

Critical Skill
Shortages Initiative

**Critical Skill
Shortages Report**
on the
Manufacturing Sector
for the
**Northeast Illinois
Economic Development
Region**



Prepared for
The Workforce Boards
OF METROPOLITAN CHICAGO

Prepared by
Center for Economic
Competitiveness
HUDSON INSTITUTE

June 4, 2004

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Introduction

This report is a component of the Critical Skill Shortages Initiative (CSSI), consisting of several planning and analysis efforts to align regional workforce programs to provide a reliable supply of qualified job seekers for critical skill shortage occupations in key industry sectors. Governor Blagojevich has established ten Economic Development Regions throughout the State with the goal of promoting regional approaches to linking workforce preparation programs with economic development. In the Northeast Economic Development Region (Northeast EDR), the Workforce Boards of Metropolitan Chicago are collaborating to lead the CSSI effort.

Workforce Boards of Metropolitan Chicago is a consortium of nine Workforce Boards covering the City of Chicago and DuPage, Kane/Kendall/DeKalb, Lake, Grundy/Livingston/Kankakee, McHenry, Northern Cook, South and West Cook, and Will counties. This area, with the exception of Livingston County, comprises the Northeast EDR. This report on the critical skill shortage occupations in the Northeast EDR is one of three analyses covering critical economic sectors to Metropolitan Chicago: healthcare, manufacturing and transportation / warehousing / logistics.

The CSSI consists of two phases: a planning phase and a training phase. The planning phase is designed to identify the skill shortage occupations in key sectors of the regional economy, the examination of the “root causes” that lead to shortages, and the development of solutions to address those causes through the redirection of both public and private resources.

This report synthesizes a number of data sources to: (1) document the thorough methodology used to identify sectors and critical skill shortage occupations, (2) demonstrate the full engagement of required partners and full support from industry partners in the targeted sectors, (3) describe the rationale for selecting each sector/industry, (4) document the rationale for selecting the critical occupations for each sector/industry, and (5) specify the size and location of the short-term and long-term shortages.

An Introductory Note on the Broader Context of National Skills Concerns

Demand – Supply Gaps

National discussion about skills and worker shortages began in the 1980s. Most of the early debate centered on research studies by think tanks and others, exploring demographic changes as they would likely affect the labor force. A general conclusion was that the U.S. would face worker and skills shortages beginning approximately 10 years hence¹. In the late eighties, the National Center on Education and the Economy released its “America’s Choice: High Skills or Low Wages” report. The logic of this report was that America’s future economic prosperity lies in higher value added economic activity, requiring more sophisticated products and services, and demanding higher skilled workers. These forecasted shortages came to reality, as projected, in the mid-late nineties. They were brought on not only by structural demographic and economic changes as anticipated, but by a boom economy. Today, the issue continues, even in a slower economy. Massive economic restructuring and globalization along with continuing change in age distribution and educational attainment of the workforce point to further challenges for the long haul.²

1 Hudson Institute, Workforce 2000, 1987

2 This viewpoint is well developed in the work of the Aspen Institute, Tony Carnevale and others. Anthony Carnevale is Vice President for Assessments, Equity, and Careers at the Educational Testing Service. The author of several books, including *The American Mosaic: An In-depth Report on the Future of Diversity at Work and America* and *The New Economy: How New Competitive Standards are Radically Changing American Workplaces*, Carnevale has been researching and writing about workforce development for many years. Carnevale was appointed by President Clinton as a commissioner to the White House Advisory Committee on Technology and Adult Education and Training, and Chair of the National Commission for Employment Policy, while serving as vice president and director of human resource studies at the Committee for Economic Development.

On the other side of the supply-demand argument are authors³ who point out that the U.S. labor force is incredibly flexible and, over the long run, adjusts to supply-demand gaps. Cappelli points out that adjustments will occur as new labor supply is added from older workers who prefer to continue to work after their traditional retirement age, disabled workers who are now able to work with the aid of advanced technology, better preparation and inclusion of the formerly incarcerated and ex-welfare recipients into the workforce, etc. In addition, at the margins, so long as the United States keeps an open door policy on immigration, both low-skill and high-skill labor can be attracted from overseas to correct for near-term imbalances.

Both these points of view continue as controversies in the skills debate. This report bypasses this “in the long-run argument.” Rather, it acknowledges that as a result of today’s fast-moving and churning economy, skill shortages are bound to occur and if not corrected expeditiously, they hurt local industries’ competitive position. In other words, critical skill shortages deal with the here and now and with the urgency of immediate solutions. What a state or region must do is to continuously monitor future gaps in critical occupations and to deploy flexible tools to adapt. That, in essence, is the motivation behind the CSSI initiative—to identify today’s gaps, find causes, recommend solutions, and mobilize for collaborative action.

Regional Differences

Behind national demand-supply gaps, regions across the U.S. vary considerably and accentuate various labor and skills gaps. For the decades, federal policy has recognized, local and regional initiatives as central to solving the nations workforce challenges. The Comprehensive Employment and Training Act (CETA), the Job Training Partnership Act (JTPA) and the Workforce Investment Act (WIA) all engaged local / regional delivery infrastructures. The CSSI project goes one step further by stressing the importance of in-depth regional, economic and workforce analysis in crafting regional workforce solutions. Indeed, the initiative gives practical expression to a statement made nearly a decade ago by Michael Porter of Harvard University: “Metropolitan areas and regions are the locus of competitive advantage”. Consequently, this report reflects the best economic analysis possible, using regional secondary sources of data along with locally collected field interviews, focus groups, industry councils and existing industry studies. Further, the nine board membership of this coalition enables a truly metro-regional framework for these analyses.

Specific Industry Challenges

Regardless of whether or not the labor market adjusts to shortages in the long run, the CSSI project recognizes that imbalances within economic sectors are likely to occur, given the rapid economic change affecting the U.S. economy. Quite different growth paths are shaping up for different industries within the Greater Metropolitan Chicago region, leading to different work-site expectations and preparations by both hourly and salaried workers. For example, with respect to the three sectors of this CSSI project, the U.S. manufacturing sector is losing employment, but gaining significantly in productivity. Consequently, pay per worker is increasing alongside a requirement for much higher skills /competencies. Manufacturing is characterized by less demand for frontline production workers and a shift to technician level workers. In the case of transportation, warehousing and logistics, another principal industry in Metro Chicago, the global segmentation of production is resulting in demand for highly sophisticated supply chain management, requiring a broad range of occupations and skills from software specialists to security engineers and computer-literate schedulers. Healthcare presents a different picture, again. This is an industry in rapid growth due to the aging population and access to ever more advanced technologies / treatments. Healthcare is a growth sector requiring many more workers at all levels, but especially those in the clinical, therapy, and diagnostic occupations, all of which require significant educational preparation and continuous learning.

³ Peter Cappelli is the George W. Taylor Professor of Management at the Wharton School of the University of Pennsylvania in Philadelphia and director of Wharton’s Center for Human Resources and is a research associate for the National Bureau of Economic Research in Cambridge, Massachusetts. He is author of *The New Deal at Work: Managing the Market Driven Workforce*, the first book of its kind to address the ever-changing landscape between employee and employer. Dr. Cappelli has chronicled how the employment field has evolved over the years, and according to many experts, he is the sole academic in the country to monitor this phenomenon.

Skills Shortages

While scholars differ regarding the degree to which the U.S. faces a worker shortage, both regional differences and industry transformations are resulting in a quite remarkable “re-skilling cycle” in the Metro Chicago Region. Professional occupations and healthcare occupations are most likely to experience skill shortages. Carnevale and Desrochers⁴ contend that productivity growth changes the occupational patterns, requiring higher skilled jobs while stretching the pipeline of skilled workers. They further predict that inadequate educational attainment threatens to slow down on productivity growth. Others are more optimistic about productivity growth, as GenX, GenY and the New Millennials achieve higher levels of college attainment. However, the college attainment data is not encouraging. The Aspen Institute points to a slowdown in the growth rate in general post secondary educational attainment and especially at the graduate level. Between 1980 and 2000, the share of the labor force that had a college degree rose from 21.6 percent to 30.2 percent, but according to Aspen Institute, this is expected to rise only to 33.6 percent by 2020⁵. Similarly the fraction of workers with some post high school education rose by nearly 20 percentage points during the same period, but it is projected to grow just 4 percentage points between 2000 and 2020.

There has been an increase in skill requirements in economy, although the magnitude of the trends is debated. Jobs that require an associate’s degree are expected to grow the fastest, increasing by 32 percent through 2010, followed by jobs that require a bachelor’s degree growing 24 percent according the Hecker⁶. In the global context, what is important not just in absolute trend, but also in relative competitive position for the U.S. to attract new students for the right disciplines, domestically and from overseas. The National Science Foundation points out that the relative attractiveness of the U.S. might erode as living standards rise in developing countries and as other industrialized nations intensify their international recruitment efforts. Foreign graduates may find returning home more attractive than staying in the U.S. after their training, and business might locate increasingly sophisticated functions overseas. Consequently, this initiative pays particular attention to ascertaining skill shortages by industry and seeks targeted solutions as needed.

4 Carnevale A.P. and D.M. Desrochers (April 2002). The Missing Middle: Aligning Education and the Knowledge Economy. Office of Vocational and Adult Education, U.S. Department of Education.

5 Aspen Institute (Jan 2002). Grow-Faster Together or Grow Slowly Apart: How Will America Work in the 21st Century?

6 Hecker DE (2004). Occupational Employment Projecting 2012, Monthly Labor Review Vol 127(2) pp 80 -105.

Methodology Used to Identify Sectors and Critical Skill Shortage Occupations

The Workforce Boards of Metropolitan Chicago have drawn upon a significant amount of data to assist in the selection of manufacturing as a critical sector and in the identification of manufacturing occupations for which there are critical shortages. “Critical occupations” are those that are vitally important to the overall health of the industry. Critical occupations are those that experience strong employment demand, provide good wages, are critical to industry competitiveness and are appropriate for targeting for the workforce system. A “critical shortage occupation” is a critical occupation for which there are not enough qualified people to meet the demand, or for which the projected demand is greater than the projected supply. In manufacturing, current critical shortage occupations are often commonly identified by high vacancy rates, or lack of skilled labor availability. Projected shortage occupations are based on projected demand increases, which may be due to demographics, new technologies, and processes that require personnel with new skills. The manufacturing sector in the U.S. has undergone major changes in the past several decades, particularly during the last decade. While the industry may be “shrinking,” it will still face major barriers in staffing and labor: recruiting talented and skilled workers, retaining those workers and keeping pace with new technologies, among others. The critical skill shortage occupations listed here reflect occupations which are currently in-demand by the manufacturing sector in the Northeast EDR, as well as around the state and country.

The methodology used to identify these critical occupations and critical shortage occupations specific to the Northeast Economic Development Region includes a review of existing studies, an analysis of secondary data, and the collection and analysis of primary data.

Review of Existing Studies

Prior to focusing on the Northeast EDR, a literature review was conducted to document the national and regional context of the manufacturing industry and its workforce. This industry has moved into the national spotlight in recent years due to the growing trends of downsizing, globalization and off-shoring.

Illinois has had a strong presence and tradition in manufacturing since the turn of the 20th century. For example, in 2000 Illinois was 9.4 percent more concentrated in manufacturing employment than the nation. The manufacturing sector continues to be an important contributor to the state economy. It contributes \$0.48 in purchases within the state for every dollar spent on manufacturing output, putting \$34 billion back into the Illinois economy⁷. Its longevity is also very critical to the economy because of its high employment multiplier. For every one manufacturing job created in Illinois, another 2.7 jobs are created in other sectors, which in 2000, equated to 1.4 million jobs that relied on the manufacturing sector⁸.

In the past few decades Illinois’ manufacturing sector has been facing competition from low-wage manufacturers in developing countries, highly skilled manufacturers in developed countries, and southern and western states in the United States. In response to this competition, manufacturers have streamlined their operations, increased productivity, and/or moved production elsewhere, resulting in a loss of manufacturing jobs. Between 1992 and 2002, industry employment in Illinois dropped from 577,200 to 496,400, a loss of 80,800 jobs⁹. In 1990, manufacturing accounted for roughly 17.3 percent of Illinois employment. That proportion dropped to 13.9 percent in 2000. Most notable is the decline in Cook County’s manufacturing sector. Even when the state experienced an upturn in employment after 1987, Cook County still lost over 129,000 positions over the next ten years¹⁰.

7 The State of Illinois Manufacturing. A Report for the Illinois Manufacturers’ Association. Center for Labor and Community Research. December 2003.

8 Ibid.

9 The State of the Workforce Report for the Metropolitan Chicago Region. The Workforce Boards of Metropolitan Chicago. 2003.

10 Bureau of Labor Statistics, Covered Employment & Wages, 2001.

The outlook for Illinois' manufacturing economy, however, is not bleak. For example, metropolitan Chicago is one of only three of the top twenty metropolitan areas in the country projected to see growth in manufacturing in 2003¹¹. Analysis of the size of businesses indicates that there is some dynamism occurring in small manufacturing companies. The number of very small and very large companies are diminishing, but the number of companies with between 10 and 19 workers grew about 13 percent between 1982 and 2001¹². National trends are similar, and this is expected to continue. Large firms are less well-equipped to handle churning—when faced with hardship, these firms close down, relocate overseas, or make drastic cuts in production and personnel. Smaller firms are by nature more agile, allowing them to deal with changes in the economy. These smaller businesses, especially those which manufacture products for niche markets, are growing, and will most likely continue to grow as various forces move larger manufacturers out of the positions they have occupied for so long.

In order to stay competitive, manufacturing companies are also becoming more high-tech. Illinois ranks highly in high-tech manufacturing measures, which bodes well for the state's manufacturing base.¹³

- Ranked 2nd in communications equipment manufacturing (34,100 jobs in 2000)
- Ranked 4th in electronics and accessories manufacturing (23,400 jobs in 2000)
- Ranked 4th in industrial electronics manufacturing (16,400 jobs in 2001)

Companies are using more sophisticated computerized packaging lines, inventory management, and delivery systems. These new employment opportunities in the sector require new skills, additional training, and more advanced education. However, Illinois has a shortage of well-educated, highly skilled workers to fill the job openings brought about by changes in manufacturing industry technology and the growth of high-tech industry¹⁴. On a national level, the National Association of Manufacturers recently found employers most often cited “serious shortages” among occupational categories including craft workers (42.5% of employers identified a “serious shortage”), machinists (41.2%), technicians and electricians (33.9%), operators (20.5%), and engineers (20.0%)¹⁵. Several of these occupations were also identified as critical occupations in this report in specific areas (craft workers, machinists, engineers, technicians, and operators).

The manufacturing sector is having a difficult time recruiting highly qualified workers because they are choosing other industries. This trend can hurt smaller companies who need these employees to grow. Beyond recruitment, a pool of highly skilled workers can also be developed through investment in advanced training. Often, however, manufacturers are hesitant to invest in their workers for the fear that once trained, workers will leave. About half of the responders to a National Association of Manufacturers survey in 2001¹⁶ indicated that they invested less than two percent of payroll on training for their workers, although over half of those surveyed increased the amount they spent on training between 1998 and 2001.

In order for the Greater Chicago area to stay competitive with other regions they must retain and attract highly skilled workers into their manufacturing sectors. Without these employees many startup companies will locate in other areas or move to where they can find a highly skilled workforce. Larger companies will not reinvest in manufacturing facilities that can not employ the facilities with qualified employees.¹⁷

11 The State of the Workforce Report for the Metropolitan Chicago Region. The Workforce Boards of Metropolitan Chicago. 2003.

12 Bureau of Labor Statistics, Covered Employment & Wages, 2001.

13 From Cyberstates 2002, “Illinois Tech Job Growth Slows in 2001,” American Electronics Association, released in Rolling Meadows, IL, June 26, 2002.

14 The State of Illinois Manufacturing. A Report for the Illinois Manufacturers' Association. Center for Labor and Community Research. December 2003.

15 Keeping America Competitive: How a Talent Shortage Threatens U.S. Manufacturing, National Association of Manufacturers, The Manufacturing Institute and Deloitte & Touche, April 2003

16 National Association of Manufacturers/Andersen/Center for Workforce Success, “The Skills Gap 2001: Manufacturers Confront Persistent Skills Shortages in an Uncertain Economy,” 2001. Available online at www.nam.org.

17 Chicago Federation of Labor and the Center for Labor and Community Research. “Creating A Manufacturing Career Path System in Cook County” December 2001.

According to the National Association of Manufacturers’ “Skills Gap 2001,”¹⁸ manufacturing companies are looking for more than just a “warm body.”

“Manufacturers want well-rounded high school graduates who can read, write, calculate, solve problems, work in teams and have strong employability skills. They want graduates familiar with the world of work and post-secondary education options.”

This sentiment has been echoed by manufacturers participating in the CSSI focus groups. According to findings from these groups, prospective employees are currently lacking in:

- Work ethic or common sense
- Communication
- Critical thinking/problem solving
- Math/English
- Technical Skills

In addition, in describing the critical skill shortage (i.e. shortage of applicants, or sufficient number of applicant, but they lack skills), most employers (51 percent) reported that they “hire for attitude and train for skills, but have trouble finding either.”

The most compelling reason for focus on the manufacturing industry in the Northeast EDR is not because of its growth potential, but because of its history as a strong industry, its resilience, and its status as a leader in American manufacturing. Efforts towards improving workers in the manufacturing industry will have dramatic effects on the well-being of thousands of the region’s citizens, and will translate into greater prosperity for the region as a whole.

Analysis of Secondary Data

To assist in their CSSI planning efforts, the Workforce Boards of Metropolitan Chicago have retained a team of local and national consultants to assist with several aspects of the initiative including the collection and analysis of data. An analysis team of researchers from the Hudson Institute Center for Economic Competitiveness performed analyses using Hudson’s proprietary “Jobs, Occupations, Workforce, Education” (JOWE[®]) database tool. The JOWE[®] database combines standard secondary employment and earnings/wage data to allow researchers to conduct powerful analyses and make projections. The JOWE[®] database is designed for data analysis in any industry at the county, state, or national levels. JOWE[®] provides the following information:

- Industry employment and earnings for any industry at the county, state, or national level
- The occupational profile of any industry: which occupations are employed in each industry
- The number of workers employed in each occupation within any industry
- Hourly wages and annual salaries for each occupation
- A 10-year employment projection for each occupation
- The skills and knowledge a worker in each occupation should possess
- The education level required to perform each occupation
- The means to identify the critical occupations in any industry
- A method to determine the most important job skills and knowledge areas workers need to possess for job performance

JOWE[®] is comprised of several secondary data sources that are correlated and compiled using specialized formulas. The secondary data sources include:

- ES202, Covered Employment and Wages
- BLS Occupational Employment Survey

¹⁸National Association of Manufacturers/Andersen/Center for Workforce Success, “The Skills Gap 2001: Manufacturers Confront Persistent Skills Shortages in an Uncertain Economy,” 2001. Available online at www.nam.org.

- BLS Occupational Employment Survey Occupational Projections
- The Occupational Information Network (O*Net)

Researchers also used the customized CSSI reports from the Illinois Department of Employment Security as a baseline for comparison with the results generated by JOWE[®]. This allowed researchers to present their findings with reference to an accepted standard for projections.

Collection and Analysis of Primary Data

The Illinois Department of Employment Security (IDES) designed a survey to measure job vacancy, educational requirements, required experience, median hourly wages, hiring difficulties and recruitment methods of occupations in the Northeast EDR manufacturing sector. The IDES survey of manufacturing employers included a list of manufacturing occupations about which data was collected. IDES reported findings for full-time, permanent occupations with vacancies in each of the manufacturing sub-sectors (durable and non-durable). As of April 23, 2004, the manufacturing survey garnered an approximate 47 percent participation rate, soliciting responses from 1,421 businesses with more than five employees. For a IDES survey methodology see Appendix B.

Twenty percent of non-durable manufacturing participants reported vacancies, while 27 percent of durable manufacturing companies reported vacancies.

Through this analysis, IDES identified 51 occupations in non-durable manufacturing, and 54 occupations in durable goods manufacturing. For the IDES survey results, see Appendix B. For the purposes of this report, the top 20 in each sub-sector are considered “critical.” To create the lists of critical skill shortage occupations featured later in this report, the top 20 occupations from the Hudson Institute JOWE[®] methodology and the top 20 occupations¹⁹ from the IDES survey were compiled for each sub-sector. The critical occupations from both the non-durable goods and durable goods manufacturing industries were then compiled. The critical occupations featured in this report, then, are inclusive of the entire non-durable and durable goods manufacturing industry in the region. In some cases, both the IDES survey and JOWE[®] generated the same occupations as critical. In this case, the occupation is listed once. Figure 3, on page 25, indicates whether the occupation was identified by JOWE[®], the IDES survey, or both.

In addition to the review of existing studies and the analyses of secondary data, Workforce Boards of Metropolitan Chicago also contracted with the Corporation for a Skilled Workforce to conduct focus groups, structured telephone interviews and site visits to obtain additional primary data about this industry and its critical occupations. This diverse primary data collection strategy has garnered some rich information; findings from this process will be included throughout this report. The twenty-plus occupations identified as “hard to fill” roughly correspond to the top twenty long-term vacancies as identified by IDES.

The focus groups were comprised of representatives from private sector firms, community colleges, Workforce Investment Boards, trade groups, industry associations, Chambers of Commerce and economic development corporations. There was some diversity among the attendees of the focus groups within the manufacturing sector, but the sub-sectors with the highest representation were Printing, Toolmaking, Plastics, and Food Production. The focus groups were designed to gather data on several different factors to inform this report but also the root causes and solutions reports. The information most relevant to this report is the data gathered regarding occupations that are difficult to fill.

CSW also conducted an online survey of manufacturing businesses—this was particularly helpful in gaining information from those invited to participate in the focus groups who could not attend. This survey collected information similar to that of the focus groups, including information that will be employed to a great degree in the root causes and solutions report.

¹⁹ Critical occupations from the IDES survey were measured as the top 20 occupations, ranked by the number of permanent (more than 6 months) vacancies reported.

Regional Coalition and Industry Partner Engagement

The CSSI initiative in the Northeast EDR has included broad-based involvement from both a geographical basis and interest basis. This current process has a rich foundation of regional collaboration. The strong existing links between the local Workforce Boards, comprising the Workforce Boards of Metropolitan Chicago, and the Manufacturing industry proved to be an efficient and effective mechanism for generating industry involvement throughout the region. In addition to existing links, the Workforce Boards devoted substantial effort to ensure key stakeholders had ample opportunity to participate in identifying the critical occupations in the region's manufacturing sector.

In October of 2003, the Workforce Boards convened three regional sessions over a two day period to share information on the region's response to the CSSI request for grant applications. More than 120 individuals attended from around the region to discuss the stakeholders to be involved, the data sources to be used, and strategies to be pursued. These meetings and various outreach activities pursued by the Workforce Boards' members and staff provided extensive input and engagement in the process from stakeholders throughout the region.

To ensure that industry partners and other stakeholders were able to validate the work of the contractors in identifying the critical occupations for the manufacturing sector, the Workforce Boards designed a meeting the Leadership and Regional Councils on April 14, 2004. This meeting of the Leadership and Regional Councils allowed for discussion concerning the research process and provided some preliminary feedback on the status. This process and the use of the Councils will be continued through each step of the project. For further explanation of engagement groups, see Figure 1.

- 1) Leadership Council—The Leadership Council, whose membership is described in Appendix C, met on April 14th 2004. Kristin Wolff from the Corporation for a Skilled Workforce (CSW) facilitated conversation about the status of the Manufacturing sector, and gave the Councils some initial feedback from several industry focus groups. The Council then met again on May 24th, 2004 and received a progress report on selection of critical occupations for the manufacturing sector..
- 2) Regional Council—This group met along with the Leadership Council to receive the progress reports and provide feedback on the process. The Regional Council's membership is provided as part of Appendix C.
 - At the April 14, 2004 meeting, conversation focused on ways in which the group could best participate in the CSSI process. The Leadership Council agreed to act as a sounding board and editor for the Manufacturing CSSI reports. The Regional Council agreed to assist in the dissemination of Critical Skills Shortage Initiative information and to provide guidance and recommendations to researchers completing the report.
 - The group discussed to some extent the issues facing the Manufacturing industry, including downsizing and mergers. Globalization and own-of-town management situations have directly affected the Chicago region, in the form of staff reductions. Results from focus groups indicated that the Manufacturing industry, due to rate at which change is occurring, is unable to “visualize the future.” This, in turn, has caused problems in communicating education and training needs to community colleges.
 - The Manufacturing industry, like many other industries, is also having problems in attracting and retaining a skilled workforce. Literacy and technical problem-solving abilities are two attributes one focus group noted that the current applicant pool may be lacking.
- 3) One-Stop Council—This group, whose representation is described in Appendix D, met on April 26, 2004. The group will be responsible for:
 - Identify and share best practices in sector strategies
 - Assimilate sector strategies and models in the One-Stops
 - Support implementation of CSSI solutions

- At the meeting, representatives grouped according to their local One-Stops to discuss approaches they are currently taking to implementing sector strategies at the One-Stops. Details from this process are available in the meeting minutes in Appendix D.
- 4) Manufacturing Sector Council – The Manufacturing Sector Council met on May 18th, 2004. They were briefed on preliminary findings of focus groups, job vacancy survey results and critical occupations. The group provided feedback on preliminary critical occupations. The council was also given a preview of the methodology for the remainder of the planning process including establishment of root causes and development of regional solutions. The complete minutes of the sector council can be found in Appendix E.
- 5) Community Stakeholder Groups—The group met on April 26, 2004 to become acquainted with the CSSI process. The group also heard about the methodology from Hudson Institute and CSW staff. Preliminary findings from focus groups and early survey results were presented. Minutes from this meeting are included in Appendix F.

Figure 1. – CSSI Participation and Input
Leadership and Participation Structure

Leadership Council	
Membership:	Workforce Board Chairs and CLEOs
Responsibilities	Review and provide guidance on CSSI planning grant deliverables: <ul style="list-style-type: none"> § Critical Skill Shortages Report § Root Causes Report § Regional Solutions Report

Regional Council	
Membership:	Representatives of IDHS, DCEO, IDES, ICCB, Labor, Regional Offices of Education, Economic Development Organizations, and the Private Sector, Community College Presidents, Chairs and Vice Chairs of Industry Councils and One-Stop Council, Foundations, and Workforce Board Chairs
Responsibilities	<ul style="list-style-type: none"> • Assist with the dissemination of CSSI information. • Review & provide guidance on CSSI findings & recommendations. • Support redirection of resources.

