

**WASHINGTON STATE
WORKFORCE TRAINING AND EDUCATION COORDINATING BOARD
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TOMORROW'S ECONOMY

This is a draft of the first chapter of *High Skills, High Wages 2006*.

Over the past two years, Washington's economy has been recovering well from the last recession. Job growth has been robust, the labor force has increased, and the unemployment rate has fallen. In fact, Washington has shown more economic vitality than the nation as a whole. Forecasts indicate that our economy should continue to see job gains, although perhaps not at the level of 2005.

Technological advancements and globalization will continue to affect the jobs created and available, and the skills required of workers. New jobs will increase the demand for more highly- and differently-skilled labor. In order for Washington to remain economically competitive, we will need to ensure that we have a workforce with the training and skills required.

Employers report shortages of both job-specific and employability skills. Job vacancies in spring 2005 were especially high in the health care and social assistance industry. The construction industry reported the highest percentage of *new* openings among its vacancies.

Long-term projections indicate that the information and services industries are the fastest growing driven by software publishing and professional and business services.

Board Action Required: None. For discussion purposes only.

TOMORROW'S ECONOMY

High Wages for the Highly Skilled

Washington's economy, like that of the U.S. economy as a whole, is continuing its transition from one based mainly on the production of goods to one based more and more on knowledge and information. This emerging knowledge-based economy has been increasing demand for workers with more advanced skills and higher levels of education than in the past. The upside of these changes is that many of these jobs are not only the fastest growing, but also the best paying ones. In order to obtain these jobs, workers will generally require some form of postsecondary education or training, they won't, however, usually require a four-year degree.

Technological advances and globalization have fostered significant changes in workplace technology and in the way that workplaces are organized. Employers have invested heavily in technology, especially information technology (IT), and have instituted high-performance workplace practices such as teaming and quality improvement. However, these changes flourish only where there are workers with the requisite skills. If Washington wants its citizens to enjoy high-paying jobs, we must prepare people to use current and emerging technologies and function effectively in high-performance workplaces.

Global competition is intensifying, and the offshore outsourcing of knowledge work overseas has raised concerns about our future. Economists believe that our economy will continue to generate good jobs, but, to take advantage of new opportunities, Americans must achieve higher levels of education and training.

Even during the recent economic downturn, employers reported a shortage of job applications with the skills required for the contemporary workplace. In the current stronger labor market, these skills shortages will become even more severe. The state's workforce training and education system faces the challenge of preparing enough workers with the kinds of skills employers are looking for.

Education and training are key ingredients to economic growth and competitiveness. Our willingness to invest in educating and training our people will largely determine the long-term rate of growth for Washington's economy. These investments will also help to narrow the wide gap in earnings that have arisen across workers with different skill levels.

The National Economic Recovery

In late 2002, the nation began to recover from the 2001 recession. Early on, the recovery was fueled by increases in productivity (i.e., output per worker) resulting in more goods and services; there was, however, little creation of new jobs. It was not until the late 2004 that the recovery was coupled with large increases in jobs.

In 2005, the nation's economy continued a relatively robust expansion despite the disruptions in late August and early September 2005 caused by hurricanes Katrina and Rita. The Gross Domestic Product (GDP) in the third quarter 2005 grew at an annual rate of 4.3 percent after

increasing 3.3 percent in the second quarter.¹ The increase in real GDP resulted from strong consumer spending, business investment in equipment and software, federal government spending, and residential fixed investment increases. These quarterly increases compare to an annual rate of 4.2 percent in 2004 and 2.7 percent in 2003. The forecast calls for growth rates of 3.3 percent in 2006 and 3.0 percent in 2007.²

National non-farm payroll employment³ rose 1.1 percent in 2004, the first significant increase in four years.⁴ The added employment in 2005 is projected to result in a 1.6 percent increase, with forecasts of 1.5 percent in 2006 and 1.2 percent in 2007.⁵ The unemployment rate for 2005 is expected to be 5.11 with forecasts of 4.89 in 2006 and 4.98 in 2007.⁶

Washington's Economy

Washington State's economy was especially hard hit by the last recession. Job growth, however, began in earnest in 2004 and became even more robust in 2005. Washington's job recovery has been outpacing that of the nation. Between October 2004 and October 2005, non-farm employment increased by about 78,000 jobs, a 2.8 percent increase.⁷ Over-the-year gains were widespread by sector (see Figure 1). Construction led all other industries with 15,400 new jobs; the large majority in the specialty trades. The gains in employment were triggered by the booming housing market.

Professional and business services added 13,500 jobs. While increases were experienced across the subsectors, the largest were in employment services (2,500) and architectural and engineering services (1,500). The retail and wholesale trade sectors added 12,400 jobs with most of that increase in retail (8,200) and wholesale (4,200) trade. Manufacturing employment increased by 8,200 jobs; most in aerospace (6,900). Boeing ended the year with a substantial number of new orders for a wide variety of its aircraft. The leisure and hospitality industries added 7,800 jobs, with 7,500 in accommodation and food services. Education and health service industries added 6,200 new jobs, with 6,900 health services and social assistance jobs offsetting the losses experienced by education services.

¹ Bureau of Economic Analysis (BEA), "Gross Domestic Product: Third Quarter 2005 (Preliminary)," *News Release*, November 30, 2005, <http://www.bea.doc.gov/bea/newsrelarchive/2005/gdp305p.htm> (12/05/2005).

