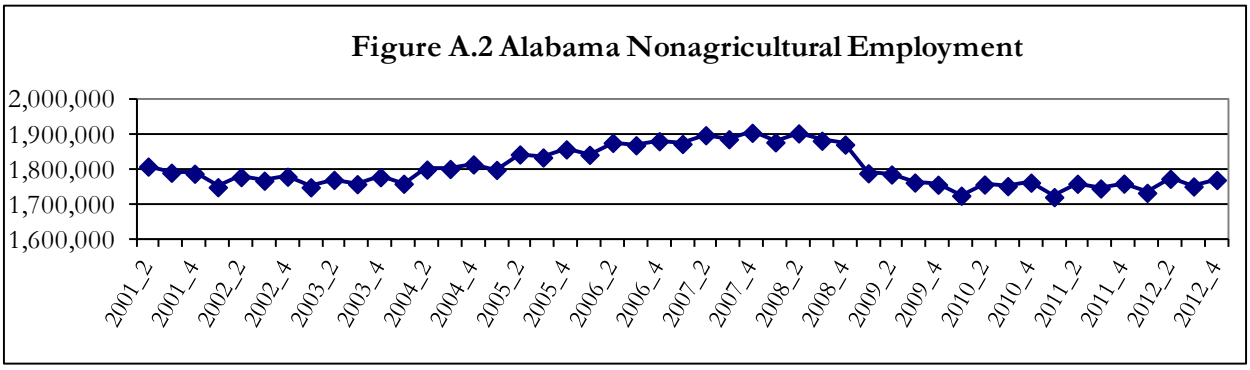
Figure A.1 Alabama Unemployment Rate



Source: Alabama Department of Labor.

Nonagricultural employment of Alabama residents in the state averaged about 1.8 million quarterly from the second quarter of 2001 to the fourth quarter of 2012 (Figure A.2). The number of jobs in the state dropped from a high in fourth quarter 2007 to a low in the first quarter of 2011, and has yet to show significant improvements. Employment showed signs of recovery after the first quarter of 2011, but dropped again in the first of quarter of 2012. At 56.8 percent, the state's labor force participation rate was lower than the nation's 63.3 percent and continues to drop.

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 fourth quarter 2012. At 20.0 percent, older workers (age 55 and over) constitute a significant part of total nonagricultural employment. The share of older workers for the WDRs ranged from 17.6 percent for Region 8 to 24.0 percent for Region 6. To meet long term occupational projections for growth and replacement, labor force participation of younger residents must increase otherwise older workers may be required to work longer.

Table A.2 Workers by Age Group (Fourth Quarter 2012)

	Nonagricultural Employment	
Age Group	Number	Percent
14-18	31,784	1.8
19-24	204,552	11.5
25-34	385,674	21.8
35-44	394,538	22.3
45-54	402,700	22.7
55-64	274,157	15.5
65+	79,605	4.5
55 and over total	353,762	20.0
Total all ages	1,773,010	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 who commuted in for work (Table A.3). Commuter outflow exceeded inflow by about 20,196 people. Most of the commuting involved Alabama's four neighboring states: Georgia, Florida, Mississippi, and Tennessee.

By 2011 the level of in-commuting rose by 41.0 percent to 61,251 and out-commuting increased by 49.4 to 95,089. Net out-commuting increased significantly from 20,196 to 33,838. The top destinations for the out-commuting Alabama residents in 2011 were Georgia (42,005), Mississippi (17,382), Florida (12,382), and Tennessee (10,394).

Table A.3 also shows the one-way average commute time and distance for Alabama workers in various years. More workers reported shorter commute times and distances in 2013 compared to 2012 implying that congestion may have eased somewhat except in troublesome areas. As population grows and the state economy recovers from the recession congestion will worsen. 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 in order to facilitate the movement of workers and goods.

Table A.3 Commuting Patterns in Alabama

Year	State Inflow	State Outflow
	Number	Number
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	61,251	95,089

	Percent of workers						
Average commute time (one-way)	**2005/2006**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
Less than 20 minutes	55.2	54.9	53.5	55.1	56.3	51.7	52.1
20 to 40 minutes	29.1	29.6	28.8	29.0	27.6	31.4	28.9
40 minutes to an hour	9.3	9.4	11.1	10.3	10.2	9.9	9.3
More than an hour	2.3	2.9	2.7	2.5	2.8	3.6	3.6
Average commute distance (one-way)	**2005/2006**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
Less than 10 miles	46.5	46.0	45.4	45.7	46.1	42.8	44.1
10 to 25 miles	30.6	32.4	32.1	32.8	32.5	34.4	32.7
25 to 45 miles	13.4	13.5	15.5	14.2	14.1	15.2	14.1
More than 45 miles	4.5	6.3	5.8	5.6	5.8	6.5	6.6

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 is 7.5 percent more than was recorded for 2000 (Table A.4). The state's population growth was lower than the nation's 9.7 percent. Population grew faster for three WDRs than for the state, but population also shrank in one WDR. Region 2 had the highest population growth at 13.4 percent followed by Region 3 with 9.6 percent, and Region 8 at 9.5 percent. Population fell in Region 6 by 7.2 percent and in Jefferson County by 0.5 percent.

Table A.5 shows Alabama's population counts, estimates, and projections by age group. The population aged 65 and over has been growing rapidly since 2010 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. 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.