Manufacturing Sector Council	
Membership:	Representatives of the Private Sector, Industry Associations, Summit Action Teams, Economic Development Organizations, Chambers, and Labor
Responsibilities	<ul style="list-style-type: none"> • Assist with data collection to support CSSI research activities • Validate CSSI findings & recommendations • Support development of CSSI reports

Manufacturing Focus Groups	
Membership:	Area manufacturers (small, medium and large-sized businesses)
Responsibilities	<ul style="list-style-type: none"> Provide “ground-level” information and validation to secondary data

One-Stop Council	
Membership:	From each Local Workforce Area, one representative for each One-Stop partner
Responsibilities	<ul style="list-style-type: none"> Identify & share best practices in sector strategies Assimilate sector strategies & models in the One-Stops Support implementation of CSSI solutions

Community Stakeholder Groups	
Membership:	Community Based Organizations, Economic Development Organizations, Chambers of Commerce, the Education for Employment/Tech Prep System, Community Colleges and Universities, Industry Associations, One-Stop partners, Private Sector, Workforce Boards, Elementary and Secondary Education, Legislators, Local Elected Officials, and others
Responsibilities	<ul style="list-style-type: none"> Assist with implementation of CSSI solutions

The work of these councils flowed naturally from the previous years’ efforts of the members of the Workforce Boards of Metropolitan Chicago to address manufacturing workforce issues on a regional basis. The consensus-building process began in May 13, 2003 at the Manufacturing Workforce Summit, co-sponsored by the Workforce Boards of Metropolitan Chicago and many industry co-sponsors. The results of the Summit were used to prepare the strategic workforce development plan for the region.

Following a panel discussion, five action groups were convened with experts from the respective topic areas. Topics included the following. Under each heading are the top three action items that emerged from the action team discussions:

- Building the Image of Manufacturing
 - Educate and influence Congress, encouraging them to understand the implications of international trade on the U.S. manufacturer.
 - Communicate and illustrate the availability and positive nature of manufacturing jobs.
 - Encourage students and guidance counselors to attend trade shows and other venues for education about manufacturing careers.
- Raising the Foundation and Technical Skills of Entry-Level Employees
 - Initiate a pilot project for developing a certification program with standardized curricula that addresses skill sets for key jobs for various employers
 - Expand the communication between education providers and manufacturers and promote more interaction and involvement
 - Increase the sharing of information about career opportunities in manufacturing and stress the many opportunities for advancement
- Raising the Skills of the Current Workforce
 - Promote the development and delivery of training programs for incumbent workers that are employer-driven—programs should subscribe to skill standards, form part of a comprehensive career path, and offer industry and education credentials

- Develop a manufacturing training system that utilizes state-of-the-art equipment to equip workers with skills needed for high-tech, advanced manufacturing
- Form an educational advisory committee that is representative of all stakeholders to help drive the actions needed to develop a manufacturing training system
- Encourage the use of public/private resources to assist with incumbent worker training programs
- Developing, Advancing and Recruiting the Immigrant Workforce
 - Form a coalition of manufacturers, educators and community organizations that drive public policy changes that impact the education, skill development, cultural integration, funding and legalization issues related to the immigrant population
 - Develop a resource guide that increases awareness of resources and programs that support the integration of the immigrant workforce
 - Identify and foster “best practices” that support the education, skill development, cultural integration and legalization of immigrants for replication purposes
- The Challenge to Small Manufacturers of Developing a Skilled Workforce
 - Collaborate to address challenges and identify cost-effective solutions; establish a working relationship between small manufacturers and the workforce development system
 - Assist the education community in understanding the needs of small manufacturers
 - Develop the capacity to respond quickly to the pressures of innovation

As evidence of widespread support for and a willingness to work with the Workforce Boards of Metropolitan Chicago to identify and address the critical skill shortages of the manufacturing sector, letters of support were submitted and are provided in Appendix G.

Target Industry Analysis

Manufacturing as a Workforce Target

In the past few decades Illinois's manufacturing sector has been facing competition from all areas including low-wage manufacturers in developing countries, highly skilled manufacturers in developed countries, and also among southern and western states in the United States. Illinois used to have a firm grip on the manufacturing sector, but has recently slipped because of technological, productivity, profit margin, and labor cost changes have made other areas more attractive for growth.²⁰ Over the past decade, Illinois has seen a dramatic drop in its manufacturing sector—industry employment dropped by approximately 100,000 between 1990 and 2000. In 1990, manufacturing accounted for roughly 17.3 percent of Illinois employment. That proportion dropped to 13.9 percent in 2000. In 2002, within the Northeast region, manufacturing accounted for 14.0 percent of all jobs (Figure 2.) Most notable is the decline in Cook County's manufacturing sector. Even when the state experienced an upturn in employment after 1987, Cook County continued to lose manufacturing employment.

The outlook for Illinois' manufacturing economy, however, is not bleak. Analysis of the size of businesses indicates that there is some dynamism occurring in small manufacturing companies. The number of very small and very large companies are diminishing, but the number of companies with between 10 and 19 workers grew about 13 percent between 1982 and 2001. National trends are similar, and this is expected to continue. Large firms are less well-equipped to handle churning—when faced with hardship, these firms close down, relocate overseas, or make drastic cuts in production and personnel. Smaller firms are by nature more agile, allowing them to deal with changes in the economy. These smaller businesses, especially those which manufacture products for niche markets, are growing, and will most likely continue to grow as various forces move larger manufacturers out of the positions they have occupied for so long.

These structural changes in the manufacturing industry are resulting in a demand-shift towards workers that are multi-skilled, educated and critical thinkers. According to the National Association of Manufacturers' "Skills Gap 2001,"²¹ manufacturing companies are looking for more than just a "warm body."

- "Manufacturers want well-rounded high school graduates who can read, write, calculate, solve problems, work in teams and have strong employability skills. They want graduates familiar with the world of work and post-secondary education options."

This sentiment has been by manufacturers participating in the CSSI focus groups. According to findings from these groups, prospective employees are currently lacking in:

- Work ethic or common sense
- Communication
- Critical thinking/problem solving
- Math/English
- Technical Skills

In addition, in describing the critical skill shortage (i.e. shortage of applicants, or sufficient number of applicant, but they lack skills), most employers (51%) reported that they "hire for attitude and train for skills, but have trouble finding either."

The most compelling reason for focus on the manufacturing industry in the Northeast EDR is not because of its growth potential, but because of its history as a strong industry, its resilience, and its status as a leader in

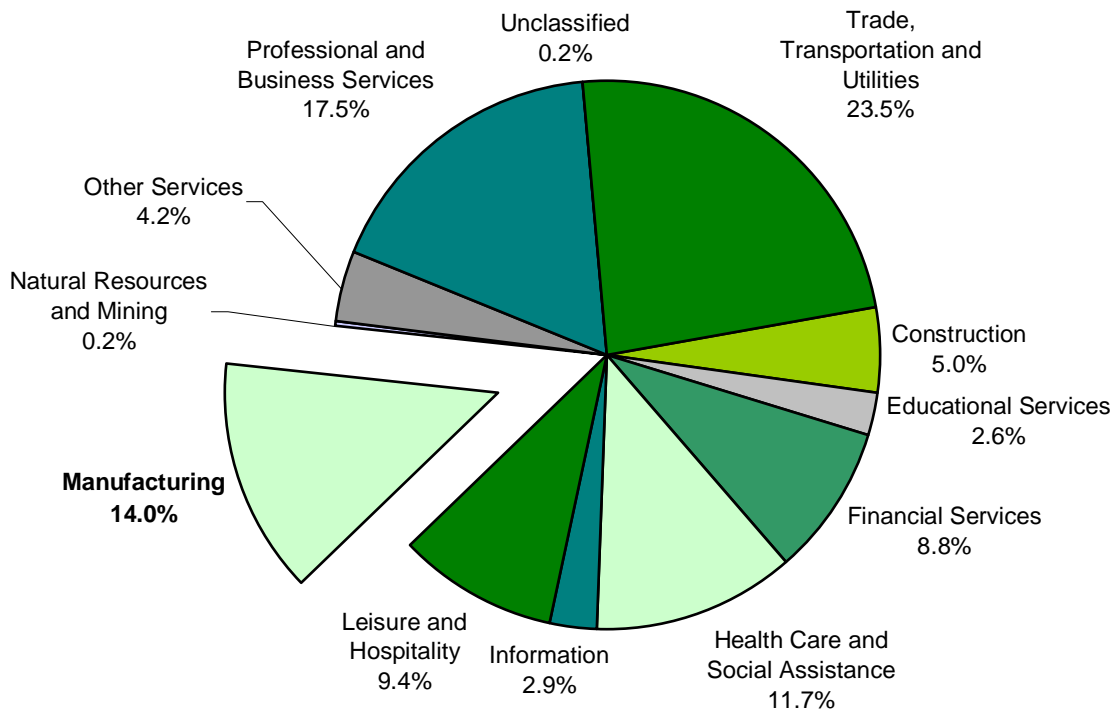
20 Based on the Profit Margin in Manufacturing: Illinois and the U.S., 1977 to 2000 Property-Type Income as a Percent of Manufacturing Output, Illinois's profit margin only grew by 3% from 24% to 27% ranking 42nd while the United States average profit margin jumped by 7% from 26% to 33%. New startup manufacturing facilities that did not need to be localized started up in other more profitable areas.

21 National Association of Manufacturers/Andersen/Center for Workforce Success, "The Skills Gap 2001: Manufacturers Confront Persistent Skills Shortages in an Uncertain Economy," 2001. Available online at www.nam.org.

American manufacturing. Efforts towards improving workers in the manufacturing industry will have dramatic effects on the well-being of thousands of the region’s citizens, and will translate into greater prosperity for the region as a whole.

Figure 2. – 2002 Employment by Industry²²
Northeast Illinois Economic Development Region

Analyzing Northeastern Illinois



Competitive Industry Analysis is a means of examining the strengths and weaknesses of the northeastern Illinois economy in terms of its industries. Each industry is examined from a number of angles to determine its current importance or future potential within the region’s economic base. The criteria examined include:

- Regional employment growth
- Total regional employment
- Degree of regional specialization, as indicated by the industry’s location quotient
- Gain or loss of regional competitive share, based on the “local factors” coefficient from shift share analysis

²² Employment data for Northeast Economic Development Region, 2003 Quarter 1, provided by Illinois Department of Employment Security.

- Gain or loss of national competitive share, based on the “industry mix” coefficient from shift share analysis.

The location quotient suggests the degree to which a local economy may “specialize” in an industry. Each industry’s location quotient is calculated by comparing the industry’s percentage of total regional employment with the industry’s percentage of total national employment. An industry that employs a greater percentage of the workforce locally than the national percentage would have a location quotient greater than one; conversely, an industry with a location quotient less than one employs a relatively smaller percentage of the labor force at the regional level than at the national level.

Shift share analysis attributes regional growth or decline in an industry to three sources: change in the overall national economy, or the “national share”; change in the industry at the national level, or the “industry mix”; and change due to regional effects, the “local factors” share. Looking at an industry through each of these “lenses” allows it to be classified on the regional level as Strong, Lagging, Constrained or Poor, depending on which areas are its relative strengths or weaknesses.

To view complete results of the Targeted Industry Analysis, see Appendix H.

Results

Target industry analysis is most accurate when the data analyzed are for years that were equivalent points in the business cycle. Thus, this analysis used data from 1989 and 2000, two peak years.

The following results are presented by performance group: strong, lagging, constrained or poor. Descriptions of each group are included in the sections below.

Strong Performers

Strong performing industries are those that are growing locally, but also outperforming their own industry nationally. Those industries that are specializations (location quotient greater than one) have developed a large employment presence in the area and continue to thrive. Industries that may not yet be specializations could signal prime emerging industries that may represent part of the region’s economic base for the future. The following focus industries are considered strong performers for the region.

SIC	Industry Name	Specialization
202	Dairy Products	
203	Preserved Fruits And Vegetables	
208	Beverages	
209	Misc. Food And Kindred Products	
276	Manifold Business Forms	√
283	Drugs	√
299	Misc. Petroleum And Coal Products	√
308	Miscellaneous Plastics Products, not elsewhere classified	√
346	Metal Forgings And Stampings	√
351	Engines And Turbines	√
352	Farm And Garden Machinery	
355	Special Industry Machinery	√
357	Computer And Office Equipment	
359	Industrial Machinery, not elsewhere classified	
366	Communications Equipment	√

They all show significant regional employment, positive growth, and stronger performance in the region than at the national level. Two of these industries, Drugs and Miscellaneous Petroleum and Coal Products, are comparatively strong on the national level as well, and should be considered specializations of the region. The rest, while either already important to the regional economy or emerging in importance, are weaker-than-average on the national level. Drugs, Miscellaneous Plastic Products, and Communications Equipment have all grown strongly and are all major regional employers, employing a combined 89,336 persons in 2000.

Lagging Performers

Lagging performers are those industries that are still showing local growth, but are declining in competitiveness when compared to the industry nationwide. For industries that are considered local specializations, this slippage indicates weakness at the local level that merits special attention. For those industries that are not currently local specializations, most employment growth seen is usually the result of larger economic or industry trends that are not tied to performance within the region. Efforts to bolster these industries to develop them for emerging strengths must be aimed at increasing local competitive advantage.

SIC	Industry Name	Specialization
201	Meat Products	
305	Hose & Belting & Gaskets & Packing	√
347	Metal Services, not elsewhere classified	√
349	Misc. Fabricated Metal Products	√
367	Electronic Components And Accessories	

Within the region, Hoses, Belting, Gaskets & Packing, Metal Services, and Miscellaneous Fabricated Metal Products are all underperforming on both a regional and national level, despite being regionally concentrated. SIC 201, Meat Products, has been lagging in performance. Although it has been a relatively stable industry, it no longer has the dominant concentration within the region that it once garnered. Electronic Component Manufacturing is another lagging performer, limited by local and national industry factors.

Constrained Performers

Constrained performers are those industries that are suffering local employment loss, but not as rapidly as elsewhere in the nation. Of those industries that are considered specializations, being constrained indicates they are of still a relevant strength, but their growth potential is being limited by external factors. Local intervention will only have a limited effect on competitiveness. Programs must address competitiveness issues at an industry-wide level. For industries that are not local specializations, it will take significant additional resources to bolster industry competitiveness as the issues of industry-wide competitiveness and local competitive advantage must both be addressed.

SIC	Industry Name	Specialization
205	Bakery Products	√
281	Industrial Inorganic Chemicals	
342	Cutlery, Hand tools, And Hardware	√
361	Electric Distribution Equipment	√
362	Electrical Industrial Apparatus	√
369	Misc. Electrical Equipment & Supplies	
385	Ophthalmic Goods	√

These “constrained performers” include Bakeries, Cutlery and Hand Tools, Electric Distribution Equipment, Electrical Industrial Apparatus, and Ophthalmic Goods. Additionally, Industrial Inorganic Chemicals and Miscellaneous Electrical Equipment have low regional employment concentration. All of these industries have experienced negative growth in the recent past, from -1% in Bakeries to -10.1% in Electrical Distribution Equipment.

Poor Performers

Poor performing industries are those that are losing employment both locally as well as competitive share nationally. Overall the growth prospects of these industries are limited. Often these industries will draw the most attention concerning employment loss, but the ability to address these issues locally in the hopes of reversing or halting this decline are dim due to overall industry issues nationwide coupled with strong local weaknesses. Unless these industries represent an overwhelming importance to the local economy, resources can best be utilized on stimuli efforts in other industries.

SIC	Industry Name	Specialization
204	Grain Mill Products	
206	Sugar And Confectionery Products	√
271	Newspapers	
272	Periodicals	√
273	Books	√
274	Miscellaneous Publishing	√
275	Commercial Printing	√
277	Greeting Cards	√
278	Blankbooks And Bookbinding	√

SIC	Industry Name	Specialization
279	Printing Trade Services	√
282	Plastics Materials And Synthetics	
284	Soap, Cleaners, And Toilet Goods	√
285	Paints And Allied Products	√
286	Industrial Organic Chemicals	
289	Miscellaneous Chemical Products	√
291	Petroleum Refining	
295	Asphalt Paving And Roofing Materials	
306	Fabricated Rubber Products, not elsewhere classified	
331	Blast Furnace And Basic Steel Products	√
332	Iron And Steel Foundries	
335	Nonferrous Rolling And Drawing	
336	Nonferrous Foundries (Castings)	√
339	Miscellaneous Primary Metal Products	√
341	Metal Cans And Shipping Containers	√
343	Plumbing And Heating, Except Electric	√
344	Fabricated Structural Metal Products	
345	Screw Machine Products, Bolts, Etc.	√
353	Construction And Related Machinery	
354	Metalworking Machinery	√
356	General Industrial Machinery	√
358	Refrigeration And Service Machinery	
363	Household Appliances	
364	Electric Lighting And Wiring Equipment	√
365	Household Audio And Video Equipment	
381	Search And Navigation Equipment	
382	Measuring And Controlling Devices	
384	Medical Instruments And Supplies	
386	Photographic Equipment And Supplies	

Manufacturing in northeastern Illinois, like in much of the country, is on the decline. Because employment in the study region is concentrated in a number of manufacturing industries, the study region is in a position to be particularly hard-hit by the sector-wide shrinkage. Employing 251,000 people in 2000—about 7% of the total regional workforce—these industries are shedding jobs both regionally and nationally. These industries all perform worse at the regional level than at the national level, making them particularly at risk for further contraction. Although a large number of these industries are specializations of the region in terms of employment concentration, their outlook is generally poor.

The Workforce Boards of Metropolitan Chicago decided the major industry groups, which include the industries analyzed above, should be the basis for analysis within the manufacturing sector. Although it can

be argued that poor performing industries should not be a main focus of regional solutions, all industry groups contain industries that are good candidates for local intervention. As the spillover effects of these programs and solutions to poor performing industries are an incidental benefit that can affect the jobs of a great number of workers, focus should still be placed on workforce development in these industries.

Final Industry Group Selections	
Durable Goods	
	Primary Metals Products
	Fabricated Metals Products
	Industrial Machinery and Equipment
	Electrical Equipment
	Electronics Equipment
	Medical Equipment and Supplies
Non-durable Goods	
	Food and Kindred Products
	Confectionary Products & Bakeries
	Printing, Publishing and Allied Products
	Chemical & Allied Products
	Petroleum Refining and Related Products
	Rubber and Miscellaneous Plastics Products

For a complete view of the Targeted Industry Analysis, see Appendix H.

Identification of Occupations

The occupations analyzed in this report are critical to Northeastern Illinois' manufacturing industries. The manufacturing sector is made up of the following industries:

Durable Goods Industries

Primary Metal Industries

- NAICS 3311 – Iron and Steel Mills and Ferroalloy Manufacturing
- NAICS 3312 – Steel Product Manufacturing from Purchased Steel
- NAICS 3313 – Steel Wire Drawing
- NAICS 3314 – Nonferrous Metal Production and Processing
- NAICS 3315 – Foundries

Fabricated Metal Products

- NAICS 3321 – Forging and Stamping
- NAICS 3322 – Cutlery and Hand tool Manufacturing
- NAICS 3323 – Architectural and Structural Metals Manufacturing
- NAICS 3324 – Boiler, Tank and Shipping Container Manufacturing
- NAICS 3325 – Hardware Manufacturing
- NAICS 3326 – Spring and Wire Products Manufacturing
- NAICS 3327 – Machine Shops, Turned Product and Screw, Nut and Bolt Manufacturing
- NAICS 3328 – Coating, Engraving, Heat Treating and Allied Activities
- NAICS 3329 – Other Fabricated Metal Products Manufacturing

Industrial Machinery and Equipment

- NAICS 3331 – Agriculture, Construction and Mining Machinery Manufacturing
- NAICS 3332 – Industrial Machinery Manufacturing
- NAICS 3333 – Commercial and Service Industry Machinery Manufacturing
- NAICS 3334 – Ventilation, Heating, AC and Commercial Refrigeration Manufacturing
- NAICS 3335 – Metalworking Machinery Manufacturing
- NAICS 3336 – Engine, Turbine, and Power Transmission Equipment Manufacturing
- NAICS 3339 – Other General Purpose Machinery Manufacturing

Electrical Equipment

- NAICS 3351 – Electric Lighting Equipment Manufacturing
- NAICS 3352 – Household Appliance Manufacturing
- NAICS 3353 – Electrical Equipment Manufacturing
- NAICS 3359 – Other Electrical Equipment and Component Manufacturing

Electronics Equipment

- NAICS 3341 – Computer and Peripheral Equipment Manufacturing
- NAICS 3342 – Communications Equipment Manufacturing
- NAICS 3343 – Audio and Video Equipment Manufacturing
- NAICS 3344 – Semiconductor and Other Electronic Component Manufacturing
- NAICS 3345 – Navigational, Measuring, Electromedical and Control Instruments
- NAICS 3346 – Manufacturing and Reproducing Magnetic and Optical Media

Medical Equipment and Supplies

- NAICS 3391 – Medical Equipment and Supplies Manufacturing

Non-Durable Manufacturing Industries

Food and Kindred Products

- NAICS 3112 – Grain and Oilseed Manufacturing
- NAICS 3114 – Fruit and Vegetable Preserving and Specialty Food Manufacturing
- NAICS 3115 – Dairy Product Manufacturing
- NAICS 3116 – Animal Slaughtering and Processing
- NAICS 3117 – Seafood Product Preparation and Packaging
- NAICS 3119 – Other Food Manufacturing
- NAICS 3121 – Beverage Manufacturing

Confectionary Products & Bakeries

- NAICS 3113 – Sugar and Confectionery Product Manufacturing
- NAICS 3118 – Bakeries and Tortilla Manufacturing

Printing, Publishing and Allied Products

- NAICS 5111 – Newspapers, Periodical, Book and Database Publishers
- NAICS 5112 – Software Publishers
- NAICS 3121 – Printing and Related Support Activities

Chemical and Allied Products

- NAICS 3251 – Basic Chemical Manufacturing
- NAICS 3252 – Resin, Synthetic Rubber, and Artificial and Synthetic Fibers and Filaments Manufacturing
- NAICS 3253 – Pesticide, Fertilizer and other Agricultural Chemical Manufacturing
- NAICS 3254 – Pharmaceutical and Medicine Manufacturing
- NAICS 3255 – Paint, Coating and Adhesive Manufacturing
- NAICS 3256 – Soap, Cleaning Compound, and Toilet Preparation Manufacturing
- NAICS 3259 – Other Chemical Product and Preparation Manufacturing

Petroleum Refining and Related Products

- NAICS 3241 – Petroleum and Coal Products Manufacturing

Rubber and Miscellaneous Plastics Products

- NAICS 3261 – Plastics Products Manufacturing
- NAICS 3262 – Rubber Products Manufacturing

Other industry designations are included in the broad definition of the manufacturing sector, but the above codes have been selected as the ones to receive intense analysis in this project. The manufacturing industry in Northeastern Illinois has been identified as a targeted industry by Workforce Boards of Metropolitan Chicago.

Critical Occupations Analysis

“Critical occupations” are those that are vitally important to the overall health of an industry. Critical occupations are those that experience strong employment demand, provide good wages, are critical to industry competitiveness, and are appropriate for targeting for the workforce system.

The process by which critical occupations were identified involved primary and secondary data analysis including utilization of the JOWE® model, surveys, focus groups, and input from industry experts.

The IDES survey, which measured current “permanent” vacancies in both durable goods and non-durable manufacturing companies, was utilized to a great extent in the identification of critical occupations. The top 20 occupations, ranked in descending order of the number of vacancies, from the IDES report are considered “critical.”

The JOWE[®] methodology for identifying critical occupations in targeted industries melded data from several different sources and measured occupations using factors that determine the impact of the occupation on the industry as a whole. The critical occupations model utilizes five secondary data sets²³:

1. Regional Employment by Industry: Covered Employment and Wages Program, 2003. From Illinois Department of Employment Security.
2. Staffing Pattern: Occupational Employment Survey: 2002 National four-Digit NAICS Industry-Specific Estimates. Bureau of Labor Statistics.²⁴
3. Wages: Median Annual Wages in the Northeast Illinois Economic Development Region, 2003 Quarter Three. Provided by the Illinois Department of Employment Security.
4. Projections: Occupational Employment Projections in Chicago PMSA for a base year of 2000 and a projected year of 2010. Illinois Workforce Info Center.²⁵
5. Job Zones: Job Zones from the O*NET 5.1 database. National O*NET Consortium.²⁶

When available, all data was aggregated across the ten-county region. While, to some extent, data at the county level is available, the analysis recognized the fact that economies and workforces, particularly those in metropolitan areas, supercede county lines. Workforces in particular are highly mobile and efforts taken to train workers in one county will affect the entire region.

In measuring critical occupations, four factors are weighed. Each factor contributed to the overall competitive rating of the occupation.

Magnitude: The total occupational employment in the industry. This factor measures the current employment demand of the occupation in the industry.

Annual Wage: The average annual wage/salary of the occupation in the region. This factor measures the earning strength of occupations in the industry.

Projections: The number of annual openings from 2000 to 2010 for each occupation in the region. Projections are not industry-specific. The projected number of job openings includes those generated by industry growth and replacements: workers needed to replace those who have retired, quit, changed careers, etc. This factor measures the future demand of an occupation.

JobZone Training Levels: The training or education requirement identified by the US Department of Labor’s Employment and Training Administration. This factor measures the training competitiveness in each occupation; occupations requiring high levels of education and training will ultimately be more difficult to fill.

The total score by which each occupation was ranked is a sum of the above factor scores. The total number of points possible was 25. The highest score for a critical occupation was 25, for General and Operations Managers. The lowest score for a critical occupation was 16 (several occupations).²⁷

Using the JOWE[®] model to identify occupations critical to the Manufacturing sector produced a list of occupations important to Manufacturing, but which are not specifically employed solely within that sector. Examples are CEO’s, customer service representatives, accountants and auditors, general maintenance

²³ For notes on these data sources, see Appendix I. For a more thorough description of the JOWE[®] methodology, see Appendix J. For the JOWE[®] critical occupations scoring sheets, see Appendix K.

²⁴ Available online at http://www.bls.gov/oes/oes_dl.htm#2002.

²⁵ Available online at <http://wic.ilworkinfo.com/analyzer/session/occupation.asp?cat=OCC>.

²⁶ Available online at <http://www.onetcenter.org/database.html#download>.