² Economic and Revenue Forecast Council (EFRC), *Washington Economic and Revenue Forecast*, November 2005, Volume XXVIII, No.4, <http://www.efrc.wa.gov/pubs/Nov05puib.pdf> (12/06/2005).

³ Non-farm, also known as non-agriculture, employment includes private and government industries. Private industries include goods-producing and service-providing industries. The major sectors in goods-producing industries include natural resources and mining, construction; and manufacturing. The major sectors in service-providing industries include trade, transportation, and utilities; information; financial activities; professional and business services; education and health services; leisure and hospitality; and other services.

⁴ EFRC, November 2005, p.6.

⁵ EFRC, November 2005.

⁶ EFRC, November 2005.

⁷ Washington ESD, Labor Market and Economic Analysis Branch, "Washington State Employment Situation Report for October", November 15, 2005, http://www.workforceexplorer.com/admin/uploadedPublications/5763_ESR_Nov15_05R.pdf (11/16/2005).

Figure 1. Over-the-Year Non-Farm Wage and Salary Employment Gains by Industry Sector: October 2004 to October 2005

Industry Sector	Seasonally Adjusted Gains in Thousands
Total Non-Farm	77.5
Construction	15.4
Professional and Business Services	13.5
Manufacturing	8.2
Transportation Equipment	8.0
Retail Trade	8.2
Leisure and Hospitality	7.8
Education and Health Services	6.2
Government	5.3
Wholesale Trade	4.2
Financial Activities	3.0
Other Services	3.0
Information	2.9
Transportation, Warehousing, and Utilities	0.0
Natural Resources and Mining	0.0

Source: Employment Security Department (ESD) LMEA, "Washington State Employment Situation Report for October," November 15, 2005.

In addition to employment gains, Washington had a seasonally-adjusted unemployment rate in October 2005 of 5.6 percent, a decline of 0.4 percent since October 2004. The estimated number of unemployed workers declined from 195,900 to 188,000. Washington's economy experienced these decreases in the unemployment rate despite adding 82,500 individuals to the labor force.⁸

Long-Run Trends Increase Skill Requirements

There are two major economic trends that have been and are expected to continue to affect our future workforce—technological advances and globalization. These trends will continue to increase the demand for more highly- and differently-skilled labor. Keeping up with this demand will pose stiff challenges for both our economic competitiveness and social cohesion.

Technological Advances

Over the years, new technologies have generated new products and industries, as well as changed the way firms are organized and how workers are utilized.⁹ Future technological advances are expected to continue to do so. With new technologies come changing job skill requirements.

⁸ Ibid.

⁹ Lynn A. Karoly and Constantijn W.A. Panis, *The 21st Century at Work: Forces Shaping the Future Workforce and Workplace in the United States* (Santa Monica, CA: RAND Corporation, 2004). Paul Sommers, *Drivers For A Successful Technology-based Economy: Benchmarking Washington's Performance* (Seattle, WA: Technology Alliance, May 2003).

Although some technologies have created demand for unskilled workers, more have engendered demand for higher skilled workers.

In 1999, the U.S. Department of Labor (DOL) examined the extent of skill upgrading in the U.S. economy.¹⁰ Average skill levels were found to have increased significantly during the 1990s, and occupational upgrading within industries was the primary source of skill change. There were substantial skill shifts both among broad occupational groups (e.g., technical workers have replaced laborers) and shifts within broad occupational groups (e.g., secretaries have become administrative assistants who perform more complex word processing and database management instead of typing and filing).

Workers in nearly every field have had to learn new skills as they have incorporated computers into their jobs. Machine tool operators make parts using computer-controlled machines. Forklift operators in factories use computerized inventory locating devices. Cars, traffic lights, heating and cooling systems, hospitals, machine shops—all have become computerized. Not only have employees needed to learn to use new, highly sophisticated machines, they have also had to learn, and often design, whole new organizational processes associated with those machines. Many U.S. manufacturers have reduced the number of supervisors in their factories and given workers greater responsibility for ensuring quality, redesigning manufacturing processes and improving products. Companies are adopting participatory, “high-performance” work systems that place more authority and problem-solving responsibilities on front-line workers. Jobs are more broadly defined, employees work in collaborative teams wherein success demands effective communication, and outcomes are focused on timeliness, quality, and customer service.¹¹

Globalization

Washington, more than any other state, relies on foreign trade. Estimates indicate that in 2005, one in three jobs in Washington was directly or indirectly supported by international trade.¹² Washington’s industry leaders in aerospace, forest products, software, financial and legal services, and agriculture derive a significant portion of their revenues through foreign exports. In 2004, Washington State exports equaled \$33.8 billion.¹³

¹⁰ U.S. DOL, “The Many Facets of Skills,” Chapter 2 of the *Report on the American Workforce*, 1999

¹¹ Karoly & Panis, 2004, p. xxv.

¹² Washington State Department of Community, Trade, and Economic Development (CTED), *Why Trade is Important*, http://www.cted.wa.gov/portal/alias_cted/lang_en/tabID_159/Default.aspx (11/28/2005).

¹³ CTED, 2004 Top 50 Washington State Origination Export Totals by Commodity (HS Code), http://qa.cted.wa.gov/cted/documents/ID_276_Publications.pdf (11/28/2005).

There is consensus among economists that globalization, at the aggregate level, has and will continue to have a favorable effect on income, prices, consumer choice, competition, and innovation in the U.S.¹⁴ The effects of globalization, however, accrue unevenly across industries and individuals. Workers displaced by competition will generally be able to find jobs; earnings losses, however, may be significant for some.