Table A.4 Population by Workforce Development Region

	1990 Census	2000 Census	2010 Census	Change 2000-2010	% Change 2000-2010
WDR 1	211,024	230,230	234,101	3,871	1.7
WDR 2	665,495	766,335	869,183	102,848	13.4
WDR 3	247,125	268,208	293,927	25,719	9.6
WDR 4	940,268	1,031,412	1,105,132	73,720	7.1
WDR 5	405,276	424,451	436,254	11,803	2.8
WDR 6	113,715	108,746	100,871	-7,875	-7.2
WDR 7	340,702	381,592	409,389	27,797	7.3
WDR 8	206,852	237,250	259,775	22,525	9.5
WDR 9	610,415	678,997	727,145	48,148	7.1
WDR 10	299,715	319,879	343,959	24,080	7.5
Jefferson County	651,525	662,047	658,466	-3,581	-0.5
Mobile County	378,643	399,843	412,992	13,149	3.3
Alabama	4,040,587	4,447,100	4,779,736	332,636	7.5
United States	248,709,873	281,421,906	308,745,538	27,323,632	9.7

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

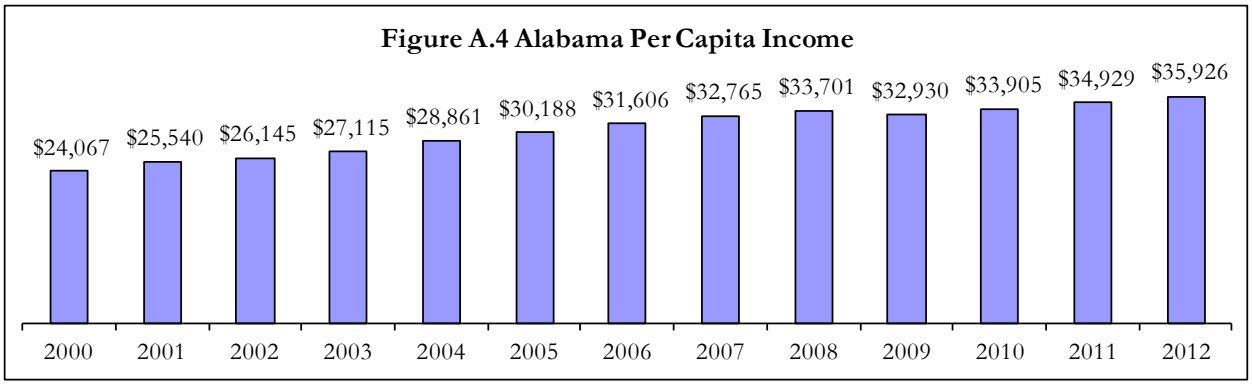
Table A.5 Alabama Population by Age Group and Projections

Age Group	2000	2010	2020	2030
0-19	1,256,169	1,276,312	1,299,829	1,309,371
20-24	306,865	335,322	354,913	364,375
25-29	301,196	311,034	313,825	325,568
30-34	301,819	297,888	306,061	330,387
35-39	340,300	308,430	323,846	327,901
40-44	345,212	311,071	306,118	314,748
45-49	315,173	346,369	316,320	333,216
50-54	285,036	347,485	315,593	311,887
55-59	225,450	311,906	346,025	317,762
60-64	190,082	276,127	339,867	311,406
65+	579,798	657,792	878,775	1,118,624
20-64 Total	2,611,133	2,845,632	2,922,568	2,937,250
Total Population	4,447,100	4,779,736	5,101,172	5,365,245
Change from 2010				
0-19			1.8%	2.6%
20-64			2.7%	3.2%
Total Population			6.7%	12.2%

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

Per Capita Income

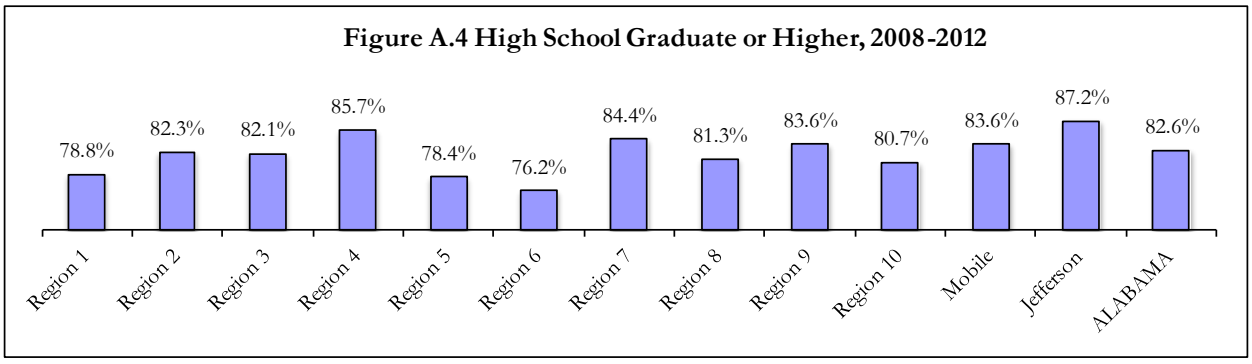
Per capita income (PCI) in Alabama was $35,926 in 2012 (Figure A.3), up 49.3 percent from 2000. WDR 4 had the highest PCI with $42,192 followed by Region 7 with $37,310 and Region 2 with $36,664. The other regions had lower PCI than the state average. At $29,750, Region 6 had the lowest PCI followed by Region 8 with $30,087.

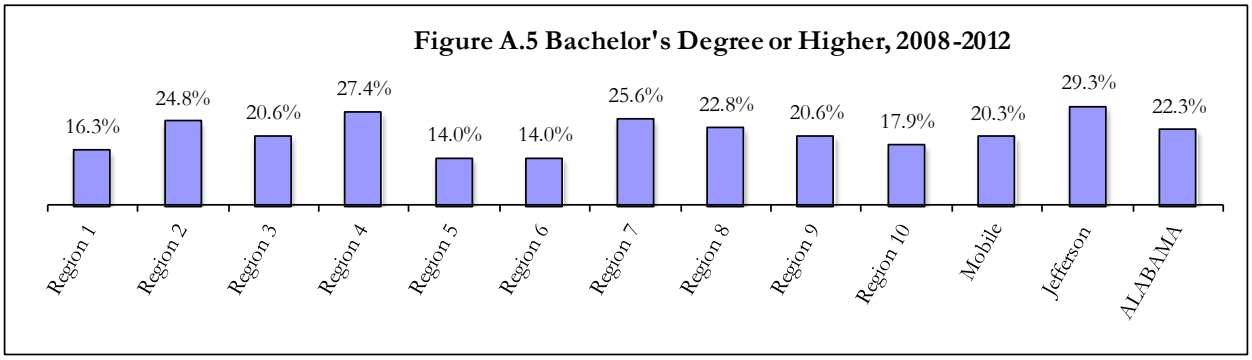


Source: U.S. Bureau of Economic Analysis and Center for Business and Economic Research, The University of Alabama.