²⁷ For a more thorough explanation of the Hudson Institute’s methodology, please see Appendix J. Notes on data sources can be found in Appendix K. The Critical Occupations Score sheet is in Appendix L.

workers, and financial managers. All of these occupations play a very important supporting role to aspects of the Manufacturing industry, particularly in meeting the administrative and business-management needs of the industry. For a list of critical occupations in manufacturing identified by JOWE[®], see Appendix L. For a complete list of industry-specific critical occupations, see Appendix M.

The following table provides a summary of the various components of the critical occupations identification process. The list is sorted alphabetically and to the right of the occupation titles is an indication of whether or not the occupations was identified as “critical” according to the JOWE[®] and survey process. The following list is a compilation of critical occupations in both durable and non-durable goods manufacturing.

Figure 3. – Critical Occupations in Manufacturing
Summary of Secondary and Primary Analysis

SOC	Occupation Title	JOWE [®] Analysis	IDES Vacancy Survey
Business & Financial Operations			
131111	Management Analysts		ü
132011	Accountants and Auditors	ü	
Computer & Mathematical Occupations			
151021	Computer Programmers	ü	
151031	Computer Software Engineers, Applications	ü	
151032	Computer Software Engineers, Systems Software	ü	ü
151041	Computer Support Specialists	ü	
151051	Computer Systems Analysts	ü	ü
151071	Network & Computer Systems Administrators		ü
Engineering Occupations			
172071	Electrical Engineers	ü	ü
172112	Industrial Engineers		ü
172141	Mechanical Engineers	ü	ü
Sales & Related			
412031	Retail Sales Persons	ü	
414012	Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific	ü	
Production			
511011	First-Line Managers of Production and Operating Workers	ü	ü
512022	Electrical and Electronic Equipment Assemblers		ü
512092	Team Assemblers		ü

SOC	Occupation Title	JOWE [®] Analysis	IDES Vacancy Survey
513023	Slaughterers and Meat Packers		ü
513093	Food Cooking Machine Operators and Tenders		ü
514011	Computer-Controlled Machine Tool Operators, Setters		ü
514031	Cutting, Punching, and Pressing Machine Setters, Operators		ü
514033	Grinding, Lapping, Polishing, and Buffing Machine Tool Setters		ü
514041	Machinists	ü	
514072	Mold, Coremaking, and Casting Machine Operators		ü
514111	Tool and Die Makers	ü	
515022	Prepress Technicians and Workers	ü	
515023	Printing Machine Operators		ü
517011	Cabinetmakers and Bench Carpenters		ü
519041	Extruding, Forming, Pressing, and Compacting Machine Setters, Operators, and Tenders		
519061	Inspectors, Testers, Sorters, Samplers and Weighers	ü	ü
519195	Molders, Shapers and Casters		ü
519198	Helpers-Production Workers		ü
Administrative Production Workers			
431011	First-Line Manager of Office/Administrative Workers	ü	ü
Customer Service & Clerical			
434051	Customer Service Representative	ü	ü
436011	Executive Secretaries and Administrative Assistants	ü	ü
439061	Office Clerks, General	ü	
433031	Bookkeeping, Accounting, and Auditing Clerks	ü	ü
Arts, Design, & Media			
273041	Editors	ü	
Life & Physical Science Occupations			
194031	Chemical Technicians		ü
Transportation & Material Moving			
533032	Truck Drivers, Heavy and Tractor-Trailer	ü	ü

SOC	Occupation Title	JOWE [®] Analysis	IDES Vacancy Survey
537062	Laborers and Freight, Stock, and Material Movers, Hand	ü	ü
537064	Packers and Packagers, Hand		ü
Buildings & Grounds			
372011	Janitors and Cleaners	ü	ü
Installation Maintenance & Repair			
499041	Industrial Machinery Mechanics		ü
499042	Maintenance and Repair Workers, General	ü	
Management Occupations			
111021	General and Operations Managers	ü	ü
112021	Marketing Managers	ü	
112022	Sales Managers	ü	ü
113021	Computer and Information Systems Manager	ü	
113031	Financial Managers	ü	
113040	Human Resource Managers		ü
113051	Industrial Production Managers	ü	ü
119041	Engineering Managers	ü	

Worker Attributes

In any workforce development effort, it is essential to know the level of education and the important skills that workers will need to possess to enter the manufacturing sector. Combining information from both primary and secondary data sources, the following pages document the appropriate skills and credentialing for the critical occupations in the manufacturing sector.

Skills and Credentials

The following table illustrates the educational levels of workers in the Northeast EDR’s manufacturing sector, as well as the government-assigned JobZone educational category of each of the occupations. The educational allocations of these occupations were reached through the IDES survey of several manufacturing industries. JobZones are defined below. It is important to note that the IDES survey results delineate the responding employers’ required credential for a position. The credentials in this table are not necessarily the same as legal requirements, or those of common conception. Employers are free to require a higher credential than the legally mandated minimum credential. Those differences will be discussed in the Root Causes and Solutions report, which will include a discussion about regulation and policy.

Figure 4. – Educational Attainment & Credentialing
From Regional Survey and National O*NET

SOC Code	Occupation	No diploma	Diploma/GE D	HS	Vocational Training	Associates	Bachelors	Masters	O*Net Job Zone
Business & Financial Operations									
131111	Management Analysts						100%	100%	4
132011	Accountants and Auditors	23%	15%			50%	46%-50%	15%	4
Computer & Mathematical Occupations									
113021	Computer and Information Systems Manager						100%		5
151021	Computer Programmers						100%		4
151031	Computer Software Engineers, Applications						40%-100%	60%	4
151032	Computer Software Engineers, Systems					100%	100%		4
151041	Computer Support Specialists					100%	75%	25%	4

28 The IDES survey report documents the educational attainment of the current manufacturing staff for non-durable goods and durable goods manufacturing. Findings from the survey are presented in range form due to variation among each occupation’s educational attainment in each of the industries.

SOC Code	Occupation	No diploma	Diploma/GE HS D	Vocational Training	Associates	Bachelors	Masters	O*Net Job Zone
151051	Computer Systems Analyst					100%		3
Customer Service & Clerical								
433031	Bookkeeping, Accounting and Auditing Clerks		22%-25%		22%-75%	22%	33%	2
434051	Customer Service Representatives	8%-18%	23%-52%		15%	15%-69%		2
436011	Executive Secretaries and Administrative Assistants		29%-92%		8%-29%	43%		4
439061	Office Clerks, General	22%	22%-57%		43%-56%			2
Engineering Occupations								
172071	Electrical Engineers					100%		5
172112	Industrial Engineers					100%-100%		4
172141	Mechanical Engineers	24%				68%	8%	4
Sales & Related								
412031	Retail Sales Persons		60%-63%			38%-40%		2
414012	Sales Representatives, Except Wholesale and Manufacturing, Technical and Scientific	NA	NA	NA	NA	NA	NA	2
Production								
511011	First-Line Managers of Production and Operating Workers	5%-13%	53%-66%	5%-20%	13%-24%			3
512022	Electrical and Electronic Equipment Assemblers	89%	11%					3
512092	Team Assemblers	100%	83%			17%		N/A
513023	Slaughterers and Meat Packers		100					2
513093	Food Cooking Machine Operators and Tenders		13%	87%				1
514011	Computer-Controlled Machine Tool Operators, Setters	34%	34%	30%-100%				2
514031	Cutting, Punching, and Pressing Machine Setters, Operators	45%-71%	29%	55%				2
514033	Grinding, Lapping, Polishing, and Buffing Machine Tool Setters	NA	NA	NA	NA	NA	NA	2.5
514041	Machinists	33%	67%					4

SOC Code	Occupation	No diploma	Diploma/GE HS D	Vocational Training	Associates	Bachelors	Masters	O*Net Job Zone
514072	Mold, Coremaking, and Casting Machine Operators	33%-50%	50%-57%	10%				2
514111	Tool and Die Makers	NA	NA	83%		17%		4
515022	Prepress Technicians and Workers		100%					4
515023	Printing Machine Operators	19%	81%					3
517011	Cabinetmakers and Bench Carpenters			100%-100%				3
519041	Extruding, Molding, Forming, Pressing, Compacting Machine Operators		100%					1.5
519061	Inspectors, Testers, Sorters, Samplers and Weighers	25%	17%-71%		42%	17%-29%		3
519195	Molders, Shapers and Casters	60%-67%	14%	19%-40%				3
519198	Helpers—Production Workers	40%-83%	17%-56%			4%		1
Arts, Design, & Media								
273041	Editors	NA	NA	NA	NA	NA	NA	4
Life & Physical Science Occupations								
194031	Chemical Technicians					100%	100%	3
Administrative Production Personnel								
431011	First-Line Manager of Office/Administrative Workers		9%		78%-87%	13%-13%		3
Transportation & Material Moving								
533032	Truck Drivers, Heavy and Tractor-Trailer	18%	81%	1%				2
537062	Laborers and Freight, Stock, and Material Movers, Hand	10%	90%-100%					1.3
537064	Packers and Packagers, Hand	32%-33%	67%-68%					1
Buildings & Grounds								
372011	Janitors and Cleaners	100%	100%					1
Installation Maintenance & Repair								
499041	Industrial Machinery Mechanics	20%	41%-60%	20%-41%		12%		3

SOC Code	Occupation	No diploma	Diploma/GE D	HS	Vocational Training	Associates	Bachelors	Masters	O*Net Job Zone
499042	Maintenance and Repair Workers, General		100%-100%						3
Management Occupations									
111021	General and Operations Managers		50%-100%				50%		5
112021	Marketing Managers		10%				90%-100%		4
112022	Sales Managers					10%	90%-100%		4
113031	Financial Managers					33%	46%-67%	54%	4.5
113040	Human Resource Managers		23%			20%	60%-77%	20%	4
113051	Industrial Production Managers		11%			30%	40%-89%	30%	4
119041	Engineering Managers	NA	NA	NA	NA	NA	NA	NA	5

JobZone Training Levels: The training or education requirement identified by the US Department of Labor’s Employment and Training Administration. This factor measures the training competitiveness in each occupation; occupations requiring high levels of education and training will ultimately be more difficult to fill.

To apply scores for JobZone Training Levels, the level indicated was simply utilized as a score. Thus, a JobZone level of five received five points.

Level 1 - Requires a high school diploma or GED certificate. May require some formal training to obtain licensing.

Level 2 - Usually requires a high school diploma in addition to some vocational or on-the-job training.

Level 3 - Requires on-the-job training, vocational education or an associate’s degree. Some positions may require a bachelor’s degree.

Level 4 - Most positions require a four-year bachelor’s degree, but some do not.

Level 5 - Minimum requirement is a bachelor’s degree. Some positions may require graduate school, such as Ph.D., MD, JD, etc.

Documentation of Skills and Important Attributes Analysis

The US Department of Labor’s Employment and Training Administration’s Occupational Employment Network, O*Net, is the only available data tool with which one can conduct large scale occupational skills analysis. O*Net is a survey-based data tool that reports on job attributes and activities that one will be expected to possess and perform during job performance. For the purposes of this project, two data sets were utilized: Knowledge Areas and Skills Areas.

O*Net profiles 33 Knowledge Areas and 35 Skill Areas, and assigns to these attributes a "level" score, which indicates the proficiency with which the worker needs to possess the attribute. Knowledge areas can be understood to be academic or "hard" skills mainly learned on the job or during training. Skill areas may be

understood as traits or "soft" attributes that an employee generally possesses before starting the job, but are required for sufficient job performance.

Both Knowledge Areas and Skill Areas are important for workforce development efforts. When looking at either individual occupations or groups of occupations, it is valuable to determine the types of knowledge and skills each worker will need in order to perform his or her job at a sufficient level; it can assist in the targeting and recruitment of workers in critical occupations and can assist human resources directors in interviewing and subsequently hiring workers with the appropriate knowledge and skill levels. This type of analysis is also helpful in curriculum development efforts. While the attributes profiled through O*Net are not occupation-specific, curriculum developers may discover attributes required that have been lacking in previous programs. For instance, Chemical Technicians require a high degree of competence in Mathematics. To ensure that Chemical Technicians reach their industry destination, educational institutions may wish to require competency testing in mathematics. Likewise, nearly every production occupation requires a great deal of strength in the production process. Workers must start their jobs knowing the basics of factory operations. To effectively teach Production and Processing to new manufacturing employees, educational institutions may require more internships or practical experiences.

Determining Important Attributes for Occupational Groups

Because training efforts may include targeting a group of occupations with a focus on developing career paths, this report includes an analysis of the Important Attributes for occupational groups. Because of the varying capacities of each of the critical occupations, we have completed eleven separate occupational group attributes analyses:

Important Attributes analysis for a group of occupations takes into account both the level of competence with which occupations are required to perform an attribute, as well as the size of the occupation in the industry. Ultimately, the Important Attributes scores indicate the Knowledge and Skill Areas that require the highest level of competence from the greatest number of workers currently employed in the industry. In curriculum development terms, these attributes will be the academic and training areas in which the greatest number of students should be instructed at the highest levels.

Determining Important Attributes for a group of occupations is a four-step process:

1. Multiply "level" score by occupational industry employment across attributes
2. Compile results from Step One by attribute
3. Rank results from Step Two by attribute, creating a ranked list of attributes
4. Divide all scores in the ranked list by the greatest score in that list, creating an index score, and multiply by 100. The highest possible score will be 100.

The resulting ranking of attributes describes the skill and knowledge requirements for each occupation, or for groups of occupations. As an example, the results for Business, Financial and Administrative Occupations are shown below. For the results for all occupational groups, please see Appendix N.

Business, Financial and Administrative Occupations

Skills Attribute Title	Index Score	Knowledge Attribute Title	Index Score
Active Listening	100	Clerical	100
Reading Comprehension	97	Mathematics	69
Writing	89	Economics and Accounting	67
Speaking	87	English Language	65
Mathematics	86	Computers and Electronics	60
Coordination	75	Customer and Personal Service	58
Monitoring	73	Administration and Management	53
Critical Thinking	70	Education and Training	48
Active Learning	68	Law and Government	46
Judgment and Decision Making	68	Personnel and Human Services	43

Career Pathways

Career pathways are defined occupational progressions, linked by training and certification programs. They provide a structure for movement between occupations, allowing workers to move into higher-skill, higher-pay careers or to shift into careers that may be more personally fulfilling or in higher demand.

These pathways are in place to educate workers about career options and increased earnings opportunities and to help fill occupational gaps in an industry. Career pathways are important because they define a realistic route from an entry-level position to a position requiring greater responsibility and training. Without career pathways in place, many workers may fail to see opportunities for upward career momentum, increased earnings potential, better quality of life, and a greater sense of career satisfaction. Increased earnings, in turn, drive the economy, leading to even better quality of life for residents of a community.

Pathways are particularly important to the manufacturing industry for several reasons. The industry is a large presence in the region. A large percentage of the occupations employed in manufacturing, such as team assemblers, require relatively little in the way of *formal* training. Yet, these workers are absolutely essential to the vitality and functioning of the industry. As with any relatively low-pay, low-skill job, this position is prone to a high degree of turnover. Career pathways offer the industry an opportunity to capitalize on an incumbent worker who, perhaps, is not satisfied with his/her career or earnings as an orderly, but would be willing to train further for a better career as a multiple-machine tool operator. The employee, seeing a defined pathway ahead of her/him, may choose to “stick it out” for a longer time, rather than self-terminating. The industry will retain a quality employee at a higher level of employment, cultivating a long-term employee relationship.

In order to address career pathways thoroughly, it is imperative to first identify critical occupations. It is the intention of Workforce Boards of Metropolitan Chicago to further explore career progression and pathways in the root causes report.

Wages

Prevailing wages are an important indicator of the relative demand of occupations in a regional economy. How regional wages compare with national ones affects supply as well, as comparatively high regional wages will encourage workers in an occupation to move into the area.

Comparison of 2002 National and Regional Median Wages

In order to make consistent regional wage comparisons to national data, median wages for 2003 quarter three in the Northeast Illinois Economic Development Region were provided by the Illinois Department of Employment Security. These wages were compared to 2002 National wage data from the Occupational Employment Survey (Bureau of Labor Statistics), adjusted to the 2003 levels using the Index of Aggregate Weekly Payrolls from the Current Employment Survey (Bureau of Labor Statistics).

Wages in the study region exceed the national median in several occupations (Figure 5). In the most extreme case, wages for Human Resource Managers exceed the national wage by \$4.93 per hour. Other occupations outpacing the national median wage include Computer Software Engineers (Software Systems), Financial Managers, Cabinetmakers & Bench Carpenters, Maintenance & Repair Workers, and Sales Managers. There are some occupations that earn a wage lower than the national median. These include Engineering Managers, Computer Software Engineers (Applications), Electrical Engineers and Chemical Technicians.

Figure 5. – Wage Comparisons
Northeast EDR v. the Nation

SOC	Occupation	Study Region Median Wage ²⁹	National Median Wage ³⁰	Difference Between Study Region & National Median Wage
Management				
111021	General and Operations Managers	\$35.14	\$33.23	\$1.91
112021	Marketing Managers	\$37.84	\$38.11	-\$0.27
112022	Sales Managers	\$39.04	\$36.55	\$2.49
113021	Computer and Information Systems Managers	\$42.31	\$41.51	\$0.80
113031	Financial Managers	\$39.18	\$35.72	\$3.46
113040	Human Resources Managers	\$36.44	\$31.51	\$4.93
113051	Industrial Production Managers	\$34.08	\$32.79	\$1.29
119041	Engineering Managers	\$42.71	\$44.28	-\$1.57
Business & Financial Occupations				
131111	Management Analysts	\$31.55	\$29.39	\$2.16

²⁹ Source: Regional Wage Data. Supplied by Illinois Department of Employment Security, 2003 Quarter 3.

³⁰ Source: 2003 National Wage Data forecasted from 2002 Occupational Employment Survey (Bureau of Labor Statistics) data using Index of Aggregate Weekly Payrolls from the Current Employment Survey.

SOC	Occupation	Study Region Median Wage ²⁹	National Median Wage ³⁰	Difference Between Study Region & National Median Wage
132011	Accountants and Auditors	\$22.44	\$22.89	-\$0.45
Building & Grounds				
372011	Janitors and Cleaners, Except Maids and Housekeeping Cleaners	\$10.10	\$8.88	\$1.22
Computers & Mathematics				
151021	Computer Programmers	\$29.47	\$29.36	\$0.11
151031	Computer Software Engineers, Applications	\$33.13	\$34.53	-\$1.40
151032	Computer Software Engineers, Systems Software	\$40.25	\$36.06	\$4.19
151041	Computer Support Specialists	\$20.74	\$19.04	\$1.70
151051	Computer Systems Analysts	\$32.16	\$30.63	\$1.53
151071	Network and Computer Systems Admin	\$28.69	\$26.69	\$2.00
Engineering				
172071	Electrical Engineers	\$31.90	\$33.21	-\$1.31
172112	Industrial Engineers	\$29.99	\$30.27	-\$0.28
172141	Mechanical Engineers	\$30.02	\$30.62	-\$0.60
Life & Physical Science Occupations				
194031	Chemical Technicians	\$17.02	\$18.23	-\$1.21
Arts, Design, & Media				
273041	Editors	\$22.31	\$20.05	\$2.26
Sales & Related				
412031	Retail Salespersons	\$9.16	\$8.62	\$0.54
414012	Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	\$21.38	\$20.81	\$0.57
Administrative Production Personnel				
431011	First-Line Supervisors/Managers of Office and Administrative Support Workers	\$20.57	\$18.90	\$1.67
Customer Service & Clerical				
433031	Bookkeeping, Accounting, and Auditing Clerks	\$14.66	\$13.33	\$1.33
434051	Customer Service Representatives	\$13.97	\$12.78	\$1.19

SOC	Occupation	Study Region Median Wage ²⁹	National Median Wage ³⁰	Difference Between Study Region & National Median Wage
436011	Executive Secretaries and Administrative Assistants	\$16.74	\$16.27	\$0.47
439061	Office Clerks, General	\$11.44	\$10.85	\$0.59
Installation, Maintenance, & Repair				
499041	Industrial Machinery Mechanics	\$17.86	\$18.50	-\$0.64
499042	Maintenance and Repair Workers, General	\$17.17	\$14.30	\$2.87
Production				
511011	First-Line Supervisors/Managers of Production and Operating Workers	\$21.40	\$20.91	\$0.49
512022	Electrical and Electronic Equipment Assemblers	\$11.04	\$11.17	-\$0.13
512092	Team Assemblers	\$10.94	\$11.04	-\$0.10
513023	Slaughterers and Meat Packers	\$11.25	\$9.92	\$1.33
513093	Food Cooking Machine Operators and Tenders	\$12.95	\$10.65	\$2.30
514011	Computer-Controlled Machine Tool Operators, Metal and Plastic	\$13.64	\$14.15	-\$0.51
514031	Cutting, Punching, and Press Machine Setters, Operators, and Tenders, Metal and Plastic	\$12.17	\$11.96	\$0.21
514033	Grinding, Lapping, Polishing, and Buffing Machine Tool Setters, Operators, and Tenders, Metal and Plastic	\$13.62	\$12.72	\$0.90
514041	Machinists	\$16.26	\$15.86	\$0.40
514072	Molding, Coremaking, and Casting Machine Setters, Operators, and Tenders, Metal and Plastic	\$12.93	\$11.32	\$1.61
514111	Tool and Die Makers	\$23.23	\$20.81	\$2.42
515022	Prepress Technicians and Workers	\$17.09	\$15.17	\$1.92
515023	Printing Machine Operators	\$14.08	\$14.13	-\$0.05
517011	Cabinetmakers and Bench Carpenters	\$15.11	\$11.69	\$3.42
519041	Extruding, Forming, Pressing, and Compacting Machine Setters, Operators, and Tenders	\$13.39	\$12.93	\$0.46
519061	Inspectors, Testers, Sorters, Samplers, and Weighers	\$12.99	\$13.18	-\$0.19
519195	Molders, Shapers, and Casters, Except Metal and Plastic	\$12.69	\$12.02	\$0.67
519198	Helpers--Production Workers	\$8.35	\$9.37	-\$1.02
Transportation & Material Moving				

SOC	Occupation	Study Region Median Wage²⁹	National Median Wage³⁰	Difference Between Study Region & National Median Wage
533032	Truck Drivers, Heavy and Tractor-Trailer	\$18.48	\$16.18	\$2.30
537062	Laborers and Freight, Stock, and Material Movers, Hand	\$9.37	\$9.60	-\$0.23
537064	Packers and Packagers, Hand	\$8.52	\$8.13	\$0.39

Size and Location of Projected Shortages

Regional Employment Projections

The Bureau of Labor Statistics and each state's Labor Market Information agency produce forecasts for future employment by occupation. These projections take into account a variety of economic forces affecting the need for workers in different jobs, making them a vital tool for workforce development. They allow policy makers, educators, and career guidance and training agencies to predict which jobs will be in the greatest demand in coming years, including many which may currently be scarce. The end beneficiaries are workers, who are given the ability to make confident, fully-informed decisions about which field of work to pursue.

Government projections predict employment over a ten-year horizon, with the most current useable projections looking to 2010. Using annual employment growth rates to estimate job counts in intermediate years allows researchers to develop a more complete picture of the current and future face of the workforce.

Chicago and Kankakee MSA projection data from IDES were summed and extrapolated in order to be used as a proxy for the region. Employment for 2004 and 2006 was calculated using the annualized growth rate from 2000-2010. From these figures, a two year short term projection (2004-2006) and a six year long term projection (2004-2010) was calculated.

The long term projection preserves the trends expected in the short term, with the same occupations among the ten fastest growing. In both short and long-term projections, computer-related occupations are projected to experience significant growth. In addition, Marketing Managers, Customer Service Representatives, Sales Managers, and Management Analysts will experience strong growth. For a complete listing of all critical occupations and their short and long term growth projections, see Appendix [O](#).

Figure 6. – Regional Short Term Projections
10 Occupations with Largest Forecasted Growth, 2004-2006

SOC	Occupational Title	Estimated Total Percent Change 2004-2006	Employment Change, 2004-2006
151031	Computer Software Engineers, Applications	14%	2,730
151041	Computer Support Specialists	12%	2,611
151071	Network and Computer Systems Admin	12%	1,198
151032	Computer Software Engineers, Systems Software	11%	829
151051	Computer Systems Analysts	9%	2,200
113021	Computer and Information Systems Managers	7%	851
112021	Marketing Managers	5%	509
434051	Customer Service Representatives	5%	4,139
112022	Sales Managers	5%	892
131111	Management Analysts	4%	570

Figure 7. – Regional Long Term Projections
10 Occupations with Largest Forecasted Growth, 2004-2010

SOC	Occupational Title	Estimated Total Percent Change 2004-2010	Employment Change, 2004-2010
151031	Computer Software Engineers, Applications	48%	9,380
151041	Computer Support Specialists	42%	8,836
151071	Network and Computer Systems Admin	40%	4,042
151032	Computer Software Engineers, Systems Software	38%	2,780
151051	Computer Systems Analysts	30%	7,217
113021	Computer and Information Systems Managers	22%	2,730
112021	Marketing Managers	16%	1,606
434051	Customer Service Representatives	16%	13,048
112022	Sales Managers	15%	2,809
131111	Management Analysts	12%	1,775

Distribution of Shortages

Intra-regional Disparities Analysis

The Northeast Illinois Economic Development Region can be considered a well-delineated regional economy; therefore, one would expect similar structural characteristics of a regional industry to appear relatively homogeneous throughout the region. However, from a theoretical economic standpoint, employment and wages for occupations vary from location to location because the locations themselves differ. In a perfectly uniform economy, industries would locate evenly throughout, with consistent employment and wage distributions from one place to another. Economies, however, are rarely uniform and never perfect. The number of workers in an occupation and the wages those workers receive is the result of a market transaction and is affected by both supply and demand factors. Industry composition and competition among employers, for instance, are important labor demand factors, while demographics, such as population, age, and education levels in the available labor pool, affect the supply side. Quality of life is important as well: cost of living, transportation, and amenities all affect the composition of labor supply. Because so many variables affect wage and employment disparities in northeastern Illinois, pinpointing specific causes is beyond the scope of this project. Nevertheless, understanding the forces at work is central to correcting regional wage disparities, and they should not be ignored.

To document this, the project team conducted an intra-regional disparities analysis that attempted to gauge variations for the manufacturing critical occupations in terms of wages, occupational growth, and occupational churn (replacements). This data was supplied by IDES at the county level. Critical occupations were identified in the categories of wage, occupational growth and occupation churn to highlight where local factors in the industry may be coming into play.