Some portion of this displacement comes from outsourcing of jobs offshore. No one knows for certain the extent to which firms currently send work offshore, and it's difficult to know how widespread it will become. The government does not track offshoring, and firms are naturally reluctant to disclose information about it. Still, the practice appears to be on the rise. Forrester Research expects that the number of U.S. jobs outsourced will grow from about 400,000 in 2004 to 3.3 million by 2015, or about 250,000 per year.¹⁵ Estimates suggest that up to 14 million Americans now work in occupations—including financial analysts, medical technicians, paralegals, and computer and math professionals—that could reasonably be considered at risk.¹⁶

Will there still be good jobs left in U.S.? Most economists think so. First, many jobs are not at risk of being outsourced. The most vulnerable jobs and occupations are ones with the following attributes or features:¹⁷

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

Cost differentials, the availability of highly-educated graduates, the widespread acceptance of English as the language of business and communication, and other institutional and cultural compatibilities are factors that facilitate the offshoring of U.S. jobs to certain foreign countries. Nevertheless, the three major emerging market economies—China, India, and Russia—that have a sizeable higher education sector, have barriers that could constrain future growth.¹⁸ India has not been able to provide basic school education on the wide-scale level that would ensure future

¹⁴ Martin N. Baily and Diana Farrell, “Exploding Myths About Offshoring,” (McKinsey Global Institute, April 2004), http://www.mckinsey.com/mgi/reports/pdf/exploding_myths/explodingoffshoringmyths.pdf (November 28, 2005). L. Josh Bivens, “Truth and Consequences of Offshoring,” Economic Policy Institute Briefing Paper, <http://www.epi.org/content.cfm/bp155> (10/28/2005). Lael Brainard and Robert E. Litan, “‘Offshoring’ Service Jobs: Bane or Boon—and What to Do?,” The Brookings Institute Policy Brief #132, April 2004, <http://www.brook.edu/comm/policybriefs/pd132.pdf> (12/01/2005). Global INsight (USA), Inc., “Executive Summary: The Comprehensive Impact of Offshore Software and IT Services Outsourcing on the U.S. Economy and the IT Industry,” (Arlington, VA: Information Technology Association of America, October 2005), <http://www.globalinsight.com/publicDownload/genericContent/103105execsum.pdf> (11/09/2005). U.S. Government Accountability Office (GAO), “Offshoring of Services: An Overview of the Issues,” November 2005, <http://gao.gov/cpi-bin/getrpt?GAO-06-05> (12/01/2005).

¹⁵ Cited in Brainard and Litan, April 2004.

¹⁶ Ibid., p. 6.

¹⁷ Ashok D. Bardhan and Cynthia Kroll, “The New Wave of Outsourcing,” (Berkeley, CA: Fisher Center for Real Estate and Urban Economics, University of California, Berkeley, Paper #1103, 2003), <http://repositories.cdlib.org/iber/fcreue/reports/1103> (12/05/2005).

¹⁸ Bardhan and Kroll, p. 5.

growth in highly-trained graduates; Russia is experiencing institutional underdevelopment, erratic reforms, and a gradual deterioration of its higher education system; and China still faces language, institutional, and cultural barriers.

Potential quality control problems and concerns over intellectual property theft also may limit outsourcing overseas. The total growth of high-tech jobs may outpace the increasing supply of knowledgeable workers in the emerging economy. As noted by Robert Reich, “Even as the supply of workers around the world capable of high-tech innovation increases, the demand for innovative people is increasing at an even faster pace.”¹⁹

The most positive jobs scenario is one in which the U.S. keeps the “cream” of new development at home, while the more routine activities are outsourced.²⁰ Under this scenario innovation would lead to a continuing stream of new service and manufacturing activities, and, hence new jobs and occupations, while competition and the need for lower-cost supply would force more mature services operations overseas. Depending on their education and skills, individual workers might still find it difficult to find replacement employment at similar wages, but, overall, the jobs lost to outsourcing would be replaced by higher-wage jobs in new subsectors brought about by innovation.”²¹ Reich has similarly argued that there will be plenty of good jobs in the future, but too few Americans are being prepared for them.

Increasing Gap Between the Haves and the Have-Nots

Starting in the mid-1970s, income inequality in America has worsened, and studies suggest that pervasive technological change is the culprit. Globalization also has been linked to the decline in earnings particularly among the less-skilled workers over the last few decades. The demand for highly-skilled workers in all sectors of the economy has increased rapidly. Supply has not kept up with demand and the earnings gap between more-educated and less-educated workers has widened.²²

Data from the Bureau of Labor Statistics show a positive relationship between training levels and 2005 annual average wage estimates of workers in Washington (Figure 2).²³ That is, jobs that require one to twelve months of postsecondary preparation paid 50 percent more than jobs that required little or no postsecondary training. Jobs that required more than one year but less than four years of postsecondary training paid 25 percent more than jobs that required one to twelve months of postsecondary preparation.

¹⁹ Robert Reich, “High-Tech Jobs Are Going Abroad! But That’s Okay,” Washington Post Company, 2003.

