

# Ohio's Graying Labor Force

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Aging through 2016



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## Preface

In 2004, the Ohio Department of Job and Family Services (ODJFS), Bureau of Labor Market Information (BLMI) published *The Graying of the Ohio Labor Force*, an examination of a then-emerging issue in workforce development: What would happen in Ohio's economy as the baby boom generation reached retirement age? What in 2004 was an emerging issue is today a widely-recognized factor affecting the future supply of workers.

The goal of this publication is to compare the current demographic and economic situation with that earlier benchmark, review continuing aging trends, and examine potential strategies for the future. We have also expanded our focus to include an analysis of the 45 to 54 age group, domestic migration patterns and labor policies toward mature workers.

Without a doubt, the aging of the baby boom generation—the group of Americans born between 1946 and 1964—continues to be the most significant demographic phenomenon the country faces. Already, the baby boomers have had strong effects on the U.S. economy, such as increased unemployment rates in the 1970s and stronger workplace diversity. Now, as this cohort enters its sixties, questions are arising in several policy arenas, such as healthcare or pension and Social Security management. In workforce development, the economy faces a potential acute shortage of trained and experienced workers in the next ten years as employees retire in increasing numbers.

Section I addresses some basic trends in Ohio's population. Section II describes labor force trends and how age demographics differ between occupations. Section III looks ahead to what will happen in Ohio's labor force in the future, including labor force participation, replacement rates, and worker immigration and emigration. In section IV, we summarize the expected implications in Ohio's economy and the steps some employers have taken. Please refer to the Technical Notes and References sections at the end of this publication for reference and documentation of the wide variety of statistical data presented.

If only through its sheer quantity of numbers, the aging of the baby boom cohort will represent one of the largest public policy issues Ohio and the United States will face in the next ten years and beyond. A principled response based on factual data will allow the state economy to continue to grow in the face of this challenge.

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## Executive Summary

The aging of the baby boom cohort will represent one of the largest public policy issues Ohio and the United States will face in the next ten years. A principled response based on factual data will enable the state economy to grow in the face of this challenge.

- The baby boom generation represents those individuals born between 1946 and 1964. During this period the United States experienced an average four million births every year. Ohio's population growth rates were similar to the rest of the nation through the 1960s, but have lagged since then.
- Baby boomers make up about 40 percent of Ohio's population. Nearly a quarter of the state population is 55 or older. The number of Ohioans 55 and older will increase by more than 540,000 from 2006 to 2016.
- Ohio's total labor force is expected to grow from 5.98 million in 2006 to approximately 6.14 million in 2016, an increase of about 170,000. Total labor force participation rates should hold relatively steady during this period.
- While the overall labor force participation rate is not expected to change much, there has been an increase for those 55 and older that is expected to continue trending upward as the baby boom generation ages.
- From 2006 to 2016, Ohio's labor force will continue to grow older as the baby boom generation ages. Those 55 and older will comprise 22.4 percent of the labor force at the end of this period, up from 16.7 percent in 2006.
- The state labor force will grow among three age groups from 2006 to 2016: 55 to 64 (217,000); 65 and older (161,000); and 25 to 34 (104,000). The greatest decline will be in the 45 to 54 age group (-184,000).
- The occupational groups with the highest proportions of workers between 45 and 54 in 2000 were education, training and library; community and social service; management; healthcare practitioners and technical; and legal occupations.
- Two-thirds of all job openings are to cover replacement needs, such as those arising from retirement. Most of the occupational groups with low net replacement rates are those which are expected to have significant growth through 2016.
- While net out-migration abated significantly during the record economic expansion of the 1990s, job losses in the last six years have led to a net loss of about 146,000 residents through migration.
- The rise of defined contribution retirement plans, continuing improvements in healthcare, and positive changes in U.S. labor policy may combine to alter historical retirement patterns by persuading mature workers to stay in the labor force past traditional retirement age.
- Companies may combat losses in human capital from retirement through a variety of policy options, including knowledge transfer programs, mentorship, snowbird employment, and flexible work schedules.

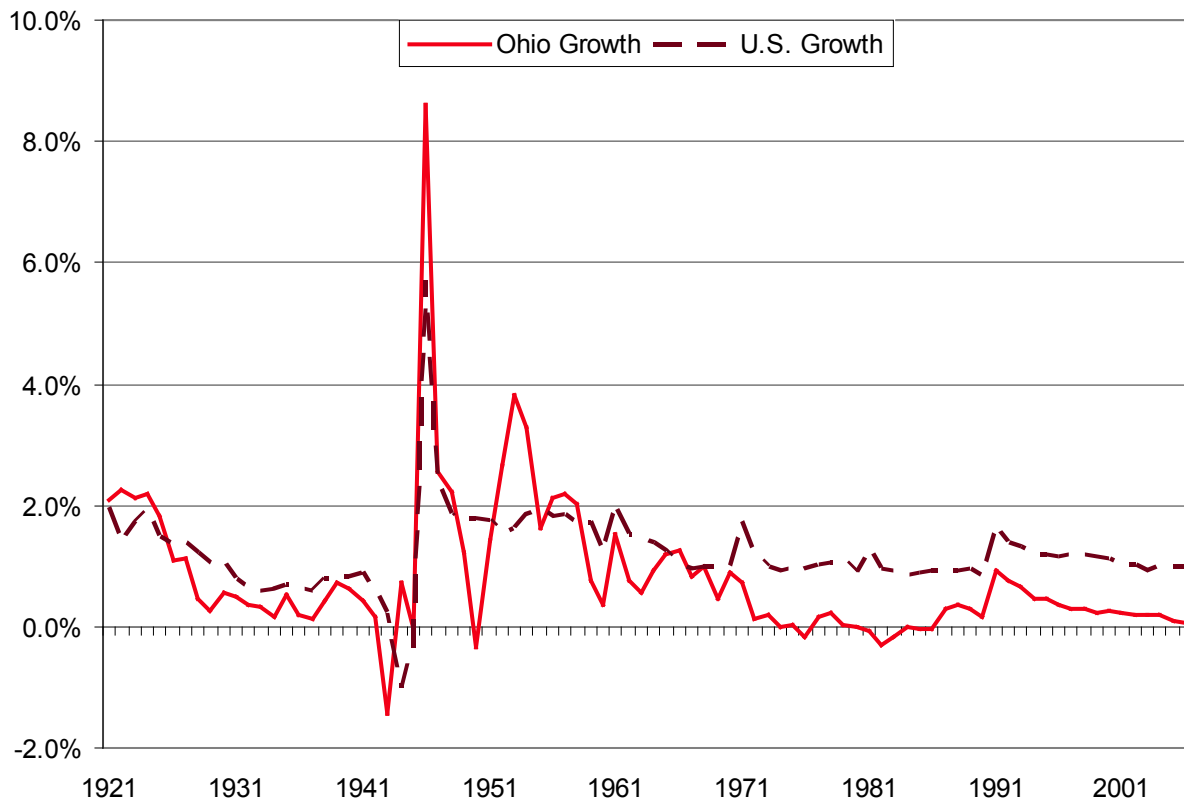
## I. Population Trends

**Population Growth.** Due to low birth rates during the Great Depression, followed by the nation's involvement in World War II, the age cohort born in the 1930s and early 1940s was quite small. Most individuals in this cohort were over 50 years old by 1992 and had exited the labor force by 2004. The end of World War II precipitated a baby boom in the United States that lasted from 1946 through 1964. During this period, there were an average four million births every year nationwide, a level that would not be seen again until 1989.

The magnitude of this spike in births can be seen in figure 1 below. After negative population growth during the war, population increased 8.6 percent in Ohio in 1946 and 5.7 percent nationwide. Throughout nearly the entire remainder of the period of analysis, the state lagged behind the rest of the country in growth. In 2006, Ohio's population grew only about one tenth of a percent, while national population grew one percent.

Since the baby boom, there have been two other large-scale demographic events in the United States, though nowhere near the baby boom's magnitude. The baby bust refers to a drop in births after 1964 and through the 1970s. These effects were more pronounced in Ohio during this period than nationwide, with state population growth dipping into negative territory in 1976 and the early 1980s. Net population out-migration due to manufacturing restructuring also contributed to this decline. Section III contains additional discussion of migratory patterns. The baby echo

Figure 1: Population Growth, 1921 to 2006



Source: ODJFS, 2007b.

refers to a modest increase in the late 1970s through the early 1990s. These are the children of women from the baby boom cohort.

**Age Demographics.** The result of the baby boom for Ohio and its workforce has been a large population cohort within the state. Figure 2 below breaks down Ohio's population by age group for 1996, 2006 and the projected population in 2016. Baby boomers, included in the highlighted groups in this table, make up about 40 percent of the state population today. The oldest of the baby boomers will be turning 70 in 2016.

**Figure 2: Ohio Population by Age**

| Age Group    | 1996            | 2006            | 2016            |
|--------------|-----------------|-----------------|-----------------|
| <b>Total</b> | <b>11,242.8</b> | <b>11,478.0</b> | <b>11,641.5</b> |
| Under 5      | 771.3           | 734.7           | 757.7           |
| 5 to 14      | 1,620.2         | 1,534.6         | 1,518.2         |
| 15 to 24     | 1,536.8         | 1,597.5         | 1,471.5         |
| 25 to 34     | 1,640.5         | 1,459.4         | 1,541.1         |
| 35 to 44     | 1,820.2         | 1,621.7         | 1,462.6         |
| 45 to 54     | 1,399.8         | 1,738.5         | 1,557.4         |
| 55 to 64     | 949.9           | 1,259.7         | 1,529.1         |
| 65 to 74     | 836.0           | 766.6           | 1,011.4         |
| 75 and older | 668.1           | 765.4           | 792.7           |

Populations are shown in thousands. The baby boom generation is included in the groups highlighted above.

Source: U.S. Census Bureau, 2003; 2005; & 2007.

Figure 3 on the facing page more clearly shows how the baby boom cohort is affecting age demographic distributions in Ohio. In 1996, only 21.8 percent of the state was 55 or older. By 2006, this proportion had risen to 24.3 percent. By 2016, when a larger proportion of the baby boom generation has reached retirement age, over 3.3 million Ohioans will be 55 or older (28.6%), an increase of more than 540,000 according to Census Bureau projections. Ohio's population breakdown is shown in greater detail in appendix A at the end of this report.