Projection Disparities Across Counties: Six Year Projected Growth

The percentage projected growth from 2004-2010 was compared for the ten counties. These percentages were examined to determine if the projected percentage growth differed depending on county, and by how much. Since an average annual growth rate is used to predict employment in 2004 and 2010, by only including growth over the six-year period, (rather than from 2000-2010) less disparity in the percentage growth might be observed. However, some strong disparities do exist. The ten critical occupations that showed the widest range of disparity in projected growth among the counties are presented in Figure 8.

DuPage, Lake, Kane, and Will Counties will need approximately 50-53 percent more Computer Software Engineers (concentrated in applications development) in the manufacturing sector by 2010, while DeKalb and Kendall Counties will only see this occupation grow by 26 percent. The second most disparate occupation in terms of projected growth by 2010 is Computer Systems Analysts. Growth for this occupation ranges from 35 percent in Kane County to 14 percent in Gundy and Kendall. Other occupations that show wide variation across counties in percentage growth through 2010 include Network and Computer Systems Administrators, Food Cooking Machine Operators, Computer Software Engineers (Systems Software), and Marketing Managers. Projected employment changes for every manufacturing critical occupation from 2004-2010 in each county in the ten county region are included in Appendix P.

Figure 8. – Six Year Growth Forecasts
 Top 10 Occupations with Largest Disparity in Percentage Growth, 2004-2010
 (Percentage Growth is shown with the actual employment change)

SOC	Occupation	Cook	DeKalb	DuPage	Grundy	Lake	Kankakee	Kane	Kendall	McHenry	Will
151031	Computer Software Engineers, Applications	47%	26%	51%	31%	51%	36%	53%	26%	34%	50%
		6,195	29	1,568	18	643	40	567	9	105	211
151051	Computer Systems Analysts	29%	23%	32%	14%	29%	20%	35%	14%	23%	27%
		4,763	26	1,207	8	538	31	416	7	75	161
151071	Network and Computer Systems Administrators	40%	45%	43%	33%	42%	29%	48%	35%	36%	41%
		2,704	23	646	8	297	19	218	6	49	95
513093	Food Cooking Machine Operator	-1%	N/A	6%	N/A	4%	-5%	8%	10%	17%	7%
		-4	N/A	6	N/A	1	-1	3	1	3	2
151032	Computer Software Engineers, Systems	37%	25%	41%	33%	41%	28%	44%	22%	32%	37%
		1,861	10	457	5	188	10	152	4	38	57
112021	Marketing Managers	16%	9%	18%	0%	16%	12%	18%	10%	15%	16%
		1,042	5	281	0	119	8	86	2	29	39
151041	Computer Support Specialists	42%	36%	42%	40%	43%	34%	46%	28%	35%	41%
		5,904	47	1,402	19	624	47	455	12	118	212
151021	Computer Programmers	7%	-1%	9%	1%	8%	0%	12%	-6%	4%	7%
		1,012	-1	336	1	134	0	129	-2	12	37
113040	Human Resource Managers	10%	6%	13%	5%	11%	3%	12%	6%	7%	10%
		855	4	245	1	105	2	68	2	13	29
513023	Slaughterers and Meat Packers	1%	0%	8%	N/A	-2%	-2%	6%	0%	10%	12%
		12	0	17	N/A	-1	-1	6	0	5	6

"N/A": Data for these occupations and/or industries are not available due to suppression. The Bureau of Labor Statistics and state employment data agencies are legally forbidden from disclosing any information that would compromise the confidentiality of reporting firms.

Projection Disparities Across Counties: Two Year Projected Growth

Expected growth from 2004-2006 as a percentage of 2004 employment was also examined by county. When examining this two year period, less disparity in projected percentage growth is present. The widest variation again occurs with Computer Software Engineers (Applications), expected to increase by 14-15 percent in Cook, DuPage, Lake, Kane, and Will County, but only eight percent in DeKalb, and Kendall (Figure 9).

Several of the critical occupations identified are not forecasted to see positive growth through 2006 in each county. For a list of projected employment changes for every manufacturing critical occupation for 2004-2006 see Appendix P.

Figure 9. – Two Year Growth Forecasts
Top 10 Occupations with Largest Disparity in Percentage Growth, 2004-2006
(Percentage Growth is shown with the actual employment change)

SOC	Occupation	Cook	DeKalb	DuPage	Grundy	Lake	Kankakee	Kane	Kendall	McHenry	Will
151031	Computer Software Engineers, Applications	14%	8%	15%	9%	15%	11%	15%	8%	10%	14%
		1,806	9	453	5	186	12	163	3	32	61
513093	Food Cooking Machine Operator & Tend	0%	N/A	2%	N/A	1%	-2%	2%	3%	5%	2%
		-1	N/A	2	N/A	0	0	1	0	1	1
151051	Computer Systems Analysts	9%	7%	10%	5%	9%	6%	10%	4%	7%	8%
		1,453	8	366	3	164	10	125	2	23	49
151071	Network and Computer Systems Administrator	12%	13%	13%	10%	12%	9%	14%	10%	11%	12%
		802	7	190	2	88	6	64	2	15	28
151032	Computer Software Engineers, Systems	11%	8%	12%	10%	12%	9%	13%	7%	10%	11%
		556	3	135	2	56	3	45	1	12	17
112021	Marketing Managers	5%	3%	6%	0%	5%	4%	6%	3%	5%	5%
		331	2	89	0	38	3	27	1	9	12
151041	Computer Support Specialists	12%	11%	12%	12%	13%	10%	13%	8%	10%	12%
		1,745	14	414	6	184	14	133	4	35	63
151021	Computer Programmers	2%	0%	3%	0%	3%	0%	4%	-2%	1%	2%
		330	0	109	0	43	0	41	-1	4	12
172071	Electrical Engineers	1%	-3%	1%	-4%	1%	0%	0%	0%	0%	1%
		15	-1	9	-1	2	0	0	0	0	1
119041	Engineering Managers	1%	-2%	2%	-1%	1%	0%	0%	-3%	-1%	0%
		71	-1	32	0	7	0	0	-1	-2	0

"N/A": Data for these occupations and/or industries are not available due to suppression. The Bureau of Labor Statistics and state employment data agencies are legally forbidden from disclosing any information that would compromise the confidentiality of reporting firms.

Annual Openings Due to Growth

Annual openings from growth as a percentage of employment in 2000 were also compared. There does not seem to be large disparities in this data. For a few occupations some noticeable disparities exist in certain counties. For example, in Kendall County, annual growth openings account for three percent of total employment for Computer Software Engineers (concentrated in applications development), while they make up 10 percent of total employment for this occupation in DuPage, Lake, Kane and Will counties (Figure 10). It should also be noted that some occupations have zero percent or a very low percentage of annual openings due to growth (Editors and Slaughterers/Meatpackers, for example). Annual Openings Due to Growth for every critical occupation and as a percentage of total employment in 2000 are included in Appendix P.

Figure 10. – Annual Growth
Top 10 Occupations with Largest Disparity as a Percentage of 2000 Total Employment
(Percentage of 2000 Employment is shown with the number of annual growth openings)

SOC	Occupation	Cook	DeKalb	DuPage	Grundy	Lake	Kankakee	Kane	Kendall	McHenry	Will
151031	Computer Software Engineers, Applications	9%	5%	10%	6%	10%	7%	10%	3%	6%	10%
		918	5	231	3	95	6	83	1	16	31
513093	Food Cooking Mach Operator & Tend	0%	N/A	1%	N/A	0%	0%	3%	0%	6%	0%
		0	N/A	1	N/A	0	0	1	0	1	0
151051	Computer Systems Analysts	5%	4%	6%	2%	5%	4%	6%	2%	4%	5%
		732	4	184	1	83	5	63	1	12	25
151071	Network and Computer Systems Admin	8%	8%	8%	5%	8%	6%	9%	7%	6%	8%
		406	3	97	1	45	3	32	1	7	14
151041	Computer Support Specialists	8%	6%	8%	8%	8%	6%	9%	5%	6%	8%
		884	7	210	3	93	7	68	2	18	32
151032	Computer Software Engineers, Systems	7%	6%	8%	8%	8%	6%	8%	7%	6%	7%
		281	2	69	1	28	2	23	1	6	9
112021	Marketing Managers	3%	2%	3%	0%	3%	2%	3%	0%	3%	3%
		166	1	44	0	19	1	14	0	5	6
131111	Management Analysts	2%	2%	2%	3%	2%	1%	2%	0%	2%	1%
		190	1	53	1	26	1	10	0	3	3
273041	Editors	2%	0%	2%	0%	2%	0%	3%	0%	3%	2%
		51	0	16	0	5	0	5	0	3	2
513023	Slaughterers and Meat Packers	0%	0%	1%	N/A	0%	0%	1%	0%	2%	2%
		2	0	3	N/A	0	0	1	0	1	1

"N/A": Data for these occupations and/or industries are not available due to suppression. The Bureau of Labor Statistics and state employment data agencies are legally forbidden from disclosing any information that would compromise the confidentiality of reporting firms.

Annual Openings Due to Replacements

The number of employee replacements needed in an occupation can have important impacts on total labor demand. Certain jobs tend to have higher employee turnover than others. The annual number of replacements needed for each occupation as a percentage of total employment in 2000 was compared across the counties (Figure 11). In occupations with the highest replacement rates, little disparity exists across counties, except for a few isolated cases. Molders, Shapers, and Casters (Except Metals & Plastics) and Cabinetmakers and Bench Carpenters have relatively high replacement in Kankakee County, for example. Annual openings due to replacements for every critical occupation are included in Appendix P.

Figure 11. – Disparities in Average Annual Replacements
 Top 10 Occupations with Largest Disparity as a Percentage of 2000 Total Employment
 (Percentage of 2000 Employment is shown with the number of annual replacement openings)

SOC	Occupation	Cook	DeKalb	DuPage	Grundy	Lake	Kankakee	Kane	Kendall	McHenry	Will
519195	Molders, Shapers, & Casters, Except Metals & Plastics	3%	0%	2%	N/A	2%	5%	3%	4%	2%	2%
		18	0	4	N/A	4	1	5	1	1	1
517011	Cabinetmakers and Bench Carpenters	3%	3%	3%	N/A	3%	5%	3%	0%	3%	3%
		41	2	8	N/A	3	1	6	0	2	5
515022	Prepress Technicians and Workers	2%	4%	2%	0%	3%	3%	3%	N/A	2%	2%
		74	1	18	0	6	1	6	N/A	3	2
172141	Mechanical Engineers	3%	3%	3%	6%	3%	2%	3%	3%	3%	3%
		132	2	40	1	19	1	13	3	9	8
514011	Computer Controlled Machine Operator, Metals & Plastics	4%	4%	4%	0%	4%	3%	4%	3%	3%	4%
		118	3	34	0	16	1	15	4	11	8
519041	Extruding, Forming, Pressing Machine Operator	2%	0%	2%	0%	2%	3%	2%	4%	2%	2%
		25	0	5	0	6	1	5	1	1	2
273041	Editors	3%	4%	3%	0%	3%	4%	4%	0%	3%	3%
		94	1	22	0	7	1	7	0	4	3
113021	Computer and IS Managers	2%	2%	2%	4%	2%	1%	2%	3%	2%	2%
		125	1	28	1	13	1	8	1	3	4
513093	Food Cooking Mach Operator & Tenderer	2%	N/A	2%	N/A	3%	0%	3%	0%	0%	0%
		12	N/A	2	N/A	1	0	1	0	0	0
513023	Slaughterers and Meat Packers	2%	0%	2%	N/A	3%	3%	2%	0%	2%	2%
		45	0	5	N/A	2	1	2	0	1	1

“N/A”: Data for these occupations and/or industries are not available due to suppression. The Bureau of Labor Statistics and state employment data agencies are legally forbidden from disclosing any information that would compromise the confidentiality of reporting firms.

Median Hourly Wage Disparity Across Counties

The county median hourly wage was calculated as a percentage above or below the state median wage for each critical occupation. This measure of variation from the state wage was then compared across counties. The goal is to identify if there are occupations that receive a wage significantly higher than the state wage in certain counties and significantly lower in other counties (Figure 12).

Retail Salespersons show the widest range of median range disparity among these critical occupations, primarily because in Kendall County, they earn 96 percent more than the state median, while in Kankakee County they earn 11 percent less. Computer Software Engineers, specializing in Systems Software, also have a wide range of median wages across the counties. They are paid the most in Lake County, \$58.27 per hour, or 52 percent above the state median wage, and the least in McHenry County, at \$26.03 per hour (32 percent below the median wage for the state). Many of the other critical occupations highlighted in Figure 12 are present because one county stands out from the rest with a much higher or lower wage. No readily discernible pattern was noticed within one county. For example, no county consistently stands out as the “best paying” or “worst paying” across all critical occupations. For median hourly wage county comparisons for all critical occupations, see Appendix P.

Figure 12. – Median Wage Comparisons³¹
 10 Occupations with the Largest Wage Disparity

SOC	Occupation	Cook	DeKalb	DuPage	Grundy	Lake	Kankakee	Kane	Kendall	McHenry	Will	Illinois
412031	Retail Salespersons	7%	6%	1%	10%	5%	-11%	-2%	96%	4%	12%	
		\$9.35	\$9.25	\$8.79	\$9.57	\$9.19	\$7.79	\$8.51	\$17.08	\$9.10	\$9.79	\$8.72
151032	Computer Software Engineers, Systems Software	-5%	-13%	14%	N/A	52%	N/A	-23%	N/A	-32%	N/A	
		\$36.52	\$33.45	\$43.58	N/A	\$58.27	N/A	\$29.38	N/A	\$26.03	N/A	\$38.32
119041	Engineering Managers	0%	4%	19%	N/A	10%	-6%	2%	-18%	-52%	15%	
		\$39.80	\$41.50	\$47.36	N/A	\$43.97	\$37.47	\$40.78	\$32.78	\$19.27	\$45.90	\$39.85
515022	Prepress Technicians and Workers	-11%	N/A	35%	N/A	2%	-18%	-31%	N/A	4%	-33%	
		\$13.89	N/A	\$21.20	N/A	\$16.06	\$12.89	\$10.85	N/A	\$16.37	\$10.43	\$15.67
111021	General and Operations Managers	14%	24%	18%	-34%	12%	-24%	1%	-5%	42%	4%	
		\$33.64	\$36.50	\$34.75	\$19.61	\$32.94	\$22.53	\$29.70	\$27.88	\$41.86	\$30.62	\$29.50
414012	Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	0%	24%	6%	55%	6%	-9%	37%	N/A	8%	4%	
		\$19.69	\$24.48	\$20.91	\$30.45	\$20.86	\$17.94	\$26.96	N/A	\$21.18	\$20.47	\$19.70
499042	Maintenance and Repair Workers, General	6%	-13%	7%	11%	-1%	6%	1%	26%	-51%	1%	
		\$17.94	\$14.76	\$18.21	\$18.88	\$16.76	\$17.99	\$17.19	\$21.45	\$8.32	\$17.20	\$16.96
537064	Packers and Packers, Hand	0%	33%	9%	N/A	1%	-9%	4%	-23%	16%	-7%	
		\$8.57	\$11.39	\$9.32	N/A	\$8.62	\$7.79	\$8.92	\$6.59	\$9.92	\$7.98	\$8.54
433031	Bookkeeping, Accounting, Auditing Clerks	6%	-40%	12%	-6%	13%	-12%	-9%	-18%	-11%	12%	
		\$14.14	\$8.06	\$14.94	\$12.52	\$15.11	\$11.72	\$12.18	\$10.96	\$11.82	\$14.88	\$13.34
514033	Grinding, Lapping, Polishing, and Buffing Machine Tool Setters, Operators, and Tenders, Metal and Plastic	1%	N/A	-6%	N/A	-4%	N/A	-5%	N/A	-8%	43%	
		\$13.96	N/A	\$13.05	N/A	\$13.32	N/A	\$13.22	N/A	\$12.81	\$19.87	\$13.87

"N/A": Data for these occupations and/or industries are not available due to suppression. The Bureau of Labor Statistics and state employment data agencies are legally forbidden from disclosing any information that would compromise the confidentiality of reporting firms.

³¹ County Wage data for several critical occupations in some counties is unavailable. Without this data, it is unknown whether more or less wage disparity among counties exists.

Entry Hourly Wage Disparity Across Counties

Entry hourly wages for the identified critical occupations were also examined. Like for median hourly wage, the entry hourly wage was calculated as a percent above or below the state entry wage for each critical occupation. This measure against the state wage was then compared across counties. Occupations with wide disparity from the state wage include those with the widest range of values. These occupations usually receive an entry wage significantly higher than the state entry wage in certain counties and significantly lower in other counties (Figure 13).

Several of the occupations that are among the ten occupations showing the widest median wage disparity across the counties also show a wide entry wage disparity:

- Sales Representatives, (Wholesale and Manufacturing, Except Technical & Scientific Products)
- Prepress Technicians & Workers
- Engineering Managers
- Retail Salespersons
- Grinding, Lapping, Polishing, & Buffing Machine Tool Setters & Operators

This indicates that the wage disparity persists over time with these occupations. Occupations among the ten with the widest wage disparity upon entry that do not appear in the top ten most disparate occupations at the median wage level include First Line Supervisors/Managers of Office & Administrative Workers, Computer and Information Systems Managers, Industrial Machinery Mechanics, Cabinetmakers & Bench Carpenters, and Financial Managers. For entry hourly wage county comparisons for all manufacturing critical occupations, see Appendix P.

Figure 13. – Entry Wage Comparisons
 10 Occupations with the Largest Wage Disparity

(Percentage above or below state median wage is shown with the actual wage)

SOC	Occupation	Cook	DeKalb	DuPage	Grundy	Lake	Kankakee	Kane	Kendall	McHenry	Will	Illinois
514033	Grinding, Lapping, Polishing, and Buffing Machine Tool Setters, Operators, and Tenders, Metal and Plastic	1%	N/A	2%	N/A	6%	N/A	-4%	N/A	-10%	81%	
		\$9.48	N/A	\$9.58	N/A	\$9.89	N/A	\$8.96	N/A	\$8.41	\$16.94	\$9.36
414012	Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	3%	7%	14%	78%	22%	-10%	21%	N/A	17%	10%	
		\$12.55	\$13.03	\$13.89	\$21.72	\$14.80	\$10.96	\$14.69	N/A	\$14.25	\$13.41	\$12.17
499041	Industrial Machinery Mechanics	-9%	N/A	10%	N/A	16%	22%	25%	N/A	-55%	31%	
		\$12.02	N/A	\$14.52	N/A	\$15.37	\$16.11	\$16.46	N/A	\$5.99	\$17.37	\$13.21
431011	First-Line Supervisors/Managers of Office & Administrative Workers	9%	67%	10%	-14%	-4%	-11%	-1%	28%	14%	-6%	
		\$13.44	\$20.55	\$13.53	\$10.53	\$11.82	\$10.87	\$12.15	\$15.71	\$14.01	\$11.50	\$12.28
515022	Prepress Technicians and Workers	-4%	N/A	65%	N/A	36%	14%	-13%	N/A	22%	-15%	
		\$9.33	N/A	\$15.95	N/A	\$13.14	\$11.08	\$8.42	N/A	\$11.78	\$8.27	\$9.69
113021	Computer and Information Services Managers	9%	-17%	5%	N/A	29%	1%	5%	27%	-25%	-46%	
		\$27.17	\$20.73	\$26.20	N/A	\$32.05	\$25.08	\$26.16	\$31.47	\$18.62	\$13.31	\$24.85
119041	Engineering Managers	4%	16%	35%	N/A	22%	3%	7%	9%	-38%	23%	
		\$27.02	\$30.30	\$35.25	N/A	\$31.88	\$26.93	\$27.84	\$28.43	\$16.23	\$32.15	\$26.06
412031	Retail Salespersons	6%	13%	-2%	-4%	11%	-6%	5%	66%	6%	2%	
		\$6.92	\$7.40	\$6.42	\$6.24	\$7.22	\$6.10	\$6.83	\$10.83	\$6.94	\$6.64	\$6.52
517011	Cabinetmakers and Bench Carpenters	15%	N/A	28%	N/A	62%	9%	-10%	N/A	N/A	-10%	
		\$10.64	N/A	\$11.84	N/A	\$14.98	\$10.12	\$8.31	N/A	N/A	\$8.30	\$9.25
113031	Financial Managers	13%	16%	5%	49%	9%	-23%	6%	9%	15%	7%	
		\$24.73	\$25.34	\$22.97	\$32.42	\$23.88	\$16.72	\$23.21	\$23.73	\$25.05	\$23.41	\$21.82

"N/A": Data for these occupations and/or industries are not available due to suppression. The Bureau of Labor Statistics and state employment data agencies are legally forbidden from disclosing any information that would compromise the confidentiality of reporting firms.

Conclusion

The Workforce Boards selected the manufacturing sector, and more specifically, the industry groups within the final industry group selections below, as one of the three shortage industries in which to focus planning efforts because:

- Vulnerability in the manufacturing sector due to competition in areas of labor availability, skill and cost
- Current dynamism within some manufacturing industries , building off existing strengths, applications of new technologies and emerging market opportunities, especially in small to mid-size businesses
- Shift in demand toward workers who are multi-skilled, critical thinkers and prepared with some post-secondary schooling /credentialing

Final Industry Group Selections
Durable Goods
Primary Metals Products
Fabricated Metals Products
Industrial Machinery and Equipment
Electrical Equipment
Electronics Equipment
Medical Equipment and Supplies
Non-durable Goods
Food and Kindred Products
Confectionary Products & Bakeries
Printing, Publishing and Allied Products
Chemical & Allied Products
Petroleum Refining and Related Products
Rubber and Miscellaneous Plastics Products

A two-pronged approach was used to identify critical shortage occupations within the manufacturing sector. First, IDES conducted an employer survey of the selected manufacturing industry groups. Second, the Workforce Boards contracted with Hudson Institute to apply its JOWE® database to manufacturing occupations in the region. Both approaches were compared and contrasted with validation and feedback from industry representatives and local stakeholders.

Stakeholder representation in the selection of critical occupations took two forms. First, on behalf of the Workforce Boards, Corporation for a Skilled Workforce held a series of focus groups and individual employer interviews on manufacturing workforce issues. Topics for the focus groups included the

identification of critical occupations. Second, members of the Manufacturing, Leadership and Regional councils reviewed the combined lists and offered additional feedback.

The list of critical occupations is presented in two forms: Tier 1 and Tier 2. Tier 2 is the base list used for analysis throughout this report. It is made up of the top 20 occupations from both the Hudson analysis and the IDES Survey. This combined list is generated for both sub-sectors, durable and non-durable manufacturing. The subsequent composite list, made up of 52 occupations defined to six-digit level in the SOC code, is catalogued below under 13 organization functions. While targeting of specific six-digit occupations may be found desirable in the follow-on solutions phase, most action would focus on the broader functional categories and career pathways identified in a parallel study by the Corporation for a Skilled Workforce. The Tier 2 list serves as base reference not only for the Workforce Boards but for partner organizations which can influence select organization functions through programs and policies. For example, the education sector can influence the quality and supply of workers for such functions as management engineering and computers. The content of Tier 1 and Tier 2 occupations may shift somewhat as a result of the ongoing root cause and solutions analysis.

Tier 1 – Operations Functions and Critical Occupations	
Management	
111021	General and Operations Managers
113051	Industrial Production Managers
Engineering	
172071	Electrical Engineers
172112	Industrial Engineers
172141	Mechanical Engineers
Life & Physical Science Occupations	
194031	Chemical Technicians
Installation, Maintenance, & Repair	
499041	Industrial Machinery Mechanics
499042	Maintenance and Repair Workers, General
Production	
511011	First-Line Supervisors/Managers of Production and Operating Workers
512022	Electrical and Electronic Equipment Assemblers
512092	Team Assemblers
513023	Slaughterers and Meat Packers
513093	Food Cooking Machine Operators and Tenders
514011	Computer-Controlled Machine Tool Operators, Metal and Plastic

Tier 1 – Operations Functions and Critical Occupations	
514031	Cutting, Punching, and Press Machine Setters, Operators, and Tenders, Metal and Plastic
514033	Grinding, Lapping, Polishing, and Buffing Machine Tool Setters, Operators, and Tenders, Metal and Plastic
514041	Machinists
514072	Molding, Coremaking, and Casting Machine Setters, Operators, and Tenders, Metal and Plastic
514111	Tool and Die Makers
515022	Prepress Technicians and Workers
515023	Printing Machine Operators
517011	Cabinetmakers and Bench Carpenters
519041	Extruding, Forming, Pressing, and Compacting Machine Setters, Operators, and Tenders
519061	Inspectors, Testers, Sorters, Samplers, and Weighers
519195	Molders, Shapers, and Casters, Except Metal and Plastic
519198	Helpers--Production Workers
Transportation & Material Moving	
537064	Packers and Packagers, Hand

However, for practical and strategic purposes a narrower, more manageable action list makes more sense to the Workforce Boards of Metropolitan Chicago as they seek to work on joint projects with region-wide impact. This list, Tier 1, was arrived at by narrowing the organization functions to those directly related to production. This same production focus was applied in the Healthcare CSSR. If Metro Chicago is not competitive in production then many other support functions likely will be negatively impacted. The feedback from the focus groups was compelling -- the three top threats: outsourcing, outsourcing, outsourcing. The industry analysis in this report affirms that for some manufacturing industries competitive weaknesses deserve collaborative action. One area in which Workforce Boards are well-equipped to partner with the other agencies and the private sector is in assessment, placement and training for production and production-related jobs. Further, since these jobs are widely distributed across the Metro Chicago landscape all participating Workforce Areas benefit.

Tier 1 was arrived at by narrowing down to the organization functions to the six most related to direct production. In the Table above these are: production management; engineering; select physical science occupations; installation, maintenance and repair; production; and transportation and material moving. This resulted in a list of 27 six –digit occupations. Several in the transportation category were not included here because they are covered under the critical skill shortages report for the Transportation, Warehousing and Logistics sector.