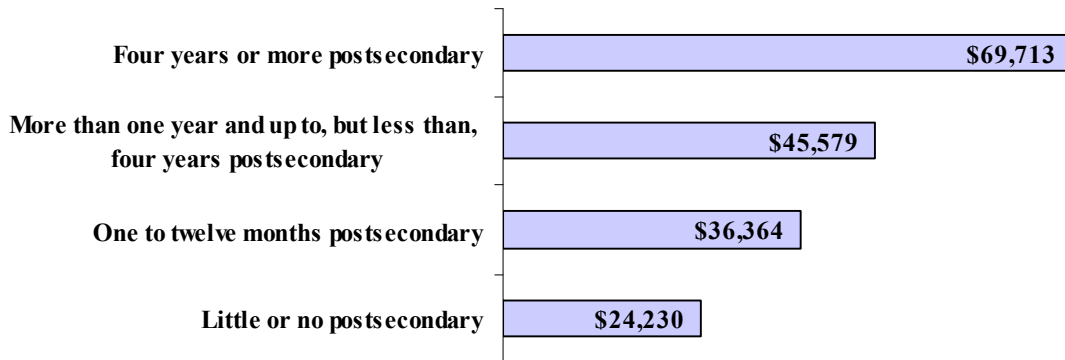
²⁰ Bardhan and Kroll, 2003, p. 12.

²¹ Ibid.

²² Karoly & Panis, 2004, p. xxiii.

²³ ESD, Washington State Occupational Outlook 2002-2012, https://www.workforceexplorer.com/admin/uploadedPublications/5421_WashWEX.pdf (11/28/2005).

Figure 2. Washington State 2005 Average Annual Wage Estimates by Training Level



Source: ESD, *Washington State Occupation Outlook 2002-0212*.

The good news is that between 1990 and 2002, hourly wages in Washington State increased in real terms.²⁴ There is also evidence that the gap between the top and bottom wage earners may have stopped growing, and perhaps even started to recede. In 1990, the ratio of the average wage of the top 10 percent of jobs to the bottom 10 percent of jobs was 7.6. The ratio peaked at 12.4 in 2000, before decreasing to 10.2 in 2002.²⁵

Washington's Industry Outlook

For years, Washington's resource-based economy was able to provide high-paying jobs with benefits to workers with only a high school education. Our forests and factories provided a living wage to loggers and production workers. Now these traditional sources of high-wage work are either shrinking or have limited prospects for growth.²⁶ With the improving employment outlook, other sectors that had been experiencing job losses during the recent economic downturn have begun to turn around; others, however, continue to decline, at least in their share of employment if not in actual employment.

Projections to 2030 show changes by industry in the distribution of Washington State's non-farm employment (see Figure 3).²⁷ The information and services industries are the fastest growing driven by increases in software publishing and professional and business services (e.g., accounting, engineering, computer systems and programming). Their share of employment is expected to increase to about 46 percent by 2030. Manufacturing employment, while continuing to grow, is expected to grow more slowly than total employment. Aerospace and wood products manufacturing were once about 13 percent of total employment; now they account for less than 5 percent. The combined mining and manufacturing industries' share of employment is expected to decrease to about 8 percent of non-farm employment by 2030. Government jobs will continue to

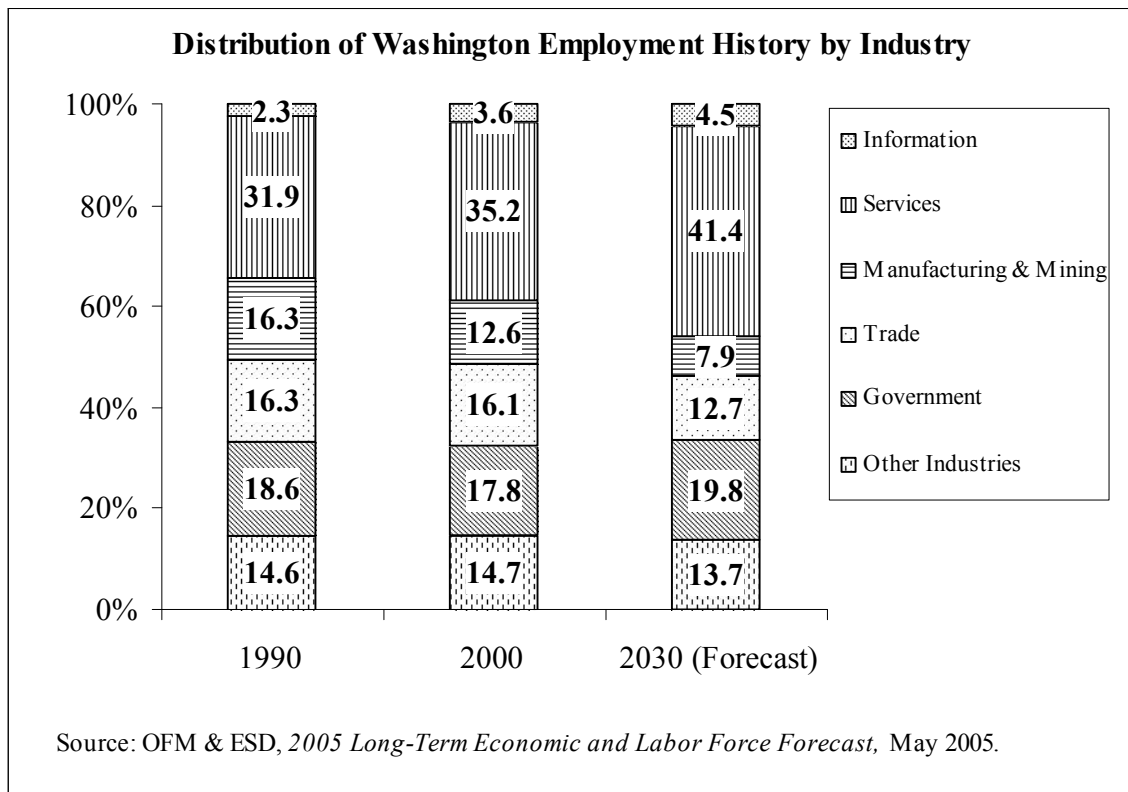
²⁴ Scott Bailey, *Washington Wage Report 1990-2002*, ESD, February 2004.