Educational Attainment

Educational attainment of Alabama residents who were 25 years old and over is shown in Table A.6 and Figures A.4 and A.5. These figures are based on American Community Survey's 5-year estimates for 2008 through 2012. About 83 percent of the population had graduated from high school and 22 percent held a bachelor's or higher degree. Region 4 had the highest educational attainment followed by Region 7 while Region 6 had the lowest. Educational attainment is important as skills rise with education, and high-wage jobs in the 21st century demand more skill sets.





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

Table A.6 Educational Attainment of Population 25 Years and Over, 2008-2012

	Region 1	Region 2	Region 3	Region 4	Region 5	Region 6	Region 7
Total	183,818	559,616	182,077	741,064	296,500	64,716	265,589
No schooling completed	2,499	7,791	2,168	6,752	4,598	1,564	3,656
Nursery to 4th grade	1,401	5,089	1,030	2,757	1,777	596	1,091
5th and 6th grade	3,098	8,584	2,314	7,971	4,682	1,255	2,911
7th and 8th grade	7,639	16,321	5,208	15,388	11,552	2,281	6,292
9th grade	6,480	15,502	4,448	16,532	9,544	1,885	6,094
10th grade	7,840	18,619	7,040	21,439	13,057	3,038	8,210
11th grade	6,800	17,546	6,791	23,254	13,219	3,222	8,378
12th grade, no diploma	3,146	9,653	3,615	11,604	5,739	1,542	4,826
High school graduate/equivalent	63,385	159,726	63,434	209,765	103,446	24,057	80,871
Some college, less than 1 year	12,262	34,695	9,623	42,088	19,854	3,105	14,938
Some college, 1+ years, no degree	27,093	86,543	28,633	125,584	46,377	8,827	43,665
Associate degree	12,153	40,925	10,299	54,693	21,052	4,273	16,655
Bachelor's degree	19,106	88,190	22,524	129,710	26,159	5,706	43,030
Master's degree	7,738	38,368	10,491	49,137	11,385	2,575	18,759
Professional school degree	1,784	7,193	2,358	16,172	2,632	467	3,776
Doctorate degree	1,394	4,871	2,101	8,218	1,427	323	2,437

	Region 8	Region 9	Region 10	Mobile	Jefferson	Alabama
Total	159,445	483,890	229,709	267,708	439,531	3,166,424
No schooling completed	2,398	5,730	3,503	3,755	3,741	40,659
Nursery to 4th grade	1,158	2,343	1,770	1,016	1,308	19,012
5th and 6th grade	2,134	4,829	3,611	2,121	4,220	41,389
7th and 8th grade	3,582	11,256	7,303	5,386	7,447	86,822
9th grade	4,274	11,505	6,851	6,165	7,315	83,115
10th grade	6,110	15,827	8,559	8,717	10,950	109,739
11th grade	6,669	18,540	8,828	11,196	13,887	113,247
12th grade, no diploma	3,546	9,456	3,920	5,444	7,179	57,047
High school graduate/equivalent	48,004	161,869	76,849	89,666	120,355	991,406
Some college, less than 1 year	9,689	28,599	15,091	15,401	23,305	189,944
Some college, 1+ years, no degree	23,934	77,016	34,070	44,336	78,806	501,742
Associate degree	11,672	37,282	18,297	20,192	32,308	227,301
Bachelor's degree	21,543	65,961	26,188	35,419	79,583	448,117
Master's degree	9,573	23,720	11,214	13,173	31,709	182,960
Professional school degree	1,953	6,009	2,318	3,395	11,646	44,662
Doctorate degree	3,206	3,948	1,337	2,326	5,772	29,262

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

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 to 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 WDRs 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 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 Alabama underemployment rate was 23.1 percent in 2013. Applying this rate to December 2013 labor force data means that 458,791 employed Alabama residents were underemployed (Table A.7). Adding the unemployed gives a total available labor pool of 579,098 for the state. This is 4.8 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 are willing to commute farther and longer for a better job; 44.0 percent are prepared for 20 or more minutes longer and 32.5 percent will go 20 or more extra miles in a one-way commute.

Table A.7 Underemployed and Available Labor by WDR

	Alabama	Region 1	Region 2	Region 3	Region 4	Region 5	Region 6
Labor force	2,110,725	115,954	389,393	130,732	510,238	185,900	31,500
Employed	1,990,418	108,829	369,364	123,471	484,803	174,531	28,295
Underemployment rate	23.1%	19.3%	22.6%	24.5%	25.0%	22.7%	26.8%
Underemployed workers	458,791	21,004	83,439	30,275	120,958	39,584	7,569
Unemployed	120,307	7,125	20,029	7,261	25,435	11,369	3,205
Available labor pool	**579,098**	**28,129**	**103,468**	**37,536**	**146,393**	**50,953**	**10,774**
	Region 7	**Region 8**	**Region 9**	**Region 10**	**Jefferson**	**Mobile**	
Labor force	181,150	117,215	309,236	139,773	298,707	182,040	
Employed	170,212	110,448	288,985	131,416	282,855	170,119	
Underemployment rate	24.7%	25.6%	21.9%	19.2%	26.1%	21.0%	
Underemployed workers	42,042	28,264	63,288	25,206	73,938	35,776	
Unemployed	10,938	6,767	20,251	8,357	15,852	11,921	
Available labor pool	**52,980**	**35,031**	**83,539**	**33,563**	**89,790**	**47,697**	

Note: Rounding errors may be present. Based on December 2013 labor force data and 2013 underemployment rates.