Tier 2 – Critical Occupations	
Management	
111021	General and Operations Managers
112021	Marketing Managers
112022	Sales Managers
113021	Computer and Information Systems Managers
113031	Financial Managers
113040	Human Resources Managers
113051	Industrial Production Managers
119041	Engineering Managers
Business & Financial Occupations	
131111	Management Analysts
132011	Accountants and Auditors
Building & Grounds	
372011	Janitors and Cleaners, Except Maids and Housekeeping Cleaners
Computers & Mathematics	
151021	Computer Programmers
151031	Computer Software Engineers, Applications
151032	Computer Software Engineers, Systems Software
151041	Computer Support Specialists
151051	Computer Systems Analysts
151071	Network and Computer Systems Admin
Engineering	
172071	Electrical Engineers
172112	Industrial Engineers
172141	Mechanical Engineers
Life & Physical Science Occupations	
194031	Chemical Technicians

Tier 2 – Critical Occupations	
Arts, Design, & Media	
273041	Editors
Sales & Related	
412031	Retail Salespersons
414012	Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products
Administrative Production Personnel	
431011	First-Line Supervisors/Managers of Office and Administrative Support Workers
Customer Service & Clerical	
433031	Bookkeeping, Accounting, and Auditing Clerks
434051	Customer Service Representatives
436011	Executive Secretaries and Administrative Assistants
439061	Office Clerks, General
Installation, Maintenance, & Repair	
499041	Industrial Machinery Mechanics
499042	Maintenance and Repair Workers, General
Production	
511011	First-Line Supervisors/Managers of Production and Operating Workers
512022	Electrical and Electronic Equipment Assemblers
512092	Team Assemblers
513023	Slaughterers and Meat Packers
513093	Food Cooking Machine Operators and Tenders
514011	Computer-Controlled Machine Tool Operators, Metal and Plastic
514031	Cutting, Punching, and Press Machine Setters, Operators, and Tenders, Metal and Plastic
514033	Grinding, Lapping, Polishing, and Buffing Machine Tool Setters, Operators, and Tenders, Metal and Plastic
514041	Machinists
514072	Molding, Coremaking, and Casting Machine Setters, Operators, and Tenders, Metal and Plastic
514111	Tool and Die Makers
515022	Prepress Technicians and Workers

Tier 2 – Critical Occupations	
515023	Printing Machine Operators
517011	Cabinetmakers and Bench Carpenters
519041	Extruding, Forming, Pressing, and Compacting Machine Setters, Operators, and Tenders
519061	Inspectors, Testers, Sorters, Samplers, and Weighers
519195	Molders, Shapers, and Casters, Except Metal and Plastic
519198	Helpers--Production Workers
Transportation & Material Moving	
533032	Truck Drivers, Heavy and Tractor-Trailer
537062	Laborers and Freight, Stock, and Material Movers, Hand
537064	Packers and Packagers, Hand

The next step in the CSSI project is to determine the root causes for shortages in these organization functions and critical occupations, then to craft regional solutions.

Appendix A: Summary of Reports and Studies

Workforce Studies

Workforce 2020 - Work and Workers in the 20th Century, Richard W. Judy and Carol D'Amico, Hudson Institute, 1997

State of the Workforce Report for the Grundy Livingston Kankakee Workforce Region, Richard W. Judy and Jane M. Lommel, Workforce Associates, Inc. February 16, 2004

The State of the Workforce Report for the Metropolitan Chicago Region, The Workforce Boards of Metropolitan Chicago, October 2003

Lake County State of the Workforce "How is Lake County Doing?", The Lake County Workforce Board

State of the Workforce: McHenry County, Prepared for the McHenry County Workforce Investment Board by the Corporation for a Skilled Workforce, July 2003

The State of the Workforce Brief: River Valley – DeKalb, Kane and Kendall Counties, The River Valley Workforce Investment Board, May 2003

Will County State of the Workforce 2003, The Workforce Board of Will County

The State of the Workforce Report, 2003 Executive Summary, The Workforce Board of Northern Cook County

Regional Partnerships for Economic & Workforce Development, Linda J. Kaiser, Esq., Dr. Bill McMillan, American Association of Community Colleges Workforce Development Institute, January 29, 2004.

Economic Development Reports

Kankakee County Community Assessment, URS TPAP Szatan & Associates Ronald J. Bussey, October 2003

Lake County, Illinois: Target Industry Analysis & Competitive Assessment, Deloitte & Touche LLP and Prager Company, November 20, 2002

Industry Trends

The State of Illinois Manufacturing. A Report for the Illinois Manufacturers' Association. Center for Labor and Community Research. December 2003.

Manufacturing Skills Crisis: Solutions for this National Challenge. A Conference Report. November 20-21, 2003. National Coalition for Advanced Manufacturing (NACFAM)
<http://www.nacfam.org/Nov21SkillsCrisisReport.pdf>

Creating A Manufacturing Career Path System in Cook County, Chicago Federation of Labor and the Center for Labor and Community Research. December 2001.

Industry Trends 2001. Chicago-Cook Business Center
http://www.chicagocook.org/b2k/industry/html/logistics_leader.html

Projected Job Growth in Growing Occupations and Industries Chicago, Cook County and the Metropolitan Area. Prepared by the Center for Labor and Community Research.
http://egov.cityofchicago.org/webportal/COCWebPortal/COC_ATTACH/Projected_Job_Growth_CLCR04.pdf

The State of U.S. Manufacturing. National Center for Policy Analysis. No. 456

Wednesday, September 17, 2003. <http://www.ncpa.org/pub/ba/ba456/ba456.pdf>

U.S. Department of Labor, Bureau of Labor Statistics. <http://www.bls.gov/home.htm>

Appendix B: IDES Survey Methodology & Results

Survey Design

The Illinois Department of Employment Security conducted a survey of the Northeast Economic Development Region of Illinois to measure the duration, nature, extent and labor supply constraints associated with job vacancies in five targeted industry sectors: nondurable manufacturing, durable manufacturing, wholesale trade, transportation and warehousing, and railroads.

The surveyed region comprises nine Local Workforce Areas: Lake County Workforce Investment Board; McHenry County Workforce Investment Board; River Valley Workforce Investment Board; DuPage Workforce Board; Cook County Workforce Investment Board; The Workforce Board of Northern Cook County; Chicago Workforce Board; Workforce Investment Board of Will County; and Grundy, Livingston, Kankakee Workforce Board. IDES coordinated with Brandt Information Services, Inc. (BISI), which solicited employer responses, recorded the results, created a survey results database, and transmitted the results database back to IDES.

The questionnaire asked employers for their perceptions of past business and employment conditions (six months ago) and expectations for future conditions (six months from now). Employers were also asked whether they are willing to be contacted by their Local Workforce Boards to participate in an employer focus group to examine the causes of job vacancies in their industry. The survey also posed questions concerning job vacancies at the firm. Employers with at least one job vacancy were prompted to list the specific occupation of the vacancy and the count of openings (whether permanent or seasonal and full-time or part-time). Then, for each occupation with a job vacancy the questionnaire requested information on:

- duration of vacancy- less than 30 days, 31-60 days, 61-90 days, more than 90 days, and don't know;
- minimum education requirement- no diploma, high school/GED, vocational training/certification, 2-year degree, bachelor's degree, and advanced degree;
- minimum experience requirement- no experience, some experience, experience in related field, and experience in this occupation;
- starting hourly or annual wage;
- benefits- no benefits, health insurance, paid sick leave, paid vacation, and retirement benefits;
- hiring difficulty- internal corporate policy, applicant's technical skills, applicant's work readiness skills, labor availability and other; and,
- effective recruitment method- newspaper, Internet, schools/colleges, public employment agencies, private employment services, hire from within, referrals, and other.

Occupations were given by Standard Occupational Classification (SOC) coding structure.

Methodology

IDES designed the sample using three stratification criteria: geography, industry sector and firm employment size. First, firms are assigned a county designation based on the physical location of the worksite or business. Next, they are assigned to an industry sector. The Workforce Boards of Metropolitan Chicago (WMBC) designated five sectors for this study: nondurable manufacturing, durable manufacturing, wholesale trade,

transportation and warehousing, and railroads. Finally, within each industry sector, the sample stratifies firms by six categories of employment size: 5-9, 10-19, 20-49, 50-99, 100-249, and 250 or greater. IDES set the total sample size at approximately 5,300 firms to reflect the geographic and industry detail required for the reliable estimation of job vacancy results.

The sample selection for the metropolitan Chicago firms is based on the Neyman Allocation method, a method recommended by the US Bureau of Labor Statistics. This method optimally allocates sample units to the cell strata in the case where the stratification criteria vary greatly in size. The survey requires such optimization because of variation in the size of workforce areas and industry sectors in metropolitan Chicago. The Neyman method involves the random selection of firms within each of the aforementioned six employment-size categories. BISI achieved an overall response rate of 70% or more in each of the industry sectors.

Workforce Boards of Metropolitan Chicago: Job Vacancy Sample Selection
(number of survey respondents)

Local Workforce Area	Non Durable Manufacturing	Durable Manufacturing	Wholesale Trade	Transportation, Warehousing, & Logistics	Total
Lake County	58	74	88	14	234
McHenry County	42	57	25	10	134
River Valley	104	99	60	26	289
DuPage County	110	199	180	75	564
Northern Cook County	96	204	205	54	559
City of Chicago	184	177	152	89	602
Southern Cook County	133	211	149	75	568
Will County	34	38	32	25	129
Grundy, Livingston, Kankakee	27	24	26	20	97
Total	788	1083	917	388	3176

The total number of complete surveys returned to IDES was 3,176. The breakdown by industry sector shows the greatest number of responses in durable manufacturing (1,083 surveys) followed by wholesale trade (917 surveys) and nondurable manufacturing (788 surveys). Not surprisingly, this pattern is replicated in the number of sample firms. Transportation/warehousing constituted only twelve percent in the sample and a similar amount among respondent firms.

Area: Workforce Boards of Metropolitan Chicago Industry Sector: Durable Manufacturing
Full-Time Job Vacancies

Job Titles	Duration of Vacancy				Educational Requirement				Experience Required				Monthly Vacancy/Critical	Benefits					Hiring Difficulties					Recruitment Method							
	0-30 days	31-60 days	61-90 days	>90 days	None	High school / GED	Assoc./ diploma	2-year degree	4-year degree	Advanced Degree	None	Exp in related field		Exp in specific area	Exp in related field	Exp in specific area	No benefits offered	Health Insurance	Dental/Vision	Retirement/Savings	Relocation	Other	Internal promotion	Apprenticeship/On-the-job	Advertising/Recruitment Firms	Other	Referrals	Headhunters	Recruitment Agencies	College/Trade Schools	Employment Agencies
Computer-Controlled Mach Tool Oper	88	62%	2%	35%	34%	34%	30%			2%	25%	16%	25%	34%	\$9.00	17%	72%	77%	66%	83%	2%	19%	30%	40%	47%	47%	1%	51%	2%		

* (language, reading, work ethic); ** (math, computer, supervisory, problem solving); *** (private employment services/staffing agencies)

Area: Workforce Boards of Metropolitan Chicago Industry Sector: Non-Durable Manufacturing Full-Time Job Vacancies

Table with columns: Job Titles, Duration of Vacancy, Educational Requirement, Experience Required, Hourly Wage (if listed), Benefits, Hiring Difficulties, Recruitment Method.

* (language, reading, work ethic); ** (math, computer, supervisory, problem solving); *** (private employment services/staffing agencies)

Appendix C: Leadership and Regional Councils Members and Meeting Minutes

Leadership Council

Name	Title	Organization
Rita Athas	Director of Regional Programs, Office of the Mayor	City of Chicago
Nancy Clawesome	Director	UBS Financial Services
The Honorable Richard M. Daley	Mayor	City of Chicago
Al Friedman	President	Friedman Properties
B.J. Walker	Chief of Human Infrastructure, Office of the Mayor	City of Chicago
Michael Johl	DuPage County Workforce Board Chair	United Parcel Service
Robert Schillerstrom	DuPage County Board Chair	DuPage County
Sandy Erschen	Branch Manager	Manpower
Karl Kruse	Chairman, Kankakee County Board	Kankakee County
Paul Nelson	Grundy County Board Chair	Grundy County
Suzi Schmidt	Lake County Board Chair	Lake County
Arnie Silberman	Lake County Workforce Board Chair	A.D. Silberman & Associates
Virginia Peschke	McHenry County Board	McHenry County
Sandra Pierce	McHenry County Workforce Board Chair	Phoenix Woodworking
Michael Tryon*	McHenry County Board Chair	McHenry County
David Carlquist	North Cook Workforce Board Chair	IBM Corporation
Steve Fallek	V.P. Strategic Planning	Zurich North America Insurance Group
George VanDusen	Mayor	Village of Skokie
John Church	Chairman, Kendall County Board	Kendall County
Chris Manheim	River Valley Workforce Board Chair	Elgin Chamber of Commerce
Michael McCoy	Kane County Board Chair	Kane County
Dennis Sands	Chairman, DeKalb County Board	DeKalb County
James Eldridge, Jr.	CAO, Bureau of Administration	Cook County
Dennis J. Irvin	South and West Cook Workforce Board Chair	Highland Community Ban
John H. Stroger	Cook County Board President	Cook County
John Crowe	Will County Workforce Board Co-Chair	Sprint PCS
Joseph Mikan	Will County CEO	Will County
Deb Teuteberg	Will County Workforce Board Co-Chair	Nicor Gas

Regional Council

Name	Title	Organization
Carol Adams	Secretary	Illinois Department of Human Services
Gretchen Alexander	Executive Director	West Cook ISC
Rita Athas	Director of Regional Programs	Office of the Mayor, City of Chicago
Tom Balanoff	President	Service Employees International Union Local 1
Marguerite Boyd	President	Truman College
Thomas Centowski	Regional Superintendent	Grundy/Kane ROE
Lori Clark		DCEO
Gwendolyn Clemons	Director, Planning and Economic Development	Cook County Planning and Economic Development
Kathie Collins	Economic Development Coordinator	Village of Bartlett
Tom Cuculich	Director of Economic Development	DuPage County
Sharon Dixon		
Patricia Doherty-Wildner	Vice President	Community and Economic Development Association
Lynn DuBajic		Yorkville Economic Development Corporation
Arne Duncan	CEO	Chicago Public Schools
Richard Duran	Regional Superintendent	Will County ROE
Donald Englert	Regional Superintendent	McHenry County ROE
Steve Fallek	V.P. Strategic Planning	Zurich North America Insurance Group
Margot Fennelly	Deputy Superintendent	Suburban Cook ROE
Mike Finnegan		Kankakee County Economic Development Council
Dennis Gannon	President	Chicago Federation of Labor
Nester Garcia		Kane County ROE
John Greuling	President and CEO	Center for Economic Development Joliet/Will County
Diana Grossi	Executive Director	South Cook ISC
Josh Grozdin		DuPage County Economic Development
Barbara Habschmidt	Executive Director	North Cook ISC
Ashref A. Hasim	President	Blackstone Group
Sarah Hawker	VP for Workforce Development	Illinois Community College Board
Manny Hoffman		State Farm Insurance
Roger Hopkins		DeKalb Economic Development Council
Tom Howard		International Union of Operating Engineers, Local 399
Robert Ingrassia	Regional Superintendent	Suburban Cook ROE

Chuck Jenrich	VP, US Operations	GBJD Registrars
Candice King		DuPage Federation
Anne Ladky	Executive Director	Women Employed
Shirlanne Lemm	President	Greater O'Hare Association
Sheila Lyne, RSM	Chief Executive Officer	Mercy Hospital and Medical Center
Jeff May	Executive Director	Grundy/Kendall ROE
Therese McMahon	Deputy Director, Bureau of Workforce Development	Department of Commerce and Economic Opportunity
Bill McMillan	Associate Vice Chancellor of Occupational Programs	City Colleges of Chicago
Janice Miller	Education to Careers	Kankakee County ROE
Gilbert Morrison, Jr.	Regional Superintendent	DeKalb County ROE
Nancy Norton Ammer		Grundy County Economic Development Council
Paul O'Connor	Executive Director	World Business Chicago
Ian Ostergaard		LaSalle Bank Corporation
Walter Packard	President	McHenry County College
Edward Paesel	Executive Director	South Suburban Mayors and Managers
Kay Pangle	Regional Superintendent	Kankakee County ROE
Karen Patel	President	McHenry County Economic Development Corporation
Don Petkus	President and CEO	Enterpriz Cook County
Sylvia Ramos	President	Daley College
J.D. Ross	President	Joliet Junior College
Darlene Ruscitti	Regional Superintendent	DuPage ROE
Brenda Russell	Director	Illinois Department of Employment Security
Carrie Simmons	Director of Operations	World Business Chicago
Whitney Smith	Senior Policy Associate	Chicago Jobs Council
Don Turner	President Emeritus	Chicago Federation of Labor
John Vrba	Administrator	HCR Manor Care
Robert Wharton	Executive Director	Community Economic Development Association
Roycalee Wood	Regional Superintendent	Lake County ROE
Dave Young	President	Lake County Partners

The Workforce Boards of Metropolitan Chicago

Minutes for Regional Council & Leadership Council Meeting, April 14, 2004

Hyatt Regency, 151 East Wacker Drive, Chicago, IL 60601 9 a.m. to 11 a.m.

Welcome and Introductions

The meeting welcome was given by Deb Teuteberg, Nicor Gas, who is Co-Chair of the Workforce Board for Will County. Participants introduced themselves to the group. The meeting purpose was to provide an overview of the Critical Skills Shortages Initiative (CSSI) project and clarify the role of the Leadership and Regional Councils in this effort. The Hudson Institute, Thomas P. Miller Associates, Metropolitan Chicago Healthcare Council (MCHC), and Corporation for a Skilled Workforce were there to clarify the process being used for the Northeast Region and to provide a summary of analyses completed with preliminary findings for Healthcare, Manufacturing, Transportation/Warehousing/ Logistics. Next steps and future dates would also be given.

Overview of the Critical Skill Shortages Initiative (CSSI)

A slide showed the 10 regions in Illinois followed by the Northeast Region's coalition of nine workforce boards, which is unique throughout the United States in terms of number of boards working together. The Northeast Region contains 68 percent of Illinois' workforce and 65 percent of Illinois' employers as well as 17 of the state's 48 community colleges. The CSSI goal is to align regional workforce programs to provide a reliable supply of qualified job seekers for critical skill shortage occupations that pay a good wage and provide benefits. Key sectors identified for Illinois are healthcare, manufacturing, and transportation, warehousing and logistics. The Illinois Department of Commerce and Economic Opportunity will provide financial incentives to voluntarily redirect resources toward the creation and design of education and training programs that will address critical skill shortages. Healthcare is targeted for early completion dates of reports which identify occupations with skill shortages (April 21), identify root causes (June 1), and apply for training grant funds (June 18) which would help support (distributed August 1) the redirection of resources to close gaps in the supply qualified applicants to critical skill shortage occupations. Similar planning phase reports and application for Manufacturing and Transportation, Warehousing, and Logistics (TWL) are due June 4, July 16, with application for training funds on October 31 and receipt on January 1. September 30 is due date for a Regional Solutions report. Regional solutions should realign existing public and private resources to meet short term and long term needs. Regional solutions should include a broad network of public and private organizations and training providers.

Role of Leadership and Regional Councils

Pat Fera, Will County Workforce Board, explained the regional consortium via a slide of concentric circles with CSSI in the center and the Leadership Council as the closest circle followed by Regional Council, Industry Sector Councils, and Community Organizations/Stakeholders. The Leadership Council will review and provide guidance for deliverable reports: Critical Skill Shortages, Root Causes, and Regional Solutions. The Regional Council will assist in dissemination of CSSI information as well as providing guidance on findings/recommendations and supporting redirection of resources.

Review of Process/Key Activities

Graham Toft of the Hudson Institute emphasized that the process is intended to engage leaders to collaborate on a combined front. Funding is intended to 'seed' some partnerships that might not have happened without the process. We are looking for ways in which we find solutions to our problems. A slide showing a two pronged approach for arriving at findings in this planning phase include:

- statistical analysis of secondary data from federal, state, county, and community or industry studies (He described how Hudson's JOWE database is set up to do this;
- qualitative analyses of practitioner input via interviews, surveys, and focus groups.

Graham asked participants to send his team any known studies/data regarding growth patterns and employment opportunity. Council members can send information to the Hudson Institute team via Jan Etkorn, Regional Coordinator (Jetz66@aol.com)

Manufacturing & Transportation, Warehousing & Logistics (TWL)

Kristin Wolff of Corporation for a Skilled Workforce (CSW) said that the plan for these sectors included 30 focus groups – 10 for each sub-sector employers and five for employees in each sector. These will be in a mix of geographic and sub sectors. She mentioned that TWL has fewer professional associations and thus is less organized. And that manufacturing and parts of TWL are looking at different crises, such as, downsizing. In the April 12 Tooling and Manufacturing Association (TMA) Focus Group, there were small companies concerned about mergers or who had merged with another company already – causing decisions about equipment and technology to be made by company components not in the Chicago area. Globalization and reduction of staff are now occurring in small companies. This translates into their difficulty in communicating training and education needs to Community Colleges. One manufacturer said, “My industry is changing and I don’t know what the long term looks like.” With new robotic equipment, another says, we may be able to run our plant with five people rather than 30. Another story line Kristin relayed to the group was the comment, “We train our own people – but we are having difficulty finding people who apply and are trainable. We need someone who is literate and can become a problem solver with technical expertise. It is a shift from just setting up equipment – set-up is easy – to knowing what to do when a problem occurs.” Another participant supported Kristin’s focus group data saying that in his experience in trying to set up training for Transportation, Warehousing and Logistics (TWL), “Our local Warehousing and Logistics people can’t specify their needs. Security and technology are quickly changing the nature of their jobs.” Regarding a meeting (April 19) with Community College presidents a participant commented that the colleges can’t be expected to build programs with expensive techniques and technology without knowing how many will attend for how long. Industry is in such turmoil that they don’t know. Because they cannot articulate their needs in advance, there is not enough information for a community college to set up a curriculum to solve their immediate needs when those needs occur. A new ‘demand articulation approach’ may be a solution for manufacturing and TWL (i.e. our standard process of expressing need, training needs assessment, prediction of training needs). A comment was made about an apprenticeship type program being helpful.

Key Dates and Next Steps

- April 21 Healthcare Critical Skills Shortages Report
- May 24 Leadership & Regional Councils meeting, 1-3 pm
 - § This meeting precedes the Root Causes Report for Healthcare (due June 1)
 - § and the Manufacturing/TWL Report on Critical Skill Shortages (due June 4)
- Next joint Council Meetings are June 28 9-11 am & September 23 1-3 pm
- June 15 Leadership Council 12-2 pm
 - § Also October 14 12-2 pm

Regional Input Forums

- April 26 1-4 pm
- May 14 10-12 noon
- June 7 9-11 am
- August 12 1-3 pm Manufacturing
- August 13 1-3 pm Transportation, Warehousing and Logistics

Pat Fera, Will County Workforce Board, adjourned the meeting and thanked participants.

Appendix D: One-Stop Council Meeting Minutes

The Workforce Boards of Metropolitan Chicago

Minutes from One-Stop Council Meeting

April 26, 2004

11:00 am - 12:00 noon

The Hyatt Regency Chicago

151 East Wacker Drive Chicago, IL 60601

Welcome and Introductions

Joe Kilbride, meeting facilitator, welcomed participants and outlined the purposes of the session:

- § Clarify the role of the One Stop Council in the Northeast Economic Development Region's Critical Skill Shortages Initiative (CSSI).
- § Allow participants to share approaches for implementing Sector Strategies in the One Stops.
- § Announce co-chairs.
- § Clarify next steps.

Kilbride explained this is the first meeting of the One-Stop Council for the Northeast Economic Development Region's Critical Skill Shortages Initiative (CSSI), and reviewed the agenda:

Time	Topic
11:00-11:10	Welcome and Introductions
11:10-11:15	Overview of the Critical Skills Shortages Initiative Clarify role of One-Stop Council in this effort
11:15-11:45	Breakout Activity: Workforce Areas Sharing One Stop Approaches Used to Implement Sector Strategies
11:45-11:55	Announcement of Co-Chairs
11:55-12:00	Conclusion, Key dates, including next meeting

Participants introduced themselves.

Overview of CSSI

Joe Kilbride provided an overview of the Critical Skill Shortages Initiative. He explained that participants received a packet of information, including handouts with all powerpoint slides, plus the Regional State of the Workforce Report. The overview of CSSI included the following points:

- § The Governor has designated 10 areas as Economic Development Regions through state's Department of Commerce and Economic Opportunity (DCEO)
- § Northeast Economic Development Region is the EDR for metropolitan Chicago.
- § A coalition of nine Workforce Boards in the region are charged with addressing critical skill shortages by redirecting resources and applying for funds to fill gaps.

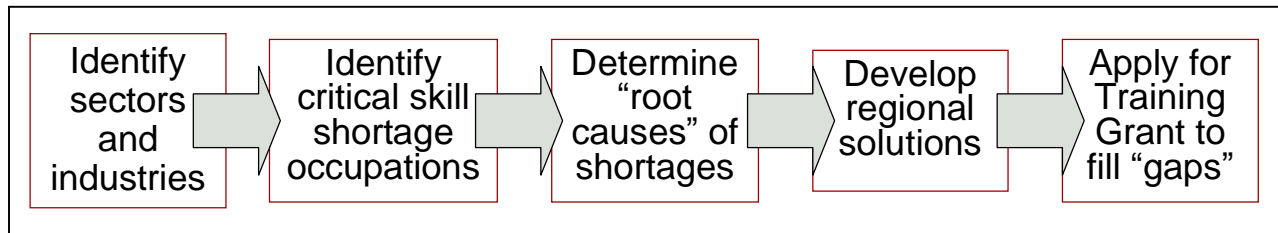
These Workforce Boards and the areas they cover were reviewed as summarized below:

Name of Workforce Board	Workforce Area Covered

Chicago Workforce Board	City of Chicago
Cook County Workforce Investment Board	South and West Suburban Cook County
DuPage County Workforce Board	County of DuPage
Grundy Livingston Kankakee Workforce Board	Counties of Grundy, Livingston, and Kankakee
Lake County Workforce Investment Board	County of Lake
McHenry County Workforce Investment Board	County of McHenry
River Valley Workforce Investment Board	Counties of DeKalb, Kane, and Kendall
The Workforce Board of Northern Cook County	North and Northwest Suburban Cook County
Workforce Investment Board of Will County	County of Will

The Goal of CSSI is to align regional workforce programs to provide a reliable supply of qualified job seekers for critical skill shortage occupations that pay a good wage and provide benefits.

Major steps in the planning phase were reviewed as summarized below.



- § Sectors and industries (sub-sectors) will be identified. Previous regional activities, including Community Audits and Industry Summits have been instrumental in this phase. For the Northeast region, three preliminary target sectors have been identified. These are:
 - Healthcare
 - Manufacturing
 - Transportation/Warehousing/Logistics
- § Within each identified sector, critical skill shortage occupations will be identified.
- § Root Causes for these shortages will be examined, and Solutions will be developed to address identified root causes. Solutions will be achieved by re-directing local resources and programs to address employer and workforce needs.
- § DCEO (Dept. of Commerce and Economic Opportunity) will provide financial incentives for the EDRs that re-align resources within existing programs to address employer and workforce needs.