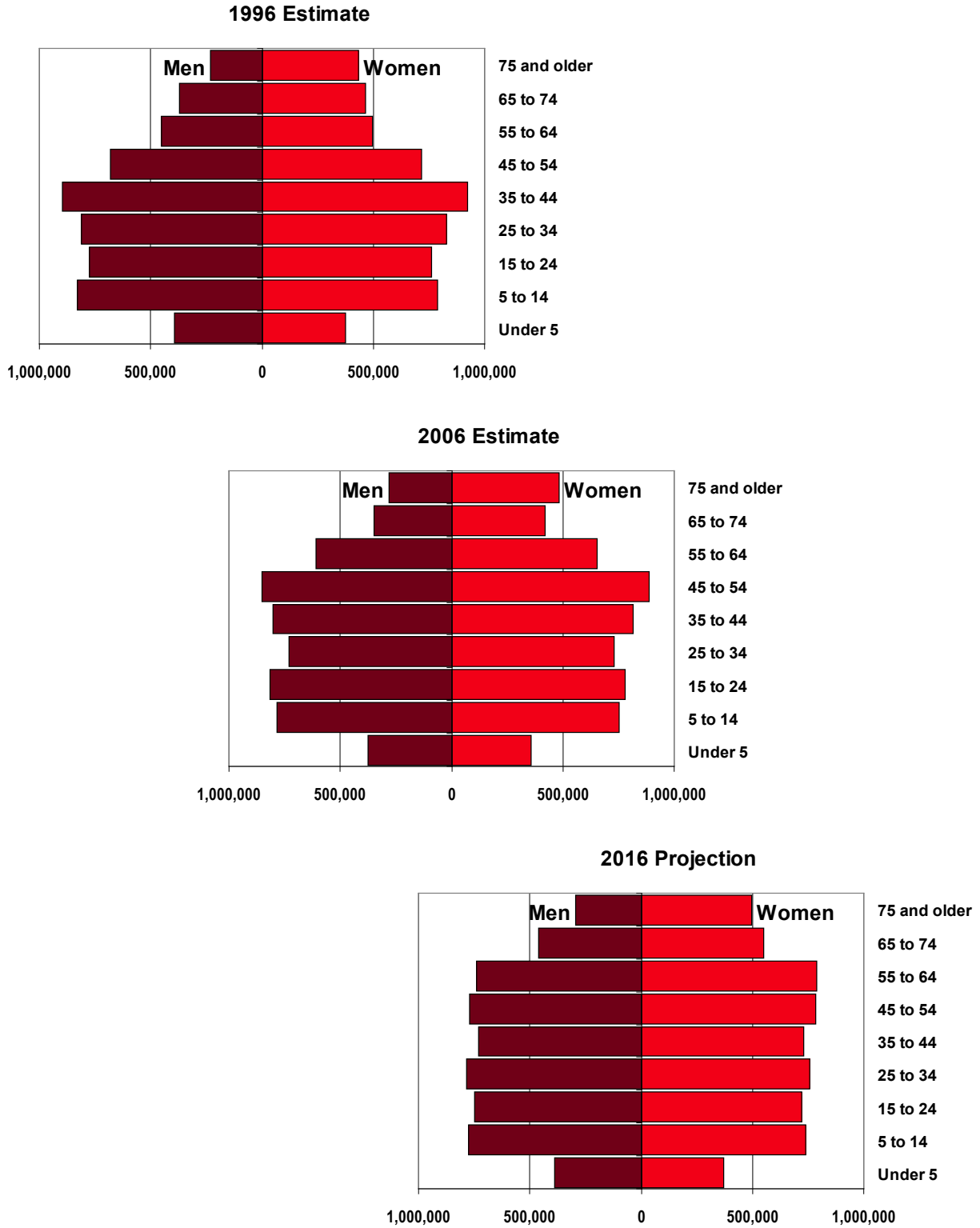
Several studies have examined the possible effects of such a large population cohort reaching old age at once. Much of the discussion of the aging baby boom generation and its economic and societal effects has focused on mass Social Security and other pension claims; increasing demand for medical services, especially home care services; and a declining national worker-to-retiree ratio.<sup>1</sup> Recent projections even predict slower economic growth due to this phenomenon.<sup>2</sup>

<sup>1</sup> Kinsella & Velkoff, 2001; Purcell, 2007.

<sup>2</sup> Su, 2007.



**Figure 3: Ohio Population Estimates, 1996, 2006, and 2016**



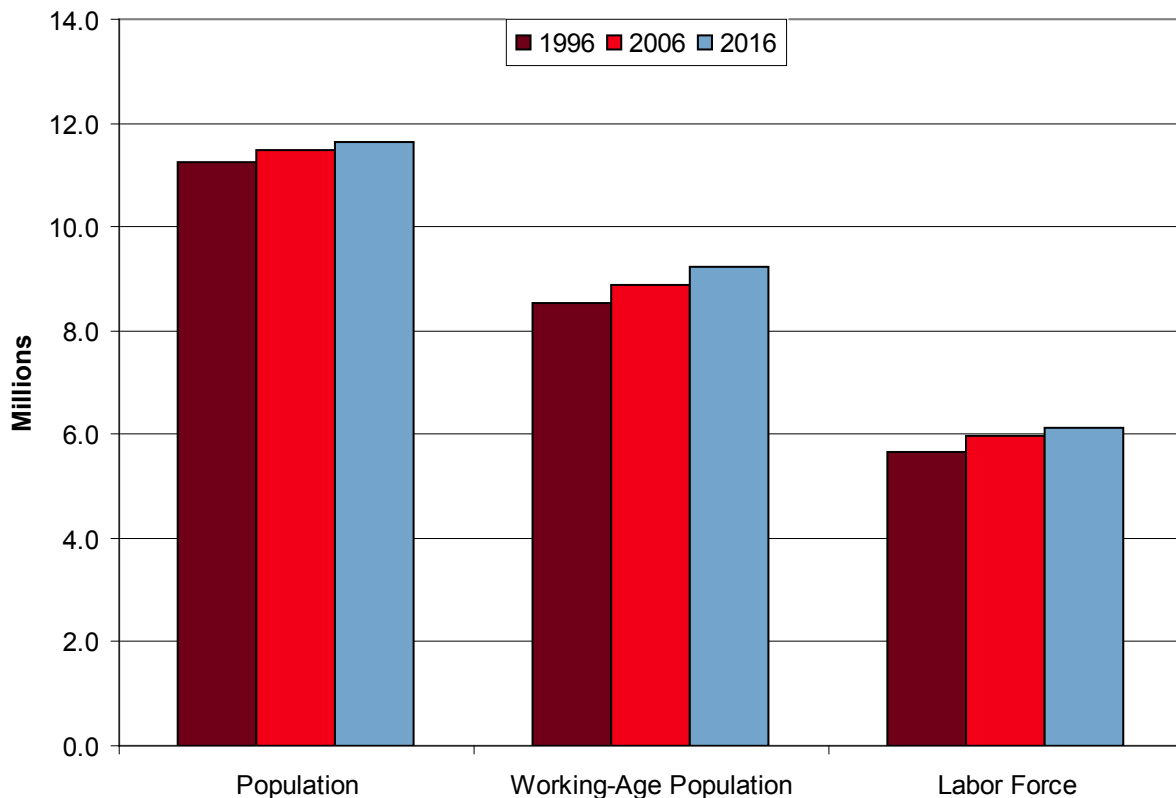
Source: U.S. Census Bureau, 2003; 2005; & 2007.



## II. Labor Force Trends

**Labor Force Participation Rates.** There are two primary factors that determine Ohio's labor force: the working-age population and the labor force participation rate (LFPR). The working-age population is the population 16 years or older who are not institutionalized (e.g. in the hospital, the military, correctional facilities, etc.). The labor force participation rate is the proportion of the

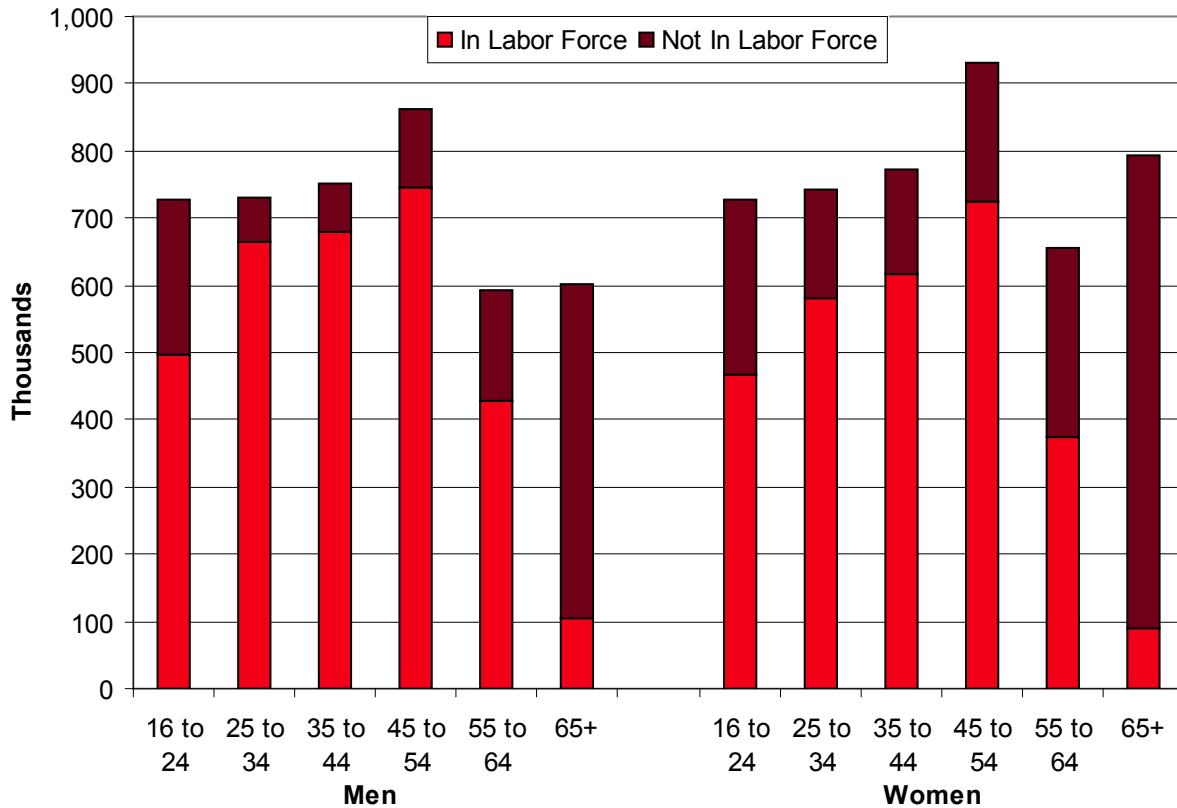
**Figure 4: Ohio Population and Labor Force, 1996, 2006 & 2016**



working-age population that is either working or looking for work. Projected changes in Ohio's labor force are shown in figure 4. Ohio's overall supply of workers is projected to grow from 5.98 million in 2006 to approximately 6.14 million in 2016—an increase of about 170,000 workers. This growth is projected to come about through increases in the working-age population of about 3.6 percent from 2006 to 2016; labor force participation rates should hold relatively steady during this period.

