



# The Right Jobs: Identifying Career Advancement Opportunities for Low-Skilled Workers

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*A Guide for Public and Private Sector  
Workforce Development Practitioners*

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ADVANCEMENT FOR LOW-WAGE WORKERS**

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**JOBS FOR THE FUTURE**

CREATING STRATEGIES  
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## Advancement for Low-Wage Workers: *A Series of Reports from Jobs for the Future*

Jobs for the Future develops models, strategies, and policies that enable adults to advance toward economic self-sufficiency for themselves and their families. Drawing on innovative workforce development efforts around the country, our publications, tool kits, and other resources respond to the challenges to advancement for low-wage workers. With the series *Advancement for Low-Wage Workers*, JFF seeks to elevate discussion of this critical issue within and outside the workforce field. Elaborating upon the themes in the series introduction, *The Next Challenge*, these occasional papers address public policy and on-the-ground practice.

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*From the Entry Level to Licensed Practical Nurse: Four Case Studies of Career Ladders in Health Care* (2005)

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*Career Ladders: A Guidebook for Workforce Intermediaries* (2003)

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*Public Views on Low Wage Workers in the Current Economy* (2001)

*A National Survey of American Attitudes About Low-Wage Workers and Welfare Reform* (2000)

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We would also like to thank the industry professionals, training program administrators, and educators who generously made themselves available to share their experiences and insights. Their input was a critical component of our research and confirmed the practicality and importance of *going beyond the numbers* to identify challenges and opportunities for advancing less-skilled workers in the workforce.

# The Right Jobs:

## Identifying Career Advancement Opportunities for Low-Skilled Workers

### EXECUTIVE SUMMARY

**T**he *Right Jobs* provides workforce policymakers and directors of workforce development programs with a methodology to:

- Identify the most promising employment opportunities within reach of low-skill workers;
- Determine the postsecondary training and career preparation routes that will yield results for their clients; and
- Make the case for investment to public and private funders.

*The Right Jobs* reveals opportunities in a wide range of industries and occupations, including transportation, construction, customer service, automotive repair, and information technology. Counterbalancing these opportunities are several barriers that make it difficult for less-educated workers to gain access to these occupations. The report presents a range of program designs and strategies to help low-skill workers overcome these obstacles.

#### **The Right Jobs begins with a close look at the numbers.**

What jobs are projected to grow? What jobs offer good starting wages with potential for advancement? What jobs are accessible without a four-year college degree? To answer these questions, *The Right Jobs* applies a series of quantitative screens to occupational data compiled by the U.S. Bureau of Labor Statistics on 725 discrete occupations. An earnings screen brings the number down to 527, an educational attainment screen narrows the field to 347, an availability screen reduces it to 20, and a work experience screen yields a list of 16 occupations for further consideration. Collectively, the BLS projects these 16 occupations to offer over 700,000 new job opportunities per year nationally.

#### **The second step considers risk factors associated with the target occupations.**

BLS employment projections do not always capture current dynamics. JFF has identified three fundamental risks that could reduce demand for an occupation: offshoring, technological innovation, and industry decline. Five of the sixteen occupations identified in step one are at medium or high risk of offshoring; seven are at medium or high risk of technological innovation.

#### **Taking a Closer Look at Occupational Clusters: Going Beyond the Numbers**

**The next step is a qualitative analysis. Industry sources serve as an important “reality check” on the quantitative analysis.**

From the sixteen occupations identified in the quantitative research, JFF identified a diverse sample of six occupational clusters for fine grained investigation: nursing, customer service representative, automotive and truck technician, computer support specialist, building trades, and commercial drivers. This analysis goes beyond the numbers to evaluate the suitability of these occupations as advancement targets for less-skilled workers and to better understand what it would take to help individuals secure one of these jobs. Interviews with employers and training providers probe a variety of issues, including the accessibility of training programs, evolving hiring requirements, long-term career advancement options, and stability of demand.

This investigation identified three types of *barriers* hindering the advancement of less-educated workers into these six occupations:

- **Barriers to entering and completing training programs:** High academic requirements for entry, long training programs, the lack of evening and part-time enrollment options, high tuition costs, and competi-



tion for limited training spots pose significant obstacles to less-educated workers who need to earn a living while attending school. For example, Registered Nurse, the most promising occupation in terms of number of openings and salary, presents several access barriers, including high academic requirements, a very competitive selection process for Associate's degree programs, and a typical program of three years of full-time study to earn a degree. In contrast, Licensed Practical Nurse training programs which are one year long and emphasize more practical, hands-on learning, offer a more accessible first step into the nursing field.

- **Barriers to gaining employment after completing training:** For several occupations, including nursing, automotive and truck technician, and the skilled building trades, completing a training or apprenticeship program and earning a license or certification virtually guarantees a job. But this is not the case for computer support specialist: employers are reticent to hire training program graduates who do not have work experience in the field.
- **Barriers to identifying the “right jobs” within broad occupational clusters.** Customer service representative jobs generally require neither post-secondary credentials nor intensive pre-employment training, making them the most accessible of the six occupation clusters investigated. However, the quality of CSR jobs varies widely, as do advancement opportunities. Rarely are the promotional routes (or their absences) transparent to a job applicant.



After identifying these barriers, JFF's investigation shifted to identifying effective strategies and best-in-class job preparation programs to help low-skill workers surmount them. For example, *The Right Jobs* profiles four innovative employer- and union-sponsored programs that prepare nursing assistants and other entry-level health care workers to become LPNs. These programs provide academic remediation at or near the worksite to prepare workers to pass the LPN entrance exam, flexible part-time and evening class and clinical schedules, employer tuition payments, and ongoing tutoring and counseling.

*The Right Jobs* also profiles an innovative training program called Year Up that has had outstanding success placing low-skilled urban young adults in computer support specialist positions. Year Up provides participants with six months of technical and professional skills training tailored to employer specifications, followed by a six-month, paid internship. Also highlighted are programs that help workers overcome barriers to entry into skilled trades work and commercial driving.

### **Making the Right Jobs More Accessible: Lessons for Program Design and Policy**

*The Right Jobs* offers a number of lessons for program design and policy in the interest of making it possible for low-skill workers to advance up the job ladder.

#### **Program Design and Operation**

- Local and state workforce planning organizations (e.g., WIBs) need to go beyond the published numbers of job openings to determine the most promising opportunities. This further investigation includes a careful evaluation of employer hiring needs and practices and the accessibility of training for low-skill workers. It also includes identifying the subset of jobs in broad occupational categories that offers the best prospects for advancement.
- Programs designed to advance low-skill workers must provide the full complement of skills training, work experience, and employer connections necessitated by current hiring practices within targeted occupations.
- Embedding training for skilled jobs within employer-sponsored advancement programs that offer intensive remedial instruction at or near the work worksite, with ample support, flexible schedules, and clear rewards in promotion and pay, are

particularly effective. Similarly, adult basic education that seamlessly transitions to college coursework best prepares low-skill workers to meet the academic demands of further skill training.

### Public Policy

- The heavy remedial education and personal support needs of less-educated workers can reasonably be met only by a combination of private and public funds. Employers can and should be willing to invest in the training of workers who will become increasingly valuable employees, but employers cannot be expected to bear the full costs of preparing their lowest-skilled for meaningful occupational advancement. Public funds are critical to making “grow your own” workforce strategies economically viable and attractive to employers.
- States need to set targets for the participation of low-income working adults in occupational education programs leading to well-paying jobs—and then hold publicly funded institutions accountable for meeting those targets. Education and training funds should be allocated through a competitive, performance-based system that rewards innovation and improvement and is open to all program sponsors, not just traditional postsecondary training institutions.
- Funds should be made available to help WIBs and other workforce intermediaries gain the capacity to analyze local labor markets and direct program development energies toward the most promising occupational opportunities. Similarly, new public and private financing mechanisms should be created to help program developers follow the market, shifting from declining occupational areas to more promising ones.





# The Right Jobs:

## Identifying Career Advancement Opportunities for Low-Skilled Workers

### Introduction

**T**he *Right Jobs* provides workforce policymakers and directors of workforce development programs with a structured approach to:

- Identifying the most promising employment opportunities within reach of low-skill workers;
- Determining the postsecondary training and career preparation routes that will yield results for their clients; and
- Making the case for investment to public and private funders.

Jobs for the Future undertook the research for this guide because of concerns on the part of practitioners and policymakers that, with changes in the global economy, few good jobs outside of health care are accessible to low-skill workers. This guide is the product of our efforts to identify the best career advancement opportunities for low-skilled workers.

JFF's research reveals opportunities in a wide range of industries and occupations, including transportation, construction, customer service, automotive repair, and information technology. Career advancement programs that prepare low-skill workers to take advantage of these opportunities can help them rise from entry-level employment to career-track jobs that pay middle-class wages.

But to achieve those kinds of outcomes, practitioners must go far beyond the traditional “job first” approach. Instead, they must design and develop programs strategically, giving careful thought to what makes a particular occupation a suitable goal for low-skill job seekers and to the kinds of assistance those job seekers will need to succeed.

In evaluating opportunities for low-skill workers, JFF assessed a number of factors—from labor market projections to larger economic forces and trends, from barriers to gaining the necessary skills and credentials to local hiring practices. As we did

so, we recognized that both *what* we learned and *the way* we conducted the research could help our partner organizations and other practitioners to design and implement programs that help low-skill, low-wage workers advance to economic self-sufficiency.

### About this Guide

*The Right Jobs* provides a cost-effective research methodology that combines statistical analysis with field research, including interviews of training providers and industry representatives. The guide can be easily adopted by funders and operators of employment and training programs to understand the prospects for low-skilled workers in their own labor markets.

This approach to occupational research consists of two parts:

**Part 1 takes a close look at the numbers.** It describes a quantitative analysis of growth occupations, using occupational data from the U.S. Bureau of Labor Statistics. Practitioners can narrow or widen the range of occupational possibilities based on the parameters they choose to set for the data. Recommended data to consider include earnings, educational attainment and work experience (which measures accessibility to low-skilled workers), the number of projected openings (which measures availability of jobs), and the income differential between low earners and high earners (which meas-



***Practitioners must design and develop programs strategically, giving careful thought to what makes a particular occupation a suitable goal for low-skill job seekers***

ures the potential for advancement within the occupation). These jobs are then screened again to determine whether the target occupations are at any risk from offshoring, technology changes, or other competitive factors leading to industry decline. To understand these risks, the methodology recommends consulting secondary resources (e.g., consulting firm reports, expert analysis in newspapers, journals, and other publications).

**Part 2 combines a qualitative analysis with the quantitative data.** Industry sources serve as an important “reality check.” By talking to employers and training providers, it is possible to learn about local market conditions and employer expectations, actual hiring practices, emerging trends not reflected in data reports, training requirements, potential barriers to accessing the jobs or the training, and options for advancement into other kinds of positions with additional training and experience.

*The Right Jobs* describes each of these steps in detail, along with the results that are produced at each step of the process. After describing all steps in

the research, the guide shows the final result: detailed examinations of several occupations that are in high demand and pay well, focusing on whether they are within reach of low-skilled workers and would make good targets for career advancement programs.

This guide uses national employment data. In applying this approach locally, care should be taken to utilize data specific to the region under consideration. This applies to analyzing market demand as well as evaluating accessibility of local training.

*The Right Jobs* concludes with strategies for designing programs that help make these high-demand, well-paying jobs more accessible to low-skilled adults, along with lessons for policymakers. In compiling these strategies and lessons, we have drawn upon JFF’s field-based research and experience in designing innovative policies and program strategies to advance low-income workers into middle-class jobs that offer continued career and wage growth.



## PART 1. A Look at the Numbers

Identifying target jobs for career advancement programs requires taking a look at some hard data:

What jobs are projected to grow in terms of numbers of openings in the future? What jobs offer good starting wages with potential advancement? What jobs are accessible to individuals who do not have a four-year college degree? And, after narrowing down the possibilities, which jobs are relatively safe from threats like automation and offshoring?

There are two main steps to this part of the research: analyzing government occupational data, followed by screening based on secondary sources.

### Step 1: A Quantitative Analysis of Growth Occupations

A valuable resource for quantitative analysis on occupations is the U.S. Department of Labor's Bureau of Labor Statistics ([www.bls.gov](http://www.bls.gov)). The BLS has compiled information on 725 discrete occupations, each categorized by a unique Standard Occupational Code (SOC). Useful BLS data categories for an occupational study include:

- Median Earnings;
- Job Openings Due to Growth and Net Replacement Openings;

- 10th Percentile Earnings Data (PCT 10);
- Educational Attainment Cluster; and
- PostSecondary Education or Training Category.

After downloading the BLS data for your study, the analysis requires setting initial requirements for the types of occupations that you want to target. For the sample analysis in this guide, we analyzed the occupations using the data categories and criteria in Table 1 to narrow the field of candidates for consideration.

For your study, you may choose different categories or set different criteria to screen the occupations. For example, you can widen the field of possible occupations by setting target earnings at a minimum of \$20,000 instead of \$25,000, or you may screen for fewer than 20,000 openings per year. The rationale we adopted is described below.

### Earnings

For the purposes of our study, we looked at the data category Median Earnings and set the minimum threshold at \$25,000. This was approximately 200 percent of the federal poverty level for a family of two in 2003. At this level of income, household members would not be eligible for most forms of



**Table 1. U.S. Bureau of Labor Statistics Data to Analyze for Occupational Study**

Category	BLS Data Field(s)	Information to Seek	Target Criteria for this Study
<b>Earnings</b>	Median Earnings	Annual income data	More than \$25,000 per year
<b>Accessibility</b>	Educational Attainment Cluster PostSecondary Education or Training	Distribution of educational attainment within the occupation Work experience required by the occupation	Job requires an Associate's degree or less and minimal previous work experience
<b>Availability</b>	Growth and Net Replacement Openings	Number of net openings per year	More than 20,000 openings per year
<b>Advancement Potential</b>	Percentile Earnings Data	Comparison of lowest income decile with highest income decile for the occupation	National study did not use this category as a screen because of geographic differences in wages. Local studies may choose to target earnings growth greater than 75% from lowest to highest decile.

federally funded assistance, such as food stamps and many workforce development programs.<sup>1</sup>

### Accessibility

To develop a sample list of occupations accessible to individuals with limited work experience and educational attainment, occupations that met the living wage threshold as defined above were then screened in two ways: first, according to the level of training and education required to access the field, and second, according to required work experience.

*Educational Attainment:* We sought jobs that a person can secure with a two-year postsecondary degree or less; we excluded jobs requiring a four-year degree. The BLS evaluates occupational training requirements in two ways. One measure, Postsecondary Education or Training, captures *the single most significant source* of postsecondary education or training for all workers in the profession (e.g., a two-year certificate or a Bachelor's degree). The other measure, Educational Attainment Cluster, introduced more recently, provides data on *the distribution of educational attainment* by workers in an occupation based on data collected from the Current Population Survey (CPS). This second measure is the one that is most useful to this study because it is based only on data from 25 to 44 year

olds in the occupation. By excluding the oldest workers, the data more likely reflects the most recent hiring trends, compared with measures that look at the educational attainment of all workers in the profession.

Table 2 shows how the CPS clusters occupations according to the distribution of educational attainment. Because the clusters include the full distribution of educational attainment, they can help to distinguish, for example, professions in which workers typically have either a high school diploma or some college from professions in which most workers have either some college or a Bachelor's degree. This distinction can be quite important for understanding an occupation's accessibility to low-skill workers.

For our analysis, we determined that occupations that met the earnings target but which are classified within the College Cluster (within which at least 60 percent of 25 to 44 year olds have a four-year college degree or higher) were too difficult for disadvantaged and low-skilled workers to access easily. Accordingly, College Cluster occupations were screened out of the sample. Occupations in all other clusters are mixed in terms of educational attainment and therefore offer relatively good wages while still being accessible to less educated workers.

**Table 2. Educational Attainment Within Occupations**

Education Cluster (Education Code)	High School or Less	Some College (including AA)	Bachelor's or Higher
<b>High School (HS)</b> <i>Most in this category have high school or less, with small numbers having some college or college degrees</i>	≥60%	< 20%	< 20%
<b>High School/Some College (HS/SC)</b> <i>Most in this category have either high school or less, or some college; a small number with Bachelor's or higher</i>	≥20%	≥20%	< 20%
<b>Some College (SC)</b> <i>Most in this category have some college experience but not a degree</i>	< 20%	≥60%	< 20%
<b>High School/ Some College/College (HS/SC/C)</b> <i>Split fairly evenly within category</i>	≥20%	≥20%	≥20%
<b>Some College/ College (SC/C)</b> <i>Most in this category have some college or a degree</i>	< 20%	≥20%	≥20%
<b>College (C)</b> <i>Most in this category have a Bachelor's or higher</i>	< 20%	< 20%	≥60%

*Work Experience:* An additional accessibility screen was applied based on BLS data for the required work experience for the occupation. Occupations that were accessible based on the educational cluster analysis yet which required work experience in a related field were deemed beyond the reach of entry-level workers. For example, a number of first-line supervisor and manager occupations met all of the other screening criteria, but they were screened out because of the need for work experience in a related field.

### Availability

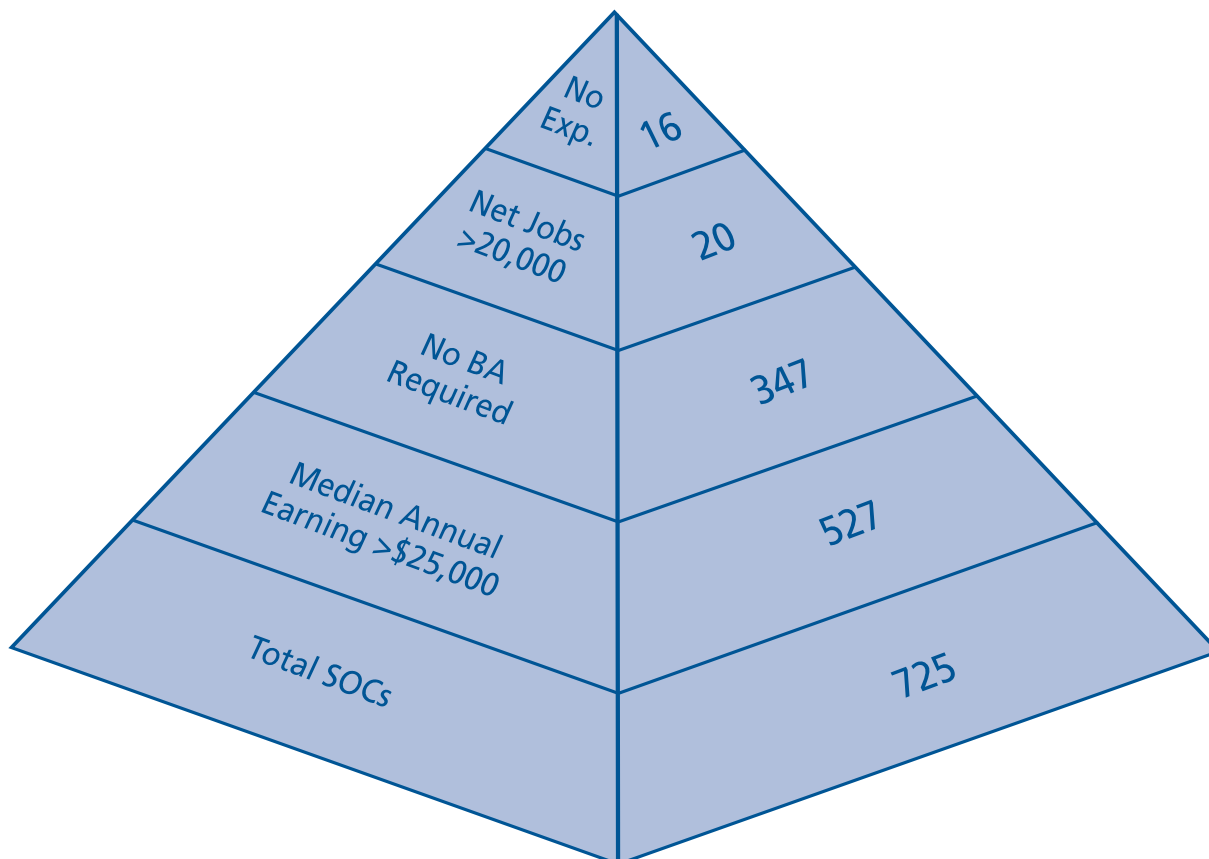
To measure availability—or opportunities for new entrants to an occupation—we used the BLS category Job Openings Due to Growth and Net Replacement, which is the projection of net openings, as the best measure of opportunities for new entrants to an occupation. The net openings measure factors in internal turnover within the industry and thus excludes job openings projected to be filled by people already working in the industry.<sup>2</sup> Because this analysis examines national data, we set the number of annual openings for our screen rela-

tively high, at a minimum of 20,000 openings annually based on growth and net replacements. Local studies would need to set this number much lower.<sup>3</sup>

### Sample Results: A Preliminary List of Promising Occupations

The diagram below illustrates the cumulative results of applying each layer of screening criteria to the BLS universe of occupations. The earnings screen brought the number from 725 SOCs down to 527, the educational attainment screen narrowed the field to 347, the availability screen brought it down to 20, and the work experience screen brought the list down to 16 occupations for further consideration.