At key steps in the planning phase, reports will be submitted to DCEO.

- § Timelines for Healthcare reports are as follows:
 - Critical Skill Shortages report, submitted April 21, 2004
 - Root Causes/ Regional Solutions Report, due June 1, 2004
 - Grant application, due June 18, 2004.
 - DCEO to award funds by August 1, 2004

- § Timelines for reports to be submitted for both Manufacturing and Transportation/Warehousing/Logistics are as follows:
- Critical Skill Shortages report, due June 4, 2004
 - Root Causes report, due July 16, 2004
 - Regional Solutions report, due Sept. 30, 2004
 - Grant application, due October 21, 2004.
 - DCEO to award funds by January 1, 2005

After local remedies are exhausted there will likely be "gaps" in the regional strategy. To fill some of the unmet needs and provide an incentive to regions to participate in this initiative, DCEO funds will be made available on a competitive basis for solutions/training activities. Successful applications will:

- § Demonstrate re-direction of resources/programs
- § Make a strong case for the need to address "gaps" in the Northeast Economic Development region.
- § Include solutions developed with input from a broad range of stakeholders. To involve industry participants and other stakeholders, a structure has been established. The membership and responsibilities for the following councils were explained:
- Leadership Council – including Workforce Board Chairs and CLEOs (Chief Local Elected Officials) or their representatives
 - Regional Council– including Representatives of IDHS, DCEO, IDES, ICCB, Labor, Regional Offices of Education, Economic Development Organizations, and the Private Sector, Community College Presidents, Chairs and Vice Chairs of Industry Councils and One-Stop Council, and Workforce Board Chairs
 - Sector Councils– including representatives of Private Sector, Industry Associations, Summit Action Teams, Economic Development Organizations, and Chambers. The following sector councils have been established in the NE region:
 - Healthcare
 - Manufacturing
 - Transportation/Warehousing/Logistics
- § One-Stop Council– including representative for One-Stop partner from each Local Workforce Area. This is the first meeting of the One Stop Council. Its responsibilities will include:
- Identify and share best practices in sector strategies
 - Assimilate sector strategies and models in the One-Stops
 - Support implementation of CSSI solutions

Sharing Approaches to Implement Sector Strategies in the One Stops

Participants were asked to group according to local workforce area/One-stop and briefly discuss approaches they are currently using/plan to use to implement sector strategies in the one-stops. A summary of the reports from these breakout activities follows.

Northern Cook Partners

- Completed an extensive business planning process, which led to establishment of dedicated Business & Employer Service teams. These teams have been:
 - § Gathering information about business and employer needs

- § Developing relationships within targeted sector
- § Sharing the employer databases of various partner agencies
- § Piloting “virtual” one stop for youth... to get them information about occupations in critical sectors

South and Southwest Suburban Cook County Partners

- Had previously established a task force to work with healthcare sector, including St.. James Hospital.
- South/southwest regional advisory councils include these sectors
- West suburban Cook county is working on healthcare program
- Have included healthcare in their 2004 RFP from task force
- Account Executives have been contacting Transportation/Warehousing/Logistics and Manufacturing employers

Will County Partners

- One –stop in planning phase. Have:
 - § Aligned business services staff by sector
 - § Revised their ITA policy to meet goals of Workforce Report & CSSI
 - § Community College partners have developed short-term training to meet needs of these sectors

DuPage County Partners

- Mary Beth Marshall has been involved in the Healthcare summit. Since then have been working with Community College to find more participants for clinical sites for healthcare training.
- DuPage TechPrep and Vocational Education working with Youth Council to reach out to counselors in order to get students interested in manufacturing.
- The IETC Business Services team is working with the targeted sectors.

River Valley Workforce Area Partners

- Working to strengthen economic development linkages throughout the area, with Elgin, Kendall County, etc.
- Broadening its reach by extending itself to additional partners, and identifying resources of the various partners
- Responding to employer requests to improve basic skills (essential skills)... have developed soft skills program, i.e., computer skills, job seeking/retention skills... includes a Spanish speaking component... have kicked it off to employers who host these sessions, invite other employers, and have sent their workers.
- Elgin has targeted the same three sectors... held some forums for these industries, partnered on healthcare career awareness event, educating youth and adults about a broad array of jobs/careers in healthcare beyond nursing.
- Realigned Business Teams with WIB person to focus on targeted sectors
- In Transportation, working with Rockford airport, Rochelle railport

Chicago Partners

- Have established five Business Service teams
- Pilsen one example. It has been divided into industry cluster teams.
- Business Services team at Daley College currently has collaborative partnership:
 - § Their marketing materials reflect all five business teams.

- § Looking at one-stop business partnerships and examine by sector. Approached Daley College to establish local job fair, which has grown into city-wide job fair to be held June 5.
- § Conducting workshops in conjunction with this event. Students can take courses/workshops by employment services team on resume writing, etc.

Lake County One Stop Partners

- Have two business service teams, one healthcare, one manufacturing.
- Been successful by focusing on mid-sized companies.
- Also formed job seeker team, which is exploring ways to better focus our services on sectors. Held joint meeting and have identified possibilities such as:
- Funnelling job candidates
 - § Women in trades fair
 - § Targeting recruitment days in the center
 - § Website will focus on these teams also

McHenry County Partners

- Working with WIA youth programs, aligning them with sectors
- Employer relations team also focused on these sectors
- New hospital announced in Crystal Lake. Will be working with Mercy Hospital (if the city of Crystal Lake grants approval for the hospital to be built).
- McHenry County College – private service provider. Working to increase training opportunities for healthcare.
- At one stop will target industries with info/marketing.
- Job Club has businesses from each sector come and talk to potential employees.

At future sessions, we intend to do more planning and sharing around sector based strategies.

Appendix E: Industry Council Meeting Minutes

The Workforce Boards of Metropolitan Chicago
Critical Skill Shortages Initiative
Northeast Economic Development Region

Minutes from Council Meeting for MANUFACTURING

May 10, 2004
1:00 p.m. to 3:00 p.m.
The Conference Center-UBS Tower
One North Wacker, 2nd Floor
Chicago, IL 60606

Below is a summary of the meeting agenda.

Summary of Agenda

Time	Topic
1:00-1:10	Welcome and Introductions Charge to the Council
1:10-1:25	Overview of the Critical Skill Shortages Initiative
1:25-2:25	Identification of Critical Occupations and Skills Shortages
2:25-2:45	Preparation for Root Cause Analyses
2:45-2:50	Co-Chairs for the Leadership Council
2:50-3:00	Wrap up and plan next meeting

Following are minutes from the meeting.

Welcome and Introductions

Joe Kilbride, facilitator for the meeting, welcomed attendees and explained that this is the first Manufacturing Sector Council meeting for the Northeast Economic Development Region’s Critical Skill Shortages Initiative (CSSI).

Kilbride outlined the purposes of the session:

Provide an overview of the Critical Skill Shortages Initiative (CSSI), and clarify the role of the Sector Council in this effort.

Clarify the process being used in the Northeast Economic Development Region for identification of critical shortage occupations, root causes, and solution development.

Provide a summary of analyses planned and completed, and preliminary findings for Manufacturing.

Receive input/feedback from Council members.

Clarify next steps.

Kilbride reviewed the agenda and participants introduce themselves.

Overview of CSSI

Joe Kilbride provided an overview of the Critical Skill Shortages Initiative. He explained that participants received a packet of information, including handouts with all powerpoint slides, plus Frequently Asked Questions about the Workforce Boards of Metropolitan Chicago.

The overview of CSSI included the following points:

Ten (10) Economic Development Regions (EDRs) have been designated throughout the state through the Department of Commerce and Economic Opportunity (DCEO).

The Northeast Economic Development Region is the EDR for metropolitan Chicago.

A coalition of 9 workforce boards from throughout the region have formed the Workforce Boards of Metropolitan Chicago, and are charged with managing the region’s CSSI effort to address critical skill shortages by redirecting resources and applying for funds to fill gaps. These Workforce Boards and the areas they cover are:

Name of Workforce Board	Workforce Area Covered
Chicago Workforce Board	City of Chicago
Cook County Workforce Investment Board	South and West Suburban Cook County
DuPage County Workforce Board	County of DuPage
Grundy Livingston Kankakee Workforce Board	Counties of Grundy, Livingston, and Kankakee
Lake County Workforce Investment Board	County of Lake

McHenry County Workforce Investment Board	County of McHenry
River Valley Workforce Investment Board	Counties of DeKalb, Kane, and Kendall
The Workforce Board of Northern Cook County	North and Northwest Suburban Cook County
Workforce Investment Board of Will County	County of Will

Economic statistics for this region characterize its significant impact on the state overall.

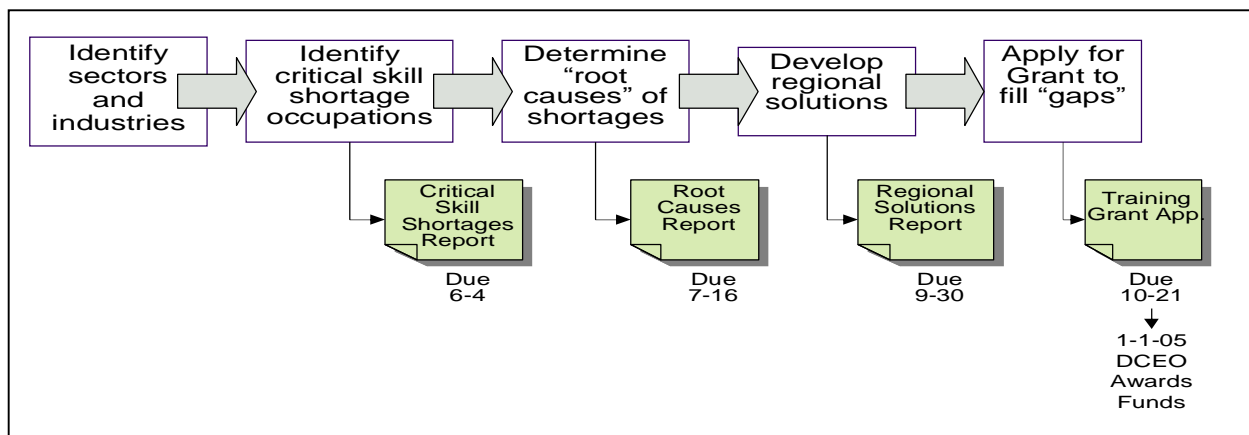
The Goal of CSSI is to align regional workforce programs to provide a reliable supply of qualified job seekers for critical skill shortage occupations that pay a good wage and provide benefits.

The approach is to begin at a macro-level by identifying employer needs for certain critical shortage occupations within key industries and sub-sectors, and to understand the root causes of these shortages.

Solutions will be achieved by re-directing local resources and programs to address employer and workforce needs.

DCEO (Dept. of Commerce and Economic Opportunity) will provide financial incentives for the EDRs to voluntarily redirect resources within existing programs to address employer and workforce needs.

Major steps in the planning phase for the Manufacturing sector and due dates for key deliverables to DCEO were reviewed as summarized below.



§ This project focuses on the demand side of workforce issues for the entire Chicago Metropolitan Region. Specifically it is to identify occupational skill shortages (aka occupational demand) within the Region in three key sectors: Healthcare, Manufacturing, and Manufacturing. The supply side of this equation will be addressed through specific solutions identified for the root causes of occupational skill shortages.

Within each sector, industries (sub-sectors) will be identified. Previous regional activities, including Community Audits and Industry Summits have been instrumental in this phase.

Within each identified sector, critical skill shortage occupations will be identified.

Root Causes for these shortages will be examined, and Solutions will be developed to address identified root causes.

At key steps in the planning phase, reports will be submitted to DCEO.

§ Timelines for reports to be submitted for Manufacturing are as follows:

- Critical Skill Shortages report, due June 4, 2004
- Root Causes report, due July 16, 2004
- Regional Solutions report, due Sept. 30, 2004
- Grant application, due October 21, 2004.
- DCEO to award funds by January 1, 2005

As the grants will be awarded based upon a competitive process, Kilbride explained that successful applications will:

§ Demonstrate re-direction of resources/programs

§ Make a strong case for the need to address “gaps” in the Northeast Economic Development region.

§ Develop solutions based upon input from a broad range of stakeholders. To involve industry participants and other stakeholders, a structure has been established. The membership and responsibilities for the following councils were explained:

- Leadership Council – including Workforce Board Chairs and CLEOs (Chief Local Elected Officials) or their representatives
- Regional Council– including Representatives of IDHS, DCEO, IDES, ICCB, Labor, Regional Offices of Education, Economic Development Organizations, and the Private Sector, Community College Presidents, Chairs and Vice Chairs of Industry Councils and One-Stop Council, and Workforce Board Chairs
- Sector Councils– including representatives of Private Sector, Industry Associations, Summit Action Teams, Economic Development Organizations, and Chambers. Sector councils have been established for each of the following:
 - § Healthcare
 - § Manufacturing
 - § Transportation/Warehousing/Logistics
- One-Stop Council– including representative for One-Stop partner from each Local Workforce Area.
- Stakeholder Forums, such as this for interested groups including:

• Community Based Organizations	• Industry Associations
• Economic Dev. Organizations	• One-Stop partners
• Foundations	• Private Sector
• Chambers of Commerce	• Workforce Boards
• Education for Employment/Tech Prep System	• Elementary and Secondary Education
• Community Colleges and Universities	• Legislators

- Labor Unions
- Local Elected Officials

Kilbride described the process that is underway in the Northeast Region to gather key information and develop findings and reports.

- § Hudson Institute will be compiling all of the various information sources and producing the key reports.
- § The project will utilize a two-pronged approach, including both primary data from practitioners in the various sectors, and secondary data from economic and other databases, including Industry projections, Occupational projections, New hires data, ES 202 data, Dunn & Bradstreet data, local economic research, etc.
- § A variety of contractors have begun work to perform both primary and secondary research. Some of these activities include:
 - Job Vacancy / Hard to Fill Jobs Surveys
 - Employer Focus Groups
 - Inventory of Producers
 - Incumbent Worker Surveys & Focus Groups
 - Career Awareness & Perception Analysis
 - Assessment of Policies & Regulations
 - Career Progression Analysis

The vendors for Job Vacancy surveys, Employer Focus Groups, Incumbent Worker Surveys and Focus Groups, made brief presentations to the Council.

Bruce Bernardi, Illinois Dept. of Employment Security

Bruce Bernardi described the approach DES is taking to complete Job Vacancy surveys for Manufacturing (both durable and nondurable), Wholesale trade, Transportation and Warehousing.

- § Employers were identified by NAIC code.
- § Surveys have been distributed to over 5300 employers.
- § The final report will be submitted May 20, 2004. This final report will provide information for the entire region, and provide breakdowns by local workforce areas.
- § To preview the type of information that will be provided by DES, Bernardi reviewed some preliminary data from the Job Vacancy survey, including a sampling of job vacancies for non-durable manufacturing positions in the River Valley workforce area.

Kristin Wolff, Corporation for a Skilled Workforce (CSW)

CSW will be doing Employer Focus Groups, Incumbent Worker surveys and focus groups for this sector. Kristin Wolff of CSW briefly described the approach and preliminary findings from employer focus groups.

- § The plan is to complete 5 employer focus groups in Manufacturing. These will provide a mix of sub-sectors (Metals, Fabricated Metals, Machinery, Electrical Machinery, Professional/Scientific Instruments, Food, Printing & Publishing, Chemical, Petroleum, Rubber & Plastic) and regions. Some structured interviews will also be done.
- § Surveys are being done using both on-line and written forms.

- § Data collection is to be completed by May 30. The analysis and report are to be completed by early June.
- § Organizations interested in participating in these surveys and/or focus groups are encouraged to contact Jan Etkorn, jetz66@aol.com
- § Wolff provided a summary of participating firms. The initial focus groups have included firms with sizes ranging from 8-3,000 employees.
 - About 1/3 employ 1-100
 - About ½ employ 100-500
 - A few employ 500-1000
 - One employs over 1000
- § Of these, we are finding:
 - Larger firms hiring less, smaller hiring more
 - 60% regularly use “alternative labor”
 - 20 occupations identified as “hard-to-fill”, many entry- and senior-level, fewer in middle (pay \$7-\$40/hr)
 - Referrals and newspapers primary recruiting resources—but employers uncertain which are most effective?
 - Talent—availability and skills both challenges
 - Long tenures are the norm (retention less of a problem)
 - Most jobs require only GED or HS, though more education/experience is preferred
 - Firms seeking to attract more women
 - Proportion of immigrants growing
- § Though very preliminary, some “themes” are emerging from the early focus groups with employers, such as:
 - Profound uncertainty, and a hint of optimism
 - “The Image Problem” remains... Not new, but worse
 - Wanted: Employees with Workplace Basics! (then math – 5-6th grade basic math skills, reading, ESL, safety, technology, cultural competence, and skills related to specific occupation)
 - Short-term needs different than long-term needs
 - Enormous range of strategies for attracting & keeping workers
 - Struggle: *craft* vs. *job* (expectations of both employer and employee)
 - Wholly inadequate “pipelines”
 - Confusion about roles and responsibilities for investing in next generation. Apprenticeships an area of tension.
 - The “knowns” and the “unknowns”
 - § What’s working/not working now?
 - § Who decides what we do?
 - § Where will we be, and when?

Shane Burkhardt, Hudson Institute

The Hudson Institute will gather key information from multiple sources and use it to produce the reports that must be submitted to DCEO for the CSSI initiative.

Shane Burkhardt of the Hudson Institute returned briefly described the process Hudson will use to develop reports for these sectors. Burkhardt made the following key points:

- § Target Industries were selected that meet the following criteria:
 - Key to a region’s quality of life, safety, and well-being
 - Provides high-paying occupations
 - Defined career ladders offering entry-level positions for individuals with less training and qualifications the ability to increase skills and education, and personal wealth
 - Key in meeting the needs of the changing demographic of the region
 - High impact on personal and business costs
- § Target Industries for Manufacturing include:
 - Non-Durable Goods Manufacturing
 - § Food & Kindred Products
 - § Printing, Publishing and Allied Production
 - § Chemical & Allied Products
 - § Petroleum and Coal Production
 - § Rubber & Miscellaneous Plastics
 - Durable Goods Manufacturing
 - § Primary Metals
 - § Fabricated Metal Products
 - § Industrial Machinery & Equipment
 - § Electrical Equipment
 - § Electronics Equipment
 - § Medical Equipment & Supplies
- § Critical Skills Occupations will be identified that meet the following criteria:
 - strong employment demand,
 - provide good wages, are
 - critical to industry competitiveness, and are
 - appropriate for targeting for the workforce system.
- § The selection of Critical Skills Occupations will involve analysis and synthesis of three key information/data sources:
 - The results of Job Vacancy surveys being completed by DES.

- The results of employer focus groups being completed by CSW.
- Hudson Institute’s statistical analysis of secondary data using their proprietary data platform JOWE© (Jobs, Occupations, Wages, and Education). Occupations will be identified based upon:
 - § Magnitude -- The total occupational employment in the industry
 - § Annual Wage -- Annual wage/salary of the occupation in the region
 - § Projections -- The number of annual openings from 2000 to 2010 for each occupation in the region
 - § O*NET JobZone Training Levels -- The training or education requirement identified by the US Department of Labor’s Employment and Training Administration.

Preliminary Findings

Burkhardt explained that Hudson has begun its analysis of secondary data, but as yet the primary data from DES and CSW have not been integrated. Based upon this preliminary analysis, without the benefit of DES and CSW findings, the following list of preliminary occupations were reviewed for feedback from the Council. Occupations are organized by functions.

Functions	Occupations	Feedback/Comments
Business & Financial Operations	<ul style="list-style-type: none"> § Accountants and Auditors § Purchasing Agents, Except Wholesale, Retail, and Farm Products 	
Computer & Mathematical Occupations	<ul style="list-style-type: none"> • Computer Software Engineers, Systems Software • Computer Support Specialists • Computer Software Engineers, Applications • Computer Programmers • Computer Systems Analysts 	Software Engineers, especially with manufacturing or industry experience, are extremely critical.
Engineering	<ul style="list-style-type: none"> • Mechanical Drafters • Industrial Engineers • Electrical and Electronic Engineering Technicians • Mechanical Engineers • Electrical Engineers • Electronics Engineers, Except Computer 	<p>Additions to the list:</p> <ul style="list-style-type: none"> • Strong agreement on Manufacturing Engineers such as Process or Tool & Dye Designers, both needed in any automated production process. Often only tradesman, possibly with associate degree but mostly not 4-year degree. • Some questioned whether there is a critical shortage of Mechanical engineers.

		<ul style="list-style-type: none"> Weak agreement that Design Engineers are in short supply.
Sales	<ul style="list-style-type: none"> § First-Line Supervisors/Managers of Non-Retail Sales Workers § Retail Salespersons § Advertising Sales Agents § Sales Engineers § Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products § Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products 	<ul style="list-style-type: none"> § Retail Personnel was questioned.
Life & Physical Science Occupations	<ul style="list-style-type: none"> Medical Scientists, Except Chemical Technicians Chemists 	<p>Question: Why is biotech not on the list?</p> <p>Burkhardt: It is not part of health care either but it might show up if we look in more detail e.g. at medical equipment & supplies, and/or under pharmaceutical products (chemical & allied products).</p>
Arts, Design, & Media	<ul style="list-style-type: none"> Editors News Analysts, Reporters and Correspondents Graphic Designers Desktop Publishers 	
Administrative Production Personnel	<ul style="list-style-type: none"> Production, Planning, and Expediting Clerks Shipping, Receiving, and Traffic Clerks Stock Clerks and Order Fillers 	
Customer Service	<ul style="list-style-type: none"> Customer Service Representatives 	<p>Question: Seems to be high turnover in customer service (most likely to be why these occupations are critical)</p> <p>Burkhardt: low wages and high pressure work environment and the temporary nature of the jobs.</p> <p>Comment: maybe the reason for the bad performance of a company is because they cannot retain workers in customer service and are therefore not able to</p>

		provide a consistent service experience.
Maintenance, & Repair	<ul style="list-style-type: none"> • Maintenance and Repair Workers, General • First-Line Supervisors/Managers of Mechanics, Installers, and Repairers • Machinery Mechanics 	Confirmation of the need for Maintenance and Repair tradespeople.
Trades	<ul style="list-style-type: none"> • Sheet Metal Workers • Electricians 	
Production Workers	<ul style="list-style-type: none"> • Supervisors <ul style="list-style-type: none"> ○ First-Line Supervisors/Managers of Production and Operating Workers • Assemblers & Fabricators <ul style="list-style-type: none"> ○ Structural Metal Fabricators and Fitters ○ Electrical and Electronic Equipment Assemblers ○ Team Assemblers • Metal Workers & Plastics Workers <ul style="list-style-type: none"> ○ Lathe and Turning Machine Tool Setters ○ Operators, and Tenders, Metal and Plastic ○ Machinists ○ Tool and Die Makers ○ Welders, Cutters, Solderers, and Brazers ○ Grinding, Lapping, Polishing, and Buffing Machine Tool Setters, Operators, and Tenders, Metal and Plastic ○ Computer-Controlled Machine Tool Operators, Metal and Plastic ○ Cutting, Punching, and Press Machine Setters, 	Strong agreement on the need for production workers

	<ul style="list-style-type: none"> Operators, and Tenders, Metal and Plastic <ul style="list-style-type: none"> ○ Multiple Machine Tool Setters, Operators, and Tenders, Metal and Plastic • Food Processing <ul style="list-style-type: none"> ○ Bakers ○ Food Batchmakers ○ Slaughterers and Meat Packers • Other <ul style="list-style-type: none"> ○ Inspectors, Testers, Sorters, Samplers, and Weighers ○ Packaging and Filling Machine Operators and Tenders ○ Mixing and Blending Machine Setters, Operators, and Tenders ○ Helpers--Production Workers • Printing <ul style="list-style-type: none"> ○ Bindery Workers ○ Prepress Technicians and Workers ○ Job Printers ○ Printing Machine Operators 	<p>Printing occupations in general were not considered critical, but shortage of skills in how to maintain and repair the sophisticated new equipment</p>
<p>Transportation & Materials Moving</p>	<ul style="list-style-type: none"> • Truck Drivers, Heavy and Tractor-Trailer • Truck Drivers, Light or Delivery Services • Industrial Truck and Tractor Operators • Laborers and Freight, Stock, and Material Movers, Hand • Machine Feeders and Offbearers • Packers and Packagers, Hand 	

Buildings & Grounds	<ul style="list-style-type: none"> • Janitors and Cleaners, Except Maids and Housekeeping 	
General Administrative & Office Workers	<ul style="list-style-type: none"> • Executive Secretaries and Administrative Assistants • Bookkeeping, Accounting, and Auditing Clerks • Office Clerks, General • Secretaries, Except Legal, Medical, and Executive 	
Management Occupations	<ul style="list-style-type: none"> • General and Operations Managers • Chief Executives • Financial Managers • Sales Managers • Industrial Production Managers • Engineering Managers 	

Burkhardt and Kilbride explained that the Council will soon receive a unified list of critical occupations for the sector, which incorporates findings from Hudson’s analysis, IDES job vacancy survey, and CSW’s employer focus groups.

- § The Sector Council will be asked to “vote” on the criticality of shortages for each occupation identified.
- § Prompt response to this request will be essential to move the effort forward.
- § Participants will likely receive an email with link to online survey, with follow up mailing of written survey and self-addressed stamped envelope.

After occupations are identified, the next step will be analysis to identify the root causes of these shortages.

Nadine Jeserich, Hudson Institute

Nadine Jeserich of the Hudson Institute described the process Hudson will use to analyze for root causes of shortages and develop regional solutions reports to address them. Key points include:

- § The Root Causes Report for Manufacturing is due July 16, 2004. It will identify underlying trends and systemic causes of shortages at national and global level through study of:
 - The National Labor Markets
 - Regional Demand Indicators
 - Status of Regional Training
 - Regional Assets and Liabilities

- § The Regional Solutions Report for Manufacturing is due Sept. 30, 2004. It will provide a summary of existing solutions to root causes.

Co-chairs

Two members of the Sector Council will be asked to represent this council at meetings of the Leadership and Regional Councils. Those willing to volunteer to do so were asked to contact Jan Etzkorn, jetz66@aol.com

Key Dates

The next meetings of the Manufacturing Sector Council are as follows:

- § June 22 from 10-12 noon
- § Sept. 2 from 9-11 a.m.