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

Underemployment rates for counties, WDRs, and the state were determined from an extensive survey on the state's workforce. A total of 10,164 complete responses were obtained. About 41 percent (4,174 respondents) were employed, of whom 962 stated that they were underemployed. Among the WDRs, underemployment ranged from 19.2 percent for Region 10 to 26.8 percent for Region 6. Region 4 has the most available labor, followed by Region 2; these two regions account for about 43 percent of the state's available labor pool. Among counties, Coosa had the highest rate of underemployment at 39.0 percent followed by Autauga and Macon with 33.3 percent. Cullman County had the lowest underemployment rate at 8.2 percent followed by Talladega at 8.9 percent. Thirty-seven counties had underemployment rates above the state's 23.1 percent.

The primary reasons for being underemployed are a lack of job opportunities in their area, low wages at available jobs, living too far from jobs, other family or personal obligations, and owning a house in their area. Ongoing economic development efforts can help in this regard. Nonworkers cite retirement, disability or other health concerns, a lack of job opportunities in their area, and social security limitations as the main 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.

[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.

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 have shorter commute distances and times.
- The underemployed are for the most part distributed evenly across industries and occupations. However, there are slightly more in accommodation and food services; arts, entertainment, and recreation; retail trade; and construction industries.
- They earn less and have less 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.
- More would leave their current jobs for higher income.
- More are willing to commute more than 20 minutes and over 20 miles for a better job.
- Fewer are satisfied with their current jobs.
- More are willing to train for a better job even if they have to pay part or all of the cost.
- More have sought better jobs in the preceding quarter.
- Their educational attainment is similar to all employees.
- The median age, 52, is a year lower than all employees.
- Fewer are married, male, or white.
- More are Hispanic and African American or other nonwhite ethnicities.

Table A.8 shows the detailed survey results on job satisfaction and willingness to train. Responses for overall job satisfaction as well as various aspects of the job were obtained. In general most Alabama workers (76.0 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. Clearly, fewer underemployed workers are satisfied with their jobs (56.7 percent). The underemployed are also more dissatisfied with their earnings.

Workers are generally willing to train for a new or better job, with the underemployed being much more willing (70.8 percent vs. 57.7 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 strongly 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 are more willing to train for the new or better job even if they have to bear the full cost.

Table A.8 2013 Job Satisfaction and Willingness to Train (Percent)

Job Satisfaction					
	Completely Dissatisfied	Dissatisfied	Neutral	Satisfied	Completely Satisfied
Employed					
Overall	4.0	4.1	15.4	25.5	50.6
Earnings	10.8	10.7	21.0	24.8	32.3
Retention	4.3	4.2	12.0	18.8	59.2
Work	1.7	1.8	8.6	23.6	64.1
Hours	4.6	4.4	11.1	18.8	60.8
Shift	3.0	3.1	7.7	16.0	69.7
Conditions	3.0	3.6	13.2	25.9	54.1
Commuting Distance	4.1	4.6	11.5	13.7	65.8
Underemployed					
Overall	10.4	8.3	24.0	23.7	33.0
Earnings	24.8	20.3	23.7	15.7	15.4
Retention	9.8	7.8	19.7	19.7	43.8
Work	4.3	4.1	14.7	27.3	49.5
Hours	11.0	7.5	14.9	18.9	47.4
Shift	6.6	4.6	9.9	19.1	59.5
Conditions	7.6	6.4	17.1	26.4	42.2
Commuting Distance	5.8	6.1	13.6	13.9	60.3

Willingness to Train					
	Completely Unwilling	Unwilling	Neutral	Willing	Completely Willing
Employed					
For a new or better job	21.8	4.0	15.3	11.1	46.6
If paid by trainee	44.9	18.6	19.4	5.6	8.3
If paid by trainee and government	14.0	11.4	32.2	18.9	19.7
If paid by government	5.8	3.2	9.5	14.1	65.4
Underemployed					
For a new or better job	14.9	2.5	11.2	10.5	60.3
If paid by trainee	43.4	19.1	17.4	5.9	10.2
If paid by trainee and government	11.1	9.9	30.3	20.5	24.4
If paid by government	3.5	2.2	5.5	10.5	76.5

Note: Rounding errors may be present.

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

Workforce Demand

Industry Mix

The manufacturing sector was the leading employer in Alabama with 249,318 jobs in the fourth quarter of 2012 (Table A.9). Rounding out the top five industries by employment are health care and social assistance, retail trade, educational services, and accommodation and food services. These five industries provided 1,032,943 jobs, 58.3 percent of the state total. The average monthly wage across all industries in the state was $3,534. New hire monthly earnings averaged $2,194 or 62.1 percent of the average monthly wage. The highest average monthly wages were for mining $5,927; professional, scientific, and technical services at $5,912; and utilities $5,667. Accommodation and food services paid the least at $1,410. Mining also had the highest average monthly new hire wage at $4,995 followed by professional, scientific, and technical services at $4,366 and utilities at $4,301. Arts, entertainment, and recreation paid newly hired workers the least, $987.

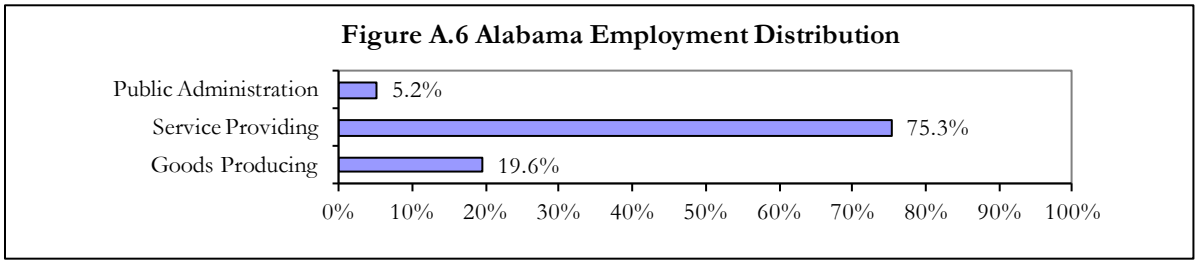
Table A.9 Industry Mix (Fourth Quarter 2012)