Table 3 summarizes information regarding the 16 occupations that had the largest number of annual openings, offered adequate earnings, were available to those with less than a Bachelor's degree, and did not require substantial work-related experience. Collectively, these occupations are projected to offer over 700,000 new job opportunities per year nationally.



**Table 3. Summary of Occupations After Quantitative Screening, 2005-2012**

Occupation	Annual Openings	Median Earnings (\$)	Entry-Level Earnings (\$)	Education Code*
Registered nurses	110,119	48,090	33,970	SC/C
Customer service representatives	74,137	26,240	17,230	HS/SC/C
Sales representatives**	66,239	42,730	22,610	HS/SC/C
Truck drivers, heavy and tractor-trailer	62,517	33,210	20,820	HS/SC
Maintenance and repair workers, general	44,978	29,370	17,170	HS/SC
Bookkeeping, accounting, and auditing clerks	43,077	27,380	17,670	HS/SC
Executive secretaries and administrative assistants	42,444	33,410	22,270	HS/SC
Secretaries, except legal, medical, and executive	37,819	25,290	15,890	HS/SC
Carpenters	31,917	34,190	20,700	HS/SC
Automotive service technicians and mechanics	31,887	30,590	16,930	HS/SC
Police and sheriff's patrol officers	31,290	42,270	25,270	SC/C
Licensed practical and licensed vocational nurses	29,480	31,440	22,860	HS/SC
Electricians	28,485	41,390	24,560	HS/SC
All other sales and related workers	25,011	35,170	NA	HS/SC/C
Computer support specialists	21,579	39,100	23,060	SC/C
Plumbers, pipefitters, and steamfitters	20,511	40,170	23,360	HS/SC

\* See Table 2

\*\* Non-technical wholesale and manufacturing

It is worth repeating that you may choose to expand or change the list of potential occupations to pursue by changing the criteria during the screening process. For example, by setting the number of annual openings at 10,000 instead of 20,000, our analysis generated a list of 34 occupations instead of 16 (see Table 4).

### Step 2: A Secondary Screen to Determine Level of Risk

The next step is to consider risk factors associated with the target occupations. This is important because BLS employment projections do not always capture current dynamics. For example, in the mid 1990s, the BLS projected tremendous growth in the number of home health aides (Horrigan 2004). Based on past trends, this was a reasonable projection. However, the 1998 Medicare reforms dramati-

cally reduced federal funding for home health care services and, as a result, depressed the market for home health aides. Because BLS data are not updated annually, BLS projections did not reflect this changed political reality for several years.

Our assessment identified three fundamental risks that could reduce domestic demand for an occupation:

- **Offshoring:** Demand for the occupation remains strong, but the work could be relocated to a country with less costly labor. An oft-cited example is the moving of IT technical support services to India.
- **Technological innovation:** Technology is likely to displace workers. For example, the widespread use of ATMs has affected the demand for bank tellers.

**Table 4. Summary of Occupations Using Broader Screening Criteria**

Occupation	Annual Openings	Median Earnings (\$)	Entry-Level Earnings (\$)	Education Code*
Registered nurses	110,119	48,090	33,970	SC/C
Customer service representatives	74,137	26,240	17,230	HS/SC/C
Sales representatives**	66,239	42,730	22,610	HS/SC/C
Truck drivers, heavy and tractor-trailer	62,517	33,210	20,820	HS/SC
Maintenance and repair workers, general	44,978	29,370	17,170	HS/SC
Bookkeeping, accounting, and auditing clerks	43,077	27,380	17,670	HS/SC
Executive secretaries and administrative assistants	42,444	33,410	22,270	HS/SC
Secretaries, except legal, medical, and executive	37,819	25,290	15,890	HS/SC
Carpenters	31,917	34,190	20,700	HS/SC
Automotive service technicians and mechanics	31,887	30,590	16,930	HS/SC
Police and sheriff's patrol officers	31,290	42,270	25,270	SC/C
Licensed practical and licensed vocational nurses	29,480	31,440	22,860	HS/SC
Electricians	28,485	41,390	24,560	HS/SC
All other sales and related workers	25,011	35,170	NA	HS/SC/C
Computer support specialists	21,579	39,100	23,060	SC/C
Plumbers, pipefitters, and steamfitters	20,511	40,170	23,360	HS/SC
Correctional officers and jailers	19,199	32,670	22,010	HS/SC
Dental assistants	18,735	27,240	17,570	HS/SC
Sales representatives***	18,157	55,740	28,770	HS/SC/C
Bill and account collectors	17,880	26,780	18,650	HS/SC
Industrial truck and tractor operators	17,814	26,070	18,360	HS
Welders, cutters, solderers, and brazers	17,651	29,160	19,570	HS/SC
Inspectors, testers, sorters, samplers, and weighers	14,140	27,060	16,240	HS/SC
Firefighters	14,024	36,230	17,700	HS/SC
Operating engineers and construction equipment operators	12,745	35,240	22,060	HS
Billing and posting clerks and machine operators	12,619	26,110	18,300	HS/SC
Medical secretaries	12,347	25,430	18,310	HS/SC
Machinists	12,203	32,570	19,900	HS/SC
Painters, construction, and maintenance	12,014	29,070	18,930	HS
HVAC and refrigeration mechanics and installers	11,209	34,900	21,510	HS/SC
Production, planning, and expediting clerks	11,004	33,650	19,680	HS/SC/C
Bus and truck mechanics and diesel engine specialists	10,655	34,380	22,160	HS/SC
Postal service mail carriers	10,474	39,530	31,180	HS/SC
Legal secretaries	10,019	35,020	21,990	HS/SC

\* See Table 2

\*\* Non-technical wholesale and manufacturing

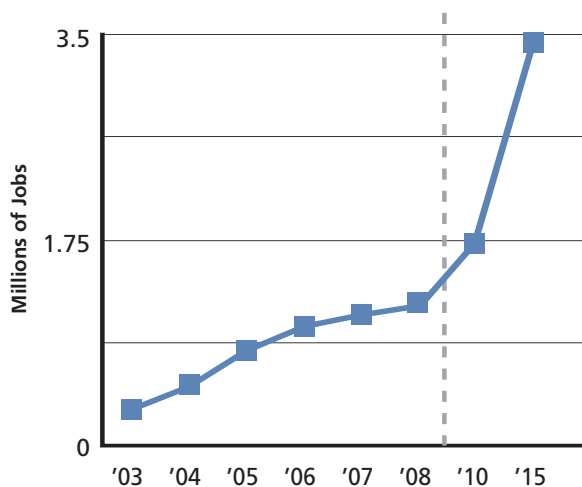
\*\*\* Technical wholesale and manufacturing

**Assessment of risk factors associated with target occupations is important because BLS employment projections do not always capture current dynamics.**

• **Industry decline:** The industry weakens within the United States, whether due to foreign competition, technological change, or maturation. For the most part, BLS projections take industry decline into account when it affects the industry nationwide. For example, BLS projections reflect the general decline in manufacturing. However, BLS projections are not adjusted for regional differences, which can be significant. For example, over the past several decades, the paper industry has migrated from the Northeast to the South to take advantage of cheaper labor and facilities, as well as the availability of less expensive forestlands. These kinds of regional changes can be significant for the local occupational outlook.

To assess these three risk areas, we scanned secondary sources, such as academic studies and reports from consulting firms, trade associations, and the popular press. U.S. government statistics

**Chart I.**  
**Total number of U.S. Jobs moving offshore, 2003 to 2015**



Source: McCarthy (2004)

also provided useful information. Appendix A lists sample resources to consider for this kind of analysis. You may also choose to conduct a more formal and in-depth risk appraisal.

### Offshoring

The risk of offshoring is occupation-specific and apt to change over time as the relative costs of production, technological innovation, and workforce development abroad can quickly transform a seemingly secure occupation into a vulnerable one. The offshoring of radiologists, IT help desk professionals, and back office administrative personnel in recent years has demonstrated that white collar jobs are potentially just as vulnerable as blue collar jobs to competition with foreign industry and labor forces.

Forrester Research, Inc., a technology trend analysis firm, estimates that 830,000 U.S. service jobs will have been lost to offshoring by 2005, and a total of 3.4 million by 2015 (see Chart 1) (McCarthy 2004). Gartner Research estimates that one third of companies with more than 1,000 employees already use offshore business process outsourcing (BPO) services.<sup>4</sup>

Although offshoring has garnered a lot of attention in the popular press, relatively little academic research has addressed the issue, in large part because of a lack of data. A frequently cited scholarly look at outsourcing, “The New Wave of Outsourcing,” was produced by economists at the Fisher Center for Real Estate and Urban Economics at the University of California, Berkeley (Bardhan and Kroll 2003). The authors list a number of attributes that put an occupation at risk of outsourcing, including:

- No face-to-face customer requirement;
- High information content;
- Work process is “telecommutable” and Internet enabled;
- High wage differential with similar occupation in destination country;
- Low setup barriers; and
- Low social networking requirement.

Based on these criteria, we determined the offshoring risk (low, medium, or high) for each of the occupations.



## Technology

Technological evolution can threaten occupational stability in the United States in three ways. First, as discussed above, technological innovation can make offshoring practical even for occupations once seemingly rooted in this country. For example, the development of the Internet has made it possible to shift many data-processing jobs abroad. Second, new technologies can supplant existing technologies and potentially threaten industries that are based on old technology. A good example is the ascendancy of the automobile and the attendant decline of carriage builders and blacksmiths. Third, industries can adopt new technology that renders certain occupations obsolete and/or greatly reduces demand for the occupation. Consider the demand for draftsmen. Before the advent of computer-aided design, a draftsman would create and revise plans under the guidance of an architect. With CAD, the architect can easily generate and manipulate her own plans, resulting in the employment of fewer

draftsmen per architect while boosting the productivity of the overall design process.

Our risk assessment assessed the technology for each occupation based on its perceived vulnerability to automation and/or software substitution for labor.

## Industry Risk

In this study of national occupational data, the risk of an industry's decline is already factored into the BLS projections of job openings. As a result, our study did not screen out any occupations based on a separate study of this risk factor. Local studies should examine this carefully; regions can experience industry declines that the rest of the country does not.

## Sample Results: The Risk Factors of the Promising Occupations

Our risk assessment showed that five of our occupations are at medium or high risk of offshoring, and seven are at medium or high risk of technological innovations (see Table 5).

**Table 5. Risk Factors of the 16 Promising Occupations**

Occupation	Offshoring	Technology	Industry Risk
Registered nurses	Low	Low	Low
Customer service representatives	Medium-High	Medium	Low
Sales representatives*	Low-Medium	Medium	Low
Truck drivers, heavy and tractor-trailer	Low	Low	Low
Maintenance and repair workers, general	Low	Low	Low
Bookkeeping, accounting, and auditing clerks	Medium	Medium	Low
Executive secretaries and administrative assistants	Low	Medium	NA
Secretaries, except legal, medical, and executive	Low	High	NA
Carpenters	Low	Low	Low
Automotive service technicians and mechanics	Low	Low	Low
Police and sheriff's patrol officers	Low	Low	Low
Licensed practical and licensed vocational nurses	Low	Low	Low
Electricians	Low	Low	Low
All other sales and related workers	Medium	Medium	Low
Computer support specialists	High	High	Low
Plumbers, pipefitters, and steamfitters	Low	Low	Low

\* Non-technical wholesale and manufacturing

NA = not applicable

## PART 2.

### Consulting Industry Sources to Further Define Occupational Opportunities



In evaluating opportunities for advancement in high-growth occupations, statistical data and trend analysis can only tell part of the story. BLS statistics regarding educational attainment within occupations are useful for understanding the composition of the workforce nationally, but they may not reflect current trends in employer expectations or local labor market characteristics. Nor does this data provide important information on the accessibility and availability of training programs.

The third step in occupational research, therefore, is to interview both employers and training providers on a range of topics related to specific occupations that may be considered for career pathways programs. These interviews can probe the following issues:

**The nature of the work in that occupation.** Such information can provide details on how physical the work is, how long the hours are, and what a typical day's work looks like.

**Evolution of hiring practices.** Employer expectations are not static. Hiring practices often evolve faster than formal human resource policies.

Changes in hiring practices may be based on cyclical or systemic factors.

*Cyclical factors*, such as the pace of the economy, can create significant variations from year to year and have a great impact on labor demand. In slow economies, for example, the supply of labor is large relative to demand; employers can demand credentials and levels of experience that would be unavailable to them in tighter labor markets, and workers may take positions for which they are overqualified.

*Systemic change* in an occupation permanently changes employer expectations and transforms the accessibility of an occupation. Technology is a prime driver of systemic change. In the automotive repair industry, for example, the widespread adoption of computerized controls for everything from engine management to door locks has transformed the role

of the service technician from mechanical troubleshooter to electronic diagnostician. As a result, in an occupation that was once primarily learned on the job, perhaps with some preparation in a vocational high school, employers now frequently expect entry-level candidates to have completed postsecondary training in automotive repair.

**Local preferences in hiring practices.** There are often local or regional differences in hiring practices, which may explain why the BLS data show that educational attainment of workers in the same occupation can vary greatly. For example, the BLS classifies paralegal educational attainment as Some College/College, suggesting that most workers in the field have attended college but have not necessarily earned an Associate's or Bachelor's degree. However, employers in some markets have a strong preference for paralegal candidates who have a Bachelor's degree in addition to a paralegal certificate program.<sup>5</sup>

**Details about training programs.** It is important to learn from local training providers about how accessible the training programs are for low-skilled workers. Accessibility is affected by program prerequisites and costs. In addition, because career pathways programs are designed for adults, it is important to keep in mind the difficulty of pursuing education while also earning a living. Low-skilled workers can rarely dedicate four years to full-time study. Ideal training programs are shorter in duration, with the most accessible ones offering courses in the evenings, on weekends, or even online.

**Long-term career advancement options.** When talking with employers, it is important to understand what kind of advancement opportunities exist for workers in the occupation. In some cases, there may be opportunities to advance within that occupation. In other cases, advancement to new positions or occupations may be possible with additional education and training.

**Stability of the demand.** In conversations with industry sources, revisit the topic of industry risk factors (e.g., outsourcing, technology, industry decline). Insider perspectives can provide important information for your analysis of occupations.

**Strategies to make occupations more accessible.**

A number of training providers and workforce intermediaries have used unique strategies to make occupations and training programs more accessible to low-skill workers. Other practitioners can take advantage of these strategies to make career pathways programs more successful for this target population.

**Sample Results: A Close Look at Six Occupational Clusters**

From the list of sixteen occupations identified in the quantitative research, we identified for further investigation a sample of six occupational clusters:

- Nurses (Registered Nurses and Licensed Practical Nurses);<sup>6</sup>
- Customer service representatives;
- Automotive and truck technicians;
- Computer support specialists;
- Building trades; and
- Commercial drivers of heavy vehicles.

These occupations represent a range of characteristics that could affect access for low-income workers, including type of work (professional, craft, administrative), training requirements, work settings, and primary gender of workers.

The analysis of these occupational clusters illustrates the value of using qualitative data from field research and other sources to complement statistical analysis in evaluating the suitability of occupations for entry-level workers.

For each occupational cluster, we interviewed both employers and training providers regarding employer expectations, hiring practices, advancement potential, and emerging trends in the occupation. We supplemented these interviews with research from industry journals and other secondary sources. We placed particular emphasis on identifying training requirements and evaluating the difficulty of accessing and completing required training. (See Appendix B for a list of interviewees).

For each cluster, we provide an overview of the occupation, which includes:

- A summary table of the results from the quantitative and qualitative analyses;
- Basic information about the nature of the work involved; and
- A general assessment of the occupation's suitability for low-skill workers based on job and training accessibility, advancement opportunities, risk factors, and strategies for making the occupation more accessible to low-skilled workers.

Following this overview, we provide more in-depth discussions of:

- The accessibility of these jobs to new entrants;
- The accessibility of training programs;
- Long-term career advancement options; and
- The stability of the demand.

This fine-grained investigation uncovered several important findings. For example, Registered Nurse, the most promising occupation in terms of number of openings and salary, turns out to have several barriers to access for less-educated workers, including high academic requirements, a very competitive selective process for entry into Associate's degree programs, and a typical program length of three years of full-time study to earn a degree. In contrast, Licensed Practical Nurse offers a much more manageable and accessible first step into nursing for less-educated individuals who need to work while they go to school.





## Registered Nurses (RNs)

### SUMMARY OF OPPORTUNITY ANALYSIS

Standard Occupational Code	29-1111
Current employment	2,284,459
Projected annual openings	110,119
Median earnings	\$48,090
Wage range (25th percentile to 75th percentile in 2002)	\$40,100-\$57,500
Offshoring risk	Low
Technology risk	Low
Industry risk	Low
Educational profile	Some College/College
Accessibility of jobs to new entrants	Appears to be very accessible, given that it is a rare professional occupation that does not require a four-year degree. Also, given the current and projected shortage of RNs, the AND degree virtually guarantees a job.
Accessibility of training programs	Not very accessible Three years of full-time study for ADN Highly competitive admission High academic entrance requirements: eleventh-grade level or higher Little flexibility in training schedule for working adults
Career paths and advancement options	Salary growth with years of experience; many opportunities to improve earnings with specialties or supervisory roles
Stability of demand	Very stable
Successful strategies for adapting program to low-skill workers	Select candidates who either are prepared to handle the academic rigors of the program or who are nearly qualified and can be prepared within a reasonable timeframe. Provide personal and academic counseling as well as tutoring as part of the program. Provide access to financial aid and other financial supports to allow students to attend nursing school on a full-time basis. Expand LPN-to-RN programs to put the RN degree within reach of entry-level workers who find LPN a much more manageable first step up the nursing career ladder.

### Overview

In terms of degree requirements, pay, and employment opportunities, Registered Nurse appears to be one of the most attractive career options for low-income adults. It is one of the few high-paying professional jobs that does not require a Bachelor's degree. While a Bachelor's in Science of Nursing (BSN) degree generally opens up more opportunities to work in specialized hospital settings and

more routes to advancement, an Associate Degree in Nursing (ADN) has retained its currency in the nursing job market, where demand continues to significantly outstrip supply. In 2002, the U.S. Department of Health and Human Services estimated that demand for Registered Nurses exceeded supply by approximately 110,000 nurses, representing 6 percent of total RN positions. This shortage is projected to increase to 20 percent of openings by 2015.

But appearance is deceiving in this case. For the vast majority of low-income adults with limited educational preparation, RN is not an accessible option because of the difficulty in obtaining admission to and completing an ADN degree program. Unlike most other Associate's degrees, it generally takes candidates a minimum of three years of full-time study to complete an ADN degree (Gray 1998). RN programs are academically challenging, with a strong emphasis on completing a rigorous sequence of college-level health science courses. They often use performance in prerequisite science courses (e.g., anatomy and physiology, chemistry) to weed out potential candidates for their programs. (Many colleges, in fact, report a 50 percent or higher failure for students in the anatomy and physiology courses.)

In addition, admission to ADN programs is highly competitive, with schools accepting as few as 10 to 20 percent of applicants. Nursing programs have been flooded with applicants in recent years as more and more people see nursing as one of the few secure, high-growth careers in a weakening and changing economy. Many applicants are older adults who have college degrees and work experience and are seeking to change careers (Stein 2004). Low-income working adults with limited educational experience are at a distinct disadvantage in the competition to secure a training slot.

Still, Project Quest in San Antonio, along with Project Arriba in El Paso and Capital IDEA in Austin, have had success in preparing, placing, and supporting low-income Texans in RN training programs. Their experiences suggest some of the terms under which low-income, less-educated adults can succeed in earning an ADN degree. These programs require candidates to test at a twelfth-grade level in reading, writing, and math and to show that their personal lives are stable enough that they can make it through a demanding, three-year program. Candidates are also expected to put full-time schooling first and to support themselves financially through a combination of government subsidies (TANF, Pell Grants, food stamps, rent subsidies, child care), help from employed spouses or other relatives, and small support payments from the program. In addition to financial support, participants

receive extensive personal and academic counseling and tutoring from program counselors and case managers. It is important to note that these programs were located in three cities where the community college nursing programs were having difficulty recruiting and retaining qualified candidates, particularly Latino candidates, despite the strong demand by local hospital employers for a more culturally diverse pool of nurses.

### **Accessibility of Jobs to New Entrants**

A major advantage of Registered Nursing as a target job for advancing low-income workers is the transparency and accessibility of employment routes for new entrants. Given the current nursing shortage, graduates of RN programs are all but guaranteed employment.