These meetings will be held at the 410 Club & Conference Center-Wrigley Building 410 North Michigan Ave., Chicago, IL

Members of the Sector Council who are willing to volunteer to participate in Solutions Teams during mid-to-late June were asked to contact Jan Etzkorn, jetz66@aol.com

Other upcoming events include Stakeholder Forums for anyone who might be interested in the CSSI effort overall. Some of these Forums will be focused on specific target sectors, as indicated below:

May 14	Stakeholder Forum 10-12 noon	Healthcare	The Hyatt Regency Chicago (Crystal Ballroom-West Tower) 151 East Wacker Drive Chicago, IL 60601
June 7	Stakeholder Forum 9-11 am	Healthcare Manufacturing Transportation/ Warehousing/ Logistics	The Hyatt Regency Chicago (Regency D-West Tower) 151 East Wacker Drive Chicago, IL 60601
August 12	Stakeholder Forum 1-3 pm	Manufacturing	The Conference Center UBS Tower One North Wacker, 2 nd Floor Chicago, IL 60606
August 13	Stakeholder Forum 1-3 pm	Transportation/ Warehousing/ Logistics	The Conference Center UBS Tower One North Wacker, 2 nd Floor Chicago, IL 60606
October 5	Stakeholder Forum 12-2 pm	Manufacturing	The Conference Center UBS Tower One North Wacker, 2 nd Floor

			Chicago, IL 60606
October 5	Stakeholder Forum 2:30-4:30 pm	Transportation/ Warehousing/ Logistics	The Conference Center UBS Tower One North Wacker, 2 nd Floor Chicago, IL 60606

Closing

Kilbride mentioned the Industry Sector-based Curricula being developed by TPMA with input from a working group of one-stop partners and others. This online learning module will enable one-stop partners and executive staff to learn about the dynamics of the manufacturing and healthcare sectors. It is scheduled to be available by June 30, 2004. Contact Jan Etzkorn, jetz66@aol.com to be notified when curricula goes “live”.

Contact Information

Participants were asked to stay in touch with the ongoing CSSI effort in the Northeast Region by visiting the web site of the Workforce Boards of Metropolitan Chicago, at www.WorkforceBoardsMetroChicago.org

For questions about CSSI in general, contact Jan Etzkorn, jetz66@aol.com

Participants were thanked for their time and attention.

The meeting was adjourned at 3:00 p.m.

Appendix F: Stakeholder Forum Meeting Minutes

The Workforce Boards of Metropolitan Chicago

Minutes from Stakeholder Forum

April 26, 2004

1:00 - 4:00 pm

The Hyatt Regency Chicago

151 East Wacker Drive Chicago, IL 60601

These minutes have been edited to include only information pertaining to the manufacturing sector.

Welcome and Introductions

Mike Johl, chair of the DuPage Workforce Board, welcomed everyone in attendance, thanked them for coming and challenged everyone to keep in mind the interdependence of all workforce areas as this regional Critical Skill Shortages Initiative (CSSI) moves forward.

Joe Kilbride, facilitator for the meeting, outlined the purposes of the session:

- § Provide an overview of the Critical Skill Shortages Initiative (CSSI).
- § Clarify the process being used in the Northeast Economic Development Region for identification of critical shortage occupations, root causes, and solution development.
- § Provide a summary of analyses planned and completed, and preliminary findings for Healthcare, Manufacturing, Transportation/Warehousing/Logistics.
- § Clarify next steps.

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Kilbride explained this is the first stakeholder meeting for the Northeast Economic Development Region's Critical Skill Shortages Initiative (CSSI), and reviewed the agenda for the session:

• Time	• Topic	• Presenter
• 1:00-1:10	• Welcome	• Mike Johl, chair of the DuPage Workforce Board
• 1:10-1:25	• Overview of Critical Skill Shortages Initiative	• Joe Kilbride
• 1:25-1:40	• Process for Northeast Region Planning Phase	• Graham Toft, Hudson Institute
• 1:40-1:50	• Inventory of Producers • Assessment of Policies & Regulations	• Scott Hutcheson, Thomas P. Miller & Associates
• 1:50-2:00	• Career Progression Analysis • Awareness & Perception Analysis	• Kristin Wolff, Corporation for a Skilled Workforce

<ul style="list-style-type: none"> • Sector: Healthcare • 		
<ul style="list-style-type: none"> • 2:00-2:05 	<ul style="list-style-type: none"> • Review timeline/milestones for Healthcare • 	<ul style="list-style-type: none"> • Joe Kilbride
<ul style="list-style-type: none"> • 2:05-2:15 	<ul style="list-style-type: none"> • Job Vacancy/Hard to Fill Job Survey • 	<ul style="list-style-type: none"> • Gary Drain, Metropolitan Chicago Healthcare Council
<ul style="list-style-type: none"> • 2:15-2:30 	<ul style="list-style-type: none"> • Employer Focus Groups, Incumbent Worker Surveys and Focus Groups 	<ul style="list-style-type: none"> • Murat Philippe, HR Solutions
<ul style="list-style-type: none"> • 2:30-3:00 • 	<ul style="list-style-type: none"> • Summary of Healthcare Critical Skill Shortages Report • 	<ul style="list-style-type: none"> • Shane Burkhardt, Hudson Institute
<ul style="list-style-type: none"> • Sector: Manufacturing • Sector: Transportation/Warehousing/Logistics 		
<ul style="list-style-type: none"> • 3:00-3:05 	<ul style="list-style-type: none"> • Review timeline/milestones for these sectors 	<ul style="list-style-type: none"> • Joe Kilbride
<ul style="list-style-type: none"> • 3:05-3:15 • 	<ul style="list-style-type: none"> • Job Vacancy/Hard to Fill Job Surveys for these sectors 	<ul style="list-style-type: none"> • Bruce Bernardi, Illinois Dept. of Employment Security
<ul style="list-style-type: none"> • 3:15-3:30 	<ul style="list-style-type: none"> • Employer Focus Groups, Incumbent Worker Surveys and Focus Groups 	<ul style="list-style-type: none"> • Kristin Wolff, Corporation for a Skilled Workforce
<ul style="list-style-type: none"> • 3:30-3:45 	<ul style="list-style-type: none"> • Review of Overall Process for developing Critical Skill Shortages Reports for these sectors 	<ul style="list-style-type: none"> • Shane Burkhardt, Hudson •
<ul style="list-style-type: none"> • 3:45-3:55 	<ul style="list-style-type: none"> • Conclusion, Key dates 	<ul style="list-style-type: none"> • Joe Kilbride •

The Executive Directors from the nine Workforce Boards that are the consortia for the region’s CSSI effort introduced themselves:

- § Anne Hogan, Cook County Workforce Investment Board
- § Carl Martens, McHenry County Workforce Investment Board
- § Chris Stevens, Lake County Workforce Investment Board
- § Elisabeth Dunbar, Grundy Livingston Kankakee Workforce Board
- § Linda Kaiser, Chicago Workforce Board
- § Mary Pepperl, The Workforce Board of Northern Cook County
- § Pamela Fettes, River Valley Workforce Investment Board
- § Pat Fera, Workforce Investment Board of Will County

§ Ray Marchiori, DuPage County Workforce Board

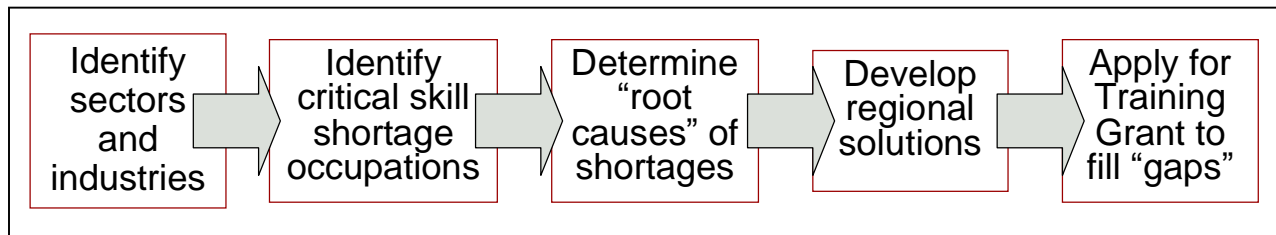
Overview of CSSI

Joe Kilbride provided an overview of the Critical Skill Shortages Initiative. He explained that participants received a packet of information, including handouts with all powerpoint slides, plus the Regional State of the Workforce Report.

The overview of CSSI included the following points:

- § The Northeast Economic Development Region is the EDR for metropolitan Chicago.
- § Economic statistics for this region characterize its significant impact on the state overall.
- § The Goal of CSSI is to align regional workforce programs to provide a reliable supply of qualified job seekers for critical skill shortage occupations that pay a good wage and provide benefits.
- § The approach is to begin at a macro-level by identifying employer needs for certain critical shortage occupations within key industries and sub-sectors, and to understand the root causes of these shortages.
- § Solutions will be achieved by re-directing local resources and programs to address employer and workforce needs.
- § DCEO (Dept. of Commerce and Economic Opportunity) will provide financial incentives for the EDRs that re-align resources within existing programs to address employer and workforce needs.

Major steps in the planning phase were reviewed as summarized below.



- § Sectors and industries (sub-sectors) will be identified. Previous regional activities, including Community Audits and Industry Summits have been instrumental in this phase. For the Northeast region, three preliminary target sectors have been identified. These are:
 - Healthcare
 - Manufacturing
 - Transportation/Warehousing/Logistics
- § Within each identified sector, critical skill shortage occupations will be identified.
- § Root Causes for these shortages will be examined, and Solutions will be developed to address identified root causes.

At key steps in the planning phase, reports will be submitted to DCEO.

- § Timelines for Healthcare reports are as follows:
 - Critical Skill Shortages report, submitted April 21, 2004
 - Root Causes/ Regional Solutions Report, due June 1, 2004
 - Grant application, due June 18, 2004.
 - DCEO to award funds by August 1, 2004
- § Timelines for reports to be submitted for both Manufacturing and Transportation/Warehousing/Logistics are as follows:
 - Critical Skill Shortages report, due June 4, 2004
 - Root Causes report, due July 16, 2004
 - Regional Solutions report, due Sept. 30, 2004
 - Grant application, due October 21, 2004.
 - DCEO to award funds by January 1, 2005

As the grants will be awarded based upon a competitive process, Kilbride explained that successful applications will:

- § Demonstrate re-direction of resources/programs
- § Make a strong case for the need to address “gaps” in the Northeast Economic Development region.
- § Develop solutions based upon input from a broad range of stakeholders. To involve industry participants and other stakeholders, a structure has been established. The membership and responsibilities for the following councils were explained:
 - Leadership Council – including Workforce Board Chairs and CLEOs (Chief Local Elected Officials) or their representatives
 - Regional Council– including Representatives of IDHS, DCEO, IDES, ICCB, Labor, Regional Offices of Education, Economic Development Organizations, and the Private Sector, Community College Presidents, Chairs and Vice Chairs of Industry Councils and One-Stop Council, and Workforce Board Chairs

- Sector Councils– including representatives of Private Sector, Industry Associations, Summit Action Teams, Economic Development Organizations, and Chambers. The following sector councils have been established in the NE region:
 - § Healthcare
 - § Manufacturing
 - § Transportation/Warehousing/Logistics
- One-Stop Council– including representative for One-Stop partner from each Local Workforce Area.
- Stakeholder Forums, such as this for interested groups including:
 - Community Based Organizations
 - Economic Dev. Organizations
 - Foundations
 - Chambers of Commerce
 - Education for Employment/Tech Prep System
 - Community Colleges and Universities
 - Industry Associations
 - One-Stop partners
 - Private Sector
 - Workforce Boards
 - Elementary and Secondary Education
 - Legislators
 - Local Elected Officials

Question: Will the report submitted April 21 be available on web site?

Answer: All reports will be made available on the web site as soon as possible after they are submitted to DCEO. The website address is www.WorkforceBoardsMetroChicago.org

Northeast Economic Development Region’s Process/Key Activities

Introduction of Graham Toft, Hudson Institute, to review the process/key activities being used in the Northeast Region. Hudson will gather key information from multiple sources and use it to produce the reports that must be submitted to DCEO for the CSSI initiative.

Graham Toft, Hudson Institute (following is a summary of Mr. Toft’s remarks)

- § The CSSI is an exciting and innovative initiative by the state of Illinois
- § The need for this has been discussed for years, but we clearly something different in today’s economic, whether you call it the “new” economy, or innovation-economy, or high-tech economy. It requires new skills from the workforce.
- § The regional nature of the project is exciting, especially for the Northeast Economic Development region, because of the size and diversity of its economy.
- § The project will utilize a two-pronged approach, including both primary data from practitioners in the various sectors, and secondary data from economic and other databases, including Industry projections, Occupational projections, New hires data, ES 202 data, Dunn & Bradstreet data, local economic research, etc.
- § Hudson will utilize its proprietary data platform JOWE© (Jobs, Occupations, Wages, and Education) for statistical analyses of these various data sources.
- § If participants know of additional research, reports, or data that may be helpful, or know of individuals or organizations that you feel should be included in surveys and/or focus groups, Hudson requests that these be provided.

Q: What is the mechanism for providing input?

A: Contact Jan Etzkorn, jetz66@aol.com with information and/or questions.

Q: There are many young African-American ex-offenders in Chicago. How will this population be included in this study?

A: This project focuses on the demand side of workforce issues for the entire Chicago Metropolitan Region. Specifically it is to identify occupational skill shortages (aka occupational demand) within the Region in three key sectors: Healthcare, Manufacturing, and Transportation/Warehousing/Logistics. The supply side of this equation can be addressed through specific solutions identified for the root causes of occupational skill shortages, which may include solutions targeted to specific populations.

- § A variety of contractors are being used to perform both primary and secondary research. Some of these activities include:
 - § Job Vacancy / Hard to Fill Jobs Surveys
 - § Employer Focus Groups
 - § Inventory of Producers
 - § Incumbent Worker Surveys & Focus Groups
 - § Career Awareness & Perception Analysis
 - § Assessment of Policies & Regulations
 - § Career Progression Analysis
- § Each of these contractors presented a brief summary of the process they will be using and the findings to-date, where available.

Scott Hutcheson, Thomas P. Miller & Associates (TPMA)

TPMA will complete both the Inventory of Producers, and the Assessment of Policies and Regulations. Hutcheson briefly described the process that will be used for each.

- § The Inventory of Producers will look at the supply side of the equation to determine what education and training providers are producing workers, what other training resources are available, and what industry recognized skill standards are out there.
- § The Policies & Regulatory Assessment will look at what policies and/or regulations may be restricting the “pipeline” for producing qualified workers. This will result in development of recommendations.

Kristin Wolff, Corporation for a Skilled Workforce (CSW)

CSW will complete the Career Progression Analysis, and Career Awareness and Perception Analysis. Wolff briefly described the process that will be used for each.

- § The Career Progression Analysis will look at how workers move up, at ways to encourage talent and develop a “new look” for career path analysis. It will include research on national, regional, and local business in the target sectors. Several key reports will be aggregated and analyzed as part of this effort. Three reports will be produced.
 - § Strategies to Address Skill and Knowledge Requirements
 - § Career Progression Scenarios in Critical Occupations/Industries
 - § Actions to Address Skill Shortage Occupations
- § The Career Awareness and Perception analysis will explore how people find out about work, how to get that work, and how to progress within an industry. CSW will conduct approximately nine focus groups with a variety of populations who are seeking jobs. .CSW will be reporting back at various points on the findings of this effort.

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Q: There are over 100,000 students out of school. Could another focus group be added to include this at-risk group?

A: One focus group is being done at alternative school, which should include this population. Any specific information you may have on career awareness, career progression, or incumbent workers related to a specific population should be sent to Jan Etzkorn. Jetz66@aol.com

Q: Will these reports be published?

A: All reports will be made available on the web site after they are complete at www.WorkforceBoardsMetroChicago.org

Manufacturing Sector and Transportation/Warehousing/Logistics Sector

As the projects for these sectors have later timelines, these activities are at an earlier stage.

Timelines for both Manufacturing and Transportation/Warehousing/Logistics are as follows:

- § Critical Skill Shortages report, due June 4, 2004
- § Root Causes report, due July 16, 2004
- § Regional Solutions report, due Sept. 30, 2004
- § Grant application, due October 21, 2004.
- § DCEO to award funds by January 1, 2005

For both these sectors, the following activities are underway:

- § Illinois Dept. of Employment Security has begun Job Vacancy/Hard to Fill Job Surveys
- § CSW has begun Employer Focus Groups, and will do Incumbent Worker surveys and focus groups.
- § Hudson will be preparing reports for these sectors.

Each was briefly described by the contractor.

Bruce Bernardi, Illinois Dept. of Employment Security

Bruce described the approach DES is taking to complete Job Vacancy surveys for Manufacturing (both durable and nondurable), Wholesale trade, and Transportation and Warehousing.

- § Employers have been identified by NAIC code
- § Surveys have been distributed to over 5300 employers and will be collected until the end of April.
- § As of April 23, the response rate is above 50 percent. The target is 60 percent.
- § The final report will be submitted May 20, 2004. This final report will provide information for the entire region, and provide breakdowns by local workforce areas.
- § DES has already delivered a list of employers who have indicated a willingness to participate in focus groups.

Q: Are all 10 counties included in the sample and what percent of total employers are by county?

A: Yes, all 10 counties are included in the study. The final report will provide breakdowns by local workforce areas, but that information is not available today. All reports submitted will be posted on the Metro Region website at www.WorkforceBoardsMetroChicago.org. Please check there for the full reports and analysis.

Q: Is the survey done?

A: No, responses are being accepted until April 30, 2004.

Kristin Wolff, Corporation for a Skilled Workforce

CSW will also conduct focus groups and worker surveys for these sectors.

- § The plan is to complete five employer focus groups in manufacturing, and five in transportation/warehousing/logistics. These will provide a mix of sub-sectors and regions. Some structured interviews will also be completed with employers.
- § Surveys are being done using both on-line and written forms.
- § Data collection is to be completed by May 30. The analysis and report are to be completed by early June.
- § The initial focus groups have included firms with sizes ranging from 8-3,000 employees. 2/3 are between 100-1,000. These indicate:
 - Larger firms hiring less, smaller hiring more
 - 60 percent regularly use “alternative labor”
 - 20 occupations identified as “hard-to-fill”, many entry- and senior-level, fewer in middle (pay \$7-\$40/hr)
 - Referrals and newspapers primary recruiting resources—but employers uncertain which are most effective?
 - Talent—availability and skills both challenges
 - Long tenures are the norm (retention less of a problem)
 - Most jobs require only GED or HS, though more education/experience is preferred
 - Fewer women than men
 - Proportion of immigrants growing
- § Though very preliminary, some “themes” are emerging from the early focus groups with employers, such as:
 - Profound uncertainty, and a hint of optimism
 - “The Image Problem” remains... Not new, but worse
 - Wanted: Employees with Workplace Basics! (then math – 5-6th grade basic math skills, reading, ESL, safety, technology, cultural competence, and skills related to specific occupation)
 - Short-term needs different than long-term needs
 - Enormous range of strategies for attracting & keeping workers
 - Struggle: *craft vs. job* (expectations)
 - Wholly inadequate “pipelines”
 - Confusion about roles and responsibilities for investing in next generation. Apprenticeships an area of tension.

Shane Burkhardt, Hudson Institute

Shane Burkhardt of the Hudson Institute returned to briefly describe the process Hudson will use to develop reports for these sectors.

The Critical Skill Shortages Report is due June 4, 2004. It will involve:

- § Review of Plans & Studies
- § Targeted Industry Validation
- § Assimilation with Primary Data
 - Focus Groups & Surveys (CSW)
 - Industry Group
- § JOWE[©] Analysis
- § Determination of Critical Occupations
- § Validation by industry representatives

The Root Causes Report is due July 16, 2004. It will involve an examination of underlying trends and systemic causes of shortages within the region.

Q: Will causes and solutions be specific to occupations?

A: Yes and No. Depending upon the cause, solutions may be unique to an occupation, or generic to many different occupations. For example, if lack of transportation is an issue for one occupation, it will likely be a cause for many others. Other causes might be much more occupation-specific, e.g., satisfaction with the job, competitive wage levels, shift schedules that do not allow opportunities to take additional training, etc.

Q: Will the Manufacturing study look at portability of skills, i.e., those which can be transferred to different employers?

A: This study will include input from a variety of reports and sources, many of which are likely to address this issue, including O*Net, which is a national survey completed by workers, plus the employee and employer focus groups.

Q: What about national skills standards? There is an industry trend toward certification, such as ACT WorkKeys. Has skill certification come up in focus groups?

A: Assessment and certification approaches in general have come up in Employer focus groups. Specific assessment standards and/or approaches will be considered as appropriate, when solutions are identified and selected.

Key Dates

- The schedule for upcoming Stakeholder Forums was announced. Some of these Forums will be focused on specific target sectors, as indicated below:

<ul style="list-style-type: none"> May 14 	<ul style="list-style-type: none"> Stakeholder Forum 10-12 noon 	<ul style="list-style-type: none"> Healthcare 	The Hyatt Regency Chicago (Crystal Ballroom-West Tower) 151 East Wacker Drive Chicago, IL 60601
<ul style="list-style-type: none"> June 7 	<ul style="list-style-type: none"> Stakeholder Forum 9-11 am 	<ul style="list-style-type: none"> Healthcare Manufacturing Transportation/ Warehousing/ Logistics 	The Hyatt Regency Chicago (Regency D-West Tower) 151 East Wacker Drive Chicago, IL 60601
<ul style="list-style-type: none"> August 12 	<ul style="list-style-type: none"> Stakeholder Forum 1-3 pm 	<ul style="list-style-type: none"> Manufacturing 	The Conference Center UBS Tower

			One North Wacker, 2 nd Floor Chicago, IL 60606
<ul style="list-style-type: none"> • August 13 	<ul style="list-style-type: none"> • Stakeholder Forum • 1-3 pm 	<ul style="list-style-type: none"> • Transportation/ Warehousing/ Logistics 	The Conference Center UBS Tower One North Wacker, 2 nd Floor Chicago, IL 60606

- Others are TBD (To Be Determined), possibly October 5 for Manufacturing and Transportation/ Warehousing/ Logistics.

Closing

Kilbride mentioned the Industry Sector-based Curricula being developed by TPMA with input from a working group of one-stop partners and others.. A handout was provided to those interested. This online learning module for one-stop partners and executive staff to learn about the dynamics of the manufacturing and healthcare sectors is scheduled to be available by June 30, 2004. Contact Jan Eitzkorn, jetz66@aol.com to be notified when curricula goes “live”.

Participants were asked to stay in touch with the ongoing CSSI effort in the Northeast Region by visiting the web site of the Workforce Boards of Metropolitan Chicago, at www.WorkforceBoardsMetroChicago.org

For questions about CSSI, contact Jan Eitzkorn, jetz66@aol.com

Participants were thanked for their time and attention.

The meeting was adjourned at 3:50 p.m.