Industry by 2-digit NAICS Code	Total Employment	Share	Rank	Average Monthly Wage	Average Monthly New Hire Earnings
11 Agriculture, Forestry, Fishing and Hunting	11,480	0.65%	19	$3,215	$2,503
21 Mining	8,086	0.46%	20	$5,927	$4,995
22 Utilities	20,010	1.13%	16	$5,667	$4,301
23 Construction	78,070	4.40%	9	$3,989	$3,018
31-33 Manufacturing	249,318	14.06%	1	$4,414	$3,059
42 Wholesale Trade	72,822	4.11%	10	$4,681	$3,175
44-45 Retail Trade	226,040	12.75%	3	$2,290	$1,417
48-49 Transportation and Warehousing	57,217	3.23%	12	$3,530	$2,548
51 Information	23,832	1.34%	14	$4,418	$2,773
52 Finance and Insurance	70,205	3.96%	11	$4,945	$3,274
53 Real Estate and Rental and Leasing	23,385	1.32%	15	$3,323	$2,319
54 Professional, Scientific, and Technical Services	95,107	5.36%	7	$5,912	$4,366
55 Management of Companies and Enterprises	17,983	1.01%	17	$4,543	$2,888
56 Administrative and Support and Waste Management and Remediation Services	108,398	6.11%	6	$2,462	$1,778
61 Educational Services	166,598	9.40%	4	$3,402	$2,470
62 Health Care and Social Assistance	233,245	13.16%	2	$3,396	$2,456
71 Arts, Entertainment, and Recreation	17,161	0.97%	18	$1,830	$987
72 Accommodation and Food Services	157,742	8.90%	5	$1,410	$991
81 Other Services (Except Public Administration)	44,722	2.52%	13	$2,760	$1,780
92 Public Administration	91,590	5.17%	8	$3,609	$2,053
ALL INDUSTRIES	**1,773,010**	**100.00%**		**$3,534**	**$2,194**

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 small employers—mining; professional, scientific, and technical services; and utilities. By broad industry classification, service providing industries generated 75.3 percent of total state jobs in fourth quarter 2012 (Figure

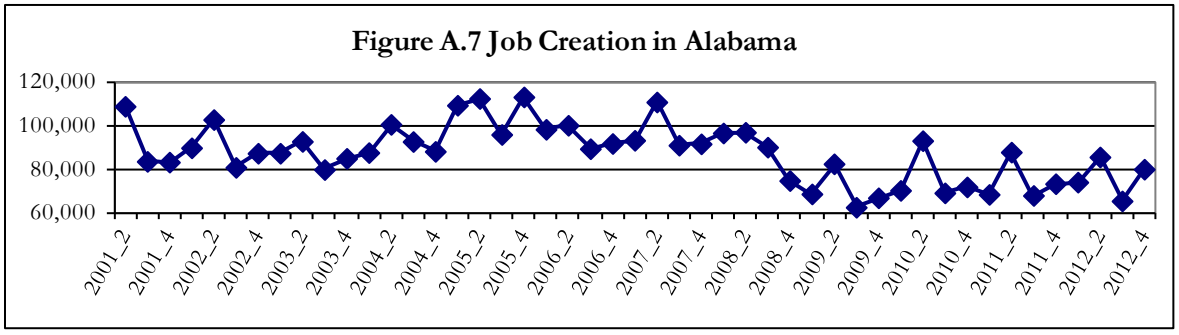
A.6). Goods producing industries were next with 19.6 percent and public administration accounted for 5.2 percent. The distribution is for all nonagricultural jobs and there is significant variation by WDR.

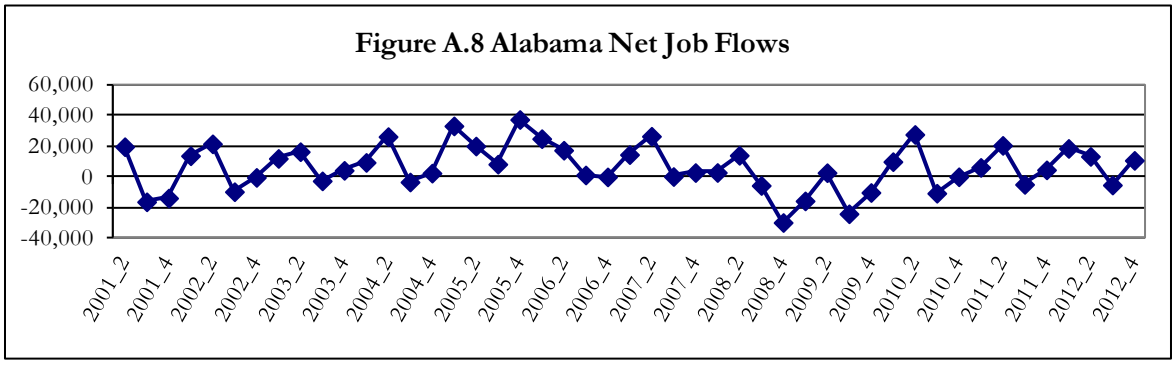


Source: Alabama Department of Labor and U.S. Census Bureau.

Job Creation and Net Job Flows

The state's job creation and net job flows are presented in Figures A.7 and A.8. Quarterly job creation averaged 87,007 from second quarter 2001 to fourth quarter 2012. Both job creation and net job flows have fluctuated significantly since 2008 but rose in fourth quarter 2012. Quarterly net job flows averaged 6,473 and ranged from a loss of 30,396 in the fourth quarter of 2008 to a gain of 37,692 in the fourth 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.





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

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

Statewide there are 785 single occupations in Alabama. Table A.10 shows the 40 occupations that are expected to be in high-demand, ranked by projected average annual job openings over the 2010 to 2020 period. Many of these occupations are common to two of the five largest employment sectors identified earlier (Table A.9): health care and social assistance and manufacturing. Thus, these sectors will continue to dominate employment in the state.