²⁵ Bailey, 2004, p. 3.

²⁶ Dave Wallace, "Getting Paid to Make Paper," *Washington Labor Market Quarterly Review*, Volume 29, Number 3, July-September 2005.

²⁷ Washington State Office of Financial Management (OFM) and ESD, *2005 Long-Term Economic and Labor Force Forecast for Washington*, May 2005.

be about 20 percent of employment. The composition of government employment, however, has shifted from federal jobs to state and local jobs; this trend is projected to continue.



What Jobs Will be Available?

Many of the new family-wage job opportunities will be in occupations that require postsecondary education but not necessarily a four-year degree. Figure 4 includes the top 15 occupations requiring more than one year and up to, but less than four years of postsecondary training that are expected to be in demand between 2002 and 2012.²⁸

²⁸ ESD determined the top 15 occupations using a ranking based on the average of three criteria: average annual growth rate, number of job openings due to growth, and total number of job openings due to growth and replacement.

Figure 4. Number of Annual Openings in Occupations Requiring More Than One Year and up to, but Less Than, Four Years of Postsecondary Education (2002-2012)

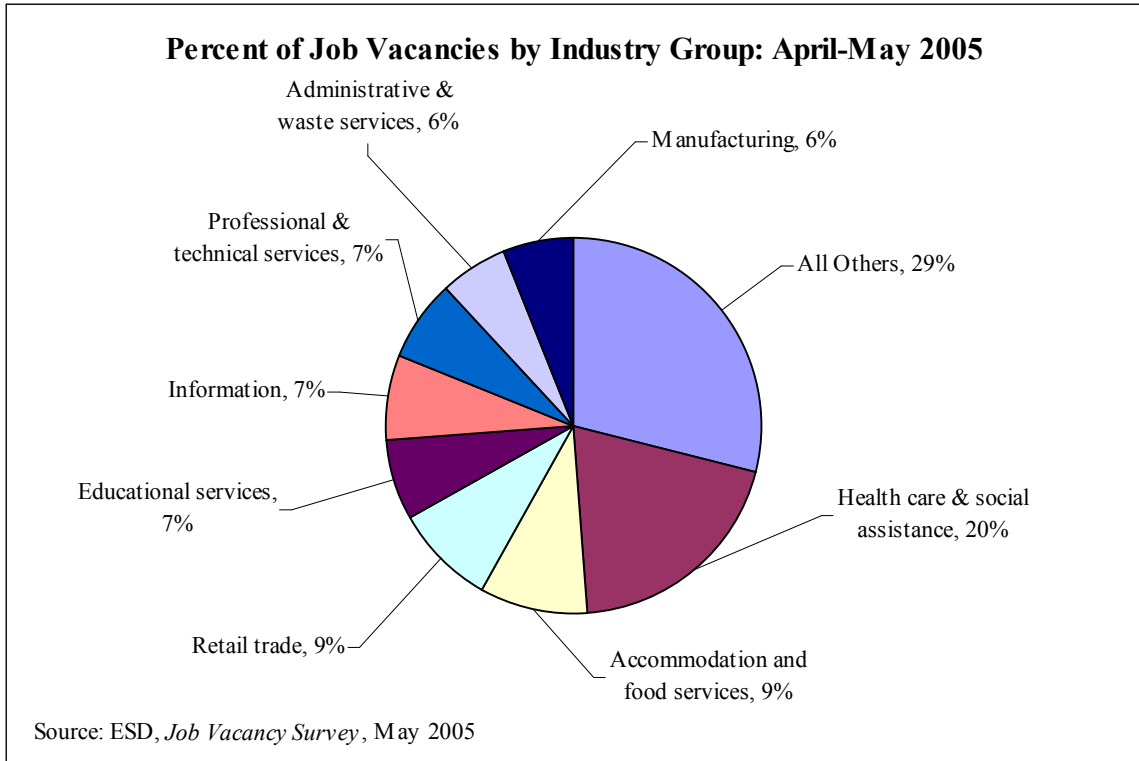
Occupation	Estimated Employment 2002	Average Annual Openings 2002-2012	Estimated Average Wage March 2005
Registered Nurses	45,693	1,944	\$59,977
Carpenters	36,104	1,381	\$45,119
Supervisors/Managers of Construction Trades and Extraction Workers	17,585	658	\$64,314
Hairdressers, Hairstylists, and Cosmetologists	12,991	595	\$27,606
Computer Support Specialists	15,881	555	\$49,247
Licensed Practical and Licenses Vocational Nurses	10,522	441	\$38,443
Medical Secretaries	11,619	498	\$30,152
Supervisors/Managers of Personal Service Workers	6,787	328	\$40,624
Gaming Dealers	5,405	298	\$18,627
Massage Therapists	6,040	285	\$50,002
Fitness Trainers and Aerobics Instructors	5,183	251	\$33,967
Legal Secretaries	5,189	220	\$40,092
Travel Agents	3,248	185	\$31,448
Barbers	2,907	167	\$28,728
Dental Hygienists	4,320	142	\$77,884

Source: ESD, *Occupational Outlook 2002-2012*.