Any growth in labor force participation among younger workers will likely be offset by overall aging in the population. Figure 5 on the next page shows how labor force participation differs between age groups. As one can clearly see, most of those 65 and older do not work. As this age group grows in the next ten years, it is likely to lower total labor force participation rates, although changing work patterns among the elderly may dull this effect.

**Figure 5: Civilian Adult Noninstitutional Population by Gender, 2006**



**Figure 6: Ohio Labor Force Estimates, 1996, 2006 & 2016**

|              | Civilian Noninst.<br>Population 16 and<br>Over | Civilian<br>Labor<br>Force | Labor Force<br>Participation<br>Rate | Share         |
|--------------|------------------------------------------------|----------------------------|--------------------------------------|---------------|
| <b>1996</b>  |                                                |                            |                                      |               |
| <b>Total</b> | <b>8,517,000</b>                               | <b>5,645,000</b>           | <b>66.3%</b>                         | <b>100.0%</b> |
| Men          | 4,072,000                                      | 3,040,000                  | 74.7%                                | 53.9%         |
| Women        | 4,445,000                                      | 2,605,000                  | 58.6%                                | 46.1%         |
| <b>2006</b>  |                                                |                            |                                      |               |
| <b>Total</b> | <b>8,890,000</b>                               | <b>5,975,000</b>           | <b>67.2%</b>                         | <b>100.0%</b> |
| Men          | 4,267,000                                      | 3,121,000                  | 73.1%                                | 52.2%         |
| Women        | 4,623,000                                      | 2,854,000                  | 61.7%                                | 47.8%         |
| <b>2016</b>  |                                                |                            |                                      |               |
| <b>Total</b> | <b>9,213,000</b>                               | <b>6,144,000</b>           | <b>66.7%</b>                         | <b>100.0%</b> |
| Men          | 4,458,000                                      | 3,202,000                  | 71.8%                                | 52.1%         |
| Women        | 4,755,000                                      | 2,942,000                  | 61.9%                                | 47.9%         |

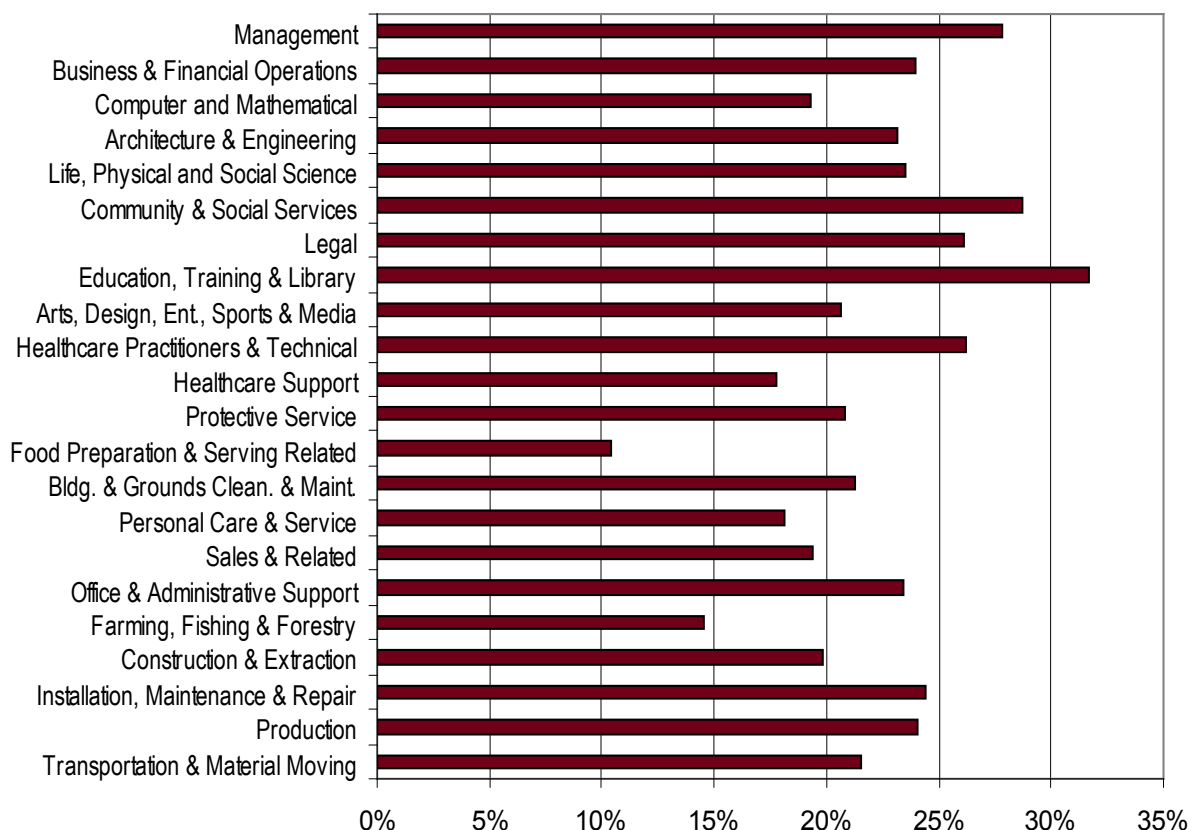
Figure 6 shows how labor force participation rates vary between men and women. Generally speaking, men have higher participation rates than women, though this gender gap is slowly narrowing. In 1996, the participation rate for men was 16.1 percentage points higher than for

women. In 2006, that difference had dropped to 11.4 percentage points. By 2016, the gap between men and women is expected to fall to 9.9 percentage points. Also notable, the percentage shares of men and women in the labor force is also equalizing. In 2006, 52.2 percent of the civilian labor force were men, compared with 53.9 percent ten years earlier. By 2016, only 52.1 percent of the labor force will be male.

**Occupational Age Demographics.** Changing participation rates and retirement patterns will not affect all industries and occupations equally. Some occupations tend to have older incumbents than others and thus may be subject to acute labor shortages as the general population ages. While these data reflect national-level figures from the 2000 decennial census, research shows only slight variation between states.<sup>3</sup>

Figure 7 shows the proportions in each major occupational group aged between 45 and 54 in 2000. People in these categories in 2000, if still employed in the same occupations, would have aged to between 53 and 62 years old by 2008. Nearly one-third of people in education, training, and library occupations were in this age group in 2000, making it one of the oldest occupational groups that year. Other occupational groups with large shares of older workers include community and social service; management; healthcare practitioners and technical; and legal occupations.

**Figure 7: Proportions of Occupational Groups Ages 45 to 54, 2000**



See Technical Notes for important information on the data used and how these occupations were classified.  
Source: Goldstein, 2004.

<sup>3</sup> Goldstein, 2004.

While some of these groups represent late-career occupations that one would expect primarily mature workers to hold (e.g., management), others could indicate coming labor shortages as the baby boom generation retires. For example, nearly a quarter of production and installation, maintenance & repair workers are also in this older category.

The occupational groups with the lowest proportions of older workers are food preparation and serving; farming, fishing and forestry; healthcare support;<sup>4</sup> personal care and service; and computer and mathematical occupations.

Data on the age distributions for specific occupations in Ohio reveal a broad range of skills that may be critically in demand. These are occupations which had a high percentage of people aged 45 to 54 at the time of the 2000 Census and also have a high number of annual openings. Forty occupations met these criteria and are listed in appendix C.

A closer look at these occupations shows the need for concern. Eighty percent of the occupations on this list need at least a year of on-the-job training or further formal schooling beyond high school. Many of the occupations require at least a bachelor's degree, most notably teachers at all levels. There may also be problems in the healthcare field. About thirty percent of registered nurses and licensed practical nurses were between 45 and 54 years old, according to the 2000 Census. There are a few jobs listed in appendix C, such as postal service mail carriers and court, municipal and license clerks, that only require short-term on-the-job training. In general, in order to meet the need for those occupations listed in appendix C, education should start now.

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<sup>4</sup> The healthcare support group differs slightly from the healthcare practitioners and technical group. The latter generally requires more occupational training and includes doctors, registered nurses, and medical technicians. Healthcare support includes various aides and assistants.

### III. Labor Force Dynamics and Projections

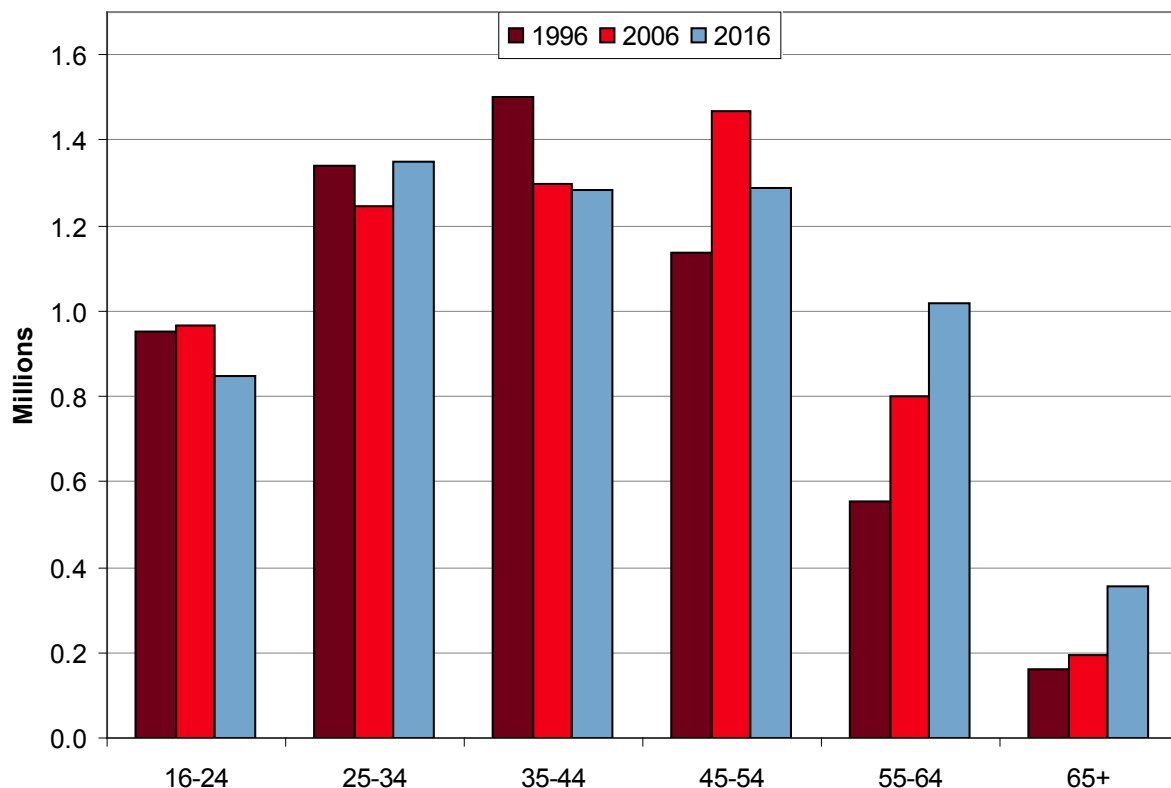
**Projected Participation Rates.** The demographics of the 2016 labor force will differ from those in 2006 to the extent that the demographic composition of entrants and leavers will vary over the decade. This section looks more closely at the changing age and gender characteristics. The aggregate changes may be attributed to three distinct groups:

- Entrants—those who were not in the labor force in 2006, but will be in 2016;
- Leavers—those who will exit the labor force between 2006 and 2016; and
- Stayers—those who were in the labor force in 2006 and will remain through 2016.