### **Accessibility of Training Programs**

#### **Length of Program**

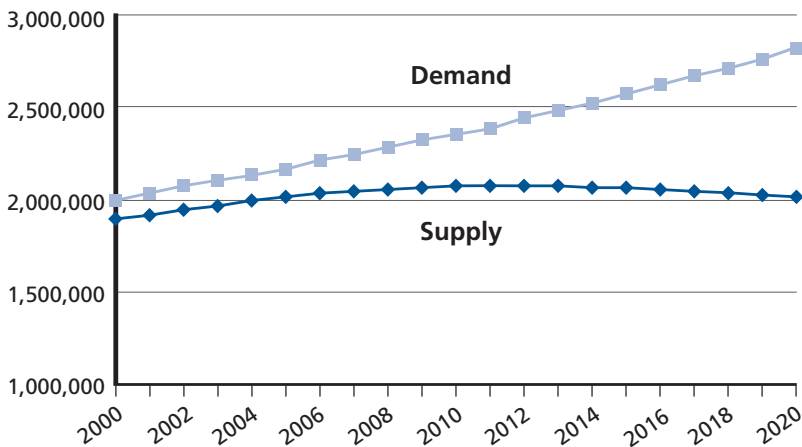
Unlike most Associate's degree programs, an ADN degree can take three or more years of full-time study to earn. Candidates for ADN programs must pass several prerequisite college courses, such as anatomy and physiology, microbiology, and freshman English, before being considered for admission. Once they have completed the prerequisite courses and are admitted, programs often consist of 70 to 80 credit hours, which can take up to two-and-one-half years to complete. Bachelor's degrees in nursing, which are sponsored by four-year colleges, take four to five years to complete. Diploma programs, usually sponsored by hospitals and offering a more clinically based, hands-on style of instruction, take about three years to complete. But only a small number of diploma programs are still operating; most hospitals shut down programs as the number of college-based programs increased.

#### **Availability of Training Spaces**

Most community colleges offer ADN programs. Admission into these programs is highly competitive.

***Low-income working adults with limited education are at a distinct disadvantage in the competition to secure training to become an RN.***

**Chart 2.**  
**National Supply and Demand Projections for FTE Registered Nurses: 2000 to 2020**



Source: Bureau of Health Professions, *RN Supply and Demand Projections*

#### Flexibility of Schedule for Working Adults

ADN programs are typically full-time, day programs that offer little flexibility for working adults. However, students often can take prerequisite courses on a part-time basis evenings or weekends. This option allows working adults to stay at their present jobs until they secure admission to an ADN program.

#### Entrance Requirements

RN programs are academically demanding, with highly competitive admissions standards. Typically, candidates must earn As and Bs in the prerequisite college courses to have a strong chance of gaining admission. In addition, programs require students to score at the eleventh-grade level or higher on entrance exams (e.g., the Nursing Entrance Test).

#### Cost

The cost of ADN programs is based on the yearly tuition and fees charged by sponsoring state community college systems.

#### Career Pathways and Advancement Options

RNs can enjoy significant salary growth as they accumulate years of experience. There are also opportunities to move into supervisory or specialty positions. Additional training and certification is often required to qualify for specialized nursing positions.

#### Stability of Demand

RN employment is concentrated in the hospital sector (61 percent), with smaller concentrations in physicians' offices (9 percent) long-term care (5 percent) and home health care (5 percent). The BLS projects an average of 110,000 RN openings per year between 2002 and 2012, and the U.S. Department of Health and Human Services forecasts a continuing shortage of RNs for the foreseeable future (see Chart 2).

Given the maturity and stability of the health care industry, a nursing degree appears to be one of surest investments that an individual can make in the current economy. While there is a preference among some sectors of the hospital industry (e.g., academic medical centers) in certain parts of the country to hire BSN nurses, the severe shortage of BSN nurses makes this trend a long-term threat at best to ADN degree holders. Still, it is important for advocates to monitor the hiring trends of hospitals in their area as well as to confer with hospital administrators to identify ways that ADN graduates can improve their value in the marketplace by obtaining additional certifications and clinical experience in varied settings.



## Licensed Practical Nurses/Licensed Vocational Nurses (LPNs/LVNs)

### SUMMARY OF OPPORTUNITY ANALYSIS

Standard Occupational Code	29–2061
Current employment	701,879
Projected annual openings	29,480
Median earnings	\$31,440
Wage range (25 percentile to 75 percentile in 2002):	\$26,400–\$37,000
Offshoring risk	Low
Technology risk	Low
Industry risk	Low
Educational profile	High School/Some College
Accessibility of jobs to new entrants	Highly accessible, given the current and projected nursing shortage; greatest projected demand may be in long term care
Accessibility of training programs	More accessible than RN programs 12 months of full-time study Numerous training programs, but number of available slots varies by community High academic entrance requirements: eleventh-grade level in reading and math Little flexibility in training schedule for working adults, although some innovative work-based, part-time programs are beginning to emerge
Career paths and advancement options	Limited advancement within LPN positions With additional training, LPNs can advance to RN level. LPN-to-RN programs may be more accessible to low-skill workers than is the typical RN program.
Stability of demand	Stable demand in long-term care. Demand in acute care closely tied to RN supply and demand: RN shortage has slowed trend of replacing LPNs with RNs in acute care settings.
Successful strategies for adapting program to low-skill workers	Provide remedial academic preparation. Offer part-time and flexible evening/weekend programs for working adults. Provide personal and academic counseling as well as tutoring. Integrate training into employer-sponsored advancement programs that provide financial and educational support.

### Overview

Licensed Practical Nurse programs offer an accessible, realistic advancement route for working adults with limited educational backgrounds. Compared with RN programs, LPN programs are much shorter—12 to 18 months. As vocational programs, they emphasize hands-on learning and critical thinking in the context of practical situations.

While LPNs earn significantly less than RNs (median annual earnings for LPNs are about \$16,500 lower) and have more limited advance-

ment options within that occupation, the LPN represents a significant step up the career ladder for low-income workers. It is a particularly attractive option for nursing assistants and other entry-level direct care workers who enjoy caregiving but need to earn more money and would like more control over their work lives. Within the long-term care sector, in which close to half of all LPNs work, there are opportunities for LPNs to advance to management positions, such as supervisors of nursing aides. Within the hospital sector, advancement opportuni-



ties are more limited. In fact, there is a trend to replace LPNs with RNs in acute care hospital settings, but given the shortage of RNs, it is doubtful that this trend will accelerate in the near term.

Although advancement within the LPN occupation is limited, LPN is becoming a viable career step to RN, and an increasing number of community colleges have opened up LPN-to-RN degree programs in response to the severe shortage of RNs. While most “LPN-to-RN” bridge programs do not significantly reduce the time required to complete an RN degree because of limited transfer of course credits between the programs, they offer a more accessible entry path into highly competitive RN training programs. These bridge programs have a completely separate admissions process from the school’s basic RN training program, and the pool of LPN candidates vying for training slots is generally much smaller. Thus, many low-income adults, who would not have been competitive candidates for RN programs, can gain entry to these programs through the “back door” if they first obtain their LPN degrees and practice as LPNs for a few years.

While LPN programs provide one of the most attractive career advancement options for low-income working adults, they are still demanding and require strong basic academic skills, clinical reasoning skills, and a deep desire to provide direct care to severely ill patients.

Program schedules pose an additional obstacle to working adults. The vast majority of LPN programs are full-time and offered during the day. And while admission is not nearly as competitive as for RN programs, there are typically more candidates than slots available. In the last five years, a few LPN programs geared to the needs of low-income health care workers have been developed through partnerships among employers, community colleges, and community-based organizations (see box on page 17). These programs point the way for advocates in the public and nonprofit sectors who want to make this career option more accessible to nursing assistants and other direct care workers who have proven their commitment to providing quality care. Some of these training providers have structured part-time and flexible evening/weekend programs for working adults, and all provide remedial academic prepara-

tion as well as extensive counseling and tutoring support to students.

### **Accessibility of Jobs to New Entrants**

A major advantage of Licensed Practical Nursing as a target job for advancing low-income workers is the transparency and accessibility of employment routes for new entrants. To gain employment as an LPN, one must graduate from a state-approved training program and pass a national licensure exam. Given the current nursing shortage, graduates of LPN programs are all but guaranteed employment, with the highest demand in long-term care as hospitals continue to move away from use of LPNs.

### **Accessibility of Training Programs**

#### **Length of Program**

Most practical nursing programs last about one year and include both classroom study and supervised clinical practice (patient care), making it one of the shortest training programs for obtaining a technical job in health care. Classroom study covers basic nursing concepts and patient care-related subjects, including anatomy, physiology, medical-surgical nursing, pediatrics, obstetrics, psychiatric nursing, nutrition, first aid, and the administration of drugs. Clinical practice usually is in a hospital but sometimes includes other settings.

#### **Availability of Training Spaces**

LPN training programs are numerous, with about 1,100 state-approved programs nationwide. Most programs are sponsored by technical or vocational schools, with community colleges the next most likely provider. In 2002, almost six out of ten students were enrolled in public or private technical or vocational schools, while three out of ten were in community and junior colleges.<sup>7</sup>

LPN programs, although not as popular as RN programs, have experienced a surge in applications, and many now have waiting lists. Many of the programs located in publicly funded vocational-technical centers are connected to high school vocational programs and reserve a certain number of slots for high school students. The availability of training spaces will likely vary considerably by community, as well as by the willingness of providers to allocate training spaces to your program participants. Contacting all local sponsors of LPN programs is the only reliable way to find out about the availability of training spaces and their willingness to reserve spaces for qualified candidates from your program.

#### **Flexibility of Schedule for Working Adults**

LPN programs are typically full-time and offered during the day, with little flexibility for working adults. In the



last few years, however, a small number of flexible part-time or night-evening LPN programs have been developed, with special government funding and employer demand often serving as the catalyst. It may be possible for low-income working adults who are already employed as nurses' aides to attend daytime classes and still work part-time evenings or weekends if their employers are willing to accommodate this schedule. However, to make enrollment in LPN training programs a realistic option for most low-income working adults, particularly those with family obligations, the creation of more part-time and flexible evening-weekend programs is critical.

### Entrance Requirements

LPN programs are academically demanding, and the bar for entry is high. In addition to requiring a high school diploma or equivalent, programs generally require students to score at the eleventh-grade level on entrance exams in reading and math. Programs use a variety of assessment exams including Compass, TABE, and the Nursing Entrance Test.

Given the entry requirements, LPN does not appear to be a good target job for adults with low literacy levels and limited English language proficiency. However, recently developed demonstration programs have had good success in advancing nurses' aides and other adults with limited education, serving those with as low as sixth-grade math and reading levels (see box). For example, a part-time LPN program in Philadelphia jointly sponsored by a health care union (1199C) and employers offers a 16-week prep course (3 days a week for 3 hours a day) for candidates who test at a ninth-grade level in reading and eighth-grade level in math. Generally, 60 percent of those who enroll complete the course, and of those who complete, most pass the Nursing Entrance Test. Attendance and pass rates have been much higher for people who already work in health care as caregivers; it may be that their experience has made them more committed to the goal of becoming a nurse. Success rates have been particularly high for prep classes delivered on site in nursing homes as part of employer-sponsored advancement programs for nursing aides.<sup>8</sup> These employer-sponsored programs provide opportunities for workers with low-literacy levels to achieve short-term wage gains and promotions while they work toward the long-term goal of qualifying for entry into an LPN program.

### Cost

Tuition can range from a high of \$13,000 for private technical school programs to a low of \$3,000 for community college-sponsored programs. The cost of community college-sponsored LPN programs is based on the per

credit tuition and fee charges of the state system in which the community college operates. Community colleges may charge in the range of \$7,000 to \$10,000 per student to establish a contracted LPN training program for an employer or community-based provider; they cannot draw upon state payments to subsidize the addition of these slots.

### **Strategies for Designing LPN Programs for Low-Skill/Low-Income Workers**

Fueled by government funding and increased employer investment in "grow your own" strategies to address the severe shortage of nurses, a handful of innovative LPN training programs has arisen to serve low-income adults working in entry-level health care. Profiles of several of these programs are available on the JFF Web site at: [www.jff.org/jff/kc/library/0262](http://www.jff.org/jff/kc/library/0262).

These programs share several features that set them apart from traditional LPN training programs and account for their success in helping low-income working adults with limited education enter and complete demanding LPN training programs:

- They provide intensive academic remediation in math, reading, and writing to prepare students for college-level work and pass program entrance exams.
- They offer part-time or evening/weekend schedules so that participants can continue working while they are in school.
- They provide formal tutoring and counseling support to students once they enter the program to help them meet the demands of school, work, and family.

Most important, they incorporate their programs of study into well-defined steps of employer-sponsored career ladder programs that offer financial support, classes at or near the worksite, and clear rewards in pay and promotion for successful completion of each step. Sponsoring employers typically pay tuition costs in return for the student's commitment to continue to work for them for a period of time upon graduation.

While the programs JFF has looked at share many similarities, they vary in the types of educational providers they use and the nature of program sponsorship. Two programs use community colleges to provide training, another uses a non-profit vocational school, and another runs its own vocational LPN program. Program sponsors include a large nursing home employer, a jointly administered union-management training fund, a community college-initiated partnership with local nursing home employers, and a Workforce Investment Board-initiated partnership with local area hospitals.

### **Career Pathways and Advancement Options**

Career advancement opportunities for LPNs are limited, with promotion to supervisory positions in long-term care facilities the most common option. Using the LPN degree as a stepping stone to gain entry into RN programs appears the most attractive advancement path.

### **Stability of Demand**

LPN employment is evenly divided between long-term care (nursing care) facilities (26 percent) and hospitals (29 percent), with the remainder of LPNs working in doctors' offices (13 percent), home health care (7 percent), and a variety of other health care settings. A very small percentage of LPNs are employed outside of health care. As a mature sector with a captive and rising domestic demand for services, health care is one of the most stable and predictable industries within the U.S. economy. As such, BLS projections of job openings for LPNs are among the more reliable predictions.

LPN demand is closely tied to RN demand and supply. For example, many health care employers would prefer to replace LPNs with RNs in acute care settings, but the shortage of RNs has prevented them from moving forward with that substitution. If RNs become more available, the reduction of hospital demand for LPNs will follow. Programs need to monitor this trend, and also to identify the scope of demand for LPNs within the more stable employment sector for LPNs—long-term care. It is also important to identify ways that LPNs can increase their attractiveness and value by acquiring additional skills and certifications. In addition, LPN-to-RN programs can help LPNs advance to the higher demand positions.

In assessing the stability of industry demand for LPNs, it is worth noting the unreliability of past predictions of persistent nursing shortages. In the mid-1980s, the health care industry was experiencing severe shortages

of RNs and LPNs comparable to present circumstances, and there were predictions that the shortages would only intensify unless dramatic actions were taken. However, by the early 1990s the shortages had disappeared as hospitals began cutting back on nursing staffs to reduce costs in response to reduced government and private insurance payments. Also easing the shortage was the decline in hospital admissions as more services shifted to outpatient settings.

In the past few years, the nursing shortage has returned with a vengeance. With the aging baby boomer population, as well as an aging nursing workforce, the projected demand for nurses between now and 2010 appears a reliable prediction. Still, it will be important to closely monitor changes in government and private insurance payment policies, as well as technological changes affecting the health care industry and the demand for nurses.



## Customer Service Representatives

### SUMMARY OF OPPORTUNITY ANALYSIS

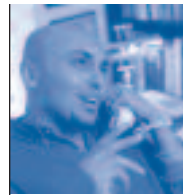
Standard Occupational Code	43-4051
Current employment	1,894,000
Projected annual openings	74,137
Median earnings	\$26,240
Wage range (25 percentile to 75 percentile in 2002):	\$20,960–\$33,540
Offshoring risk	Medium-High
Technology risk	Medium
Industry risk	Low
Educational profile	High School/Some College/College
Accessibility of jobs to new entrants	Highly accessible for recent college graduates with no experience, high school graduates with some work experience, and workers with strong “soft skills”
Accessibility of training programs	Most training provided on the job. Some programs offer soft skills training as pre-employment training. These programs are highly accessible to low-skill workers, requiring only a high school diploma or GED.
Career paths and advancement options	Three advancement pathways: <ul style="list-style-type: none"> <li>• Moving up to higher CSR levels within the call center</li> <li>• Moving into more sophisticated product or customer groups</li> <li>• Moving to other positions in the organization</li> </ul>
Stability of demand	Not very stable due to dual threat of offshoring and automation
Successful strategies for adapting program to low-skill workers	Identify the subsets of CSR that offer the best prospects for advancement and help clients navigate the pathway to advancement.  Consider carefully the risks of offshoring and automation in evaluating job opportunities.  Provide soft skills training in addition to basic computer skills.  Investigate back office CSR opportunities as a starting place for those lacking strong communication skills or English fluency.

### Overview

Customer Service Representative jobs are relatively accessible to low-skill workers in that they generally do not require postsecondary credentials or intensive pre-employment training. Candidates with strong soft skills can do well in these positions. However, the jobs vary widely, as do opportunities for advancement. Advancement opportunities may be nonexistent in some work environments and not very transparent in others. This, combined with the high risk of offshoring and automation, should lead practitioners to be highly selective of CSR opportunities for low-skill workers if the objective is long-term employment stability and career advancement.

CSRs are found in a wide range of work environments. Some serve external customers (e.g., inbound call center staff, bank tellers), while others are in “back office” environments serving “internal” customers, including staff in other departments or divisions. Some CSRs are isolated in stand-alone call centers, while others are housed in more diverse environments and have access to people in different parts of the organization. Of the nearly two million customer service representatives employed in the United States, more than a quarter are in banks, insurance carriers, brokerages, and other financial institutions.

CSR jobs selected for investigation for this guide were primarily in inbound financial services call



centers and the back office operations of financial services institutions. These kinds of CSR jobs are relatively plentiful, offer reasonable compensation, and are accessible to entry-level workers.

Except in certain sub-sectors like insurance companies and brokerages, CSR jobs do not require extensive training or certification. The typical minimum educational requirement is a high school diploma, and employers look for strong skills in communication, basic data entry, and word processing. For back office functions, employers look for familiarity with Microsoft Excel and computerized databases. Most employers provide on-the-job training, ranging from a few days to a few weeks.

Median earnings for CSRs in this sector range from approximately \$25,000 to \$28,000. Some higher-end sub-sectors of financial services, like brokerages, pay more but may require a college degree, with recent college graduates increasingly competing for these positions. CSR positions outside of call centers are often located in fulfillment and claims processing departments. These jobs have entrance requirements similar to call center positions but tend to be more data-intensive or transaction-oriented. Earnings in back office jobs, depending on the level, can range from lower twenties to lower thirties.

Opportunities for advancement within call centers exist but can be limited in number and by the structure of the work environment. Taking on more challenging products or clients is one road to advancement; advancement to supervisory roles, on the other hand, is difficult due to a high ratio of phone workers to supervisors. For advancement beyond direct phone representative, call centers employees usually must have a four-year college degree. Perhaps the best opportunities for advancement are possible for CSRs who are housed within

larger organizations, where they are exposed to other jobs and may have more opportunities to pursue either lateral or vertical moves within the organization. These opportunities are not always transparent, however. Low-skill workers with minimal experience in office environments may require coaching or other assistance that helps them navigate the system.

Despite the relative ease of entry, CSR work presents a number of concerns for entry-level job seekers:

**High Turnover.** Highly routinized work and a stressful emotional environment (e.g., often dealing with irate or demanding customers) lead many to quit. Limited opportunity for advancement may also be a factor. The combination of limited upward mobility and high stress can lead to turnover reaching 100 percent in some cases. Financial services call centers have slightly lower turnover rates, in part because they pay relatively well compared with call centers in other industries.

To some extent, turnover may also be determined by the structure of call centers. The proportion of CSRs who voluntarily leave is slightly lower for in-house, captive call center operations, where people often stay to pursue opportunities in other areas of the parent organization. For the same reason, these jobs may make better targets for the placement and advancement of lower skilled individuals, compared to standalone centers.

**Complex Products.** The product knowledge requirement of CSR jobs in financial services is becoming increasingly complex, a result of changes both in the industry and the markets they serve. For example, banks now bundle traditional services with credit card services and other personal investment tools, and health insurance companies increasingly require customers to take responsibility for portions of their health plans which, in turn, makes servicing such plans more complex. As a result, in addition to responding to basic queries, CSRs in call centers and back offices are expected to help customers understand their obligations and benefits while also promoting new products. The continued expansion of the CSR role may therefore result in higher skill requirements.