Washington employers in a recent survey regarding their job vacancies in late spring 2005, reported an estimated 70,653 job openings.²⁹ Health care and the social assistance industry employers reported more than twice as many openings (14,195) as any other industry group (see Figure 5). This industry's openings had the highest percentage requiring certification or licensing (73 percent), offered the second highest median wage (\$15.25), and had the third highest percentage of permanent openings (98 percent).

The construction industry led in the percentage of *new* openings (28 percent of its 2,610 vacancies). The construction industry, along with professional, scientific, and technical services, offered median wages just below that of health care and social assistance; \$14.00 and \$14.25, respectively. The utilities industry offered the highest median hourly wage (\$18.62) but had the fewest number of vacancies (117). Accommodation and food services had the second highest number of vacancies (6,615) but, along with agriculture, forestry, fishing, and hunting, offered the lowest median wage (\$7.35).

²⁹ ESD, *Washington State Job Vacancy Survey*, July 2005.



With regard to jobs, health care practitioners and technical occupations accounted for the largest share of vacancies (13 percent), followed by office and administrative occupations (12 percent), and food preparation and serving-related occupations (9 percent). While the median hourly wage offered for health care practitioners and technical occupations (\$21.59) was much higher than the state median of \$10.00, food preparation and service related occupations had the lowest median wage (\$7.35, the state minimum), and office and administrative occupations were offered the state median. Ninety percent of health care practitioners and technical occupation vacancies required a certificate or license, more than any other occupational group. Management and architecture and engineering openings, which offered the highest (\$31.25) and second highest (\$23.79) median hourly wage, respectively, were more likely to require education beyond high school than other occupations.³⁰

Employers Report a Shortage of Skilled Workers (To be updated based on the Workforce Training and Education Coordinating Board’s (Workforce Board) 2005 Employer Survey)

The transition to a more knowledge-based economy has called for some changes in the types of skills employers are requiring now, or will be requiring in the near future.³¹ Advanced technologies clearly call for workers with the knowledge and skills to use them effectively, efficiently, and creatively. Rapid technological changes and increased global competition have led to a growing importance of strong non-routine cognitive skills, such as abstract reasoning, problem-solving, communication, and collaboration. Employers continue to report a shortage of workers with either basic workplace or job-specific skills, or both.

³⁰ ESD, *Job Vacancy Survey*, July 2005, p. 6.
³¹ Karoly & Panis, 2004.

Roughly 3,000 firms responded to the Workforce Board’s *Washington State Employers’ Workforce Needs and Practices Survey*, conducted during the summer and fall of 2003.³² Fewer firms reported hiring new employees as compared to previous surveys, 55 percent in 2003 compared to 65 percent in 2001. The problem of skill shortages, however, persisted. Among firms attempting to hire, 45 percent reported difficulty finding qualified job applicants, compared with 60 percent in 2001. The difficulty in finding qualified job applicants was most severe in the construction (65 percent) and high-tech (54 percent) industries. Extrapolating from the survey results, an estimated 55,980 Washington firms—about one in every four—had difficulty finding qualified job applicants during the reporting period.

Employers had the most difficulty finding applicants with job-specific skills (91 percent). For example, they wanted to hire a registered nurse but had trouble finding one; however, large percentages also reported difficulty finding applicants with problem-solving or critical thinking skills (87 percent), positive work habits and attitudes (83 percent), communication skills (83 percent), and ability to adapt to changes in duties and responsibilities (79 percent).

Employers attempting to hire were asked about the level of difficulty they encountered in finding qualified applicants with specific education levels. They reported the greatest shortage of applicants for jobs requiring postsecondary education, especially for vocationally trained workers from our community colleges, apprenticeship programs, and private career schools. Among employers attempting to hire workers with postsecondary vocational training, 67 percent reported difficulty finding qualified applicants. In contrast, among employers attempting to hire workers with only a high school diploma, 24 percent reported difficulty (see Figure 6).

**Figure 6. Employer Difficulty Finding Applicants by Educational Level
(Percentage and Estimated Number of Firms With Difficulty)**

Educational Level	Among Employers Attempting to Hire at That Level	Estimated Number of Firms
Neither a high school diploma or GED	19%	4,200
High school diploma or GED	24%	9,300
Some college course work	35%	11,300
Vocational certificate	53%	17,000
Vocational associate degree	67%	16,600
Academic associate degree	60%	10,800
Baccalaureate degree	68%	12,700
Master’s, doctoral, or professional degree	68%	7,300

Source: Workforce Board, 2004.

The problem will likely grow worse. Skills required in the workplace continue to increase, and, as a result, about one third of all firms reported that their need for workers with postsecondary training would increase over the next five years (see Figure 7).

³² Workforce Board, *Washington State Employers’ Workforce Training Needs and Practices*, 2004. The final version of this paper will have findings from the 2005 Employers’ Survey.

Figure 7. Educational Level (Among all Employers the Percentage Expecting a Change in Demand)

Educational Level	Increase	Decrease
Neither a high school diploma or GED	12	18
High school diploma or GED	17	6
Some college course work	27	3
Vocational certificate	35	2
Vocational associate degree	30	2
Academic associate degree	30	2
Baccalaureate degree	34	2
Master's, doctoral, or professional degree	24	8

Source: Workforce Board, 2004.