The complete projections for Ohio's labor force are shown in appendix B, including the civilian noninstitutional population 16 and older, the number of workers in the labor force, the share of the total labor force each age group comprises, and each age group's labor force participation rate. Estimates are listed by year, age group, and gender.

**Age.** The Ohio labor force has been growing older, as shown in figure 8 below. The proportion of the labor force age 55 and older was 12.6 percent in 1996 and increased to 16.7 percent by 2006. This share is projected to rise to 22.4 percent by 2016. The participation rate in the oldest age category, 65 and over, rose from 11.6 percent in 1996 to 14.0 percent in 2006. The expected increase to 19.8 percent in 2016 may be partially attributed to the Senior Citizens Freedom to Work Act of 2000, which eliminated certain penalties for those aged 65 to 70 who continue to work, along with other changes in U.S. labor law.

**Figure 8: Age Distribution of the Ohio Labor Force**

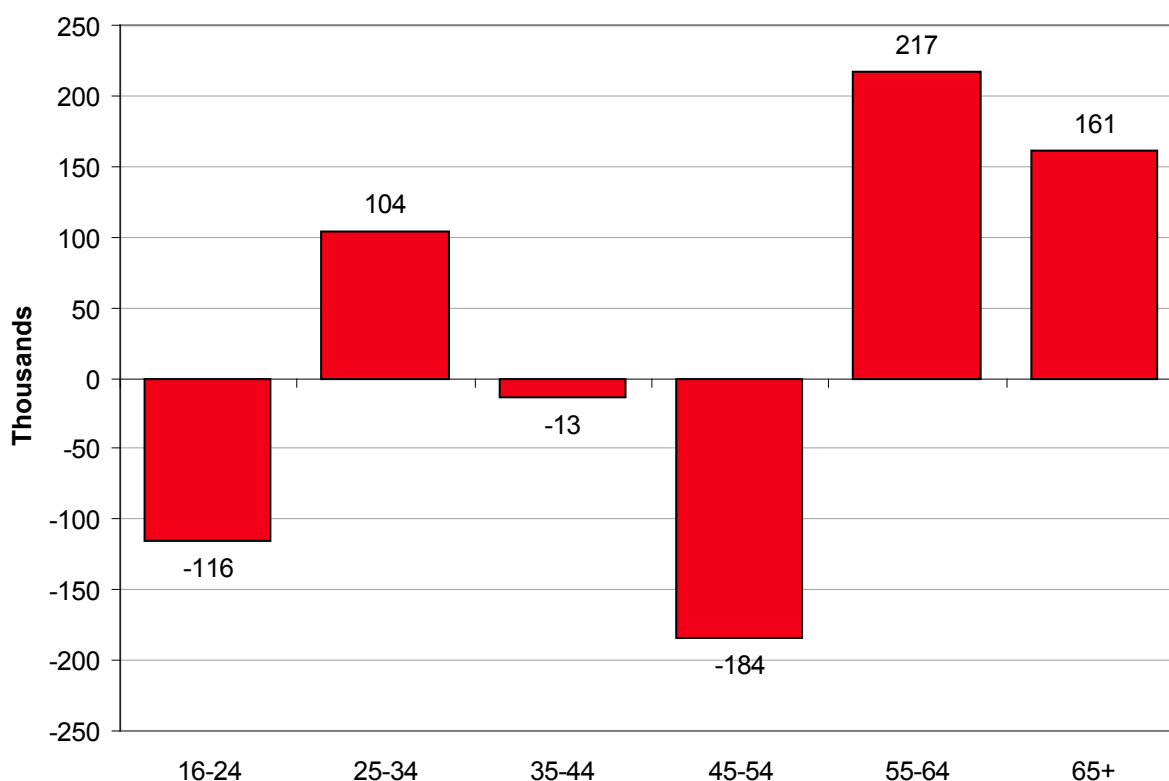


Over the 1996 to 2006 period, the age group with the greatest change was those aged 45 to 54, most of the baby-boom generation, increasing by 334,000 workers. The baby bust caused a drop of nearly 100,000 over this same period in the Ohio labor force of those aged 25 to 34.

The demographic composition of the labor force is expected to change as Ohio's population ages and work force participation continues to increase; 63.8 percent of Ohio's labor force will be in the 25-54 age group by 2016, down from 67.2 percent in 2006.

From 2006 to 2016, the older Ohio labor force will grow much faster than the younger labor force as the baby boom generation continues to age. The 45 to 54 age group is expected to drop by 184,000 as workers age out. The labor force 35-44 years of age is also expected to decline slightly, reflecting the decrease in births in the late 1960s and early 1970s. Those 55 and older in the state labor force are expected to increase by 378,000. The number of young people 25-34 years of age in the workforce is expected to increase by over 100,000, reflecting the baby echo—the higher number of births to the large cohort of women of child-bearing age from the baby boom.

**Figure 9: Changes in the Ohio Labor Force by Age, 2006 to 2016**



**Young, Prime-Age and Older Workers.** To get a clearer picture of labor force participation rates and age demographics, the age categories from appendix B were grouped into three categories: young workers, aged 16 to 24; prime-age workers, aged 25 to 54; and older workers, aged 55 and above.



Figure 10 below shows how the participation rates of the youngest age group, those 16 to 24, has steadily decreased, while participation among those 55 and over has increased. Participation rates for the prime working age population have remained relatively constant for men and increased for women, resulting in a slight increase in the participation rates for the total prime-age working population.

**Figure 10: Ohio Labor Force Estimates for Young, Prime-Age and Older Workers**

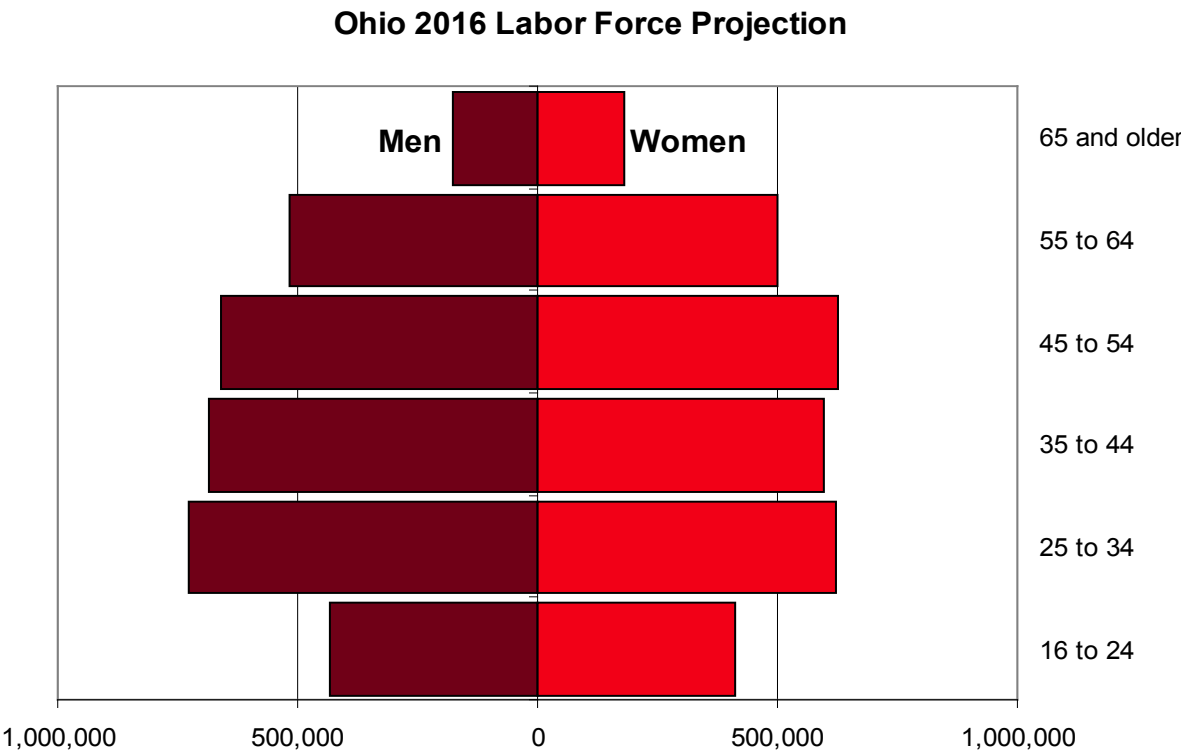
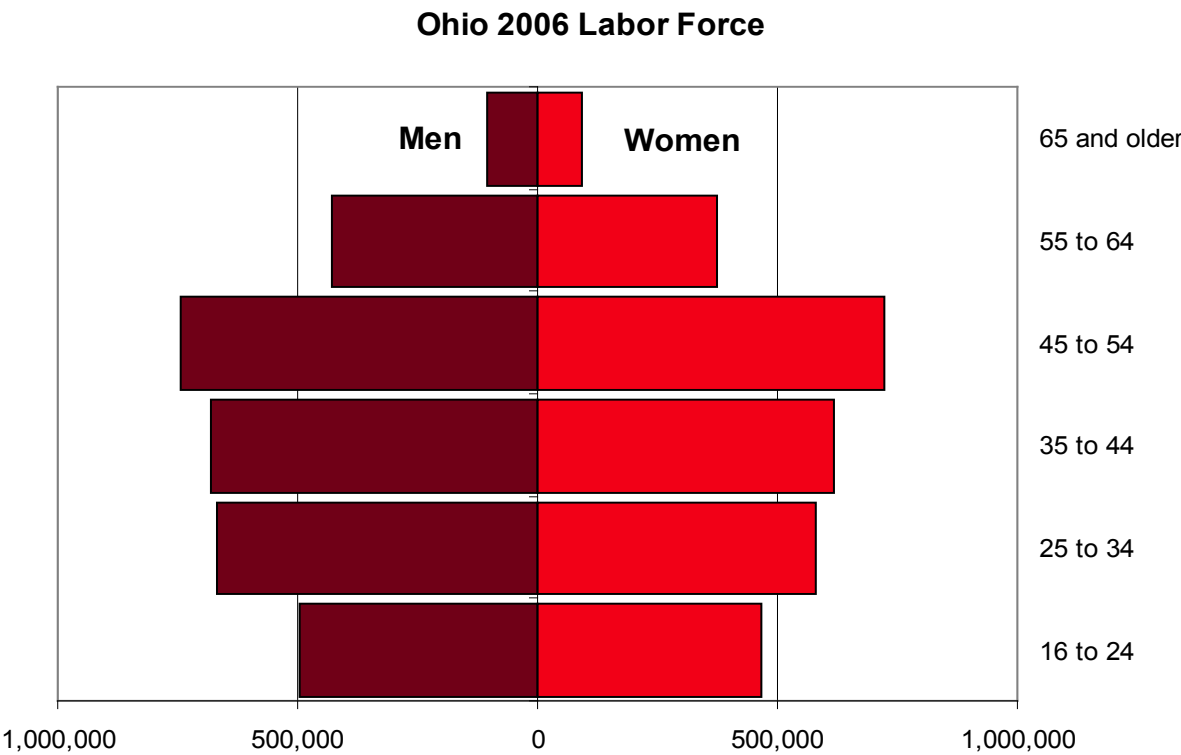
| Age          | 1996         | 2006         | 2016         |
|--------------|--------------|--------------|--------------|
| <b>Total</b> |              |              |              |
| <b>Total</b> | <b>66.3%</b> | <b>67.2%</b> | <b>66.7%</b> |
| 16-24        | 69.3%        | 66.3%        | 64.3%        |
| 25-54        | 82.7%        | 83.8%        | 85.9%        |
| 55+          | 30.6%        | 37.7%        | 41.3%        |
| <b>Men</b>   |              |              |              |
| <b>Total</b> | <b>74.7%</b> | <b>73.1%</b> | <b>71.8%</b> |
| 16-24        | 72.4%        | 68.2%        | 64.7%        |
| 25-54        | 90.8%        | 89.2%        | 90.5%        |
| 55+          | 38.7%        | 44.6%        | 46.4%        |
| <b>Women</b> |              |              |              |
| <b>Total</b> | <b>58.6%</b> | <b>61.7%</b> | <b>61.9%</b> |
| 16-24        | 66.1%        | 64.4%        | 63.9%        |
| 25-54        | 73.3%        | 78.5%        | 81.3%        |
| 55+          | 24.2%        | 32.0%        | 37.1%        |