***Both employers and training providers acknowledge that continued training and education toward a degree is a critical determinant of advancement.***

**Cultural Bias.** Non-native English speakers, in particular, have a distinct disadvantage in many customer service jobs. Training providers report that there may be a cultural bias against hiring speakers who do not have strong fluency in English in certain higher-end sub-sectors of financial services, such as mutual funds and investment banking. In general, those who do not have strong language skills are more likely to be placed in back office, data-oriented functions rather than front office functions such as call center work.

Market segments may vary considerably in their opportunities and limitations for English as a Second Language speakers. In mass market segments, such as retail banking and insurance, shifting customer demographics are gradually increasing demand for bilingual workers; ESL speakers may have better opportunities as a result. However, that may not yet be the case in some higher-end segments of financial services, such as investment banks or brokerage houses. Thus, organizations working to place and advance low-skill workers may find it more fruitful to target work by market segment.

Organizations that are evaluating opportunities for entry-level customer service jobs in financial services must factor in some of the larger trends affecting the industry. Stability of demand is a major issue. Both call center and back office jobs have been, and continue to be, significantly affected by offshoring and the adoption of new technology. As a result, long-term domestic demand is difficult to predict and may well lag behind government forecasts.

### **Accessibility of Jobs to New Entrants**

Entry-level customer service jobs tend to offer relatively easy access to people with limited skills and experience.

### **Education Requirements**

Employers and training providers indicate that a high school diploma is the usual minimum educational requirement for entry-level call center jobs and other basic internal functions. Training providers note, however, that despite the requirements stipulated by employers for a high school diploma, and in some cases Associate's or Bachelor's degrees, the work generally does not require reading proficiency beyond the ninth-grade level. The financial services industry tends to have more stringent standards. Given the nature of the product, any

criminal history is an automatic disqualifier. A poor credit history can also be a problem, but, if resolved, it may not necessarily disqualify candidates.

While a college education is regarded as a useful differentiator rather than a minimum requirement for this occupation, some of the higher end sub-sectors, such as the mutual funds industry, require that CSRs have college degrees. As financial services becomes more complex, the college degree may become the standard.

### **Experience**

Entry-level recruits typically fall into one of two broad categories: experienced workers without a postsecondary degree or recent college graduates holding either an Associate's or Bachelor's degree. For college graduates, prior work experience is not required. For applicants lacking a college degree, previous work experience is sought, preferably in a customer service or general office environment. Previous retail experience is particularly valued because retail workers often acquire good customer service skills through direct interaction with customers.

Although entry-level CSR work is reasonably accessible at present, access may become more difficult as higher skilled displaced workers and senior citizens—candidates with much more work experience—increasingly enter the ranks of customer service workers.<sup>9</sup>

### **Skills**

Soft skills are the chief determinants of accessibility. Other than the basic educational qualification—a high school diploma or a GED—employers screen and hire for soft skills and train workers in products and technology. “Soft skills” in this case is shorthand for “understanding workplace protocol” or “professionalism.” This can include writing a good cover letter and resume, understanding appropriate workplace attire, working well in teams, and exercising good time management skills. Recruits are also screened for personality, attitude, and other behavioral qualities.

Among the chief qualities that employers look for are strong telephone communication skills and what is often described as the “smiling voice,” an ability to sound enthusiastic and efficient at the same time. A CSR must be able to “read” the customer using only verbal cues, understand the problem or query, access information from the company's database, and solve the problem as quickly as possible, while also charming—and never rushing—the customer. Increasingly, representatives are being asked to incorporate a sales function into their jobs as well. This involves connecting the customer who has called with an appropriate new product or promotion. When sales are a part of the job, the mix of social skills

becomes more complex, with negotiation and persuasion skills becoming more critical.

Hard skills are also important, but the math and reading requirements vary from employer to employer. Increasingly, employers are focusing more on written communication, since CSRs are often required to document their calls.

Internal, back-office CSR jobs have similar academic requirements to jobs in entry-level call centers. Some positions, such as claims processor, require some experience in data entry and some computer skills. Competency in Word and Excel is required, although more advanced training in Excel is usually provided on the job. For all these jobs, key skills that employers look for are accuracy and attention to detail, particularly in banking environments, where some entry-level work in recording transactions or moving money may be involved.

### Recruitment and Screening

Employers tend to recruit CSRs through ads in newspapers, employee referrals, open houses, and occasionally by relying on community-based organizations or recruiting at community colleges. Although CSR jobs do not have stringent certification or academic requirements, the screening is rigorous. For most customer service jobs in call centers, there is a three-level process for screening: a resume screen, a phone screen, and a final interview screen, which may involve a written test.

Employers review resumes and cover letters to screen for communication skills and attention to detail. The phone screen is typically used for call center employees; this includes a test of articulation, the ability to handle customer inquiries, and a “smiling voice.” Some employers use the phone screen to set up a customer scenario and test the candidate’s ability to handle a customer’s problem. The interview is used to screen for problem-solving skills and general behavior. Employers look for professional demeanor and a demonstration of basic workplace etiquette. A written test may also be given involving a customer service scenario. Brokerage houses and other financial services firms also test for math skills and proficiency with Microsoft Office.

### Accessibility of Training

Employers typically expect to train CSRs after they have been hired, and they seek workers who are ready to be trained. Therefore, most pre-placement customer service training programs focus primarily on assessing and developing soft skills while offering some basic computer training. These programs tend to be small, free of charge, and operated by local nonprofit organizations. According to training providers interviewed, their role is to help the

candidates understand employers’ skill requirements and to bridge candidates’ skills to those requirements.

These pre-employment training programs are, generally speaking, very accessible to low-skill workers. For example, one training provider’s admission requirements included a high school diploma; achieving a minimum level in math, computer literacy, and other competencies; and performing well in a face-to-face interview. The training program itself focuses on helping candidates attain the level of competence required by employers for their threshold tests (TABE or QWIZ).

Most call center CSRs receive the bulk of their job-related training from the employer post-hire. Typically, this training is three to ten weeks long. It ends with a “nesting” or transition period during which associates work on the floor under close supervision. But training tends to diminish as they move up to higher levels of phone associate work, addressing such topics as compliance and diversity. For back-office CSR jobs serving internal company needs, entry-level workers go through a few weeks of company and product orientation. For data-oriented jobs, companies may provide extensive training in Excel, but new hires are expected to have at least a basic proficiency pre-hire.

Some companies offer opportunities for advancement through tuition reimbursement and company-sponsored training modules. But training providers indicate that many entry-level workers are stymied or intimidated by regulations and policies and may need help navigating these internal training and education opportunities.

Although there is a growing emphasis on the need for greater education and training, many companies are not positioned to do anything about it. Companies are increasingly lean because of their highly competitive markets, leaving employers with few resources to provide training in soft skills. In addition, the shrinking of middle management tiers has left many supervisors and lower-level managers with excessive workloads and little time for training and mentoring entry-level workers.

### Career Pathways and Advancement

Both employers and training providers acknowledge that continued training and education toward a degree is a critical determinant of advancement. The pathways are somewhat different for CSRs dealing with external customers compared with back office positions.

#### CSRs Working With External Customers

Wage gains and advancement in customer service jobs in call centers can take place in three ways: ascending the hierarchy within the call center, serving more complex customers or product groups, or advancing out of the call

center into the larger organization.

**Moving to higher levels of representative, leading to a supervisory position within the call center.** Within call centers CSRs can ascend limited hierarchies to higher wages. The most realistic advancement path is to move from level 1 phone associate to level 2 associate, and perhaps on to scheduling coordinator. While advancement to the supervisor level is possible (supervisors are usually promoted from within), the opportunities are limited, given a 1 to 20 ratio of supervisors to representatives. Positions higher than a supervisor, such as team manager, may require a college degree and are often recruited from external candidates.

**Moving into more sophisticated and complex product or customer groups.** CSRs can improve their wages by moving through hierarchies of products, some of which may require additional training that is provided on site by the employer. For instance, a CSR in a banking call center may progress from serving individual traditional customers, to small businesses, to preferred high-profit customers, and so on. The CSR can achieve a small wage gain with each new level.

**Moving to other positions in the organization.** Call center workers can pursue openings in compliance, sales, and marketing, as well as other back office support functions. Additional training can occur in other departmental functions. Most employers post openings on company intranets, enabling CSRs to apply for positions. Entry-level or non-salaried jobs are typically organized into bands or levels, and mobility is usually restricted to the next highest level. Connections between call center jobs and back office jobs depend on a critical factor: whether the call center is a stand-alone outfit or a captive, in-house operation of a larger organization. The in-house structure provides a bridge through which call center workers may access other jobs, or vice versa. This mobility benefits both workers and employers. For workers, the call center becomes a gateway to the rest of the organization. For employers, the call center becomes a training center, which produces workers well versed in company products and processes and customer interaction.

### Back Office Jobs

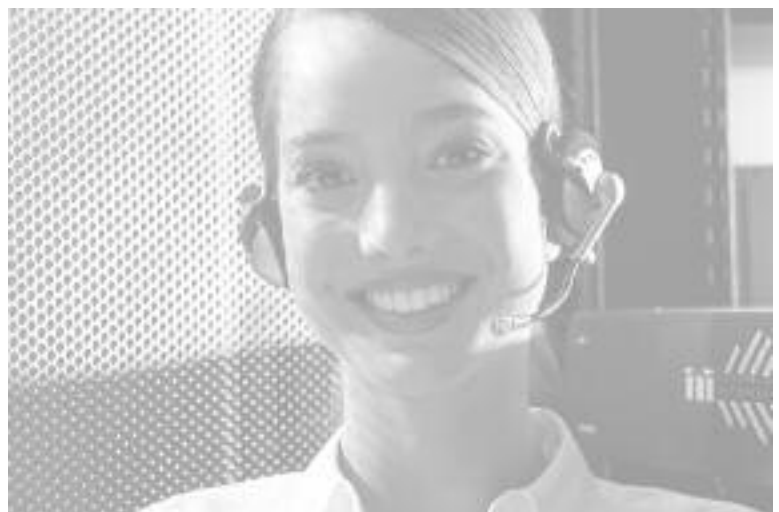
In back office jobs—such as claims processing or account reconciliation—moving laterally in different functions and jobs at the same level makes the employee well-rounded and an important “go to” person in the organization. This can bring wage gains, but such mobility is limited. Another important way to improve wages and advancement opportunities is by demonstrating a commitment to obtaining postsecondary credentials. Most financial services firms offer generous employee tuition

reimbursement programs, and employees are expected to take advantage of such opportunities to improve their credentials. While an Associate’s degree may suffice as an interim credential, our interviews revealed that long-term advancement increasingly depends on obtaining a four-year degree.

### Stability of Demand

The threat of offshoring has become a major destabilizing force affecting demand for CSRs. CSR jobs located in call centers and back office data processing jobs top the list of occupations deemed vulnerable to offshoring. Transaction processing jobs and the servicing of routine customer inquiries are expected to continue to move offshore as technological advances and the evolving capabilities of labor in lower cost offshore locations combine to make it easier to relocate work abroad. Some subsets of customer service jobs, especially jobs in the higher end of financial services or those that cannot be routinized, are likely to remain, but long-term demand is hard to predict.

Automation also affects demand. In financial services, transactional CSR positions are considered to be the first in line to be automated. The relationship between technological advancement and domestic demand for entry-level workers is complex. On the one hand, new technology may provide solutions that maintain or even reduce skill requirements (despite the increasingly complex nature of the products being serviced), enabling lower-skilled workers to continue to access such jobs. On the other, technology may reduce the number of workers required. In addition, if technology makes the job simpler, it may become more vulnerable to offshoring. If technology reduces the number of domestic jobs and the remaining jobs are more complex, entry-level workers will face a double bind: fewer total openings and higher entry-level skill requirements.





## Automotive and Truck Technicians

### SUMMARY OF OPPORTUNITY ANALYSIS

	Automotive	Truck
Standard Occupational Code	49–3023	49–3031
Current employment	818,211	267,207
Projected annual openings	31,887	10,655
Wage range (25 percentile to 75 percentile in 2002):	\$22,080–\$41,270	\$27,310–\$42,730
Offshoring risk	Low	
Technology risk	Low	
Industry risk	Low	
Educational profile	High School/Some College	
Accessibility of jobs to new entrants	Very accessible for those who complete a formal training program. Most new training program graduates need to work at a basic service chain or small independent garage initially. Dealers rarely hire technicians who do not have prior work experience in the field, even if they have completed a certificate-level training program.	
Accessibility of training programs	Not very accessible for low-skill workers: Training programs can run from six months to two years Cost is relatively high: from \$3,000 to \$24,000 for a two-year program Most automotive training is incompatible with full-time work Entrance requirements can vary greatly	
Career paths and advancement options	Increases in pay are possible by earning additional ASE certifications or by working efficiently for a flat rate. Career advancement is possible by assuming supervisory roles or securing employment with a dealership.	
Stability of demand	Demand is expected to remain strong, with future demand highest for mechanics with advanced training and Associate's degrees.	
Successful strategies for adapting program to low-skill workers	Provide remedial academic preparation and tutoring support to help less-educated workers meet training program requirements. Provide assistance in securing internship opportunities. Offer part-time programs with expanded paid internship opportunities to meet the needs of working adults.	

### Overview

Automotive and truck technician is an attractive occupation for low-skill workers: it pays relatively well, it does not require a four-year degree, and demand is expected to stay strong. However, few training programs are readily accessible, as they generally do not make scheduling concessions for working adults.

For many years, it was possible to learn this trade on the job, working up from mechanic's

helper to fully skilled technician. Today, it is very difficult to access this field without formal training because the technical skills needed to succeed as a top automotive technician have changed dramatically over the past 20 years. Sophisticated electronic circuitry has become commonplace, and complicated electronic modules control even many of the simplest functions of a car, including braking and door locking. The increasingly complex systems within cars have in turn led to the development of



more sophisticated diagnostic equipment to troubleshoot and program those systems. As a result, technicians now need to have many of the same skills as computer technicians and network administrators: computer literacy, an understanding of electrical systems, and strong diagnostic skills. Indeed, the skill sets are close enough that the auto repair industry finds itself competing with the information technology sector for young workers.

Individuals with minimal training can access entry-level positions at oil change facilities and tire shops. These tend to be the lowest paying positions, with limited potential for advancement. Better trained individuals may be able to secure work at independent garages. The best trained individuals, those with Associate's degrees and often some experience, may find work at new car dealerships. Dealerships typically offer the best wages and potential for continued skill upgrading and advancement; they employ roughly a third of mechanics.

Lesser skilled technicians frequently specialize in certain subcategories of repair work, such as transmission, exhaust systems, or brakes and suspension. The most skilled mechanics have expertise in several areas. The highest compensated technicians possess superior diagnostic skills, the technical knowledge to use advanced computer-based troubleshooting systems, and the logical thinking to interpret results and identify faults.

Working as a bus and truck technician (diesel technician) is similar in most respects to auto repair. The most notable difference is that diesel technicians need expertise in diesel engine repair and maintenance. Bus and truck repair work is also more physically demanding as the vehicles and their components are larger and heavier. Truck and bus mechanics tend to be better compensated, with median annual earnings of \$34,000.

An emerging trend in the training of technicians is partnerships among automotive manufacturers, dealers, community-based organizations, and training providers to deliver brand-specific training to aspiring technicians. Program graduates tend to be more familiar with certain brands, which makes them more attractive to dealerships servicing those makes. Internships are usually incorporated into the

structure of these programs, creating a natural path for students from internship to full-time employment with dealers.

### **Accessibility of Jobs to New Entrants**

The rapid evolution of automotive technology has made the field increasingly difficult to access for individuals who have not completed a formal training program. But for those with appropriate training, entry-level opportunities are plentiful. In fact, over the past decade, various industry sources have decried a critical shortage of technicians. A contributing factor to this shortage is a relatively negative public perception of the occupation. Many people continue to consider it a job for academic low achievers. As a result, high school guidance counselors generally do not encourage students to pursue employment in the field. Many candidates who 20 years ago might have entered the field of automotive repair are instead working in information technology. Public perception appears to lag the changed reality of the profession, in terms of both skill requirements and earnings potential.

According to a leading trade publication, 40 percent of repair facilities are looking to hire technicians.<sup>10</sup> The strong demand for technicians makes it easier for individuals with limited or no employment experience to get a job if they have completed an appropriate training program. Most training program graduates initially work at a basic service chain or small independent garage. Dealers rarely hire technicians who lack work experience in the field, even if they have completed certificate-level training. The exception to this is a technician with an Associate's degree, particularly from a program affiliated with a manufacturer and/or dealer network.

Entry-level positions within non-dealer repair facilities include lube specialists, tire specialists, and general service technicians. Workers generally need to be computer literate but do not necessarily need to have prior experience.

Internships are an important means of developing a practical understanding of the field and acquiring work experience. However, not every training program provides assistance in securing internship opportunities for students. Without such assistance, it can be difficult to obtain an internship; most repair facilities are hesitant to employ non-certified, inexperienced individuals.

***According to a leading trade publication, 40 percent of repair facilities are looking to hire technicians.***

## Accessibility of Training Programs

### Length of Program

The structure of an automotive training program can vary significantly depending on the breadth and depth of training that it is designed to deliver. In general, the range is from six-month certificate programs focused on specific repair skills to two-year degree programs that provide a solid foundation in many skill areas and culminate in an Associate's degree.

### Cost of Training

The cost of training varies widely depending on the type of program and the training provider. Proprietary schools charge as much as \$24,000 for a certificate program. One-year community college programs tend to cost around \$3,000. Two-year degree programs with internships can cost \$7,000. In addition to tuition, students in longer-term programs are expected to purchase a set of hand tools, which can easily add \$1,000 to the cost of training.

### Availability of Training

Training for automotive technicians is widely available at both the vocational high school and postsecondary levels. Access is not limited by training capacity. However, the cost of training and the time commitment could be significant obstacles to low-income adults interested in becoming automotive technicians.

The dominant credential for automotive technicians is National Institute for Automotive Service Excellence (ASE) certification. There are over 1,200 ASE-certified schools in the United States, including high schools, postsecondary trade schools, and community colleges. Certification is available in a number of automotive technical specialties, including brakes, steering and suspension, and engine overhaul. To become ASE-certified, a technician must pass one or more ASE tests and have two or more years of full-time, hands-on work experience. ASE also certifies master technicians. Master technicians must obtain certification in eight areas of specialization and possess the requisite work experience. Employers sometimes link pay increases to the completion of additional levels of ASE certification.

Many vocational high schools offer instruction in automotive technology and repair. These programs vary widely in structure and quality. In recent years, the shortage of mechanics has led automotive dealers and manufacturers to establish partnerships with schools to develop programs designed to encourage youth to enter the field. The largest of these is Automotive Youth Educational Systems. AYES is a partnership of about 150 schools and more than 300 dealers and manufacturers. Students who complete the program receive a technician's certificate and a high school diploma.

Automotive training is also widely available from community colleges, which typically offer training over the course of two years and grant an Associate's degree at the conclusion of the required course work and practicum. Perhaps the best preparation for a career in automotive repair is to complete a community college degree program that includes an internship with a dealer. These programs are structured with alternating quarters of classroom instruction and paid internship training. To participate, students must secure a commitment from a dealership to provide the internship setting.

In addition, community colleges offer a number of one-year, certificate programs. These programs expose students to a range of service operations but are less extensive, and more affordable, than degree programs. Some schools also offer one-term, specialized courses focused on a specific aspect of auto repair, such as brake work or transmission repair. While these courses typically do not lead to jobs at dealerships, they can help a student access employment with basic service chains like muffler shops and oil change facilities.

Finally, there are some proprietary training institutes. These tend to be very expensive, costing as much as \$24,000 for a two-year program, and do not offer a clear advantage over community college training.

Training opportunities and certification for diesel mechanics closely mirror those for automotive mechanics.

### Flexibility of Schedule for Working Adults

Most automotive training is incompatible with full-time work. Many programs require a two-year, full-time commitment. As described above, the shortest certificate programs typically focus on a single facet of automotive repair. They are the least expensive and require the smallest commitment of time, and, at best, they prepare one for entry-level work at a quick lube franchise or muffler shop. Some of these certificate programs are offered on a part-time, evening basis that would be compatible with full-time work.

### Entrance Requirements

Most postsecondary automotive training programs require that entrants have a high school diploma or GED. Many require that individuals have a valid driver's license as well. Community college entrance requirements for degree programs in automotive repair can vary greatly. In some cases, the requirements can represent a significant obstacle to individuals without strong academic backgrounds. For example, some programs require demonstrated competence in college-level English and algebra and/or relatively high ACT or SAT scores. On the other hand, other schools have relatively modest

entrance requirements. In evaluating accessibility of training, it is important to understand the local training market and the academic prerequisites of area training providers.

### **Career Pathways and Advancement**

A career in automotive service offers a number of opportunities for career advancement. At the pinnacle of the profession are master technicians (also referred to as Class A technicians) employed by dealerships. These technicians can earn over \$100,000 per year. At the entry-level, graduates of certificate training programs are often hired by basic service chains like Goodyear or quick lube operations such as Jiffylube and Valvoline.