All the top five high-demand occupations are in health care and social assistance sector. These are Registered Nurses; Home Health Aides; Licensed Practical and Licensed Vocational Nurses; Medical Assistants; and Personal and Home Care Aides. Eleven of the high-demand occupations are also fast-growing. This means that these 11 occupations have a minimum annual growth rate of 3.4 percent, more than twice the statewide occupational growth rate of 1.3 percent.

The 20 fastest growing occupations ranked by projected growth of employment are listed in Table A.11. More than half of these occupations are health-related. The top five fast-growing occupations are Personal and Home Care Aides, Home Health Aides, Occupational Therapist Assistants, Physical Therapist Assistants, and Metal-Refining Furnace Operators and Tenders.

Table A.12 shows the 50 highest earning occupations. In general, these occupations are in health, management, legal, engineering, computer, postsecondary education, and science fields. Nine of the top 10 are health occupations. Any discussion of earnings must consider that wages vary with experience. Occupations with the highest entry wages may not necessarily have the highest average or experienced wages. The lowest high-earning salary is $90,490 for Managers, All Others and the highest is $251,470 for Anesthesiologists.

The high-earning occupations are generally not fast-growing or in high-demand. Eight occupations are both high-demand and high-earning (Table A.10). Only one high-earning occupation –Software Developers, Systems Software—is in all three tables (Table A.11).

Of the state's 785 specific occupations, 61 are expected to decline over the 2010 to 2020 period. Employment in the 20 sharpest-declining occupations will fall by at least 10 percent, with each losing a minimum of 40 jobs over the period (Table A.13). No efforts should be made to sustain these occupations because they are declining as a result of structural changes in the Alabama economy.

Table A.10 Selected High-Demand Occupations (Base Year 2010 and Projected Year 2020)

Occupation	Average Annual Job Openings		
	Total	Due to Growth	Due to Separations
Registered Nurses	1990	1215	775
Home Health Aides*	935	785	145
Licensed Practical and Licensed Vocational Nurses	805	380	420
Medical Assistants	340	235	105
Personal and Home Care Aides*	330	300	35
Industrial Machinery Mechanics	325	190	135
Computer Systems Analysts	320	190	130
Management Analysts	295	190	105
Computer Support Specialists	280	140	140
Software Developers, Systems Software*	230	185	45
Medical Secretaries*	215	165	50
Pharmacists	**205**	**95**	**115**
Heating, Air Conditioning, and Refrigeration Mechanics and Installers	200	125	75
Dental Hygienists*	195	130	60
Public Relations Specialists	195	95	100
Mechanical Engineers	180	70	110
Network and computer systems architects and administrators	180	120	60
Dental Assistants	165	105	60
Medical and Public Health Social Workers*	160	100	55
Software Developers, Applications*	155	125	30
Radiologic Technologists and Technicians	150	95	55
First-Line Supervisors/Managers of Helpers, Laborers, and Material Movers, Hand	135	75	60
Medical and Health Services Managers	120	60	65
Cost Estimators	110	65	40
Physical Therapists*	110	85	25
Training and Development Specialists	105	70	35
Physical Therapist Assistants*	95	70	20
Computer and Information Systems Managers	**90**	**55**	**35**
Dentists, General	**90**	**40**	**50**
Rehabilitation Counselors	90	55	35
Personal Financial Advisors	**75**	**55**	**20**
Architects, Except Landscape and Naval	70	40	30
Social and Community Service Managers	70	45	25
Occupational Therapists*	65	45	20
Diagnostic Medical Sonographers*	60	45	15
Database Administrators	55	35	20
Family and General Practitioners	**55**	**35**	**25**
Anesthesiologists	**50**	**30**	**20**
Physician Assistants	40	25	15
Surgeons	**40**	**25**	**15**

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 2010 and Projected Year 2020)

Occupation	Employment		Percent Change	Annual Growth (Percent)	Average Annual Job Openings
	2010	2020			
Personal and Home Care Aides*	4,200	7,190	71	5.52	330
Home Health Aides*	11,370	19,230	69	5.40	935
Occupational Therapist Assistants	400	660	65	5.14	30
Physical Therapist Assistants*	1,330	2,050	54	4.42	95
Metal-Refining Furnace Operators and Tenders	740	1,120	51	4.23	50
Physical Therapist Aides	690	1,040	51	4.19	45
Helpers—Carpenters	1,190	1,780	50	4.11	90
Health Educators	450	670	49	4.06	30
Diagnostic Medical Sonographers*	980	1,450	48	4.00	60
Marriage and Family Therapists	350	510	46	3.84	25
Physical Therapists*	1,950	2,810	44	3.72	110
Medical Secretaries*	3,710	5,340	44	3.71	215
Dental Hygienists*	3,030	4,350	44	3.68	195
Medical and Public Health Social Workers*	2,390	3,420	43	3.65	160
Coil Winders, Tapers, and Finishers	280	400	43	3.63	15
Software Developers, Systems Software*	**4,410**	**6,250**	**42**	**3.55**	**230**
Occupational Therapists*	1,120	1,580	41	3.50	65
Software Developers, Applications*	3,050	4,300	41	3.49	155
Veterinary Technologists and Technicians	1,170	1,640	40	3.43	65
Helpers--Brickmasons, Blockmasons, Stonemasons, and Tile and Marble Setters	730	1,020	40	3.40	50

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. NA - Not available.