**Gender.** A study of the population by gender shows the male population has more youths than the female population, reflecting a higher proportion of male births. However, more women are in the older age groups due to men's higher mortality rates. These observations are apparent in the population charts in appendix A. Similar charts for the labor force for 2006 and 2016 are displayed in figure 11 on the next page. Note that these profiles are only for the working-age population: those at least 16 years old and non-institutionalized.

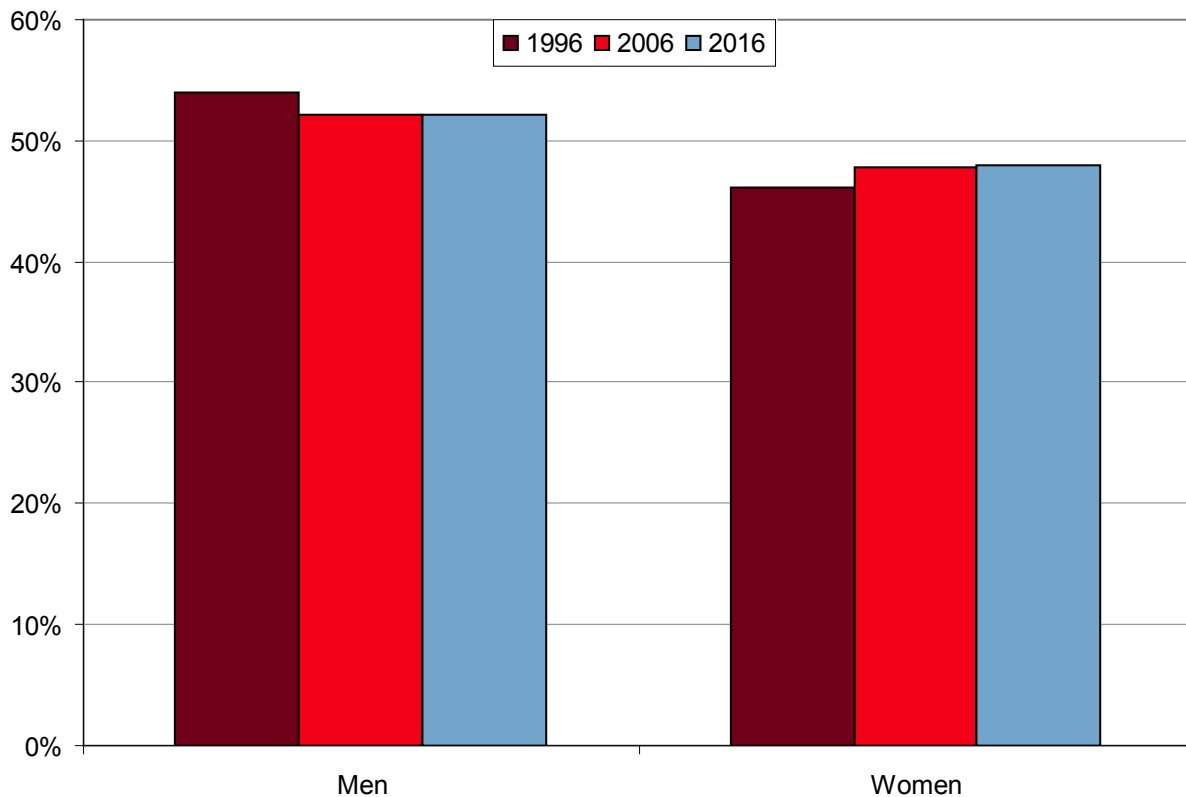
The major difference in these labor force charts, compared to the population profiles, is that those 65 and older represent the smallest group. The reason, of course, is that most Ohioans in that age category are retired and not in the labor force. Although the labor force participation rate for this oldest group is expected to increase to 23.4 percent for men and 17.2 percent for women by 2016, they will still comprise only a small share of Ohio's labor force (5.8%). Even though men's participation rates in this age category are significantly higher than women's rates, the number of men and the number of women in the labor force will be almost the same (177,000 men compared to 180,000 women).

The graying of the labor force is also apparent when comparing the snapshots for 2006 and 2016. The number of men and women in the 55-64 and 65 and over age categories increases noticeably. Males 55 and older comprised 17.1 percent of the male labor force in 2006; that share is projected to increase to 21.7 percent in 2016. The comparable women's share was 16.3 percent, expected to grow to 23.2 percent.

Figure 11: Estimated Labor Force by Age and Gender, 2006 & 2016



**Figure 12: Share of Ohio Labor Force by Gender**



The aggregate labor force participation rate is a result of the age distribution of the population by gender, as well as the labor force participation rates of the different age categories. The labor force participation rates of men and women have been converging over time; the overall participation rate for men has been slowly declining while the rate for women increased. The chart above shows how women's share of the labor force has grown over the past ten years.

Because of women's increased participation and a slight decline in men's participation, the difference between the two rates has narrowed considerably. In 1996, the gap in Ohio was 16.1 percentage points (74.7% for men compared to 58.6% for women). In 2006 the gap shrank to 11.4 percentage points. The men's labor force participation rate is projected to be only 9.9 percentage points higher by 2016 (71.8% for men compared to 61.9% for women). As a result, the gender composition gap will continue to close, with women expected to account for 47.9 percent of the Ohio labor force in 2016, up marginally from 47.8 percent in 2006.

**Entrants and Leavers.** The labor force of 2016 may be thought of as the labor force of 2006, plus the entrants and minus the leavers. Most workers in Ohio's labor force in 2006, about four out of five, will remain in Ohio's labor force through 2016. About 850,000 youth, 16-24 years old in 2016, will be part of the Ohio labor force for the first time. Although two-thirds of the baby-boomers in the 55-64 age group in 2016 are expected to be working, there will be more than one million baby boomers leaving the labor force between 2006 and 2016. The remaining increase in Ohio's labor force will be additional entrants and re-entrants to the Ohio labor force resulting from increased participation rates.

**Occupational Replacement Rates.** Job openings in Ohio may result from one of two causes: either a firm is expanding and needs additional staff to cover workload, or a person must be hired to replace another worker who has left for some reason, be it retirement, promotion, or dismissal. Most job openings, about two-thirds, arise from this second cause.<sup>5</sup> Even those industries where employment is shrinking may have a large number of openings simply to cover replacement needs.

As we saw in the discussion of occupational age demographics earlier, different occupations may be susceptible to higher retirement rates as average ages vary. Figure 13 shows average replacement rates for each of the 22 major occupational groups. Total replacements refer to workers moving between employers within an occupation and staying in the labor force. Net replacements refer to people leaving an occupation all together, such as through retirement.

**Figure 13: National Replacement Rates by Occupational Group, 2004-2014**

| Major Occupational Group                                   | 2004<br>Employ-<br>ment* | Total<br>Replace-<br>ment<br>Rate,<br>2003-04 | Net<br>Replace-<br>ment<br>Rate,<br>2004-14 | Total<br>Replace-<br>ment<br>Needs,<br>2004-14* | Net<br>Replace-<br>ment<br>Needs<br>2004-14* |
|------------------------------------------------------------|--------------------------|-----------------------------------------------|---------------------------------------------|-------------------------------------------------|----------------------------------------------|
| <b>Total, all occupations</b>                              | <b>145,612</b>           | <b>15.5%</b>                                  | <b>23.6%</b>                                | <b>24,054</b>                                   | <b>3,432</b>                                 |
| Management occupations                                     | 9,115                    | 9.1%                                          | 17.2%                                       | 878                                             | 157                                          |
| Business and financial operations occupations              | 5,873                    | 10.7%                                         | 17.7%                                       | 687                                             | 104                                          |
| Computer and mathematical science occupations              | 3,153                    | 7.8%                                          | 13.4%                                       | 282                                             | 42                                           |
| Architecture and engineering occupations                   | 2,520                    | 6.8%                                          | 22.3%                                       | 182                                             | 56                                           |
| Life, physical, and social science occupations             | 1,316                    | 8.8%                                          | 24.0%                                       | 125                                             | 32                                           |
| Community and social services occupations                  | 2,317                    | 9.6%                                          | 19.2%                                       | 247                                             | 44                                           |
| Legal occupations                                          | 1,220                    | 6.1%                                          | 11.6%                                       | 80                                              | 14                                           |
| Education, training, and library occupations               | 8,698                    | 13.5%                                         | 20.9%                                       | 1,288                                           | 182                                          |
| Arts, design, entertainment, sports, and media occupations | 2,515                    | 14.4%                                         | 18.7%                                       | 389                                             | 47                                           |
| Healthcare practitioners and technical occupations         | 6,805                    | 6.2%                                          | 19.0%                                       | 476                                             | 129                                          |
| Healthcare support occupations                             | 3,492                    | 15.3%                                         | 15.8%                                       | 624                                             | 55                                           |
| Protective service occupations                             | 3,138                    | 14.4%                                         | 28.3%                                       | 484                                             | 89                                           |
| Food preparation and serving related occupations           | 10,739                   | 27.8%                                         | 39.7%                                       | 3,223                                           | 427                                          |
| Building and grounds cleaning and maintenance occupations  | 5,582                    | 17.4%                                         | 20.0%                                       | 1,055                                           | 111                                          |
| Personal care and service occupations                      | 4,721                    | 22.1%                                         | 23.9%                                       | 1,155                                           | 113                                          |
| Sales and related occupations                              | 15,330                   | 22.3%                                         | 32.2%                                       | 3,585                                           | 493                                          |
| Office and administrative support occupations              | 23,907                   | 16.2%                                         | 22.8%                                       | 3,988                                           | 545                                          |
| Farming, fishing, and forestry occupations                 | 1,026                    | 19.1%                                         | 27.0%                                       | 194                                             | 28                                           |
| Construction and extraction occupations                    | 7,738                    | 13.6%                                         | 19.7%                                       | 1,116                                           | 152                                          |
| Installation, maintenance, and repair occupations          | 5,747                    | 10.2%                                         | 22.9%                                       | 618                                             | 132                                          |
| Production occupations                                     | 10,562                   | 14.3%                                         | 23.9%                                       | 1,500                                           | 252                                          |
| Transportation and material moving occupations             | 10,098                   | 17.6%                                         | 22.5%                                       | 1,877                                           | 227                                          |