As discussed above, ASE certification is extremely important for auto technicians. In general, earnings rise with the number of ASE certifications obtained.

Technicians generally start out being paid on an hourly basis. Most senior technicians, particularly those employed by dealerships, are paid on a “flat rate” basis. The flat rate system is based on assigning a standard time value to repair operations. A flat rate mechanic is paid a certain amount per task performed. A mechanic who can complete the task in less than the standard allotted time is paid the full flat rate. Likewise, if the job takes longer to complete than the flat rate time, the mechanic still receives the flat rate. Efficient mechanics are thus able to bill significantly more flat rate hours than hours actually worked.

Potential for advancement is largely determined by the type of training completed and the nature of the employer. In theory, a technician can enter the field as an oil change mechanic or tire specialist with a chain operator, and progress to work at an independent garage, and ultimately obtain employment at a dealership. In reality, that career path is increasingly difficult to follow as dealerships, and even many independents, demand that workers have brand-specific expertise and the ability to troubleshoot electronic systems. Work in a tire or quick lube facility does not provide this type of experience.

Dealerships offer the best opportunities for advancement and high earnings. Technicians employed by dealerships have the opportunity to perform the full range of maintenance and repair services. In addition, dealers frequently pay for training that enables technicians to earn advanced certifications and develop new skills.

Approximately one third of automotive technicians are employed by dealerships. There, a technician can enter as a general helper changing oil and tires. The next level of advancement would be to a general service technician, performing mostly mechanical work on cars, including brake, suspension, and basic maintenance services. With additional training and experience, general service technicians can advance to master technician sta-

tus. Master technicians perform all aspects of automotive repair, including electronic troubleshooting and major component rebuilds. It generally takes a general service technician three to five years to progress to master technician. Even master technicians continue to receive training to upgrade their skills and keep pace with changes in the product. Indeed, manufacturers require this of technicians employed by dealerships.

Advancement opportunities beyond the technician level are relatively limited. A top technician can become a shop foreman. Shop foremen have supervisory responsibility but continue to work directly on vehicles. Foremen can progress to service managers, although employers increasingly want service managers with college degrees. Finally, a relatively large number of technicians start their own auto repair businesses: 16 percent of technicians are self-employed.

### **Stability of Demand**

Demand for automotive mechanics and bus and truck mechanics is expected to remain strong. The BLS projects that there will be an average of 32,000 new openings for auto mechanics and an additional 10,700 for diesel technicians by 2012. As a direct service occupation, there is no risk of offshoring. Changes in technology may impact the skills that technicians need to have but not the overall demand for technicians. In general, the evolution of automotive technology has increased both the complexity of the vehicles and the equipment used to service them. As a result, it is reasonable to expect that future demand will increasingly be for technicians with advanced training and Associate’s degrees.





## Computer Support Specialists

### SUMMARY OF OPPORTUNITY ANALYSIS

Standard Occupational Code	15-1041
Current employment	507,000
Projected annual openings	21,579
Median earnings	\$39,100
Wage range (25 percentile to 75 percentile in 2002):	\$29,760–\$51,680
Offshoring risk	High
Technology risk	High
Industry risk	Low
Educational profile	Some College/College
Accessibility of jobs to new entrants	Somewhat accessible for low-skill workers. Employers prefer candidates with four-year degrees, but candidates with some formal training, industry certification, and work experience can find entry-level employment opportunities. Soft skills are critical.
Accessibility of training programs	There are many programs that provide training to prepare job seekers for certification exams, but few also provide the internship experience that employers will likely demand from candidates without a four-year degree.
Career paths and advancement options	Many opportunities for advancement exist as a computer support specialist gains new skills and years of experience. Continued education is critical for maintaining employability in this rapidly changing field.
Stability of demand	These jobs are at a high risk of offshoring and technology change.
Successful strategies for adapting training programs to low-skill workers	<p>Include intensive internship as a major part of the training program to address employer preference for candidates with work experience.</p> <p>Constantly update and revise technical training to reflect the most current employer needs so participants can “hit the ground running” in their internships.</p> <p>Provide training in professional skills—such as communication and troubleshooting—that employers value highly in hiring decisions</p>

### Overview

Computer support jobs are among the few well-paying, white-collar occupations open to those without a four-year degree. Within the family of information technology jobs—which includes programmers, software engineers, and network designers and administrators—computer support specialists are at the lower end of the spectrum, with skill requirements that can be learned in fewer than two years. With median earnings ranging in the upper-twenties to mid-thirties, these jobs represent some of the better opportunities for workers with limited formal education. However, the lack of degree requirements does not mean easy access. Job appli-

cants must be able to demonstrate the ability to perform a complex set of technical and soft skills, and in the eyes of most employers, job experience is the most accurate indicator of competency.

Training for computer support occupations is widely available in a range of formats, from short-term introductory trainings to year-long, in-depth certification programs. Most training courses concentrate on the most common software systems and equipment including Microsoft, Linux, and Cisco Systems. Certifications are available for software-related tasks and hardware setup and maintenance. According to employers and training providers, qualifying as a Microsoft Certified Systems

Engineer—which requires a three- to six-month training for a certificate—is one of the most valuable credentials in the field.

While completion of an information technology (IT) training program or attainment of a technical certification enhances one's candidacy for a computer support position, employers' strong hiring preference is for individuals with on-the-job experience. Thus, completion of a well-structured internship or some other form of on-the-job training is critical for new entrants. Such internship opportunities can be very difficult to secure, especially for low-income clients without professional contacts or networks to tap for help. IT training and certifications programs that do not include a substantial workplace internship are unlikely to be able to place graduates who do not have prior computer support experience.

Computer support specialists perform a variety of functions. They may work as help-desk technicians or as PC or network technicians, in Web site maintenance and development, and in network administration. They interpret problems and provide technical support for hardware, software, and systems. They install, modify, clean, and repair computer hardware and software. They also may work on monitors, keyboards, printers, and other peripheral equipment. They test or monitor systems and networks and perform routine maintenance checks. In general, such workers act as troubleshooters, providing valuable assistance to computer users (see box).

Computer support specialists may work either within a company that uses computer systems or directly for a computer hardware or software vendor, providing technical assistance, support, and advice to users inside their organizations and to external customers. While many large firms have in-house IT support teams, a significant number of specialists work for help-desk or support services firms, where they support clients on a contract basis. Nearly a third of computer support specialists are employed in the IT sector, principally in computer systems design and related services (Bureau of Labor Statistics 2003). Other significant employment concentrations include schools and universities (11 percent) and financial services (9 percent).

## **Computer Support Job Classifications**

### **Help-Desk Support**

Help-desk support specialists assist computer users with hardware and software, fielding telephone calls or email messages from customers seeking guidance on technical problems. In responding to these requests, help-desk technicians must listen carefully to the customer, ask questions to diagnose the problem, and then patiently walk the customer through the problem-solving steps. In larger firms with substantial IT capabilities or in firms specializing in IT support services, the help desk support specialist may provide the first line of customer support and conduct the diagnostic test over the phone but dispatch another worker (a PC or a network technician) to address the problem on site if necessary. In smaller firms, one person may perform all the functions, from customer support to the technical resolution of the problem. The salary range for entry-level help-desk staff is \$30,000 to \$40,000.

### **PC Technician**

PC technicians are involved more in basic hardware and software setup and do less troubleshooting. As a result, they may not require as strong customer service skills as help desk staff. PC techs perform a variety of tasks, including providing hardware support for hard drives, memory, CD ROMs, and other equipment. PC techs also set up new computers, transfer data, and help load and manage software upgrades. Both these positions provide comparable pay. Hourly pay starts at \$12 to \$15 per hour for workers without prior experience.

### **Network Administration**

Network administrators focus on the server/back end of the network. Primary responsibilities include network maintenance: backing up the network, upgrading servers, adding users, etc. While various certifications are available for network workers, certification is not needed to advance from help-desk to network administration. Entry-level network administrators earn \$30,000 to \$35,000. About two years of experience as a network administrator allows the worker to advance to mid-level. Mid-level network administrators can earn \$50,000 to \$60,000.

### **Website Development and Maintenance**

Other potential points of entry-level access to computer support jobs include Web site maintenance and development. However, these positions are more difficult to access for workers with limited skills and experience; superior design and some programming skills are required, especially for Web development. The relatively high programming content in Web development creates opportunities for Web developers to eventually advance to entry-level software development roles. Once an initial site has been developed, less-skilled workers can handle site maintenance. Web site maintenance, often performed by so called webmasters, is thus a less-skilled position than Web site development. Webmasters create enhancements and provide updates to existing sites. Entry-level workers earn about \$20 an hour. Ordinarily, some experience is required.

In recent years, demand has softened for computer support specialists and Web site developers. While part of the softening is attributable to the much discussed tech bust, maturation of the industry has also played a part. Offshoring has also affected these jobs, especially entry-level help-desk positions for software support. Despite these challenges, the rapid evolution of information technology is likely to continue to create demand for computer support specialists as new products are developed and incorporated in the workplace. It is also reasonable to expect that as the economy revives and cyclical business investment increases, the IT industry will experience increased demand for goods and services, which will in turn spur increased demand for IT labor.

### **Accessibility of Jobs to New Entrants**

The computer field is set apart from most white-collar professions in the value it places on the demonstration of competency over formal credentials. The story of Bill Gates, who dropped out of college to found Microsoft, is legend, but it is also part of the culture of a profession that values self-taught skills and experience above classroom learning. As the field has matured, it has established its own credentialing system apart from higher education to assess and certify the skill level of information technology professionals (Adelman 2000). This credentialing system consists of a wide range of industry certifications, including both vendor-sponsored and vendor-neutral certifications. Examples of vendor-sponsored certifications are Microsoft Certified Systems Engineer or Certified Novell Administrator, both of which qualify an individual to work on that company's products. A highly valued, vendor-neutral certification is A+, which tests more generic computer hardware and software skills.

While most individuals enroll in educational programs, ranging from four-year, computer science degree programs to short-term training courses to prepare for certification exams, instructional seat time is not always a requirement. All that is required to gain certification is passage of the relevant exam. Certifications represent an

important way the industry validates the skills and knowledge of potential job candidates. But while certifications are a plus, they do not substitute for experience performing the work. This is true from the top of the computer job pyramid (e.g., computer programmer or software engineer) to the lowest and most accessible rung (computer support specialist). Indeed, many employers report that certified individuals who lack relevant work experience usually do not have an adequate practical understanding of computer systems.

Furthermore, while certifications may be useful for validating a candidate's knowledge of a particular operating system or software, they do not measure the troubleshooting, self-learning, and communication skills that employers rate as the most important skills for computer support specialists (ITAA 2000).<sup>11</sup>

Employers are particularly interested in candidates who have strong diagnostic and analytical skills. In fact, many employers prefer to hire non-certified individuals with diagnostic experience in other fields such as auto repair rather than certified individuals with no related work experience. This is particularly true for hardware troubleshooting jobs. Employers also look for candidates who can communicate well with a variety of people, understand written and spoken information, and express ideas clearly when speaking or writing. The constant interaction with other computer personnel, customers, and other employees within their own companies requires computer support specialists and systems administrators to communicate effectively on paper, via e-mail, or in person. Technical training and certifications do not cover these skill areas. Accordingly, employers view the evidence of practical job experience performing these critical tasks as the best validation of competency in these areas.

While employers prefer job experience over all other qualifications, they also realize that they cannot be too choosy in relatively tight labor markets. When forced to choose among inexperienced candidates for support specialist positions, a growing number of employers prefer those who have a four-year degree or are graduates of private technical institutes.<sup>12</sup> According to a study conducted by the Information Technology Association of America, employers value a four-year degree as a strong indicator of a person's problem-solving abilities, and they value private technical schools for their ability to deliver focused, hands-on experience. Community college programs were rated lowest by employers in providing adequate pre-employment training. While 45 percent of employers surveyed rated four-year college programs and private technical school programs as either very effective or effective in providing pre-employment training for support specialist positions, only 30 percent rated community colleges as effective pre-employment training providers (ITAA 2000).

***While the number of computer support specialist jobs is expected to grow, there is reason to expect that a significant number of these jobs could be offshored.***

Given employer hiring preferences, training programs designed to serve individuals who lack a college education and professional work experience will not be effective unless they feature a substantial internship component. A well-designed internship enables candidates to gain experience performing a range of valued tasks and demonstrate their ability to do the job.

The success of one training program—Year Up—in placing low-income youth with limited skills in computer support positions suggests that it is possible to prepare and place individuals without a college degree or prior computer experience. Year Up delivers the components that appear necessary for success: well-structured, hands-on technical training customized to employer

needs, along with professional skills training and extensive work-based internships (see box).

### **Accessibility of Training Programs**

While many educational institutions offer computer degree programs as well as short courses (three to six months) designed to prepare students for certification exams, these programs are generally ill-suited to the needs of low-income, less-skilled individuals. They rarely include a substantial internship experience or explicit training in professional skills, and thus they fall short in important ways in preparing inexperienced workers without four-year degrees to be competitive candidates. The programs are often best-suited to providing additional

### **Year Up**

Year Up prepares and places low-income, urban young adults in entry-level IT jobs while also preparing them for college study. This innovative technology training program targets recent high school or GED graduates between the ages of 18-24 who are either unemployed or trapped in dead-end jobs. It provides them with an intensive year of technical, professional, and business communications training. It also provides an internship experience, college credit, and a high degree of personal and academic support. The program currently serves more than 200 students per year in three locations: Boston, Cambridge, and Providence. A Washington, DC, site will enroll its first class in early 2006, raising to 300 the number of students served each year.

In its first four years of operation, Year Up produced outstanding results. Despite the sharp downturn in the IT job market, the program has secured six-month internships for its students in desktop support and Web production positions for which companies pay Year Up a fee of \$725 to \$750 a week. Year Up's corporate customers include large financial services companies, technology firms, hospitals, and state government. The program has placed 86 percent of its graduates in jobs at an average pay of \$14.50 an hour. About half of Year Up graduates now attend college (most while working), and the program expects that number to grow as graduates gain access to tuition reimbursement benefits and become more established in their careers. The program has also achieved a high graduation rate—about 83 percent of the students who enroll in Year Up successfully complete the demanding one-year program.

Several features of Year Up appear to account for its success. First, it provides students with technical training that is customized to the needs of Year Up's corporate customers. Program staff work closely with these clients to stay current with their latest IT needs and adjust the training accordingly. As a result, students can enter their internships well-prepared for the particular demands they will face. Second, the program strongly emphasizes training in professional skills ("soft" skills), which include personal and project manage-

ment, teamwork, conflict resolution, communication, and learning-to-learn skills. During the first six months students receive intensive full-time training on both technical and professional skills, and they are paid a \$6 an hour stipend to reinforce their contractual obligation to come to class on time and perform at a high professional level at all times.

The six months of training that students receive is in preparation for Year Up's most critical feature: the six-month paid internship. It is this internship experience that makes Year Up graduates competitive for positions despite their lack of a college degree and professional work experience. Students are placed in one of more than 40 leading companies, such as State Street Corporation, Partners HealthCare, and Putnam Investments. The fact that Year Up charges employers \$725 to 750 a week for its interns serves as an important quality control: employers will only pay these fees if they receive candidates who can perform at a high level. The internships also provide Year Up with a funding stream that covers more than 40 percent of operating expenses. Interns return to Year Up weekly for support throughout the internship.

Finally, Year Up provides students with numerous resources during their transitions to careers and higher education. All staff advisors meet with students weekly to advise them on professional and personal issues. In addition, each student is assigned a mentor from the business community to further support their professional development. Tutors and job coaches offer additional support. Year Up students earn up to 18 college credits through the program.

The Year Up curriculum and instructors are approved for college credit at Cambridge College, a private four-year college whose mission is to help working adults continue their education by building on a lifetime of learning. Year Up students in Boston, Cambridge, and Washington are considered dually enrolled and receive credits at Cambridge College; the program is working to provide a similar arrangement with a local institution in Providence.

technical training to those who already have some computer experience.

This does not mean that private and public education institutions are irrelevant to the training process needed by low-income, less-skilled individuals. It is possible to incorporate these institutions into a larger initiative, where the educational partner provides the technical training, and other partners deliver other necessary components, such as internships and professional skills training.

The cost of training programs varies depending on the length of the program and the type of vendor used. Certification courses, depending on the length, can cost from a few hundred to a few thousand dollars. Programs offered by private technical institutes can cost several thousand dollars a year. (See the box for a description of

the certifications that have the most value for those seeking entry and advancement as computer support specialists.)

### **Career Pathways and Advancement**

There are a number of pathways out of entry-level support jobs. In general, promotions and wage gains depend more on job performance than formal education. In larger firms there may be two levels of help-desk support. From these basic levels, workers may move into supervisory positions. With one to two years of experience at the help-desk or PC tech level, workers can advance to networking functions. Entry-level network and computer systems administrators are involved in routine maintenance and monitoring of computer systems, typically working behind the scenes in an organization. After gain-

### **Types of Computer Certification**

Certifications enhance one's access to computer support positions and opportunities for advancement. Certification, coupled with relevant on the job experience, is the best preparation for computer support work.

#### **A+ Certification**

The A+ Certification, created by the Computing Technology Industry Association (CompTIA), is one of the most widely recognized certifications for entry-level work in computer support. It certifies workers in knowledge and skills essential for a successful entry-level computer service technician. A+ certified technicians can work in hard drive installation, support, and maintenance; with different operate different operating systems, and in disaster recovery and virus control. The certification validates computer service technicians with the equivalent of 500 hours of hands-on experience. Major hardware and software vendors, distributors, and resellers accept CompTIA A+ as the standard in foundation-level, vendor-neutral certification for service technicians. The exams cover a broad range of hardware and software technologies but are not bound to any vendor-specific products. The skills and knowledge measured by the CompTIA A+ exams derive from an industry-wide job task analysis. More than 500,000 workers have CompTIA A+ certification.<sup>13</sup> Microsoft accepts CompTIA A+, Network+®, and Server+™ certifications as electives toward its own Microsoft Certified Systems Engineer and Microsoft Certified Systems Administrator certifications. A growing number of colleges and universities grant course credit for certification and count certification as a plus on admissions forms.

#### **Microsoft Certified Desktop Support Technician—MCDST**

Microsoft Certified Desktop Support Technician is one of the more popular and basic certification for frontline desktop support workers—those who provide desktop support directly to users. The

MCDST certification covers the skills of help-desk technician, customer support representative, PC support specialist, technical support representative, and technical support specialist as defined by the National Workforce Center for Emerging Technologies' Skill Standards for Information Technology and other research worldwide. An MCDST candidate should have six to twelve months of experience supporting end users of a desktop operating system.<sup>14</sup> The certification provides the technical and customer service skills to troubleshoot hardware and software operation issues in Microsoft Windows environments. The MCDST credential counts towards the MCSA credential.

#### **Microsoft Certified Systems Administrator—MCSA**

Microsoft Certified Systems Administrators administer network and systems environments based on the Microsoft Windows platform. Specializations include MCSA: Messaging and MCSA: Security.

#### **Microsoft Certified Systems Engineer—MCSE**

Microsoft Certified Systems Engineers design and implement IT infrastructure solutions based on the Windows platform and Microsoft Windows Server System software. Specializations include MCSE: Messaging and MCSE: Security. This is one of the more valued but also one of the more advanced certifications, requiring individuals to have an advanced knowledge of Microsoft operating systems.

In addition to these vendor-specific certifications, workers may also benefit from customer service skills certifications, such as those developed and delivered by the Help Desk Institute, a leader in help desk credentials for customer service and call management. In some cases, such certifications may be bundled with technical certifications such as the MCDST.



ing experience and expertise, they often can advance into higher positions, with greater responsibilities. A couple of years of experience as a network administrator allows a worker to advance to mid-level. Mid-level network administrators can earn \$50,000 to \$60,000.

Some computer support specialists eventually become applications developers, designing products rather than assisting users. Support specialists may also move out into non-technology positions in human resources, marketing, or administrative services.

Because technology is constantly changing, computer support specialists must continually upgrade their skills. Advancing to other positions typically requires a combination of gaining experience on the job and taking continuing education courses in additional technologies or upgrades. Acquiring relevant certifications enhances one's ability to advance.

### **Stability of Demand**

While the number of computer specialist jobs is expected to grow, there is reason to expect that a significant number of these jobs could be offshored. Studies suggest that offshoring places up to one quarter of all IT jobs at risk in the coming decade.<sup>15</sup> Even routine system maintenance has become vulnerable to offshoring with the spread of off-site monitoring technology. Hardware and equipment support may be less vulnerable to offshoring than software support: it often requires a physical presence at the site of the problem. Thus far, the experience

of companies that have offshored computer support jobs has been mixed, and some have retreated from this strategy and brought jobs back to the United States. Nevertheless, the impact of offshoring must be factored in when preparing workers for these jobs.