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 2010 and Projected Year 2020)

Occupation	Employment		Annual Growth (Percent)	Average Annual Job Openings	Mean Annual Salary ($)
	2010	2020			
Anesthesiologists*	1,010	1,330	2.79	50	251,470
Surgeons*	830	1,080	2.67	40	248,060
Obstetricians and Gynecologists	450	570	2.39	20	247,700
Internists, General	800	1,020	2.46	40	222,220
Physicians and Surgeons, All Other	3,920	4,770	1.98	165	211,470
Dentists, General*	1,720	2,100	2.02	90	205,130
Orthodontists	110	130	1.68	5	204,560
Dentists, All Other Specialists	70	80	1.34	5	193,120
Chief Executives	4,810	5,020	0.43	145	178,610
Family and General Practitioners*	1,140	1,470	2.57	55	176,950
Psychiatrists	240	300	2.26	10	162,120
Pediatricians, General	420	540	2.54	20	161,480
Industrial-Organizational Psychologists	10	10	0.00	0	155,790
Biological Science Teachers, Postsecondary	2,140	2,590	1.93	80	125,070
Pharmacists*	4,500	5,430	1.90	205	119,810
Engineering Managers	2,310	2,630	1.31	75	116,180
Aerospace Engineers	2,620	2,670	0.19	65	116,150
Lawyers	7,350	8,390	1.33	245	115,230
Natural Sciences Managers	160	170	0.61	10	114,620
Podiatrists	200	240	1.84	10	113,800
Marketing Managers	950	1,120	1.66	45	113,230
Computer and Information Systems Managers*	2,210	2,780	2.32	90	111,260
Physicists	230	270	1.62	10	111,030
General and Operations Managers	31,650	33,570	0.59	780	109,870
Administrative Law Judges, Adjudicators, and Hearing Officers	150	140	-0.69	5	109,860
Financial Managers	4,820	5,250	0.86	130	107,530
Engineers, All Other	4,160	4,400	0.56	115	106,810
Engineering Teachers, Postsecondary	720	830	1.43	25	106,500
Agricultural Sciences Teachers, Postsecondary	220	250	1.29	5	105,580
Computer and Information Research Scientists	330	380	1.42	10	104,830
Sales Managers	2,930	3,320	1.26	125	103,610
Environmental Science Teachers, Postsecondary	20	30	4.14	0	103,610
Education Administrators, Postsecondary	2,170	2,570	1.71	100	102,400
Health Specialties Teachers, Postsecondary	1,050	1,230	1.59	35	98,910
Computer Hardware Engineers	1,130	1,270	1.17	40	98,230
Purchasing Managers	920	1,060	1.43	40	97,830
Human Resources Managers	690	790	1.36	25	96,570
Electronics Engineers, Except Computer	1,560	1,680	0.74	50	95,930
Advertising and Promotions Managers	470	530	1.21	20	94,800
Economists	140	150	0.69	5	94,780
Training and Development Managers	200	230	1.41	10	93,020
Airline Pilots, Copilots, and Flight Engineers	370	360	-0.27	15	92,880
Personal Financial Advisors*	1,950	2,510	2.56	75	92,590
Economics Teachers, Postsecondary	190	230	1.93	5	92,200
Petroleum Engineers	20	20	0.00	0	91,870
Chemical Engineers	590	590	0.00	20	91,700
Software Developers, Systems Software*	**4,410**	**6,250**	**3.55**	**230**	**90,950**
Air Traffic Controllers	270	260	-0.38	10	90,950
Administrative Services Managers	1,270	1,440	1.26	50	90,710
Managers, All Other	9,830	10,260	0.43	260	90,490

Note: Employment and salaries data are rounded to the nearest 10; openings to the nearest 5. The salary data provided are based on the May 2012 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.

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 2010 and Projected Year 2020)

Occupation	Employment		Net Change	Percent Change
	2010	2020		
Sewing Machine Operators	4740	3240	-1500	-31.65
Postal Service Mail Sorters, Processors, and Processing Machine Operators	1720	870	-850	-49.42
Postal Service Mail Carriers	4830	4160	-670	-13.87
Textile Winding, Twisting, and Drawing Out Machine Setters, Operators, and Tenders	2200	1610	-590	-26.82
Switchboard Operators, Including Answering Service	2680	2100	-580	-21.64
Textile Knitting and Weaving Machine Setters, Operators, and Tenders	1930	1370	-560	-29.02
Postal Service Clerks	920	460	-460	-50.00
Pressers, Textile, Garment, and Related Materials	1790	1480	-310	-17.32
Word Processors and Typists	1620	1430	-190	-11.73
Textile Bleaching and Dyeing Machine Operators and Tenders	550	380	-170	-30.91
Textile Cutting Machine Setters, Operators, and Tenders	540	380	-160	-29.63
Extruding and Forming Machine Setters, Operators, and Tenders, Synthetic and Glass Fibers	740	600	-140	-18.92
Textile, Apparel, and Furnishings Workers, All Other	540	400	-140	-25.93
Floral Designers	1280	1150	-130	-10.16
Postmasters and Mail Superintendents	460	330	-130	-28.26
Door-To-Door Sales Workers, News and Street Vendors, and Related Workers	900	790	-110	-12.22
Photographic Process Workers and Processing Machine Operators	810	700	-110	-13.58
Prepress Technicians and Workers	340	280	-60	-17.65
Shampooers	420	370	-50	-11.90
Petroleum Pump System Operators, Refinery Operators, and Gaugers	290	250	-40	-13.79

Note: Employment data are rounded to the nearest 10. NA - Not available.

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 high 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.

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	30	35	50
Active Listening	95	85	88
Critical Thinking	95	90	90
Learning Strategies	3	5	16
Mathematics	10	10	16
Monitoring	68	75	54
Reading Comprehension	80	60	82
Science	18	5	34
Speaking	90	85	84
Writing	50	45	56
Complex Problem Solving Skills			
Complex Problem Solving	58	45	68
Resource Management Skills			
Management of Financial Resources	3	0	2
Management of Material Resources	0	0	0
Management of Personnel Resources	8	0	12
Time Management	28	40	16
Social Skills			
Coordination	50	70	34
Instructing	15	15	20
Negotiation	0	0	8
Persuasion	3	5	10
Service Orientation	45	60	10
Social Perceptiveness	65	75	36
Systems Skills			
Judgment and Decision Making	73	50	78
Systems Analysis	15	5	10
Systems Evaluation	8	5	6
Technical Skills			
Equipment Maintenance	3	0	0
Equipment Selection	3	0	0
Installation	0	0	0
Operation and Control	3	15	2
Operation Monitoring	5	10	6
Operations Analysis	10	5	10
Programming	8	5	2
Quality Control Analysis	3	5	0
Repairing	3	0	0
Technology Design	0	0	0
Troubleshooting	3	0	0

Note: Rounding errors may be present.