\*Figures are shown in thousands.

Source: U.S. Bureau of Labor Statistics [BLS], 2006 (pp. 155-173).

<sup>5</sup> BLS, 2006 (pp. 46-88).

Most of the occupational groups with low net replacement rates are those which are expected to have significant growth through 2016, such as computer and mathematical or healthcare support occupations.<sup>6</sup> Concentrations of older workers within occupations with high net replacement rates are very low. Appendix C at the end of this document lists several specific occupations with potentially critical projected training and replacement needs arising from workforce aging.

**Migration.** Domestic migration—movement between states—is the most volatile component of population change, but also the most interesting from the perspective of regional economies. It is likely a function of economic growth as workers follow job opportunities. Population in most states tends to continue to increase naturally as the number of births exceeds the number of deaths. The Census Bureau has estimated the natural increase in Ohio's population from April 1<sup>st</sup>, 2000 to April 1<sup>st</sup>, 2006 to be about 263,000: 938,200 births less 675,200 deaths. Subtracting natural population growth from total net population change will yield approximate net migration. Ohio experienced a net loss of 145,718 persons through migration between 2000 and 2006.

Patterns in Ohio migration compared with employment are shown in figure 13 on the previous page. The 1980 and 1981-82 recessions hit Ohio very hard with high net out-migration. This was second largest migratory population loss in state history and only began to subside by the end of the decade as Ohio employment recovered. This improvement carried over into the record economic expansion of the 1990s. During the 1990s Ohio lost only 63,777 persons through migration. However, Ohio's loss of jobs so far this decade (2000-2006) is beginning to take its toll once again in higher net out-migration.

**Figure 14: Ohio Population, Employment and Migration Comparisons, 1980 to 2006**

| Period    | Population |         | Employment |         | Net Migration |
|-----------|------------|---------|------------|---------|---------------|
|           | Net Change | Percent | Net Change | Percent |               |
| 1980-1990 | 49,485     | 0.5%    | 514,900    | 11.8%   | -621,000      |
| 1990-2000 | 516,694    | 4.8%    | 742,400    | 15.2%   | -63,777       |
| 2000-2006 | 114,197    | 1.0%    | -183,400   | -3.3%   | -145,718      |

Source: ODJFS, 2007a.

<sup>6</sup> Toosi, 2007.



## IV. Implications for Workforce Development

**Work or Retire?** There are several developments that may act to persuade older workers to stay in the labor force past traditional retirement age.<sup>7</sup> The first involves a series of changes made to Social Security law. The retirement age at which a worker may begin to receive full benefits has been increasing incrementally since 2000 and will reach 67 years by 2022. While this is only a modest change, it is accompanied by reductions in partial benefits a worker may collect upon early retirement and eliminated earning limits for receiving full benefits.

Another factor is the rise of *defined contribution* retirement plans within the workforce, one popular example being the 401(k) retirement account. Under traditional *defined benefit* plans, there was a disincentive for workers to continue to work beyond retirement age or service requirements, since benefits would not increase past this point. The value of a defined contribution plan, conversely, continues to grow as an employee works, regardless of age, so there is incentive to stay in the labor force.

Third, continuing improvements in healthcare have added productive years to mature workers' lives. Not only has the overall average lifespan in America increased, but general health has improved, as measured by increased body size, improved nutrition and water quality, and lower risk of infectious disease.<sup>8</sup> The result is that workers can stay in the labor force and remain productive much longer than they could in the past.

Aside from the aforementioned Social Security changes, there have been several other developments in United States labor policy in recent years that may encourage mature workers to stay in the labor force. This has been a significant change from older policies designed to coax older workers out of the market. Figure 15 summarizes some of the laws, policies and societal expectations that may affect the decision of whether to retire or stay in the labor force. The formal labor force includes regular, salaried employment, while the informal labor force may include volunteerism, irregular employment or consulting, or emeritus positions in some occupations.

**Figure 15: Labor Policies towards Older Workers in the U.S.**

| Encouraging Work                                                                                                                    | Discouraging Work                                                                                                                                   |
|-------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Formal Labor Force</b>                                                                                                           |                                                                                                                                                     |
| “Welfare-to-Work” laws<br>Partial Retirement Options<br>Age Discrimination in Employment Act<br>Workforce Investment Act            | Mandatory Retirement Rules<br>Special Early Retirement Programs<br>Employer Age Discrimination<br>Social Security Retirement Test                   |
| <b>Informal Labor Force</b>                                                                                                         |                                                                                                                                                     |
| No help for family caregivers<br>Senior Community Service Employment Program<br>Experience Corps<br>Americans with Disabilities Act | Materialistic society discourages altruism<br>General age discrimination<br>Inadequate public transportation<br>Union attitudes toward volunteerism |

Source: Schulz, 2001 (p. 65).

<sup>7</sup> Dohm, 2000.

<sup>8</sup> Manton *et al.*, 2007 (p. 10802).

**Succession Planning.** Even with all these developments, a large number of experienced workers may be expected to leave the labor force in the next ten years. From an employer's standpoint, there may be a significant need to preserve institutional knowledge and soft skills as key employees retire. Employers have already begun to institute programs and hiring practices to ensure that their firms' human capital stays intact.<sup>9</sup>

Retiring workers may take both explicit and tacit knowledge with them when they retire. Explicit knowledge, the hard skills needed to perform a job successfully, can be passed on easily enough through classroom or on-the-job training. But tacit knowledge, such as workplace practices or office culture, may be harder to preserve. Some federal government agencies are using a form of storytelling to deliver lessons from older managers to younger employees, explaining how problems or work assignments were tackled and how they reached their decisions.<sup>10</sup> Videotaping these testimonials and business cases has been used successfully in some instances. Other firms have instituted more comprehensive mentorship programs, pairing late-career workers with younger protégés for months at a time.<sup>11</sup>

A larger number of firms are simply making their work environments more attractive to mature workers. One concept taking hold is *snowbird employment*, in which employers allow mature workers to relocate to warmer climates for part of the year. CVS Pharmacies, Home Depot, and Borders Books all have programs like this in place.<sup>12</sup> Other companies are instituting part-time employment in many occupations for which this would have been a rarity ten years ago, in order to retain late-career workers and meet their scheduling needs. Other older workers, as many as half of those leaving full-time careers, are moving into unrelated 'bridge jobs' after formal retirement, in part for extra income and in part to stay active.<sup>13</sup>

In summary, the baby boom generation, having already altered the American labor force in so many ways, stands poised to do so again through its eventual exit. Economic and workforce development professionals will need to continue to monitor the changing makeup of Ohio's workforce, in terms of demographics, occupational employment, and human capital, in order to ensure that this generational 'changing of the guard' can occur without undue threat to economic growth.

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<sup>9</sup> Rizzo, 2007.

<sup>10</sup> Walsh, 2006.

<sup>11</sup> Rizzo, *op cit*.

<sup>12</sup> Kadlec, 2006; Stern, 2007.

<sup>13</sup> Cahill, Giandrea, & Quinn, 2005.



## Technical Notes

Population figures—including those cited from the Ohio Department of Job and Family Services—are from the U.S. Census Bureau. Prior-year estimates for both Ohio and the U.S., including age and gender demographics, are from the Census Population Estimates program and are available for download from <http://www.census.gov/popest/datasets.html>. Population projections were developed in the Census Population Projections program and are available at <http://www.census.gov/population/www/projections/popproj.html>.

Labor force projections for Ohio were developed using general population estimates and projections as described above and national-level labor force projections 2006–2016 from the Current Population Survey, a joint program operated by the Census Bureau and the U.S. Bureau of Labor Statistics (BLS). Labor force participation rates for various demographic groups were assumed to grow at the same rate in Ohio as for the U.S. National-level labor force estimates and projections were published in the November 2007 Monthly Labor Review at <http://www.bls.gov/opub/mlr/2007/11/art3abs.htm>.

All occupations in this publications are classified according to the Standard Occupational Classification system (SOC), a list of over 800 standardized occupations, arranged into 23 occupational groups. For details on SOC and how occupations are defined, please visit the SOC home page at <http://www.bls.gov/soc/home.html>.

Data on occupational age demographics, such as shown in figure 7 and appendix C, were developed as part of a study of replacement rates by the State Projections Workgroup and were derived from figures from the 2000 Decennial Census. The complete set of data is available from ODJFS upon request. These occupational demographic data were originally classified using the Census 2000 Equal Employment Opportunity Tabulations, a set of approximately 500 occupations. These were converted to SOC occupations for this report. Bear in mind that any conversion between the two classification systems is imperfect and may introduce error to our analysis. For details on Census classifications, including conversion tables between Census and SOC, please visit <http://www.census.gov/hhes/www/ioindex/view.html>.

Occupational replacement rates are from Occupational Projections and Training Data (OPTD), a report by the BLS. The replacement rates are derived using demographic data similar to that described above from the Current Population Survey, a joint program of the Census Bureau and BLS. This report, along with complete replacement rate tables, is available for download at <http://www.bls.gov/emp/optd/home.htm>.