More than offshoring, the factor that has most significantly affected demand in recent years is the slowdown of the IT sector itself. The tech bust has reduced demand for a wide range of IT professionals, including computer support specialists and Web site developers. The tech bust has also meant that many qualified people are now in the job market, depressing demand for less experienced workers.

Maturation of the industry is also shaping demand for IT workers and changing skill requirements for some positions. For example, now that almost every organization has a Web presence, there is less demand for Web site developers with extensive programming skills but a correspondingly greater need for webmasters with more modest skills to maintain existing sites. In hardware, falling equipment costs may reduce demand for more skilled technicians: as prices decline, it becomes more economical to simply replace hardware than to troubleshoot and repair it. In both cases, demand will likely remain for a smaller number of highly skilled workers and a larger number of less-skilled workers. There will likely be less demand for moderately skilled workers in the long term.





## Building Trades

### SUMMARY OF OPPORTUNITY ANALYSIS

	Carpenters	Electricians	Plumbers
Standard Occupational Code	47–2031	47–2111	47–2152
Current employment	1.2 million	660,000	550,000
Projected annual openings	31,917	28,485	20,511
Median earnings	\$34,190	\$41,390	\$40,170
Wage range (25 percentile to 75 percentile in 2002):	\$26,180–\$45,560	\$31,100–\$55,120	\$30,540–\$53,820
Offshoring risk	Low	Low	Low
Technology risk	Low	Low	Low
Industry risk	Low	Low	Low
Educational profile	High School/Some College	High School/Some College	High School/Some College
Accessibility of jobs to new entrants	<p>Accessible for low-skill workers, particularly carpentry work. Plumbing and electricity are somewhat less accessible because licensing is required and the best route to employment is through formal apprenticeship and licensing.</p> <p>Employers typically require a high school diploma or GED.</p> <p>Hiring is often through word of mouth.</p>		
Accessibility of training programs	<p>Pre-apprenticeship training is typically 12 weeks of classroom instruction combined with instructor-supervised, on-the-job training. Apprenticeship training lasts three to four years, during which the apprentice earns a wage.</p> <p>Cost is typically not an issue: most pre-apprenticeship programs are free of charge, and apprenticeship programs are often paid for by the employer.</p> <p>High school diploma or GED required.</p> <p>Apprenticeships, especially union apprenticeships, can be difficult to obtain for new entrants. For many workers, starting as a “helper” in the trade is a necessary precursor to obtaining an apprenticeship.</p>		
Career paths and advancement options	<p>Carpenters have the most options in terms of the range of work. They can work in a number of industries. Advancement opportunities include foreman or supervisor, construction manager, or owning a business.</p> <p>Plumbers and electricians generally follow the path from helper to apprentice to journeyman to master.</p>		
Stability of demand	Varies from region to region but is expected to stay strong overall		
Successful strategies for adapting program to low-skill workers	<p>Identify the most accessible and suitable apprenticeship training opportunities.</p> <p>Provide remedial instruction in math, reading, and spatial reasoning to prepare candidates for apprenticeship entrance exams.</p> <p>Help candidates navigate the complex path involved in securing an apprenticeship slot in their chosen trade; this may involve helping them find helper positions as the precursor to admission to an apprenticeship program.</p>		

### Overview

The three major building trades are carpentry, electrical work, and plumbing. Carpentry is the largest, employing almost twice as many as the next largest, electricians. Success in the trades requires the ability to work independently and solve problems, as well

as the ability to work on a team. The work is physically demanding, often seasonal, and subject to the cycles of the construction industry. It is also difficult to access the apprenticeship training that is required by the industry. However, earning potential is very good, demand is projected to remain

strong, and there is opportunity for ongoing skill development and advancement. Furthermore, involvement with the criminal justice system does not preclude a career in the building trades.

Median annual earnings for carpenters are somewhat lower than for electricians and plumbers (\$34,000, \$41,000, and \$40,000, respectively). Part of the disparity may be attributable to differences in union penetration: carpenters have the lowest rate of union membership and electricians, the highest.

Organized labor is an important presence in the construction industry, influencing the quality of jobs, working conditions, and how workers are trained. Average hourly earnings for union members are as much as 50 percent higher than earnings for non-union members (Center to Protect Workers' Rights 2002). Data from the 2000 BLS Current Population Survey indicate that approximately 23 percent of non-administrative workers in the construction industry are union workers. Union penetration is deepest among those employed on public construction projects, but it varies by state and specific trade.

A distinctive aspect of the building trades is the apprenticeship system by which many new entrants to the field learn their craft, particularly electricians and plumbers. The apprenticeship process establishes clear benchmarks for skill attainment and earnings advancement, while providing the apprentice with full-time employment and, ultimately, a credential that enhances his/her value in the labor market. All of the building trades unions require their members to complete an apprenticeship. Apprenticeship programs are also sponsored by some non-union—also called “merit shop”—employers. Most electricians and plumbers learn their trade through a formal apprenticeship.

Most apprenticeships require a high school diploma or GED, can be difficult to obtain, and require an employer to agree to hire the apprentice. For many low-income job seekers, a more realistic route would be to take a job as a helper in the trade of interest and, after developing some worksite/trade experience, seek a formal apprenticeship opportunity.

Another strategy would be to pursue pre-apprenticeship training. In recent years a number of community-based organizations, community colleges,

and workforce intermediaries have developed pre-apprenticeship programs designed to expand access to the trades for women, minorities, and low-income individuals. These programs are usually designed to improve participants' math skills, broaden their knowledge of basic construction, and give them some hands-on experience in the building trades.

Career advancement in construction, particularly for plumbers and electricians, is shaped largely by the apprenticeship system. Workers start out as helpers, then move on to apprentices, journeymen, and masters. Some workers, particularly carpenters, can progress to supervisory positions that are less physically demanding and better paid.

Construction also offers more opportunities than most industries for individuals who want to own their own businesses. Construction workers need only a moderate financial investment to become contractors, and they can then run their businesses from their homes, hiring additional construction workers as needed for specific projects.

While carpenters generally need only a contractor's license to operate a business, in many states, plumbers and electricians need to be certified as masters to do so. These certifications require passing a written exam and often acquiring a year's experience beyond the journeyman level. Nevertheless, a large proportion of building trades workers are self-employed: approximately 30 percent of carpenters and 10 percent of electricians and plumbers. However, relatively low barriers to entry make the construction field quite competitive, and the rate of business failure is higher than the failure rate in the overall economy.<sup>16</sup>

Demand for building trades workers is projected to remain strong at least through 2012. Demand is driven primarily by construction activity, which accounts for most employment in each of the building trades.

### **Accessibility of Jobs to New Entrants**

Of the building trades, entry into carpentry is probably the most flexible. This may be due, in part, to the fact that carpenters generally do not need to be licensed, and most carpenters enter the field without benefit of a formal apprenticeship. Some have had preparation through vocational high school courses, while others may have obtained training at a community college. More recently,

some may have completed a pre-apprenticeship training program. Regardless of the type of training, employers seek individuals who are physically fit, have a good command of basic math, have a valid driver's license, and exhibit appropriate soft skills, including motivation, punctuality, and the ability to work as part of a team. While a college degree is not necessary, most employers and almost all apprenticeship programs require a high school diploma or GED.

### **Big-Step**

The skilled building trades offer a proven means of earning a good wage in a secure work environment. Unfortunately, women and people of color often have difficulty accessing careers in the building trades. In Milwaukee, the Big-Step program is demonstrating that it is possible to make the trades more accessible to diverse populations. Launched by local unions in partnership with local building and construction trade contractors, Big-Step reaches out to women and minorities and assists them in qualifying for and securing apprenticeships in the building trades.

Big-Step's primary focus is to prepare individuals academically to pass the entrance exam for an apprenticeship in the building and construction trades. Following an initial assessment, a program of study is designed to address deficiencies in a range of areas, including math, reading, and spatial reasoning. The basic program lasts twelve weeks. As each individual's academic skills and challenges are unique, Big-Step support is delivered in a one-on-one tutoring format that enables students to learn at a pace tailored to their schedules and abilities. Each week students typically spend one to three hours receiving tutoring and an additional two to six hours on homework.

Big-Step relies on a broad recruitment network, including joint apprenticeship committees, the Urban League, and community-based organizations, to identify candidates for the program. To be accepted into Big-Step, candidates must test at or above the eighth grade level in both reading and math. Approximately half of Big-Step participants previously failed an apprenticeship exam. By blending a number of funding streams, including private philanthropic support, state monies, and contributions from employers, Big-Step can offer the training free of charge.

In addition to academic tutoring, participants receive counseling that helps them identify which trade best suits their interests and abilities. Counseling also includes interview coaching and job placement assistance.

The Big-Step model is quite effective. Between 2001 and 2004, 200 low-income Big-Step graduates were placed into skilled trade apprenticeships. Over a third were people of color and 14 percent female. Earnings gains are significant for program graduates. At intake, most participants in the program are earning \$7 to \$9 per hour. Depending on the trade, earnings at placement vary from approximately \$12 to \$15 per hour.

Big-Step attributes its success largely to close relations with labor and employers, which strengthen Big-Step's recruitment and placement activities while also informing program content.

Because few carpenters undergo formal apprenticeship training, the difficulty of obtaining apprenticeships is not a major barrier to entering the field. Nevertheless, apprenticeship training is apt to produce the best long-term career outcomes as a worker acquires a depth and breadth of skills that prepares him or her for a wide range of opportunities.

Entry into plumbing or electrical work may be more challenging than carpentry because a higher proportion of workers enters through apprenticeships. Apprenticeships, particularly union apprenticeships, can be difficult to obtain for new entrants. For many workers, starting as a "helper" in the trade is a necessary precursor to obtaining an apprenticeship. Annual median earnings for helpers in the trades are above \$21,000.

Much hiring in the building trades is done by word of mouth. Having contacts—preferably close relatives—in a trade makes it easier to get a job. Access for women and minorities may be particularly challenging; the building trades have traditionally employed very few women and relatively few minorities. While 83 percent of the U.S. workforce is white, 90 percent of carpenters, electricians, and plumbers are white. Latinos have made significant inroads, particularly in carpentry, but women continue to make up only a tiny fraction of tradespeople, less than 2 percent overall. While in theory the building trades are accessible to women, the work is physically demanding, and contractors and tradesmen often make the environment very unpleasant for women. Women and minorities who overcome these barriers can do quite well if they own their own firms, given frequent preferences for women-owned and minority-owned firms in bidding on public projects. The Milwaukee-based Big-Step program is an excellent example of a successful program that has helped women and minorities secure apprenticeships in the building trades (see box).

### **Accessibility of Training Programs**

#### **The Apprenticeship System**

Traditionally, workers acquired skills in the building trades through apprenticeships. Apprenticeship programs combine classroom instruction with structured, on-the-job training supervised by journeyman-level workers.

Formal apprenticeships are the pathways to high-wage, high-skill jobs in the trades. The traditional apprenticeship career path begins with work as a helper, enrollment in an apprenticeship program, and, upon completion of the apprenticeship, achievement of journeyman status. Some journeymen continue onto master status. In states where licensing is required, master status must typically be obtained to operate one's own contracting business.

Apprentices earn wages while they learn their trade over a three- to five-year period. Apprenticeship pro-

grams are administered by joint apprenticeship training committees, made up of employer and worker representatives in the specific trade or craft. The U.S.

Department of Labor certifies apprenticeship programs and recognizes both union and “merit shop” (non-union) apprentice programs. The length of an apprenticeship is determined by the local apprenticeship committee.

### Pre-apprenticeship Training

A number of pre-apprenticeship training programs prepare workers for entry-level work in the building trades. Many of these programs have been launched by workforce intermediaries and community-based organizations interested in expanding access to building trades careers for disadvantaged workers, minorities, and women. While there is no standardized format for these programs, they tend to run approximately 12 weeks and consist of a combination of classroom instruction and instructor-supervised, on-the-job training.

The classroom instruction typically covers personal and construction safety, the use and care of hand and power tools, basic and trade math, blueprint reading and drawing, and basic life and job skills. In the on-the-job portion, students usually participate in a construction project that includes painting, framing structures, and installing cabinets, windows, and doors. The project may also offer an opportunity to assist with electrical wiring, plumbing, and masonry work.

### Length of Program

It typically takes three to four years to complete an apprenticeship in the building trades. The length varies depending on the trade and the guidelines set forth by the local apprenticeship committee. In general, approximately 150 hours of classroom time are required per year, along with a number of work experience hours.

Apprentices cannot take the journeyman examination until they have completed the experience requirements. While apprenticeship training is lengthy, it is on-the-job training: the apprentices earn wages while learning the trade. First-year apprentices typically earn 50 to 60 percent of a journeyman’s wages and receive regular raises as they progress to journeyman status.

Pre-apprenticeship programs are not formally certified and, accordingly, there is more variation in program design. A typical pre-apprenticeship program will last approximately 12 weeks.

### Availability of Training Spaces

In addition to organized labor, apprenticeship training is provided by a number of organizations, including the Associated General Contractors, the National Association of Home Builders, and the Associated



Builders and Contractors. The Associated Builders and Contractors has training affiliates across the country that provide apprenticeship (and pre-apprenticeship) training for the building trades. There is roughly one apprentice slot for every two net openings for carpenters, electricians, and plumbers.<sup>17</sup> Accordingly, it can be difficult to obtain apprenticeships, and many applicants must wait a year or longer to secure one.

The apprenticeship and training programs of the building trades unions are administered by local joint apprenticeship training committees, made up of representatives from the local union and from industry employers. The Joint Apprenticeship and Training Committees (JATCs) spend over \$500 million annually on training and operate over 2,000 training centers across North America. More than 180,000 apprentices and tens of thousands of journey-level workers receive training each year at these facilities. These figures include carpenters, electricians, and plumbers, as well as workers in other building trades. Access to union apprenticeship programs is restricted based on each union local’s estimate of future demand for journeymen.

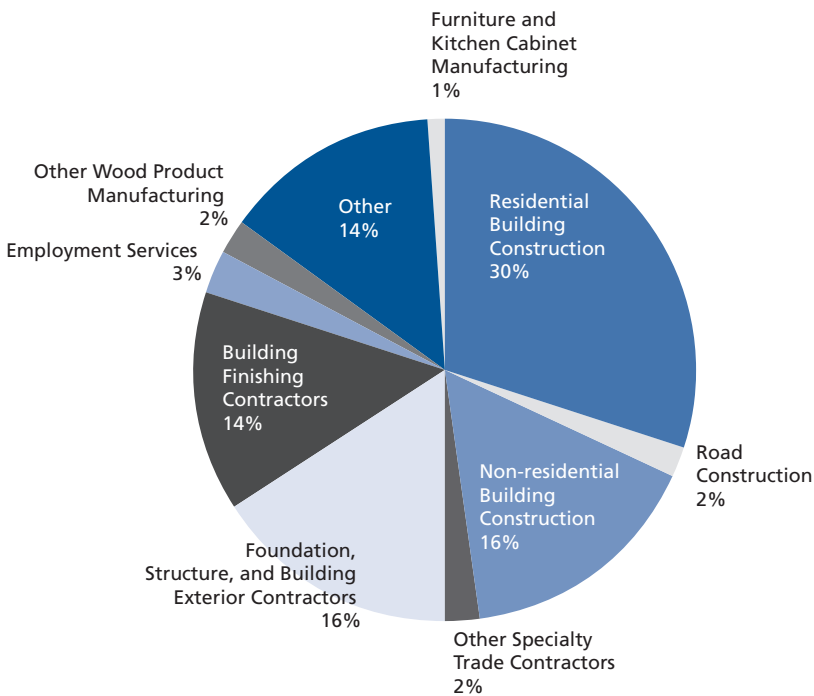
Pre-apprenticeship training programs in the building trades are not registered, nor are they affiliated in any type of an association. Accordingly, statistics are not available regarding the number of such programs. It appears that the number of such programs is growing and that they are available in many large metropolitan areas.

### Flexibility of Schedule for Working Adults

The apprenticeship model is based on students’ working in the field while concurrently taking courses to advance their skills. Accordingly, apprenticeship training is always structured to accommodate working students. In “merit shop” apprenticeships, the classroom training is usually several hours per week in the evening or on weekends.

Most pre-apprenticeship programs are full-time, weekday programs designed to meet the needs of unem-

***Many carpenters begin their careers as carpenters’ helpers and then develop their skills, through either a formal apprenticeship or informal, on-the-job training.***



Source: Bureau of Labor Statistics, Occupational Employment Statistics Survey data 2003

ployed adults. While conducive to part-time work, the schedules of these programs do not permit students to maintain a full-time job.

### Entrance Requirements

**Apprenticeship Training.** While requirements vary depending on the local union or JATC, most apprenticeship programs require that candidates have earned their high school diploma or hold a GED. Many programs also require a valid driver's license and passing a written exam in basic math and reading comprehension. There is also usually an interview. The entrance exams for electricians and plumbers tend to be more demanding than those for carpenters. Every candidate must be employed by a company that is willing to sponsor the apprenticeship.

**Pre-apprenticeship Training.** Entrance requirements vary for pre-apprenticeship programs. Many programs mirror the requirements of the apprenticeship programs for the trades they target. Pre-apprenticeship programs that have entrance requirements that depart significantly from the related trade apprenticeship requirement are not apt to be effective in preparing workers for apprenticeships.

### Cost of Training

The cost of training is typically not a key barrier to accessing training in the building trades. The cost for classroom training in non-union apprenticeships is usu-

ally modest. For example, the Gould Institute, the Massachusetts training affiliate for the Associated Builders and Contractors, charges about \$950 per year for the required 150 hours of classroom training. The cost of apprenticeship training is usually covered by the sponsoring employer. In union-sponsored programs, apprentices do not pay anything.

Pre-apprenticeship training is often free of charge to individuals who meet the intake screens of the sponsoring organization. Some pre-apprenticeship programs pay a stipend to participants.

### Career Pathways and Advancement

Career paths and opportunities for advancement are very similar for carpenters, electricians, and plumbers, and the apprenticeship system establishes a clear advancement path for tradesmen. Carpenters probably have the most flexibility both in how they access the occupation and how they advance. Carpenters work in a range of industries, and a craftsman with good general skills can move among these sectors as opportunities arise. The highest earnings for carpenters are in non-residential construction.

Many carpenters begin their careers as carpenters' helpers and then develop their skills, through either a formal apprenticeship or informal, on-the-job training. Carpenters with good general skills can progress to crew foreman and supervisor. Many carpenters ultimately go into business for themselves—30 percent of carpenters are self-employed.

Plumbers and electricians have similar career paths. Most states require plumbers and electricians to be licensed or to work under a licensed tradesman. As a result, a relatively high proportion of plumbers and electricians have had formal training in their craft and most complete an apprenticeship program. Union penetration varies by industry: 30 percent of plumbers and pipefitters are unionized, compared to 60 percent of electricians. On average, unionized electricians earn 38 percent more than their non-unionized peers.<sup>18</sup> The dominant path of advancement for electricians and plumbers is from helper to apprentice to journeyman. For plumbers and electricians, apprenticeships typically last three to five years. Unionized apprenticeships are typically longer than "merit shop" apprenticeship programs.

Like carpenters, electricians can advance to operating their own businesses if they meet licensing requirements. They can also move on to supervisory positions. However, carpenters often have an advantage over other tradesmen in competing for general construction supervisory positions: they are exposed to the entire construction process, from foundation work to finishing. Workers who have mastered skills in all facets of the trade and have demonstrated leadership qualities are the best candi-

dates for promotion to supervisor. Supervisors oversee tradesmen to ensure that work is properly performed, and they are responsible for resolving problems that arise at the job site. Frontline supervisors of construction workers have a median annual salary of almost \$48,000.

Supervisors with strong organizational skills and exceptional supervisory ability have the potential to advance to construction managers. Construction managers are responsible for getting a project completed on schedule by working with the architect's plans, assigning tasks, overseeing supervisors, and ensuring that materials are delivered on time and every phase of the project is completed properly. Construction managers have annual median earnings of \$63,500. Advancing to construction manager is feasible for workers who have not been to college: 40 percent of construction managers have only a high school degree. There are 390,000 construction managers in the United States.

### ***Stability of Demand***

Construction demand is related to population movements and business growth, factors that often reflect local economic conditions. Accordingly, the number of work and apprenticeship opportunities in a given year may vary widely from area to area. Overall, demand for workers in the building trades is projected to remain strong. Collectively, these three occupations are projected to add 80,917 new jobs each year through 2012. However, building trades workers are subject to the ups and downs of the construction industry, as well as the short-term nature of many construction projects. As a result, periods of unemployment, often seasonal, are not uncommon, particularly for carpenters.