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

High-earning occupations require more active learning, learning strategies, mathematics, reading comprehension, science, writing, complex problem solving, management of personnel resources, instructing, judgment and decision making, negotiation, and persuasion skills than both high-demand and fast-growing jobs. These are skills that require long training periods and postsecondary education. However, high-earning jobs require less social and technical skills. High-demand occupations require more basic, complex problem solving, systems, and resource management, but less social and technical skills than fast-growing occupations.

Table A.16 shows skill gap indexes for all 35 skills in Table A.14 based on previous occupation projections (2008 to 2018). Skills gap indexes range up to 100 and are standardized measures of the gap between current supply and projected demand. The index does not provide any information about current or base year skill supply. Its focus is on the projection period and identifies critical skill needs. The index essentially ranks expected training needs. The higher the index the more critical is 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 growth, which in turn implies a need to increase the pace of skill training. Skill gap indexes point to 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, resource management, system, and technical skills. Although the skills gap indexes are for a previous projection period, they are applicable to current projections. 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

Educational attainment in Alabama is low compared to the nation as a whole. About 83 percent of Alabamians age 25 and over have graduated from high school, compared to 86 percent for the United States. Of that total population over age 25, 22.3 percent in Alabama have a bachelor's or higher degree, which is lower than the nation's 28.5 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/ training category is most common. In general, high-earning occupations require high educational attainment levels; all but four of the high-earning occupations require a bachelor's or higher degree. Thirty (75 percent) of the 40 high-demand occupations require an associate degree at the minimum and 25 (63 percent) require a bachelor's or higher degree. Twelve (60 percent) of the 20 fast-growing occupations require an associate degree at the minimum and seven (35 percent) require a bachelor's or higher degree.

The 2010 to 2020 occupational projections indicate that future jobs will require postsecondary education and training at a minimum. Job ads are increasingly requiring a high school diploma or GED at a minimum. Of the state's 785 occupations, 61 are expected to decline over the period and education and training for these should slow accordingly.

Table A.16 Skills Gap Indexes (Base Year 2008 and Projected Year 2018)

Skill	Total Openings (Projected Demand)	Replacement Index	Skills Gap Index
Reading Comprehension	36,815	61	100
Active Listening	36,730	62	97
Critical Thinking	33,390	61	94
Active Learning	29,920	61	91
Speaking	29,290	61	89
Coordination	28,650	61	86
Monitoring	26,490	61	83
Instructing	26,285	61	80
Writing	25,955	61	77
Time Management	24,730	60	74
Learning Strategies	23,790	61	71
Social Perceptiveness	21,990	60	69
Service Orientation	19,375	59	66
Persuasion	18,055	62	63
Judgment and Decision Making	17,540	62	60
Complex Problem Identification	16,520	60	57
Mathematics	15,015	61	54
Equipment Selection	12,735	61	51
Troubleshooting	8,805	61	49
Negotiation	9,320	67	46
Equipment Maintenance	7,755	61	43
Management of Personnel Resources	8,835	69	40
Installation	6,285	59	37
Repairing	4,675	60	34
Operations Analysis	4,410	61	31
Quality control	4,385	62	29
Management of Financial Resources	5,230	70	26
Operation Monitoring	5,210	69	23
Systems Evaluation	3,535	58	20
Operation and Control	4,585	64	17
Science	3,245	61	14
Systems Analysis	2,620	53	11
Technology Design	2,430	58	9
Management of Material Resources	2,950	73	6
Programming	605	50	3

Source: Alabama Department of Labor.

Note: The skills gap indexes are from 2008 to 2018 projection period and not 2010 to 2020.

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	6	1	22
Master's Degree	4	3	2
Work Experience Plus a Bachelor's or Higher Degree	4	0	13
Bachelor's Degree	11	3	9
Associate Degree	5	5	2
Postsecondary Non-Degree Plus On-the-job Training	1	0	0
Postsecondary Non-Degree	2	0	0
Some College, no Degree Plus On-the-job Training	1	0	0
Some College, no Degree	0	0	0
High School Diploma Plus On-the-job Training	3	4	0
High School Diploma	1	0	2
Less than High School Plus On-the-job Training	2	4	0
Less than High School	0	0	0

Note: The on-the-job training refers to the typical on-the-job training needed to attain competency in the occupation in addition to the typical education needed for entry to the occupation. This could be long-term, moderate-term, or short-term on-the-job training. **Long-term** requires more than 12 months on-the-job training. **Moderate-term** requires one to 12 months of on-the-job training. **Short-term** requires up to one month of on-the-job training. These types of training are more common in occupations that require postsecondary non-degree or less educational attainment. Other types of on-the-job training requirements that may be needed but are not shown on the table are apprenticeship and internship/residency that are typical in certain professions many of which require higher educational attainment.

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 2010 base, worker shortfalls of 114,533 and 218,904 for 2020 and 2030 respectively are expected (Table A.18). The state must therefore focus on worker skills and the projected shortfalls as the top priorities through 2030. Worker shortfalls for critical occupations will also need to be addressed through 2030.

Table A.18 Expected Worker Shortfall

	2010-2020	2010-2030
Total population growth (percent)	6.7	12.2
Age 20-64 population growth (percent)	2.7	3.2
Job growth (percent)	8.8	14.9
Worker shortfall (percent)	6.1	11.7
Worker shortfall (number)	114,533	218,904

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

Employment is critical to economic development, and 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 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 20 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 challenge. 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 1938 (i) gradually raise the full retirement age from 65 to 67, (ii) increase the rate at which monthly payments rise with delayed benefits, and (iii) eliminate 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.