Appendix C lists the results of an analysis of specific occupations of concern using the above-mentioned 2000 Census data, OPTD figures, and employment projections from the Ohio 2004-2014 job outlook report. The table lists those occupations that exhibited three characteristics: (1) a proportion of workers aged 45 to 54 (as of 2000) higher than or equal to the statewide average of 29.4 percent, (2) at least fifty projected average annual openings, and (3) training requirements of at least one year of on-the-job training or formal education beyond high school.



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## Appendix A: Ohio Population by Age and Gender

| Age          | 1996 Estimate     |               | 2006 Estimate     |               | 2016 Projection   |               |
|--------------|-------------------|---------------|-------------------|---------------|-------------------|---------------|
|              | Population        | Share         | Population        | Share         | Population        | Share         |
| <b>Total</b> |                   |               |                   |               |                   |               |
| <b>Total</b> | <b>11,242,827</b> | <b>100.0%</b> | <b>11,478,006</b> | <b>100.0%</b> | <b>11,641,535</b> | <b>100.0%</b> |
| Under 5      | 771,293           | 6.9%          | 734,735           | 6.4%          | 757,653           | 6.5%          |
| 5 to 14      | 1,620,186         | 14.4%         | 1,534,571         | 13.4%         | 1,518,189         | 13.0%         |
| 15 to 24     | 1,536,788         | 13.7%         | 1,597,458         | 13.9%         | 1,471,474         | 12.6%         |
| 25 to 34     | 1,640,528         | 14.6%         | 1,459,394         | 12.7%         | 1,541,122         | 13.2%         |
| 35 to 44     | 1,820,195         | 16.2%         | 1,621,662         | 14.1%         | 1,462,559         | 12.6%         |
| 45 to 54     | 1,399,810         | 12.5%         | 1,738,480         | 15.1%         | 1,557,403         | 13.4%         |
| 55 to 64     | 949,918           | 8.4%          | 1,259,712         | 11.0%         | 1,529,076         | 13.1%         |
| 65 to 74     | 836,038           | 7.4%          | 766,575           | 6.7%          | 1,011,356         | 8.7%          |
| 75 and older | 668,071           | 5.9%          | 765,419           | 6.7%          | 792,703           | 6.8%          |
| <b>Men</b>   |                   |               |                   |               |                   |               |
| <b>Total</b> | <b>5,445,036</b>  | <b>48.4%</b>  | <b>5,597,677</b>  | <b>48.8%</b>  | <b>5,699,597</b>  | <b>49.0%</b>  |
| Under 5      | 394,193           | 3.5%          | 376,623           | 3.3%          | 386,955           | 3.3%          |
| 5 to 14      | 829,769           | 7.4%          | 782,726           | 6.8%          | 776,795           | 6.7%          |
| 15 to 24     | 775,398           | 6.9%          | 816,006           | 7.1%          | 749,418           | 6.4%          |
| 25 to 34     | 812,981           | 7.2%          | 729,621           | 6.4%          | 785,214           | 6.7%          |
| 35 to 44     | 896,081           | 8.0%          | 804,088           | 7.0%          | 731,623           | 6.3%          |
| 45 to 54     | 682,809           | 6.1%          | 851,738           | 7.4%          | 772,734           | 6.6%          |
| 55 to 64     | 451,331           | 4.0%          | 607,036           | 5.3%          | 738,942           | 6.3%          |
| 65 to 74     | 369,758           | 3.3%          | 347,026           | 3.0%          | 462,182           | 4.0%          |
| 75 and older | 232,743           | 2.1%          | 282,813           | 2.5%          | 295,734           | 2.5%          |
| <b>Women</b> |                   |               |                   |               |                   |               |
| <b>Total</b> | <b>5,797,764</b>  | <b>51.6%</b>  | <b>5,880,329</b>  | <b>51.2%</b>  | <b>5,941,938</b>  | <b>51.0%</b>  |
| Under 5      | 377,100           | 3.4%          | 358,112           | 3.1%          | 370,698           | 3.2%          |
| 5 to 14      | 790,417           | 7.0%          | 751,845           | 6.6%          | 741,394           | 6.4%          |
| 15 to 24     | 761,390           | 6.8%          | 781,452           | 6.8%          | 722,056           | 6.2%          |
| 25 to 34     | 827,547           | 7.4%          | 729,773           | 6.4%          | 755,908           | 6.5%          |
| 35 to 44     | 924,114           | 8.2%          | 817,574           | 7.1%          | 730,936           | 6.3%          |
| 45 to 54     | 717,001           | 6.4%          | 886,742           | 7.7%          | 784,669           | 6.7%          |
| 55 to 64     | 498,587           | 4.4%          | 652,676           | 5.7%          | 790,134           | 6.8%          |
| 65 to 74     | 466,280           | 4.1%          | 419,549           | 3.7%          | 549,174           | 4.7%          |
| 75 and older | 435,328           | 3.9%          | 482,606           | 4.2%          | 496,969           | 4.3%          |

Source: U.S. Census Bureau, 2003; 2005; 2007.

## Appendix B: Ohio Labor Force Estimates by Age and Gender

| Age                        | 1996                       |                      |               |              | 2006                       |                      |               |              | Projected 2016             |                      |               |              |
|----------------------------|----------------------------|----------------------|---------------|--------------|----------------------------|----------------------|---------------|--------------|----------------------------|----------------------|---------------|--------------|
|                            | Civilian<br>NI Pop.<br>16+ | Civilian Labor Force |               |              | Civilian<br>NI Pop.<br>16+ | Civilian Labor Force |               |              | Civilian<br>NI Pop.<br>16+ | Civilian Labor Force |               |              |
|                            |                            | Number               | Share         | LFPR         |                            | Number               | Share         | LFPR         |                            | Number               | Share         | LFPR         |
| <b>Total</b>               |                            |                      |               |              |                            |                      |               |              |                            |                      |               |              |
| <b>Total</b>               | <b>8,517</b>               | <b>5,645</b>         | <b>100.0%</b> | <b>66.3%</b> | <b>8,890</b>               | <b>5,975</b>         | <b>100.0%</b> | <b>67.2%</b> | <b>9,213</b>               | <b>6,144</b>         | <b>100.0%</b> | <b>66.7%</b> |
| <b>16-24</b>               | <b>1,377</b>               | <b>954</b>           | <b>16.9%</b>  | <b>69.3%</b> | <b>1,454</b>               | <b>964</b>           | <b>16.1%</b>  | <b>66.3%</b> | <b>1,319</b>               | <b>848</b>           | <b>13.8%</b>  | <b>64.3%</b> |
| 16-19                      | 626                        | 356                  | 6.3%          | 56.9%        | 650                        | 344                  | 5.8%          | 52.9%        | 580                        | 283                  | 4.6%          | 48.7%        |
| 20-24                      | 751                        | 598                  | 10.6%         | 79.6%        | 804                        | 620                  | 10.4%         | 77.1%        | 739                        | 565                  | 9.2%          | 76.5%        |
| <b>25-54</b>               | <b>4,813</b>               | <b>3,980</b>         | <b>70.5%</b>  | <b>82.7%</b> | <b>4,789</b>               | <b>4,013</b>         | <b>67.2%</b>  | <b>83.8%</b> | <b>4,561</b>               | <b>3,920</b>         | <b>63.8%</b>  | <b>85.9%</b> |
| 25-34                      | 1,623                      | 1,341                | 23.8%         | 82.6%        | 1,474                      | 1,246                | 20.9%         | 84.5%        | 1,541                      | 1,350                | 22.0%         | 87.6%        |
| 35-44                      | 1,785                      | 1,503                | 26.6%         | 84.2%        | 1,524                      | 1,297                | 21.7%         | 85.1%        | 1,463                      | 1,284                | 20.9%         | 87.8%        |
| 45-54                      | 1,405                      | 1,136                | 20.1%         | 80.9%        | 1,791                      | 1,470                | 24.6%         | 82.1%        | 1,557                      | 1,286                | 20.9%         | 82.6%        |
| <b>55-64</b>               | <b>952</b>                 | <b>552</b>           | <b>9.8%</b>   | <b>58.0%</b> | <b>1,251</b>               | <b>802</b>           | <b>13.4%</b>  | <b>64.1%</b> | <b>1,529</b>               | <b>1,019</b>         | <b>16.6%</b>  | <b>66.6%</b> |
| <b>65+</b>                 | <b>1,375</b>               | <b>159</b>           | <b>2.8%</b>   | <b>11.6%</b> | <b>1,397</b>               | <b>196</b>           | <b>3.3%</b>   | <b>14.0%</b> | <b>1,804</b>               | <b>357</b>           | <b>5.8%</b>   | <b>19.8%</b> |
| <b>Men</b>                 |                            |                      |               |              |                            |                      |               |              |                            |                      |               |              |
| <b>Total</b>               | <b>4,072</b>               | <b>3,040</b>         | <b>53.9%</b>  | <b>74.7%</b> | <b>4,267</b>               | <b>3,121</b>         | <b>52.2%</b>  | <b>73.1%</b> | <b>4,458</b>               | <b>3,202</b>         | <b>52.1%</b>  | <b>71.8%</b> |
| <b>16-24</b>               | <b>689</b>                 | <b>499</b>           | <b>8.8%</b>   | <b>72.4%</b> | <b>727</b>                 | <b>496</b>           | <b>8.3%</b>   | <b>68.2%</b> | <b>671</b>                 | <b>434</b>           | <b>7.1%</b>   | <b>64.7%</b> |
| 16-19                      | 315                        | 180                  | 3.2%          | 57.1%        | 346                        | 184                  | 3.1%          | 49.9%        | 296                        | 130                  | 2.1%          | 44.0%        |
| 20-24                      | 374                        | 319                  | 5.7%          | 85.3%        | 381                        | 312                  | 5.2%          | 82.5%        | 376                        | 304                  | 4.9%          | 80.8%        |
| <b>25-54</b>               | <b>2,364</b>               | <b>2,147</b>         | <b>38.0%</b>  | <b>90.8%</b> | <b>2,344</b>               | <b>2,091</b>         | <b>35.0%</b>  | <b>89.2%</b> | <b>2,290</b>               | <b>2,073</b>         | <b>33.7%</b>  | <b>90.5%</b> |
| 25-34                      | 818                        | 752                  | 13.3%         | 91.9%        | 732                        | 666                  | 11.1%         | 91.0%        | 785                        | 726                  | 11.8%         | 92.5%        |
| 35-44                      | 869                        | 803                  | 14.2%         | 92.4%        | 751                        | 680                  | 11.4%         | 93.5%        | 732                        | 686                  | 11.2%         | 93.7%        |
| 45-54                      | 677                        | 592                  | 10.5%         | 87.4%        | 861                        | 745                  | 12.5%         | 86.5%        | 773                        | 661                  | 10.8%         | 85.5%        |
| <b>55-64</b>               | <b>461</b>                 | <b>308</b>           | <b>5.5%</b>   | <b>66.8%</b> | <b>594</b>                 | <b>428</b>           | <b>7.2%</b>   | <b>68.5%</b> | <b>739</b>                 | <b>517</b>           | <b>8.4%</b>   | <b>70.0%</b> |
| <b>65+</b>                 | <b>558</b>                 | <b>86</b>            | <b>1.5%</b>   | <b>15.4%</b> | <b>602</b>                 | <b>105</b>           | <b>1.8%</b>   | <b>18.4%</b> | <b>758</b>                 | <b>177</b>           | <b>2.9%</b>   | <b>23.4%</b> |
| <b>Women</b>               |                            |                      |               |              |                            |                      |               |              |                            |                      |               |              |
| <b>Total</b>               | <b>4,445</b>               | <b>2,605</b>         | <b>46.1%</b>  | <b>58.6%</b> | <b>4,623</b>               | <b>2,854</b>         | <b>47.8%</b>  | <b>61.7%</b> | <b>4,755</b>               | <b>2,942</b>         | <b>47.9%</b>  | <b>61.9%</b> |
| <b>16-24</b>               | <b>688</b>                 | <b>455</b>           | <b>8.1%</b>   | <b>66.1%</b> | <b>727</b>                 | <b>468</b>           | <b>7.8%</b>   | <b>64.4%</b> | <b>648</b>                 | <b>414</b>           | <b>6.7%</b>   | <b>63.9%</b> |
| 16-19                      | 311                        | 176                  | 3.1%          | 56.6%        | 304                        | 160                  | 2.7%          | 54.9%        | 285                        | 152                  | 2.5%          | 53.5%        |
| 20-24                      | 377                        | 279                  | 4.9%          | 74.0%        | 423                        | 308                  | 5.2%          | 72.8%        | 363                        | 261                  | 4.3%          | 72.0%        |
| <b>25-54</b>               | <b>2,449</b>               | <b>1,833</b>         | <b>32.5%</b>  | <b>73.3%</b> | <b>2,446</b>               | <b>1,921</b>         | <b>32.2%</b>  | <b>78.5%</b> | <b>2,272</b>               | <b>1,847</b>         | <b>30.1%</b>  | <b>81.3%</b> |
| 25-34                      | 805                        | 589                  | 10.4%         | 73.2%        | 743                        | 580                  | 9.7%          | 78.1%        | 756                        | 624                  | 10.2%         | 82.5%        |
| 35-44                      | 916                        | 700                  | 12.4%         | 76.4%        | 773                        | 617                  | 10.3%         | 79.8%        | 731                        | 598                  | 9.7%          | 81.8%        |
| 45-54                      | 728                        | 544                  | 9.6%          | 74.7%        | 930                        | 724                  | 12.1%         | 77.8%        | 785                        | 625                  | 10.2%         | 79.6%        |
| <b>55-64</b>               | <b>491</b>                 | <b>244</b>           | <b>4.3%</b>   | <b>49.7%</b> | <b>657</b>                 | <b>374</b>           | <b>6.3%</b>   | <b>56.8%</b> | <b>790</b>                 | <b>502</b>           | <b>8.2%</b>   | <b>63.5%</b> |
| <b>65+</b>                 | <b>817</b>                 | <b>73</b>            | <b>1.3%</b>   | <b>8.9%</b>  | <b>794</b>                 | <b>91</b>            | <b>1.5%</b>   | <b>11.4%</b> | <b>1,046</b>               | <b>180</b>           | <b>2.9%</b>   | <b>17.2%</b> |
| <b>Age of Baby Boomers</b> |                            |                      |               |              |                            |                      |               |              |                            |                      |               |              |
|                            | 32 to 50                   |                      |               |              | 42 to 60                   |                      |               |              | 52 to 70                   |                      |               |              |