There is no risk of offshoring. In general, there is also very little risk of automation displacing human labor. However, one technological trend that is emerging is the increased reliance on prefabricated components for building construction. Prefabricated components, such as pre-hung doors and windows and prefabricated wall panels and stairs, are prepared in factories and then installed at the building site. In the long term, prefabrication may reduce the number of tradesmen, particularly carpenters, required to put up a building.





## Commercial Drivers of Heavy Vehicles

### SUMMARY OF OPPORTUNITY ANALYSIS

	Heavy Truck	Bus
Standard Occupational Code	53-3032	53-3021
Current employment	1.8 million	655,000
Projected annual openings	62,517	25,000
Wage range (25 percentile to 75 percentile in 2002):	\$26,020-\$41,610	\$21,870-\$39,510
Offshoring risk	Low	Low
Technology risk	Low	Low
Industry risk	Low	Low
Educational profile	High School/Some College	High School/Some College
Accessibility of jobs to new entrants	Highly accessible to low-skill workers. Employers seek candidates who have appropriate driving skills, the ability to read and understand maps and road signs, and at least 6 to 12 months of driving experience of any kind. Employers may also screen for soft skills. Criminal records are not an automatic disqualifier.	
Accessibility of training programs	Programs are relatively short (6-12 weeks) and offered in the evenings and on weekends. Costs range from \$2,000 to \$5,000, and programs may be eligible for Pell Grants.	
Career paths and advancement options	Increases in earnings are possible through seniority and changing jobs within the industry. Advancement opportunities include becoming an owner operator, moving into management, or training to become a diesel mechanic.	
Stability of demand	Very stable demand.	
Successful strategies for adapting program to low-skill workers	Incorporate soft skills training and job counseling into the training. Provide tuition assistance. Provide help securing the first job.	

### Overview

Commercial driving of heavy vehicles offers opportunities for living wage earnings, advancement, and stable employment. Training for this profession is widely available, relatively inexpensive, and typically offered in a format that is manageable for working adults. In addition, the BLS forecasts increasing demand. Many employers report that they have difficulty recruiting commercial drivers, they are offering various incentives to attract drivers, and wages are expected to increase.

The shortage is most acute in what is called the “truckload industry,” in which full trailers typically destined for a single location are hauled long distances. Truckload drivers are often away from home for extended periods of time; long distance routes

can take several weeks to complete. Because of the long hours, truckload driver positions tend to be among the highest paying commercial driving jobs.

“Less than truckload” (LTL) haulers transport bundled loads destined for several nearby locations in a single truck. Drivers of LTL loads are more often home at night, so it is easier to recruit and retain them. Because of the better working conditions, job opportunities with LTL carriers are harder to get than those with truckload carriers.

A number of reasons have been cited to explain the shortage of drivers in a field that generally pays well and offers predictable and steady earnings. Demand is being fueled both by increased economic activity and lower productivity per truck. Since its peak in 1997, the number of miles driven



per tractor per week has declined almost 5 percent.<sup>19</sup> This decline is attributable to increased traffic density and additional port and border security measures that slow the movement of truck freight. New federal regulations governing the number of hours a driver can work per day are expected to further reduce productivity. Analysts forecast that the rules, adopted in 2004, will reduce driver-truck productivity at least another 3 percent.<sup>20</sup> The American Trucking Association estimates that each 1 percent decline in productivity translates into a need for an additional 20,000 trucks.

A final factor in the increased demand is continued adoption and expansion of just-in-time inventory management. This increases the number of trucks required as businesses receive fewer bulk orders and more orders for smaller shipments on tighter delivery schedules.

Several factors drive the other side of the shortage: the number of workers. First, federal regulations require interstate truckers to be at least 21 years of age. As a result, high school graduates cannot be recruited directly into long haul trucking. By the time they are 21, many workers have been trained in other occupations. Second, the need to assist with loading and unloading freight makes the work physically demanding. Third is the long time away from home required of many truckload drivers. Finally, the pay may be too low to attract an adequate number of drivers. Although base pay has risen over the past 10 years, it has not kept pace with inflation. Furthermore, the decline in productivity discussed above reduces driver's earnings because most long distance truckers are paid on a per-mile basis. Given the current shortage of drivers, wages are likely to increase.

The very different nature of work among LTL drivers, truckload drivers, and other commercial drivers affords opportunities for optimizing the placement of job seekers. Commercial drivers of heavy vehicles must have either a Class B or Class B license. A high percentage of Class A driving jobs are long distance truckload hauling. Class A driving is often more physically demanding than Class B work and therefore not appropriate for all candidates. In addition, long-distance trucking work may be particularly challenging for individu-

als who have been unemployed for a long period of time: they must abruptly transition from not working at all to working long shifts and being away from home for extended periods. These aspects of long haul Class A driving make it a difficult occupation for individuals with families. The challenging nature of long distance (truckload) trucking is reflected in high turnover among drivers. The American Trucking Association reports that annual driver turnover among the large, national truckload carriers is over 116 percent. LTL carriers have a much lower rate of turnover—approximately 20 percent per year.

Most Class B truck drivers work as route drivers doing short haul pickup and delivery. Class B drivers can also qualify to become bus drivers. Although the BLS classifies bus drivers separately from heavy truck drivers, it is a common career path for holders of Class B licenses. Within bus driving are two distinct segments: school buses and municipal transit. Drivers of school buses earn less than municipal drivers and often work part-time. These jobs are not accessible to individuals with felony records. Municipal bus driving pays better, but the jobs are harder to obtain. A logical career path for individuals interested in bus driving is to develop experience as a school bus driver and then advance to transit bus driving.

While the basic driving skills required to operate a bus or truck are similar (except for tractor trailers), the characteristics of the jobs differ significantly. Bus driving offers a more social environment than delivery work and also involves responsibility for passenger safety. Truck driving, which often requires assisting with loading and unloading freight, is more physically demanding than bus driving but it typically pays better. The more physically demanding nature of truck driving may

***The shortage of drivers is most acute in what is called the “truckload industry,” in which full trailers typically destined for a single location are hauled long distances.***



explain, in part, the significant difference in employment by gender between the occupations: 48 percent of bus drivers are women but only 5 percent of truckers.

Commercial drivers must be able to handle the stress of negotiating traffic in a large vehicle while constantly under pressure to make deliveries/pick-ups on schedule. Interpersonal skills are also important. While much of the work is done behind the wheel, drivers must interact with passengers (in the case of bus drivers) and freight handlers (in the case of truckers). Interpersonal skills are particularly important for bus drivers.

Given the significant differences in the character of commercial driving opportunities, care should be taken in matching candidates with training and placements based on their background, interests, family circumstances, and physical capacity.

### Commercial Driver Licensing

**Class A:** Any combination of vehicles with a gross weight of 26,001 or more pounds, provided the gross weight of the vehicle(s) being towed is over 10,000 pounds. This is the license required to drive tractor-trailer trucks.

**Class B:** Any single vehicle with a gross weight of 26,001 or more pounds, or any such vehicle towing a vehicle under 10,000 pounds. This is the license required to drive full-size buses and most heavy delivery trucks.

**Class C:** Any single vehicle, or combination of vehicles, that does not meet the definition of Class A or Class B but is either designed to transport 16 or more passengers, including the driver, or is placarded for hazardous materials. This is the license required for operating vans, mini-school buses, ambulettes, UPS delivery trucks, etc.

### Accessibility of Jobs to New Entrants

The federal government has established three classes of commercial driving licenses (see box). Individuals interested in becoming a commercial driver of heavy trucks or buses must obtain a Class B or Class A Commercial Drivers License.<sup>21</sup> Drivers of buses must also obtain an endorsement for transporting passengers. Employers seek candidates who not only have appropriate driving skills, but also have the ability to read maps, a knowledge of the local area, and at least 6 to 12 months of driving experience of any kind, including passenger cars. The required driving experience varies by employer. In addition, all drivers must be able to read and speak English well enough to read road signs, prepare reports, and communicate with law enforcement officers and the public.

Employers also screen applicants for soft skills, including positive attitude, dependability, motivation, customer service skills, and strong interpersonal skills. For Class B drivers, the field is accessible to individuals with limited work experience as long as they possess a clean commercial driver's license and the soft skills described above.

Employment as a Class A driver can be obtained directly after successfully completing a training program. However, federal law stipulates that interstate truckers must be 21 years of age or older and undergo a federal background check. Criminal records are not an automatic disqualifier unless the records include felonies involving the use of a motor vehicle, a crime involving drugs (including driving under the influence of drugs or alcohol), or any hit-and-run accident that resulted in injury or death. Most larger trucking firms require new Class A drivers to spend an initial probation period driving with a second, experienced driver in the cab. Supervised drivers earn less per mile than experienced drivers.

Given the current shortage of commercial drivers, employment is relatively easy to obtain and training programs report high placement rates.

### Accessibility of Training Programs

#### Length of Program

Commercial driving programs combine classroom instruction and “behind the wheel” training. The length of program varies somewhat among training providers and differs depending on whether a Class A or Class B license is being sought. Typical Class A programs last 250 to 500 hours spread over six to twenty weeks. Evening, weekend, and part-time programs are common both among proprietary and community college providers. Class B programs tend to be significantly shorter—often as little as one week—and they are often delivered on a one-on-one basis. These programs can be as short as 40

to 60 hours. In either case, only a minimal amount of time outside of training is required, less than 2 hours per week.

### Availability of Training Spaces

Commercial driving training is available from proprietary training programs as well as many community colleges. Company-sponsored training is also available from some of the larger trucking firms. The Professional Truck Drivers Institute, which certifies truck driving schools, estimates that there are approximately 400 truck driving training programs in the United States. PTDI believes that there is ample training capacity to supply the industry.

### Flexibility of Schedule for Working Adults

Class A training is widely offered in evening, weekend, and part-time formats by proprietary providers and community colleges. Discussions with training providers indicate that many of their students work full time while attending training.

### Entrance Requirements

To participate in a training program, one must have a valid passenger car license. While specific commercial licensing requirements vary from state to state, one must generally have a clean driving record and no recent violations for DUI. A GED or high school diploma is not required for admission to most training programs.

To participate in behind-the-wheel training, students must obtain a Commercial Driver's License Learner's Permit. Most programs begin with a period of training to prepare students for the written permit exam. To pass the exam, a student needs to be able to read at the seventh- to eighth-grade level. To qualify for federal financial assistance, students who lack a high school diploma or GED must pass an Ability to Benefit Exam, which reflects their ability to handle college-level course work.

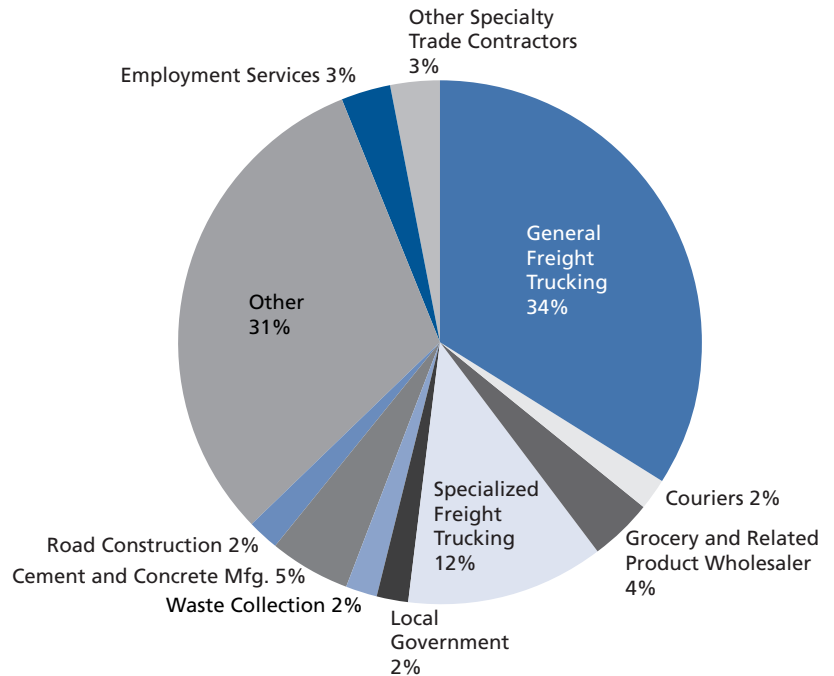
### Cost of Training

Private proprietary schools charge roughly \$3,000 for Class B training and \$5,000 for Class A training. Community college programs for Class A licenses cost around \$2,800 to \$4,000. Community College Class B programs cost around \$2,000 to \$2,500. Some schools are accredited and eligible for Pell Grants.

### Career Pathways and Advancement Options

Earning a Class B commercial license allows the candidate to obtain work as a driver of medium and heavy weight trucks but not tractor trailers. Positions include driving delivery vehicles for UPS or FedEx, driving heavy

### Heavy Truck Driving by Industry



Source: Bureau of Labor Statistics, Occupational Employment Statistics Survey data 2003

construction trucks, or driving local delivery trucks (route driver). Nationally, median earnings for heavy truck drivers (which includes both Class A and Class B drivers) are \$33,210. For route drivers, earnings usually relate to the weight of the items being transported. The top de of heavy truck drivers earn \$49,400.

Class A drivers are qualified to drive tractor-trailer trucks. Tractor-trailer drivers are usually paid by the mile and typically earn more than Class B drivers. Some Class B licensees work for several years as a bus or short-haul truck driver, and then obtain a Class A license to seek work as a heavy truck driver. Nationally, there are approximately 63,000 employment openings for heavy truck drivers per year. Employment is concentrated in ten industries that account for 69 percent of total employment for the occupation (see chart).

Of the 10 leading heavy-truck-driving industries, the highest paying are general freight trucking and grocery

**Given the current shortage of commercial drivers, employment is relatively easy to obtain and training programs report high placement rates.**

and related products wholesalers, with median earnings of approximately \$36,500 and \$35,000, respectively.

### Bus Driving

A Class B driver with a “P” endorsement is qualified to drive passenger buses. There are approximately 650,000 bus drivers, 72 percent of whom are classified as school bus drivers. On average, school bus drivers earn less than transit and city bus drivers. Median earnings for school bus drivers and transit drivers are \$22,390 and \$29,580 respectively. A logical career path for bus driving is developing experience as a school bus driver and then proceeding to transit bus driving. There are approximately 25,000 job openings per year for bus drivers.

### Advancement Beyond Driving

While most advancement takes the form of increased earnings through seniority and job hopping within the industry, there are a number of potential advancement paths for holders of Commercial Driver’s Licenses. These include becoming an owner-operator, moving into management, or training to become a diesel mechanic. (Career maps are included in Appendix C.)

### Stability of Demand

The transportation of freight by truck accounts for most heavy truck driving employment. In 2003, trucks moved 70 percent of domestic freight tonnage, and they will long continue to be the primary means by which freight is moved within the United States. Demand for truck drivers is expected to continue to be strong, with an average of 63,000 net openings per year. The work cannot be offshored and does not appear vulnerable to automation.

The demand for bus drivers is also stable and, by its nature, not at risk of being offshored. However, significantly fewer bus driver opportunities are available each year, and only 7,500 are for the better-paid transit and intercity drivers.

### *Red Hook on the Road*

There are an estimated 400 commercial driver training programs in the United States, but very few are tailored to meet the needs of low-income, unemployed job seekers. Red Hook on the Road, in Brooklyn, New York, is a noteworthy exception. Since its inception in 1995, RHOR has prepared over 700 low-income individuals for careers as Class B commercial drivers.

RHOR, a program of the not-for-profit Brooklyn Workforce Innovations, serves a difficult-to-employ population. All participants have at least one significant barrier to employment, in addition to being low-income and unemployed. A third of participants have had significant interaction with the criminal justice system, and only half have earned their high school diploma or GED. To be accepted in RHOR, candidates must be low-income, at least 21 years of age, able to read at approximately an eighth-grade level, hold a valid driver’s license with no prior DUI violations, and demonstrate genuine interest in becoming a commercial driver and a commitment to completing the training program.

RHOR training is offered free of charge and consists of a combination of classroom and “behind the wheel” training. The program lasts 5 weeks and requires a commitment of 35 to 42 hours per week. Most proprietary and community college training programs are significantly shorter, often as short as two weeks. RHOR has found that the extended training builds student confidence and better prepares them for passing the Commercial Driver’s License road test and securing employment. RHOR’s results bear this out: In 2004 RHOR’s graduation and placement rates were over 90 percent, with an average initial starting wage of \$11.11 per hour.

RHOR attributes its success to both a selective screening process and an array of supportive services, including case management and social service referrals, soft skills training, assistance with child care and housing related issues, in addition to job placement and career advancement services.



## Making Jobs More Accessible: Key Observations and Strategies

This guide is intended to help practitioners target occupations offering career advancement for low-skilled workers based on how realistic the opportunities are, how stable the demand is, and what strategies are needed to help workers succeed in them.

In the course of conducting this analysis, many lessons emerged about what it will take to make postsecondary training and higher-paying jobs accessible to less-skilled workers. Changes in program design and operation as well as in government policy will be needed to create advancement paths for those now trapped on the bottom rungs of the job ladder.

### Lessons for Program Design and Operation

*To identify the most promising advancement opportunities for less-educated adults with limited job experience, local and state workforce planning organizations (e.g., WIBs) need the capacity to go beyond published numbers to identify changing employer hiring needs and requirements and determine the accessibility of training programs required to qualify for these jobs.*

The case of computer support specialists highlights the need to understand the actual criteria that employers use in filling job openings (i.e., previous on-the-job experience is essential), as well as the way employer needs can change very quickly (i.e., rapid decline in the need for mid-level Web developer/webmaster positions).

The example of nursing illustrates the importance of carefully investigating the accessibility of training programs before determining advancement targets. While RN appears the most attractive target among jobs that require an Associate's degree or less, the length of most Associate of Nursing degree programs and the difficulty in gaining entry to these programs make this job a challenging reach for less educated, working adults. The employment and training programs that have successfully prepared and placed low-income adults into RN degree pro-

grams, like Project Quest and Project Arriba in Texas, have screened candidates carefully to ensure that their circumstances would allow them to attend school on full time for three years and that they already had at least moderately strong academic skills.

Workforce planning organizations, including public Workforce Investment Boards and private workforce intermediary organizations,<sup>22</sup> need to be able to conduct the types of investigations described in this guide to determine the most promising advancement routes for less-skilled adult workers and the strategic investments required to make these occupations accessible. They also need the means to communicate regularly with employers and training providers in order to update and revise their programs as industry and broader economic conditions change.

*Given prevailing hiring practices, programs designed to advance less-skilled workers into better-paying jobs must provide participants with the full complement of skills, work experience, and employer connections required to secure a position in the targeted occupation.*

The investigation of employer hiring practices in filling computer support specialist positions showed prior work experience to be the most valued qualification, followed closely by professional or "soft" skills, such as critical thinking and communication skills. Candidates without these qualifications would not be competitive for most positions. The success of Year Up, a computer training program for urban adults aged 18 to 24, shows that it is possible to provide young, inexperienced workers with access to well-paying support positions if they receive the skills and work experience required to meet employers' hiring standards.

Year Up trains participants and places them in six-month internships and then in permanent computer support positions. Its ability to do this successfully rests on: providing customized training based on employer specifications, updated continuously in response to employer feedback; executing a strong



marketing and quality control system to secure and properly service corporate internship placements; and providing soft-skills training and mentoring to prepare and support young urban adults in demanding corporate environments. This comprehensive set of operational features stands in sharp contrast to the typical training and placement offerings of commercial or community college sponsored computer training programs. And given employer hiring practices, programs that do not provide comprehensive services, including a well-supported, on-the-job training experience, are unlikely to be effective in securing computer jobs for low-income participants.

*To help clients capitalize on advancement opportunities within broad occupational categories like customer service representative, employment and training programs need to identify the subset of jobs that offers the best opportunities for wage and career growth, and then provide career counseling to help workers navigate complex promotional pathways.*

After RN, customer service representative is the occupation with the largest number of projected job openings that pay at least \$25,000 a year. But the jobs within that broad occupational category vary greatly, as do opportunities for advancement. Given the complex promotional paths within the customer service field, any worker seeking advancement in this field will benefit from help in navigating the territory. This assistance is a must for less educated, less experienced workers. Formal and ongoing career counseling is needed to help participants find an administrative job that offers a good starting place, evaluate the skills they should seek to improve their chances for advancement, and determine the best promotional paths to pursue.