The findings from Washington's employers are reflected in a spring 2005 national survey of the skills gap in manufacturing industries conducted by Deloitte Consulting and the National Association of Manufacturers' Manufacturing Institute/Center for Workforce Success. More than 80 percent of respondents to the survey indicated that they are experiencing a shortage of qualified workers—with 13 percent reporting severe shortages and 68 percent indicating moderate shortages.³³ Ninety percent of respondents indicated a moderate to severe shortage of qualified skills production employees, including front-line workers, such as machinists, operators, craft workers, distributors, and technicians. Further, 65 percent of respondents reported shortages of engineers and scientists—18 percent severe and 47 percent moderate shortages.

Manufacturers also reported deficiencies in employability skills. Nearly half the respondents indicated that their current employees have inadequate basic employability skills, such as attendance, timeliness, and work ethic; 46 percent reported inadequate problem-solving skills; and 36 percent reported insufficient reading, writing, and communication skills.

Industry Clusters—Health Care, IT, and Construction

Clusters are geographic concentrations of interconnected companies, specialized suppliers, service providers, and associated institutions (such as universities).³⁴ Clustering is a dynamic process; that is, as one competitive firm grows, it generates demand for other related industries. As the cluster develops, it becomes a mutually reinforcing system.

³³ The National Association of Manufacturers' Manufacturing Institute/Center for Workforce Success and Deloitte Consulting LLP, *2005 Skills Gap Report – A Survey of the American Manufacturing Workforce*, 2005.

³⁴ Definition is from the website for the Institute for Strategy and Competitiveness, Harvard Business School, <http://www.isc.hbs.edu/econ-clusters.htm> (11/29/2005).

The figure below shows the major economic clusters in six regions of Washington.³⁵ The clusters were identified based on the size and projected growth of employment in the cluster, its location coefficient (a measure of relative density of the industry compared to the nation),³⁶ and the percent of jobs in the cluster that meet a living wage standard. The importance of particular clusters varies by region (see Figure 8), but three clusters highly ranked throughout the state are health care, construction, and software/IT.³⁷

Figure 8. Important Industry Clusters by Region

Spokane	Eastern Balance¹	Pierce	King/ Snohomish	Southwest²	Northwest³
1. Health Care	1. Health Care	1. Health Care	1. Software	1. Construction	1. Construction
2. Construction	2. Education/ Social Services	2. Construction	2. Aircraft	2. Health Care	2. Health Care
3. Wholesale Trade	3. Transportation	3. Aircraft	3. Construction	3. Education/ Social Services	3. Transportation
4. Metal Fabrication	4. Wholesale Trade	4. Ship/Boat Building/ Repair	4. Business Services	4. Transportation	4. Education/ Social Services
5. Transportation	5. Agriculture/ Food Processing	5. Wholesale Trade	5. Health Care	5. Communications	5. Ship/Boat Building/ Repair
6. Electronics/ Instruments	6. Wood Products	6. Education	6. Ship/Boat Building/ Repair	6. Wood Products	6. Wood Products

¹ Eastern Balance includes all counties in Eastern Washington other than Spokane.

² Southwest includes Grays Harbor, Lewis, Mason, Pacific, Thurston, Clark, Cowlitz, Skamania, and Wahkiakum Counties.

³ Northwest includes Clallam, Jefferson, Kitsap, Island, San Juan, Skagit, and Whatcom Counties.

Source: Sommers and Heg, 2002

Health Care

Washington State’s health care industry plays a significant dual role in our economy. The health care system keeps our workforce healthy and productive. It is also one of the largest employers in the state. Among occupations that require mostly postsecondary education, the largest numbers of job vacancies reported by employers in April-May 2005 were in health care practitioner and technical occupations (see Figure 9).

Figure 9. Total Job Vacancies Among Occupation Groups Requiring Mostly Postsecondary Education

Occupation	Vacancies April-May 2005
Health Care Practitioners and Technical	8,918
Computers and Mathematical	5,491
Business and Financial Operations	3,579
Education, Training and Library	2,358
Management	2,308
Architecture and Engineering	2,174

³⁵ Paul Sommers and Deena Heg, *Occupational Demand and Supply by Industry Cluster and Region*, October 2002.

³⁶ A coefficient greater than one indicates employment in a region is more heavily concentrated in a cluster than is the case nationally.

³⁷ Sommers and Heg (2002) rated clusters by averaging their rankings across four criteria—employment size, employment growth, the location coefficient, and the percentage of workers receiving a living wage. We modified these ranking when constructing Figure 8. We excluded clusters from the highly ranked group if their location coefficient was low (less than 0.9) or if the percentage receiving a living wage was low (below 33 percent).

Washington’s ESD forecasts a substantial number of annual openings in the health care professions ranging from dentists to nursing aides, orderlies, and attendants. Figure 10 lists by preparation level, the health care occupations with projected high demand in the near future.

Figure 10. Projected Annual Openings in Selected Health Care Occupations by Training Level: 2002-2012

Training Level Occupational Title	Average Annual Openings
Little or no postsecondary	
Nursing Aides, Orderlies, and Attendants	725
Home Health Aides	310
One to twelve months postsecondary	
Dental Assistants	523
Medical Assistants	406
More than one year and up to, but less than four years postsecondary	
Registered Nurses	1,944
Massage Therapists	285
Licensed Practical and Licensed Vocational Nurses	441
Dental Hygienists	142
Four years or more postsecondary	
Dentists	133
Health Professional and Technicians, Others	203

Source: ESD, *Occupational Outlook 2002-2012*.