Estimates are shown in thousands. Percentages are based on unrounded figures except in the 25 to 54 category. NI stands for noninstitutional; LFPR stands for labor force participation rate. Projections for LFPR are averages of the Ohio historical trend and the projected national change for the U.S.

## Appendix C: Occupations with Potentially Critical Training Needs

| SOC Equiv. | Title                                                                                        | Ohio Proj. Growth, 2004-14 | Net Repl. Rate | Prop. Aged 45 to 54 | Educ./ Training Level |
|------------|----------------------------------------------------------------------------------------------|----------------------------|----------------|---------------------|-----------------------|
| 11-1011    | Chief Executives                                                                             | 14.9%                      | 18.9%          | 33.5%               | 4                     |
| 11-3011    | Administrative Services Managers                                                             | 16.9%                      | 19.4%          | 33.9%               | 4                     |
| 11-3040    | Human Resources Managers                                                                     | 20.3%                      | 16.9%          | 29.5%               | 4                     |
| 11-3061    | Purchasing Managers                                                                          | 7.0%                       | 21.7%          | 30.1%               | 4                     |
| 11-9030    | Education Administrators                                                                     | 16.6%                      | 24.8%          | 39.6%               | 4                     |
| 11-9041    | Engineering Managers                                                                         | 13.0%                      | 19.9%          | 29.4%               | 4                     |
| 11-9111    | Medical and Health Services Managers                                                         | 22.8%                      | 19.5%          | 35.1%               | 4                     |
| 11-9151    | Social and Community Service Managers                                                        | 25.5%                      | 19.2%          | 31.9%               | 5                     |
| 13-1041    | Compliance Officers, Except Agriculture, Construction, Health and Safety, and Transportation | 11.6%                      | 23.5%          | 30.8%               | 9                     |
| 13-2081    | Tax Examiners, Collectors, and Revenue Agents                                                | 5.1%                       | 22.9%          | 31.9%               | 5                     |
| 19-3030    | Psychologists                                                                                | 18.7%                      | 21.8%          | 42.8%               | 2/3                   |
| 21-1010    | Counselors                                                                                   | 21.3%                      | 22.7%          | 33.7%               | 3                     |
| 21-2011    | Clergy                                                                                       | 12.4%                      | 20.5%          | 30.4%               | 3                     |
| 25-2020    | Elementary and Middle School Teachers                                                        | 16.7%                      | 22.1%          | 36.4%               | 5                     |
| 25-2030    | Secondary School Teachers                                                                    | 14.0%                      | 28.1%          | 36.8%               | 4/5                   |
| 25-2040    | Special Education Teachers                                                                   | 20.9%                      | 23.8%          | 31.1%               | 5                     |
| 25-4021    | Librarians                                                                                   | 4.9%                       | 23.9%          | 42.0%               | 3                     |
| 29-1111    | Registered Nurses                                                                            | 29.4%                      | 20.9%          | 29.8%               | 5/6                   |
| 29-1127    | Speech-Language Pathologists                                                                 | 14.6%                      | 24.9%          | 33.7%               | 3                     |
| 29-2061    | Licensed Practical and Licensed Vocational Nurses                                            | 17.1%                      | 21.8%          | 30.9%               | 7                     |
| 33-1012    | First-Line Supervisors/Managers of Police and Detectives                                     | 15.5%                      | 33.0%          | 38.6%               | 8                     |
| 33-1021    | First-Line Supervisors/Managers of Fire Fighting and Prevention Workers                      | 21.1%                      | 41.2%          | 46.5%               | 8                     |
| 43-4031    | Court, Municipal, and License Clerks                                                         | 18.6%                      | 22.2%          | 29.5%               | 11                    |
| 43-4061    | Eligibility Interviewers, Government Programs                                                | -9.4%                      | 26.7%          | 37.0%               | 10                    |
| 43-5051    | Postal Service Clerks                                                                        | 0.0%                       | 26.4%          | 33.3%               | 11                    |
| 43-5052    | Postal Service Mail Carriers                                                                 | 0.0%                       | 31.3%          | 36.1%               | 11                    |
| 43-5053    | Postal Service Mail Sorters, Processors, & Processing Machine Operators                      | 0.0%                       | 26.4%          | 30.4%               | 11                    |
| 47-4011    | Construction and Building Inspectors                                                         | 22.3%                      | 22.5%          | 34.8%               | 8                     |
| 49-1011    | First-Line Supervisors/Managers of Mechanics, Installers, and Repairers                      | 12.4%                      | 25.1%          | 33.8%               | 8                     |
| 49-2020    | Radio and Telecommunications Equipment Installers and Repairers                              | -4.8%                      | 20.7%          | 30.0%               | 7/9                   |
| 49-9044    | Millwrights                                                                                  | 5.9%                       | 24.3%          | 40.4%               | 9                     |
| 49-9051    | Electrical Power-Line Installers and Repairers                                               | 2.5%                       | 31.7%          | 30.3%               | 9                     |
| 51-2041    | Structural Metal Fabricators and Fitters                                                     | 2.9%                       | 23.5%          | 32.9%               | 10                    |
| 51-4050    | Metal Furnace and Kiln Operators and Tenders                                                 | -14.7%                     | 22.4%          | 31.9%               | 10                    |
| 51-4191    | Heat Treating Equipment Setters, Operators, and Tenders, Metal and Plastic                   | -0.4%                      | 31.4%          | 32.7%               | 10                    |
| 51-8031    | Water and Liquid Waste Treatment Plant and System Operators                                  | 16.2%                      | 34.4%          | 35.9%               | 9                     |

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Appendix C: Occupations with Potentially Critical Training Needs (con't)

| SOC<br>Equiv. | Title                                                        | Ohio Proj.<br>Growth,<br>2004-14 | Net Repl.<br>Rate | Prop.<br>Aged 45<br>to 54 | Educ./<br>Training<br>Level |
|---------------|--------------------------------------------------------------|----------------------------------|-------------------|---------------------------|-----------------------------|
| 51-8090       | Miscellaneous Plant and System Operators                     | -9.6%                            | 31.0%             | 30.4%                     | 9                           |
| 51-9051       | Furnace, Kiln, Oven, Drier, and Kettle Operators and Tenders | -4.2%                            | 23.9%             | 30.2%                     | 10                          |
| 53-4010       | Locomotive Engineers and Operators                           | -2.5%                            | 29.3%             | 37.7%                     | 10                          |
| 53-7021       | Crane and Tower Operators                                    | 8.2%                             | 21.8%             | 32.9%                     | 9                           |

Education & Training Level Key:

1. First professional degree
2. Doctoral degree
3. Master's degree
4. Bachelor's degree or higher, plus work experience
5. Bachelor's degree
6. Associate degree
7. Postsecondary vocational award
8. Work experience in a related occupation
9. Long-term on-the-job training (one year or longer)
10. Moderate on-the-job training (one month to one year)
11. Short-term on-the-job training (one month or less)

Note: Projected growth and net replacement rates are from 2004-2014 employment projections. Proportions of workers aged 45 to 54 are from the 2000 Census and would in 2008 be between 53 and 62. Census occupational classifications differ slightly from the SOC classifications used elsewhere in this publication. See Technical Notes for details on the development of this table.

Sources: Goldstein, 2004; BLS, 2006; ODJFS, 2006.





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