*Embedding postsecondary training for skilled jobs within employer-sponsored advancement programs that offer intensive remedial instruction at or near the worksite, ongoing academic and personal support; worker-friendly schedules, and clear rewards in promotion and pay are particularly effective.*

The employer- and union-sponsored LPN training programs referenced in this report illustrate important design innovations that are opening up well-paying, licensed nursing positions to nursing assistants and other entry-level health care workers with limited educational backgrounds.<sup>23</sup> Given the rigorous academic requirements for entry into LPN programs (i.e., eleventh grade or higher literacy and math levels), these programs are a long reach for less-educated workers, many of whom who read at the eighth-grade level or lower. Were these workers to pursue traditional adult education programs to prepare for the LPN entrance exams, it would typically take them a year or more to complete that preparation. Many would get discouraged and drop out. Embedding remedial and pre-college preparation classes within an employer-sponsored career path would allow a higher percentage of less-educated workers to access LPN programs. The embedded programs typically deliver academic preparation courses at the worksite in an accelerated format while guaranteeing participants acceptance into an LPN training program upon completion of the required courses. Other design innovations—such as employer-sponsored tuition benefits, worker-friendly part-time and weekend course schedules, and ongoing academic and personal support—also help participants to succeed in these demanding academic programs while they work and raise families.

*Adult basic education and college preparatory education programs capable of providing flexible, accelerated instruction are essential for making better-paying jobs accessible to low-income workers. Wherever possible, these programs should be the first rungs of work-based career ladders and sequenced so that ABE coursework can lead directly into college preparatory classes.*

**Changes in program design and operation as well as in government policy will be needed to create advancement paths for those now trapped on the bottom rungs of the job ladder.**

Of the jobs highlighted in this report, only commercial drivers do not have to possess advanced literacy and math skills to qualify for education programs, including apprenticeship training and employment. (Drivers generally need to show at least a seventh-grade reading level to secure employment.) Adult basic education programs that efficiently prepare workers for entry-level exams are critical. Equally important are courses that prepare adults for the academic demands of postsecondary training programs, such as those in nursing or automotive technology. Creating a transparent feeder system from ABE to college-preparatory coursework is important to ensure that low-literacy adults gain the qualifications needed to enter postsecondary training programs for better jobs.

### Lessons for Policy

*A public-private financing vehicle to underwrite expanded training opportunities for incumbent workers would yield tremendous benefits by establishing a stable pipeline of qualified individuals for in-demand jobs and lifting low-income workers into middle-class jobs.*

The CNA-to-LPN advancement programs highlighted in this report exemplify the type of public-private partnership needed to provide advancement opportunities for less-educated workers with limited financial means. Employers make substantial contributions to financing their workers' advancement: through tuition reimbursement for courses, release time or adjustment of work schedules to accommodate training, free classroom space and equipment, and use of their professional nursing staff as clinical instructors. But less-educated, lower-income workers need much more support than their middle-class peers to gain access to and complete demanding postsecondary certification and degree programs. They need access to remedial literacy and math instruction as well as college-preparatory courses. They need ongoing counseling and support to juggle academic, work, and family demands. And they need financial support to cover program costs that exceed typical tuition reimbursement benefits. It is unreasonable to expect employers to bear the entire costs of preparing and supporting less-educated workers.

Public funds are critical to making “grow your own” strategies economically viable and attractive to employers. Without this public support, the vast majority of employers will take a less costly route to filling vacancies. Public funds are also critical for creating and expanding community-college training programs designed to serve the needs of working adults. The CNA-to-LPN programs highlighted in this report all succeed because they offer part-time or work-friendly schedules, often situated at or near the participant's worksite. In labor shortage areas such as nursing or automotive technician, the state should subsidize the development and expansion of worker-friendly training programs. An LPN training program can cost \$8,000 to \$13,000 per student to deliver. Employers and their low-income workers cannot be expected to cover this level of cost. Additional public funding (or the redirection of existing funds) is needed to create training slots for low-income working adults.

*States should set targets for the number of low-income working adults participating in publicly supported occupational education programs that lead to well-paying jobs, and they should hold institutions accountable for meeting participation and graduation targets. Institutions meeting or exceeding targets should receive financial rewards.*

Until public funding for occupational education programs becomes a clear state priority, existing programs will likely continue to operate as they have in the past. As long as programs can recruit enough students to fill their seats, they have little incentive to make their design more accessible to low-income working adults. States need to provide clear incentives for institutions to do so.

*Public investment in occupational training programs should be directed toward the most effective designs for advancing low-income workers, regardless of program sponsor.*

Currently, no state has a process for evaluating the effectiveness of different training program models and directing investment toward the best ones. States would benefit in several valuable ways from developing a performance-based monitoring and financing system that would enable it to: first, iden-

tify occupational training programs that are effective in preparing and placing low-income and other at-risk clients in well-paying jobs; and, second, direct funding toward those programs. A competitive, performance-based funding process would promote the development and expansion of innovative program designs outside of traditional, public post-secondary vocational training institutions, particularly those that are well-connected to employers. It would also encourage the operators of occupational training programs to upgrade their programs to improve performance and incorporate proven features of innovative models.

*New public and private financing mechanisms are needed to encourage entrepreneurial workforce program developers and operators to create and expand effective occupational training programs for less-skilled workers.*

Advancement opportunities for less-skilled workers will continue to shift as a result of changes in the economy and employer practice. To capitalize on these opportunities will require nimble, entre-

preneurial workforce program developers who can shift operations from declining occupational areas to growing ones. In the private marketplace, businesses can secure loans or equity investments to finance the costs associated with expanding into new markets or developing new product lines. No comparable financing mechanism is available to workforce program operators to fund their growth and expansion. And until there is one, even the best programs will lack the capital to seize new opportunities and develop advancement pathways to middle-class jobs for those now trapped at the bottom of the career ladder.

*Public and private funders of adult basic education and college-preparatory programs (e.g., developmental courses at local community colleges) should make it a priority to fund employer- and union-sponsored career advancement programs that make remedial courses the first rung of clearly delineated advancement pathways for low-skilled workers.*

Situating ABE and developmental education courses at or near the worksite within employer- and union-sponsored advancement programs appears to be a very effective strategy. Funders of these programs should require existing and new training vendors to design and deliver more work-based programming. They should also encourage providers—or even require them—to create transparent and coherent educational pathways from ABE to college-preparatory coursework.

*Given the importance of finding the best advancement opportunities for low-income workers and targeting investment accordingly, government funding for WIBs and other workforce intermediaries needs to include money for organizations to develop this capacity.*

Workforce planning bodies need the capacity to analyze the local labor market and communicate regularly with employers and training providers to determine the most promising advancement opportunities and direct investment and program development energies toward those targets.





## APPENDIX A: Selected Resources for Secondary Research

### Newspapers and Periodicals

*Business Week*

*The Economist*

*The New York Times*

*The Wall Street Journal*

### Trade Publications and Associations

#### Nursing

*Nurseweek Magazine*

#### Computer Support Information

*Certification Magazine*

Computing Technology Industry Association,  
CompTIA.org

#### Commercial Driving

American Trucking Association

*Drivers* (business news for the professional trucker)

*Fleet Owner Magazine*

Professional Truck Drivers Institute

#### Automotive Repair

National Institute for Automotive Service  
Excellence

*Brake and Front End Magazine*

### Internet-Based General Business Information Resources

#### Industry Information Resources

Web-based links to resources for over 250 industries. Web pages for each industry list resources available from trade associations, publications, and research firms that address subjects such as industry overview, issues, trends and outlook, financial ratios and benchmarking, compensation surveys, and valuation resources.

[www.valuationresources.com](http://www.valuationresources.com)

#### Standard & Poor's NetAdvantage

A comprehensive source of business and investment information, offering online access to Standard & Poor's independent research, data and commentary on stocks, bonds, funds, and industries.

[www.netadvantage.standardandpoors.com](http://www.netadvantage.standardandpoors.com)

#### Encyclopedia of Associations

Useful for finding trade and industry associations and their Web sites. Available through public libraries, universities, etc.

#### LexisNexis Statistical

Statistical Universe indexes statistics produced by governmental, non-governmental, and private sources. Coverage is international. Available through public libraries, universities, etc.

[www.lexisnexis.com](http://www.lexisnexis.com)

### Proprietary Research

#### Studies from Consulting Firms

Forrester Research, Inc. (technology industry research): [www.forrester.com](http://www.forrester.com)

Gartner, Inc. (technology research and consulting): [www.gartner.com](http://www.gartner.com)

#### Studies from Investment Banks

Credit Suisse First Boston, Goldman Sachs, etc.



## APPENDIX B: List of Interviews



*Interviews were conducted in fall 2004 and winter 2004-05. For each occupational cluster, interviews were conducted with both employers and training providers regarding employer expectations, hiring practices, advancement potential, and emerging trends in the occupation.*

### Commercial Driving

Phil Barrows, New England Tractor Trailer School

Nancy O'Liddy, Director, Professional Truck Drivers Institute

Bob Pine, Admissions Director, Western Truck School

Aaron Shiffman, Executive Director, Brooklyn Workforce Innovations

### Auto and Truck Technicians

William Hanlon, Manager, Youth Automotive Training Center, Newark, New Jersey

George Hritz, Program Coordinator, Auto Technology, Marin County Community College

Richard Jennings, Associate Professor of Automotive Technology, Ben Franklin Institute of Technology

Joseph Tamarro, Service Manager, BMW of Peabody

### Building Trades

Earl Buford, Executive Director, Big-Step

Burt Durand, Communications Director, New England Regional Council of Carpenters

Tracey Griffith, Lead Instructor/Intake Specialist, Big-Step

John Heffner, Executive Director, Training and Educational services, Associated General Contractors of America

Barbara Lagergren, Director, The Gould Construction Institute

Eric Parker, Executive Director, Wisconsin Regional Training Partnership

Robert Piper, Associated Building Contractors

### Customer Service Representatives

Richard Elliott and Linda Fera, New England College of Finance

Michael Fopiano, Harvard Pilgrim Group

William Freed, President, Freedlance Consulting

Jeff Jablow, President, Origin, Inc.

Larry Mariasis, Call Center Director, Bank of America

Tom Tucker, Principal, Response Design

### Computer Support Specialists

Jim Gildea, President, Aegis Associates

Jim Guion, Vice President, Quality Assurance, Bluesocket

Matt McCann, Director of Development, Year Up

Jonathan Soons, Network Administrator, Julliard School of Music

### Nursing

Elaine Baker, Director of Workforce Initiatives, Community College of Denver

Shawntsi Baret-Stone, Vice President, Workforce Development, WorkSource Partners

Patricia A. Campbell, Manager Training and Development, WorkSource Partners

Terry Eggenberger, RN, MSN, Workforce and Organizational Program Director, JFK Medical Center

Cheryl Feldman, Director, District 1199C Training and Upgrade Fund

Debora Kerr, former Vice President, Resource Development, Workforce Alliance

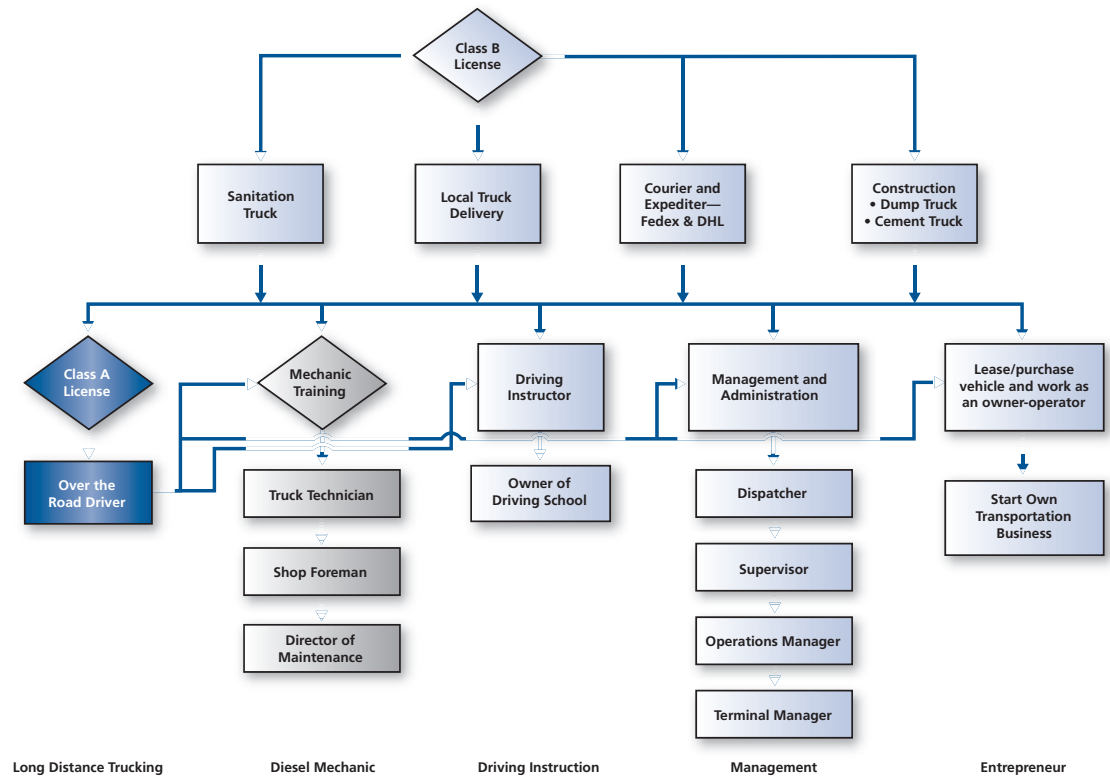
Linda Merkl, Site-based Healthcare Program Manager, Community College of Denver

Neil Silverston, President, WorkSource Partners

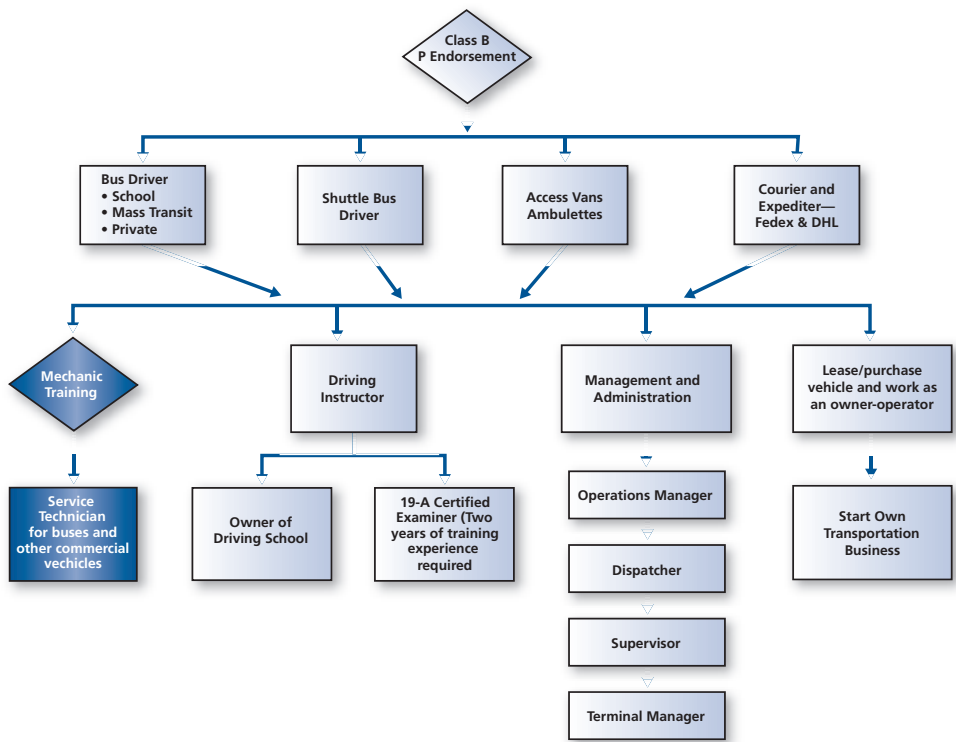
Marsha Thrower, Vice President, Resource Development, Workforce Alliance

# APPENDIX C: Commercial Drivers of Heavy Vehicles Career Maps

## Commercial Driving Class B Path



## Commercial Driving Class B (P) Path



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## Endnotes

- <sup>1</sup> Clearly, the cost of living varies regionally and is significantly influenced by local housing, health care, and transportation costs, among other factors. Ideally, target wages should be identified within a local context and, where appropriate, for a specific population to be served.
- <sup>2</sup> The BLS model for projected employment change is based on assumptions about *Industry Growth* and *Separations* (the flow of workers out of an industry or occupation). Industry growth is a measure of the number of openings in an industry based on the number of jobs projected to be needed to produce the forecast future outputs. Estimates of the number of jobs needed to produce a certain level of output are based on the present number of jobs required to produce the current output. Total Separations are the number of people who leave jobs within the industry (including people who leave a job and take another job in the same industry). Net Separations is equal to the total number of people who leave a job in the industry/occupation net of those who return to another job in the industry/occupation.
- <sup>3</sup> An alternative approach might be to look at the range of occupations locally that fit all other screens and then rank them based on job openings, focusing on the top 20 or 30 jobs in terms of numbers of openings that fit all other screening criteria.
- <sup>4</sup> Source: Debashish Sinha, principal analyst, Gartner IT services group, as quoted at: [www.gartner.com](http://www.gartner.com).
- <sup>5</sup> Source: *Occupational Outlook Handbook 2004-2005 Edition*. Bulletin 2540. Available online at: <http://www.bls.gov/oco/>
- <sup>6</sup> Because of the wealth of information available on the various nursing professions, we present details for Registered Nurses separately from Licensed Practical Nurses, although they are part of the same nursing occupational cluster.
- <sup>7</sup> Source: *Occupational Outlook Handbook 2004-2005 Edition*. Bulletin 2540. Available online at: <http://www.bls.gov/oco/>
- <sup>8</sup> Interview with Cheryl Feldman, director of 1199C Training and Upgrade Fund, Philadelphia, PA, September 1, 2004.
- <sup>9</sup> Source: *Occupational Outlook Handbook 2004-2005 Edition*. Bulletin 2540. Available online at: <http://www.bls.gov/oco/>
- <sup>10</sup> Source: *Brake and Front End Magazine*. April 2004.
- <sup>11</sup> In an Information Technology Association of America study, employers ranked troubleshooting and facilitation/customer service skills as the most important skills for computer technicians to possess, followed by hardware/software installation and configuration skills (ITAA 2000).
- <sup>12</sup> Source: *Occupational Outlook Handbook 2004-2005 Edition*. Bulletin 2540. Available online at: <http://www.bls.gov/oco/>
- <sup>13</sup> Source: [www.comptia.org/certification/default.aspx](http://www.comptia.org/certification/default.aspx)
- <sup>14</sup> Source: [www.Microsoft.com/learning/mcp/certifications.asp](http://www.Microsoft.com/learning/mcp/certifications.asp)
- <sup>15</sup> Diane Morello, Vice President of Research, Gartner Inc. Quoted at [Earthweb.com](http://Earthweb.com) March 16, 2004
- <sup>16</sup> Dun and Bradstreet Data Business Failure Record 1997. The Dun & Bradstreet Corporation, Economic Analysis Department. Business Failure Record. New York, 1990-1996. (last year available)
- <sup>17</sup> While the U.S. Department of Labor collects data on the number of apprenticeship programs and participants in the country, the data is aggregated across industries. Precise figures for the specific trades (carpenters, plumbers, and electricians) are not available. In aggregate, there are approximately 12,000 construction apprenticeship programs serving an estimated 186,000 individuals. Because plumbing, carpentry, and electrician apprenticeships typically last at least four years, this suggests that there are approximately 45,000 first-year apprenticeship slots available each year. Projected annual openings are over 80,000 for all three trades, so there is roughly one apprentice slot for every two net openings for carpenters, electricians, and plumbers.
- <sup>18</sup> Source: Differences in Union and Nonunion Earnings in Blue-collar and Service Occupations. [www.bls.gov/opub/cwcl/cm20030623ar01p1.htm](http://www.bls.gov/opub/cwcl/cm20030623ar01p1.htm), Posted June, 2003.
- <sup>19</sup> Source: Thomas Albrecht, in *Freightlines*, BB&T Capital Markets Equity Research Department. September 30, 2004.
- <sup>20</sup> Ibid.
- <sup>21</sup> Drivers who operate special types of commercial vehicles must also pass additional tests to obtain any of the following endorsements on their commercial driver's license: Double/Triple Trailers, Passengers, Tank Vehicles, Hazardous Materials, Combination of Tank Vehicle and Hazardous Materials.
- <sup>22</sup> Workforce intermediaries are organizations that can take the lead in serving both the skill needs of employers and the career needs of workers. They help close gaps between what the public workforce development system can provide and what workers and employers need. In many ways, intermediaries can operate like Workforce Investment Boards, planning for local or regional economic needs. Two examples are the Wisconsin Regional Training Partnership, a nonprofit membership organization that is dedicated to family-sustaining jobs, and the Connecticut Business and Industry Association, the nation's largest statewide business organization, with 10,000 member companies. See also JFF (2004).
- <sup>23</sup> See page 17, "Strategies for Designing LPN Programs for Low-Skill/Low-Income Workers," for detailed descriptions of four programs.





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