Despite Washington’s educational institutions preparing more health care workers than previously, gaps between supply and demand remain.³⁸ The Workforce Board’s analysis of the gap shows that we will need to increase the number of newly prepared registered nurses by 520 per year (beyond 2004 levels) for the next 10 years to meet current and projected demand. Figure 11 shows the annual number of newly prepared workers to close the supply-demand gap in the next ten years for ten health care occupations.

³⁸ Workforce Board, *Progress 2005: Report of the Health Care Personnel Shortage Task Force*, January 2006.

Figure 11. The Gaps Between Supply and Demand by Health Care Occupation

Occupation	Annual Need of Additional Newly Prepared Workers To Close the Gap in 10 Years*
Registered Nurses	520
Dentists	80
Physical Therapists	70
Dietitians and Nutritionists	40
Occupational Therapists	40
Respiratory Therapists	20

*Estimates are rounded to the nearest ten.

Source: Workforce Board, *Progress 2005: Report of the Health Care Personnel Shortage Task Force*, January 2006.

The shortage of health care practitioners in Washington is compounded by demographic trends. First, hospital caregivers are aging faster than the state workforce. The average age of a hospital health care worker is 45, about 5 years older than the average for all workers. More than 41 percent of the state's health services workers are over 45 years old.³⁹ Second, the state population is also aging rapidly. Since the elderly typically require more health care resources, service levels cannot be maintained given current staffing levels.

IT

IT workers design, program, and maintain computers and computerized systems. They work both within the IT industry and in non-IT industries, such as hospitals, government, and financial services. Since computers are pervasive in our lives, so is the need for IT workers.

The IT industry was not immune to the effects of the last recession, but long-term prospects are strong. IT-related occupations are among the fastest growing occupations. Furthermore, many of these occupations are among the higher paid. Figure 12 includes the IT-related occupations that are among the 15 with the highest projected demand regardless of level of preparation.

Figure 12. Employment and Projected Annual Openings in Selected IT Occupations: 2002-2012

Occupational Title	Estimated Employment 2002	Average Annual Total Openings	Estimated Average Wage March 2005
Software Engineers, Applications	18,701	705	\$83,708
Computer Programmers	12,677	687	\$79,485
Software Engineers, Systems Software	14,213	544	\$88,138
Computer Support Specialists	15,881	555	\$49,247

Source: ESD, *Occupational Outlook 2002-2012*.

³⁹ Workforce Board calculation based on Washington State Population Survey, 2000, OFM.

Construction

Construction activity rises and falls with the business cycle, and the industry was hurt by the last recession. A four-year boom in Washington's construction industry ended in 2001, and employment in the sector declined during both 2001 and 2002. Employment began to rise again in 2003, and between October 2004 and October 2005, the construction industry saw a gain of 15,400 jobs, the highest number among all industries. What is particularly notable with the increases in construction employment is that in October 2004 construction jobs were about 6 percent of total non-farm employment but 20 percent of the over-the-year employment growth. Moreover, in the long term, the need to replace an aging construction workforce will add to the number of annual job openings in the sector.

Long-term occupation projections, conducted by ESD, suggest there will be about 7,535 annual job openings in Washington's construction industry over the next few years to 2012.⁴⁰ Figure 13 presents the projected openings for the construction occupations that are in particularly high demand by training level. According to the Workforce Board's recent survey, employers are having difficulty filling current openings. Among firms attempting to hire construction workers, 65 percent reported having difficulty finding qualified job applicants—the highest reported percentage of any sector.⁴¹

Figure 13. Projected Annual Openings in Selected Construction Occupations by Training Level: 2002-2012

Training Level Occupational Title	Average Annual Openings
One to twelve months postsecondary	
Construction Laborers	814
Painters, Construction, and Maintenance	502
Operating Engineers and Other Construction Equipment Operators	347
Roofers	297
Drywall and Ceiling Tile Installers	210
More than one year and up to, but less than four years postsecondary	
Carpenters	1,381
First-Line Supervisors/Managers of Construction Trades and Extraction Workers	658

Source: ESD, *Occupational Outlook 2002-2012*.

⁴⁰ This projected number of annual openings does not include management occupations such as construction managers.

⁴¹ Workforce Board, *Washington State Employers' Workforce Needs and Practices Survey 2004*.

Summary and Implications

Washington's economy was especially hard hit by the last recession. Since early 2003, however, our job growth has been better than the nation. Employment gains were strong throughout 2005 and recent gains were widespread across all industries. Construction and professional and business services have experienced especially notable gains.

Long-term economic trends—pervasive technological change and increasing globalization—will continue to skew labor demand toward the more highly skilled. Keeping up with this demand will pose stiff challenges for both social cohesion and economic competitiveness. The jobs being created demand higher skills. A world-class workforce is vital for global competitiveness, and the bar for competitiveness is rising.

Employers report a shortage of job applicants with the skills required for the contemporary workplace. The state's workforce training and education system must prepare more workers with the kinds of skills employers are looking for. The training system must also assist in the continual retraining and upgrading of incumbent workers so their skills stay current. Given the dramatic technological and structural changes buffeting our economy, we must do more to enable workers to make smooth employment transitions.