Appendix G: Letters of Support

Appendix H: Findings from Targeted Industry Analysis

Targeted Industry Analysis: 3-Digit SIC

Strong Performer - current strength, good national industry performance

SIC	Industry Name	Industry Employment (2000)	Percent		Location Quotient (2000)	Industry Mix (1989-2000)	Local Factors (1989-2000)
			Employment Change (1989-2000)				
283	Drugs	20402		40.8%	1.992	0.122	
299	Misc. Petroleum And Coal Products	1495		39.3%	3.064	0.025	
319	Leather Goods, NEC	1166		27.3%	3.139	0.006	
451	Air Transportation, Scheduled	69446		94.3%	1.920	0.700	
473	Freight Transportation Arrangement	13308		69.1%	2.100	0.337	
478	Miscellaneous Transportation Services	3268		254.1%	1.873	1.590	
564	Children'S And Infants' Wear Stores	2377		223.0%	1.307	0.332	
614	Personal Credit Institutions	11882		126.0%	1.728	0.412	
732	Credit Reporting And Collection	6274		59.4%	1.208	0.346	
734	Services To Buildings	40296		63.1%	1.220	0.030	
736	Personnel Supply Services	152965		169.1%	1.215	1.372	
752	Automobile Parking	4230		45.6%	1.632	0.163	
874	Management And Public Relations	63708		120.0%	1.750	0.694	
899	Services, NEC	3258		101.9%	1.900	0.239	

Strong Performer - current strength, poor national industry performance

SIC	Industry Name	Industry Employment (2000)	Percent		Location Quotient (2000)	Industry Mix (1989-2000)	Local Factors (1989-2000)
			Employment Change (1989-2000)				
254	Partitions And Fixtures	5772		28.1%	1.918	-0.075	0.130
265	Paperboard Containers And Boxes	15393		4.9%	2.151	-0.193	0.016
267	Misc. Converted Paper Products	10226		5.3%	1.295	-0.225	0.052
276	Manifold Business Forms	3069		5.9%	2.172	-0.373	0.205
308	Miscellaneous Plastics Products, NEC	37659		27.4%	1.539	-0.031	0.079
346	Metal Forgings And Stampings	18277		16.7%	2.183	-0.142	0.083
351	Engines And Turbines	3834		100.5%	1.364	-0.284	1.063
355	Special Industry Machinery	7093		13.5%	1.278	-0.182	0.091
359	Industrial Machinery, NEC	15150		34.9%	1.246	-0.075	0.198
366	Communications Equipment	31275		24.7%	3.463	-0.210	0.231
472	Passenger Transportation Arrangement	11451		25.0%	1.604	-0.033	0.057
507	Hardware, Plumbing & Heating Equipment	15262		21.7%	1.452	-0.113	0.104
525	Hardware Stores	14011		71.7%	2.493	-0.175	0.666
543	Fruit And Vegetable Markets	2044		133.1%	2.115	-0.055	1.160
544	Candy, Nut, And Confectionery Stores	2161		4.6%	2.212	-0.303	0.123
608	Foreign Bank & Branches + Agencies	1614		31.0%	1.910	-0.294	0.378
622	Commodity Contracts Brokers, Dealers	8761		12.2%	13.754	-0.124	0.020
723	Beauty Shops	17443		36.9%	1.255	-0.068	0.210
822	Colleges And Universities	45889		27.5%	1.512	-0.006	0.055

Lagging Performer - high priority retention target

SIC	Industry Name	Industry Employment (2000)	Percent Employment Change (1989-2000)	Location Quotient (2000)	Industry Mix (1989-2000)	Local Factors (1989-2000)
175	Carpentry And Floor Work	14285	27.3%	1.354	0.328	-0.281
305	Hose & Belting & Gaskets & Packing	4974	6.6%	2.012	0.020	-0.181
347	Metal Services, NEC	9196	0.0%	1.897	-0.005	-0.221
349	Misc. Fabricated Metal Products	16090	11.9%	1.774	-0.059	-0.048
415	School Buses	8470	20.5%	1.742	0.102	-0.123
502	Furniture And Homefurnishings	7956	0.9%	1.377	-0.103	-0.114
504	Professional & Commercial Equipment	44195	14.5%	1.421	-0.010	-0.071
509	Miscellaneous Durable Goods	14103	3.9%	1.264	-0.128	-0.059
516	Chemicals And Allied Products	7582	13.2%	1.422	0.002	-0.096
615	Business Credit Institutions	7531	53.7%	1.607	0.684	-0.374
623	Security And Commodity Exchanges	3362	6.5%	11.020	-0.081	-0.080
628	Security And Commodity Services	9060	112.2%	1.603	1.179	-0.283
637	Pension, Health, And Welfare Funds	3681	60.8%	1.681	0.596	-0.214
653	Real Estate Agents And Managers	29575	17.4%	1.205	0.083	-0.135
731	Advertising	19376	22.4%	1.953	0.074	-0.077
733	Mailing, Reproduction, Stenographic	18379	10.5%	1.700	0.251	-0.371
811	Legal Services	41885	11.3%	1.260	-0.095	-0.017
821	Elementary And Secondary Schools	22569	31.9%	1.393	0.244	-0.151
841	Museums And Art Galleries	4656	25.5%	1.788	0.373	-0.344
842	Botanical And Zoological Gardens	1832	64.2%	2.048	0.778	-0.363
861	Business Associations	7673	6.8%	2.037	-0.113	-0.045
862	Professional Organizations	8488	22.1%	3.692	0.189	-0.195
863	Labor Organizations	6037	5.4%	1.270	-0.145	-0.027
872	Accounting, Auditing, & Bookkeeping	36091	21.7%	1.623	0.054	-0.063

Constrained Performer - prospects limited due to external trends

SIC	Industry Name	Industry Employment (2000)	Percent Employment Change (1989-2000)	Location Quotient (2000)	Industry Mix (1989-2000)	Local Factors (1989-2000)
205	Bakery Products	12561	-1.0%	1.870	-0.260	0.024
231	Men'S And Boys' Suits And Coats	1184	-47.2%	1.753	-0.852	0.154
342	Cutlery, Handtools, And Hardware	5587	-4.1%	1.419	-0.333	0.066
361	Electric Distribution Equipment	5971	-10.1%	2.132	-0.379	0.052
362	Electrical Industrial Apparatus	8957	-4.3%	1.832	-0.386	0.116
385	Ophthalmic Goods	1331	-7.2%	1.221	-0.392	0.094
492	Gas Production And Distribution	5835	-13.6%	1.389	-0.445	0.083
603	Savings Institutions	18106	-12.5%	2.184	-0.702	0.351

Poor Performer - prospects limited due to local weaknesses

SIC	Industry Name	Industry Employment (2000)	Percent Employment Change (1989-2000)	Location Quotient (2000)	Industry Mix (1989-2000)	Local Factors (1989-2000)
206	Sugar And Confectionery Products	9045	-27.6%	2.998	-0.284	-0.219
272	Periodicals	8868	-0.6%	1.849	-0.069	-0.163
273	Books	5138	-33.4%	1.253	-0.176	-0.384
274	Miscellaneous Publishing	5420	-17.4%	1.733	-0.064	-0.336
275	Commercial Printing	27281	-8.9%	1.488	-0.201	-0.115
277	Greeting Cards	1133	-16.9%	1.366	-0.204	-0.192
278	Blankbooks And Bookbinding	6393	-24.3%	3.293	-0.430	-0.039
279	Printing Trade Services	3389	-36.0%	2.177	-0.489	-0.097
284	Soap, Cleaners, And Toilet Goods	10121	-21.7%	1.951	-0.238	-0.205
285	Paints And Allied Products	4231	-29.9%	2.478	-0.402	-0.123
289	Miscellaneous Chemical Products	6303	-13.1%	2.075	-0.303	-0.053
331	Blast Furnace And Basic Steel Products	9978	-25.3%	1.351	-0.426	-0.053
336	Nonferrous Foundries (Castings)	4194	-11.3%	1.343	-0.136	-0.203
339	Miscellaneous Primary Metal Products	1907	-23.7%	2.130	-0.267	-0.196
341	Metal Cans And Shipping Containers	3055	-39.4%	2.611	-0.547	-0.074
343	Plumbing And Heating, Except Electric	2526	-15.2%	1.281	-0.242	-0.136
345	Screw Machine Products, Bolts, Etc.	10812	-1.7%	3.106	-0.163	-0.081
354	Metalworking Machinery	22372	-8.3%	2.059	-0.244	-0.065
356	General Industrial Machinery	10641	-11.0%	1.295	-0.198	-0.138
364	Electric Lighting And Wiring Equipment	13443	-14.6%	2.220	-0.290	-0.082
374	Railroad Equipment	3913	-40.0%	3.392	-0.174	-0.452
395	Pens, Pencils, Office, & Art Supplies	1646	-35.7%	1.663	-0.368	-0.215
399	Miscellaneous Manufactures	8413	-10.0%	1.462	-0.010	-0.316
505	Metals And Minerals, Except Petroleum	14067	-9.3%	2.658	-0.128	-0.191
506	Electrical Goods	26704	-5.2%	1.385	-0.094	-0.184
508	Machinery, Equipment, And Supplies	34472	-16.5%	1.243	-0.206	-0.185
511	Paper And Paper Products	14098	-3.8%	1.573	-0.038	-0.226
591	Drug Stores And Proprietary Stores	26820	-7.7%	1.214	-0.127	-0.176
601	Central Reserve Depository	1225	-38.2%	1.466	-0.341	-0.267
633	Fire, Marine, And Casualty Insurance	27962	-13.6%	1.553	-0.223	-0.139
671	Holding Offices	6036	-35.9%	1.746	-0.243	-0.342
873	Research And Testing Services	28759	-12.9%	1.361	-0.009	-0.346

Strong Performer - emerging strength, good national industry performance

SIC	Industry Name	Industry Employment (2000)	Percent Employment Change (1989-2000)	Location Quotient (2000)	Industry Mix (1989-2000)	Local Factors (1989-2000)
075	Animal Services, Except Veterinary	1632	126.0%	0.854	0.130	0.904
078	Landscape And Horticultural Services	19792	75.5%	1.137	0.486	0.043
244	Wood Containers	1241	91.2%	0.647	0.084	0.602
253	Public Building & Related Furniture	1002	98.8%	0.568	0.367	0.395
484	Cable And Other Pay Tv Services	5756	187.4%	0.815	0.584	1.063
552	Used Car Dealers	1896	131.8%	0.546	0.443	0.649
573	Radio, Television, & Computer Stores	16150	111.3%	1.026	0.511	0.376
599	Retail Stores, NEC	18608	52.7%	1.035	0.116	0.185
616	Mortgage Bankers And Brokers	10805	122.1%	1.058	0.814	0.181
673	Trusts	1727	226.5%	0.971	0.457	1.581
679	Miscellaneous Investing	2187	102.1%	1.198	0.527	0.268
729	Miscellaneous Personal Services	6115	60.2%	0.950	0.258	0.117
735	Misc. Equipment Rental & Leasing	8054	72.9%	0.889	0.199	0.304
751	Automotive Rentals, No Drivers	7807	42.3%	1.078	0.064	0.133
754	Automotive Services, Except Repair	9542	92.0%	1.143	0.496	0.197
783	Motion Picture Theaters	3995	73.6%	0.898	0.007	0.503
792	Producers, Orchestras, Entertainers	5868	45.2%	1.051	0.041	0.185
794	Commercial Sports	3901	61.1%	0.799	0.311	0.074
799	Misc. Amusement, Recreation Services	36654	120.2%	0.829	0.613	0.363
803	Offices Of Osteopathic Physicians	413	118.5%	0.258	0.180	0.779
804	Offices Of Other Health Practitioners	11863	83.4%	0.820	0.543	0.065
805	Nursing And Personal Care Facilities	45390	48.3%	0.768	0.091	0.166
808	Home Health Care Services	14206	263.9%	0.679	1.372	1.041
809	Health And Allied Services, NEC	7745	80.1%	0.660	0.382	0.193
829	Schools & Educational Services, NEC	7119	209.3%	1.103	0.905	0.962
833	Job Training And Related Services	7491	79.1%	0.751	0.279	0.286
835	Child Day Care Services	18065	110.3%	0.809	0.677	0.200
869	Membership Organizations, NEC	1283	179.5%	0.485	0.008	1.561

Strong Performer - emerging strength, poor national industry performance

SIC	Industry Name	Industry Employment (2000)	Percent Employment Change (1989-2000)	Location Quotient (2000)	Industry Mix (1989-2000)	Local Factors (1989-2000)
018	Horticultural Specialties	2309	230800.0%	0.409	-0.047	2307.821
154	Nonresidential Building Construction	11393	25.0%	0.527	-0.127	0.151
202	Dairy Products	5326	7.5%	1.114	-0.296	0.145
203	Preserved Fruits And Vegetables	6534	58.1%	0.893	-0.304	0.659
208	Beverages	7014	34.0%	1.149	-0.259	0.373
209	Misc. Food And Kindred Products	5483	76.0%	0.921	-0.179	0.712
232	Men'S And Boys' Furnishings	2213	223.5%	0.512	-0.771	2.780
323	Products Of Purchased Glass	1984	30.6%	0.914	-0.091	0.171
327	Concrete, Gypsum, And Plaster Products	5985	39.8%	0.737	-0.065	0.236
329	Misc. Nonmetallic Mineral Products	2471	5.0%	1.017	-0.344	0.167
352	Farm And Garden Machinery	1385	28.7%	0.433	-0.295	0.356
357	Computer And Office Equipment	5769	9.7%	0.492	-0.441	0.312
483	Radio And Television Broadcasting	5502	34.7%	0.659	-0.127	0.248
546	Retail Bakeries	7614	19.3%	1.170	-0.066	0.033
553	Auto And Home Supply Stores	7766	35.1%	0.579	-0.026	0.151
651	Real Estate Operators And Lessors	14740	8.6%	0.760	-0.141	0.001
839	Social Services, NEC	6061	66.7%	0.910	-0.019	0.460

Lagging Performer - prospects limited due to weak base and declining competitiveness

SIC	Industry Name	Industry Employment (2000)	Percent Employment Change (1989-2000)	Location Quotient (2000)	Industry Mix (1989-2000)	Local Factors (1989-2000)
074	Veterinary Services	5616	83.6%	0.777	0.620	-0.010
152	Residential Building Construction	24465	17.1%	0.915	-0.017	-0.038
161	Highway And Street Construction	4976	14.9%	0.543	-0.008	-0.070
171	Plumbing, Heating, Air-Conditioning	28593	25.2%	0.932	0.196	-0.170
172	Painting And Paper Hanging	7485	24.4%	1.014	0.052	-0.035
173	Electrical Work	26350	47.7%	0.932	0.349	-0.099
174	Masonry, Stonework, And Plastering	16985	17.3%	0.923	-0.034	-0.019
176	Roofing, Siding, And Sheet Metal Work	7694	8.6%	0.959	-0.036	-0.103
177	Concrete Work	9897	8.5%	0.908	0.238	-0.379
179	Misc. Special Trade Contractors	21530	13.5%	0.901	0.177	-0.268
201	Meat Products	8763	1.3%	0.528	0.001	-0.215
243	Millwork, Plywood & Structural	3329	0.1%	0.305	0.009	-0.234
367	Electronic Components And Accessories	19757	6.4%	0.882	-0.116	-0.047
411	Local And Suburban Transportation	6596	52.2%	0.881	0.555	-0.259
422	Public Warehousing And Storage	7830	47.1%	1.153	0.579	-0.334
503	Lumber And Construction Materials	6736	0.6%	0.705	0.009	-0.229
514	Groceries And Related Products	30626	5.6%	0.991	-0.111	-0.059
526	Retail Nurseries And Garden Stores	3023	3.2%	0.916	-0.050	-0.144
531	Department Stores	73139	21.2%	0.880	-0.010	-0.004
549	Miscellaneous Food Stores	2204	31.3%	0.762	0.744	-0.656
551	New And Used Car Dealers	31675	14.5%	0.867	-0.066	-0.016
565	Family Clothing Stores	11974	15.3%	0.802	0.358	-0.431
571	Furniture And Homefurnishings Stores	18446	11.9%	0.977	-0.003	-0.104
581	Eating And Drinking Places	225393	20.4%	0.844	0.037	-0.059
593	Used Merchandise Stores	3480	52.2%	0.805	0.883	-0.588
594	Miscellaneous Shopping Goods Stores	33404	19.9%	0.914	0.041	-0.068
606	Credit Unions	2704	29.4%	0.425	0.264	-0.196
609	Functions Closely Related To Banking	3775	19.8%	1.111	0.707	-0.735
621	Security Brokers And Dealers	20757	30.1%	1.141	0.426	-0.352
632	Medical Service And Health Insurance	13145	3.0%	1.055	0.441	-0.637
636	Title Insurance	2982	25.6%	1.166	0.048	-0.019
641	Insurance Agents, Brokers, & Service	28660	7.1%	1.150	-0.066	-0.089
701	Hotels And Motels	38188	9.5%	0.641	-0.058	-0.073
722	Photographic Studios, Portrait	2279	6.3%	0.994	-0.099	-0.064
726	Funeral Service And Crematories	2209	14.9%	0.660	0.029	-0.107
737	Computer And Data Processing Services	70429	150.4%	0.998	1.706	-0.428
738	Miscellaneous Business Services	66763	31.0%	1.122	0.283	-0.199
753	Automotive Repair Shops	22912	33.9%	1.031	0.118	-0.005
781	Motion Picture Production & Services	5007	54.5%	0.559	0.820	-0.501
801	Offices & Clinics Of Medical Doctors	46277	34.4%	0.727	0.284	-0.166
802	Offices And Clinics Of Dentists	21888	34.9%	0.971	0.142	-0.019
806	Hospitals	149306	9.0%	1.148	-0.048	-0.089
807	Medical And Dental Laboratories	5141	29.2%	0.746	0.093	-0.028
832	Individual And Family Services	25236	68.3%	0.952	0.620	-0.163
836	Residential Care	17824	44.5%	0.674	0.669	-0.450
864	Civic And Social Associations	16558	9.1%	0.968	0.051	-0.186
866	Religious Organizations	5866	31.4%	1.146	0.580	-0.492
871	Engineering & Architectural Services	26838	8.4%	0.808	0.079	-0.221
881	Private Households	5589	54.3%	0.405	0.377	-0.060

Poor Performer - prospects limited overall

SIC	Industry Name	Industry Employment (2000)	Percent Employment Change (1989-2000)	Location Quotient (2000)	Industry Mix (1989-2000)	Local Factors (1989-2000)
162	Heavy Construction, Except Highway	7319	-1.4%	0.364	-0.087	-0.153
204	Grain Mill Products	4700	-22.5%	1.158	-0.240	-0.212
239	Misc. Fabricated Textile Products	3812	-11.5%	0.541	-0.179	-0.162
249	Miscellaneous Wood Products	1609	-38.8%	0.588	-0.284	-0.330
251	Household Furniture	2997	-41.2%	0.315	-0.272	-0.366
252	Office Furniture	1753	-23.3%	0.683	-0.132	-0.328
271	Newspapers	11903	-8.2%	0.824	-0.298	-0.010
282	Plastics Materials And Synthetics	3142	-28.6%	0.632	-0.400	-0.112
286	Industrial Organic Chemicals	1664	-52.3%	0.427	-0.429	-0.320
291	Petroleum Refining	2109	-31.5%	0.776	-0.528	-0.014
295	Asphalt Paving And Roofing Materials	1009	-5.8%	1.035	-0.138	-0.146
306	Fabricated Rubber Products, NEC	2608	-41.6%	0.735	-0.243	-0.399
332	Iron And Steel Foundries	2351	-32.2%	0.580	-0.333	-0.216
335	Nonferrous Rolling And Drawing	3874	-37.3%	0.663	-0.220	-0.380
344	Fabricated Structural Metal Products	10734	-17.1%	0.657	-0.072	-0.325
353	Construction And Related Machinery	7913	-12.0%	1.011	-0.157	-0.190
358	Refrigeration And Service Machinery	5671	-1.9%	0.813	-0.107	-0.138
363	Household Appliances	2952	-55.9%	0.784	-0.350	-0.435
365	Household Audio And Video Equipment	2516	-68.3%	0.959	-0.310	-0.599
371	Motor Vehicles And Equipment	12681	-13.4%	0.380	-0.026	-0.334
381	Search And Navigation Equipment	1950	-56.5%	0.391	-0.725	-0.066
382	Measuring And Controlling Devices	9079	-19.0%	0.925	-0.324	-0.093
384	Medical Instruments And Supplies	9233	-25.1%	0.991	-0.038	-0.439
386	Photographic Equipment And Supplies	1471	-58.7%	0.646	-0.562	-0.252
394	Toys And Sporting Goods	2897	-36.6%	0.868	-0.249	-0.343
421	Trucking & Courier Services, Ex. Air	50125	-1.9%	0.939	-0.125	-0.120
458	Airports, Flying Fields, & Services	2554	-10.7%	0.541	0.293	-0.626
481	Telephone Communication	33272	-10.7%	0.877	0.098	-0.431
491	Electric Services	11701	-20.8%	0.991	-0.416	-0.019
495	Sanitary Services	4802	-11.9%	0.837	0.419	-0.764
501	Motor Vehicles, Parts, And Supplies	15679	-2.1%	0.911	-0.097	-0.150
512	Drugs, Proprietaries, And Sundries	7198	-7.9%	0.837	0.169	-0.474
513	Apparel, Piece Goods, And Notions	4085	-17.9%	0.577	-0.177	-0.228
517	Petroleum And Petroleum Products	1941	-63.7%	0.391	-0.514	-0.349
518	Beer, Wine, And Distilled Beverages	5585	-1.1%	1.036	-0.121	-0.116
519	Misc. Nondurable Goods	17006	-2.2%	0.948	-0.094	-0.155
521	Lumber And Other Building Materials	9788	-29.4%	0.471	0.197	-0.717
523	Paint, Glass, And Wallpaper Stores	1732	-29.6%	0.823	-0.359	-0.162
533	Variety Stores	2921	-76.1%	0.580	-0.552	-0.435
539	Misc. General Merchandise Stores	4268	-37.1%	0.680	-0.365	-0.232
541	Grocery Stores	74892	-4.1%	0.743	-0.140	-0.127
542	Meat And Fish Markets	1140	-34.5%	0.714	-0.350	-0.221
554	Gasoline Service Stations	10511	-27.1%	0.493	-0.206	-0.291
561	Men'S & Boys' Clothing Stores	2781	-32.5%	1.025	-0.459	-0.093
563	Women'S Accessory & Specialty Stores	2284	-30.7%	1.150	0.058	-0.591
566	Shoe Stores	6080	-25.7%	0.948	-0.357	-0.127
569	Misc. Apparel & Accessory Stores	1382	-40.4%	0.626	-0.262	-0.368
592	Liquor Stores	4121	-14.8%	1.094	-0.284	-0.091
596	Nonstore Retailers	15278	-24.3%	1.155	0.129	-0.598
602	Commercial Banks	50673	-12.5%	1.080	-0.304	-0.047
655	Subdividers And Developers	3092	-20.7%	0.758	-0.414	-0.019
721	Laundry, Cleaning, & Garment Services	12812	-4.4%	0.883	-0.186	-0.084
762	Electrical Repair Shops	3195	-11.1%	0.932	-0.306	-0.031
769	Miscellaneous Repair Shops	6680	-14.4%	0.874	-0.214	-0.157
784	Video Tape Rental	3274	-9.2%	0.603	0.173	-0.491
824	Vocational Schools	2629	-21.8%	0.804	-0.179	-0.265

Appendix I: Notes on Analysis Data Sources

Critical Occupations Analysis:

Staffing Pattern:

Disclosure issues at the county and PMSA (Primary Metropolitan Statistical Area) geographic level prohibited use of region-specific staffing patterns, which identify the percentage of an industry occupied by a particular occupation. Furthermore, Illinois Department of Employment Security (IDES) was unable to release a full set of statewide staffing patterns due to data confidentiality laws. As the Chicago metropolitan region tends to mirror a national industry mix, it was determined that variance between a national staffing pattern and regional staffing pattern would not have a significant impact on critical occupation findings.

Industry-specific occupational employment is determined by compiling regional employment by industry data and national staffing patterns. The product of this compilation will be referred to as “Magnitude,” and is a measure of the employment demand of an occupation in the industry. Magnitude is identified by Standard Occupational Classification code, or SOC, a classification system for occupations established by the federal government. All occupational analysis in this report will be conducted according to SOC.

Source: Occupational Employment Survey: 2002 National four-Digit NAICS Industry-Specific Estimates. Bureau of Labor Statistics. Available online at http://www.bls.gov/oes/oes_dl.htm#2002.

Regional Employment by Industry:

Regional employment by industry is available from ES-202 covered wage data administered by both IDES and U.S. Dept. of Labor. This data set is available at the county level, and has been aggregated across the EDR region. Because of disclosure issues and project timing, Hudson Institute utilized data from the Minnesota IMPLAN group, which adjusts industry employment to overcome disclosure issues. IDES did supply 2003 ES-202 data aggregated at the regional level (to avoid disclosure issues). Due to project deadlines, this data was not received in time to employ in the analysis, but will be used for the remaining CSS analysis.

Source: Covered Employment and Wages Program, 2002. Bureau of Labor Statistics; statistical adjustment performed by Minnesota IMPLAN Group, Inc.

Wages:

The wages measured in the critical occupation analysis are regional-level. The wages are not industry-specific, meaning that the wages listed for Registered Nurses are not specific to hospitals or clinics; these wages are an average of Registered Nurse wages across all industries in which that occupation is employed. Wages correspond to the SOC.

Source: Median Annual Wages in the Northeast Illinois Economic Development Region, 2003 Quarter Three. Provided by the Illinois Department of Employment Security.

Job Zones:

O*Net, the US Department of Labor’s Employment and Training Administration database, identifies the general education and training levels required for job performance for each occupation in the Standard Occupational Classification system.

Source: Job Zones from the O*NET 5.1 database. National O*NET Consortium. Available online at <http://www.onetcenter.org/database.html#download>.

Projections:

The IDES provided occupational projections for the Chicago PMSA for the years 2000 through 2010. The projections include a growth rate for the occupation across the ten-year period, and the total number of jobs opening each year as a result of industry growth and replacement needs (retirement, turnover, etc.). The

project team understands the state is requiring 10 year projections, but are unable to meet that requirement as IDES may not release 2002 – 2012 projections until third-quarter 2004. Projection data is organized by SOC.

Source: Occupational Employment Projections in Chicago PMSA for a base year of 2000 and a projected year of 2010. Illinois Workforce Info Center. Available online at <http://wic.ilworkinfo.com/analyzer/session/occupation.asp?cat=OCC>.

Appendix J: Methodology for Selection of Critical Occupations

The occupations analyzed in this report are critical to Northeastern Illinois' manufacturing industries. The manufacturing sector is made up of the following industries:

Durable Goods Industries

Primary Metal Industries

- NAICS 3311 – Iron and Steel Mills and Ferroalloy Manufacturing
- NAICS 3312 – Steel Product Manufacturing from Purchased Steel
- NAICS 3313 – Steel Wire Drawing
- NAICS 3314 – Nonferrous Metal Production and Processing
- NAICS 3315 – Foundries

Fabricated Metal Products

- NAICS 3321 – Forging and Stamping
- NAICS 3322 – Cutlery and Hand tool Manufacturing
- NAICS 3323 – Architectural and Structural Metals Manufacturing
- NAICS 3324 – Boiler, Tank and Shipping Container Manufacturing
- NAICS 3325 – Hardware Manufacturing
- NAICS 3326 – Spring and Wire Products Manufacturing
- NAICS 3327 – Machine Shops, Turned Product and Screw, Nut and Bolt Manufacturing
- NAICS 3328 – Coating, Engraving, Heat Treating and Allied Activities
- NAICS 3329 – Other Fabricated Metal Products Manufacturing

Industrial Machinery and Equipment

- NAICS 3331 – Agriculture, Construction and Mining Machinery Manufacturing
- NAICS 3332 – Industrial Machinery Manufacturing
- NAICS 3333 – Commercial and Service Industry Machinery Manufacturing
- NAICS 3334 – Ventilation, Heating, AC and Commercial Refrigeration Manufacturing
- NAICS 3335 – Metalworking Machinery Manufacturing
- NAICS 3336 – Engine, Turbine, and Power Transmission Equipment Manufacturing
- NAICS 3339 – Other General Purpose Machinery Manufacturing

Electrical Equipment

- NAICS 3351 – Electric Lighting Equipment Manufacturing

- NAICS 3352 – Household Appliance Manufacturing
- NAICS 3353 – Electrical Equipment Manufacturing
- NAICS 3359 – Other Electrical Equipment and Component Manufacturing

Electronics Equipment

- NAICS 3341 – Computer and Peripheral Equipment Manufacturing
- NAICS 3342 – Communications Equipment Manufacturing
- NAICS 3343 – Audio and Video Equipment Manufacturing
- NAICS 3344 – Semiconductor and Other Electronic Component Manufacturing
- NAICS 3345 – Navigational, Measuring, Electromedical and Control Instruments
- NAICS 3346 – Manufacturing and Reproducing Magnetic and Optical Media

Medical Equipment and Supplies

- NAICS 3391 – Medical Equipment and Supplies Manufacturing

Non-Durable Manufacturing Industries

Food and Kindred Products

- NAICS 3112 – Grain and Oilseed Manufacturing
- NAICS 3114 – Fruit and Vegetable Preserving and Specialty Food Manufacturing
- NAICS 3115 – Dairy Product Manufacturing
- NAICS 3116 – Animal Slaughtering and Processing
- NAICS 3117 – Seafood Product Preparation and Packaging
- NAICS 3119 – Other Food Manufacturing
- NAICS 3121 – Beverage Manufacturing

Confectionary Products & Bakeries

- NAICS 3113 – Sugar and Confectionery Product Manufacturing
- NAICS 3118 – Bakeries and Tortilla Manufacturing

Printing, Publishing and Allied Products

- NAICS 5111 – Newspapers, Periodical, Book and Database Publishers
- NAICS 5112 – Software Publishers
- NAICS 3121 – Printing and Related Support Activities

Chemical and Allied Products

- NAICS 3251 – Basic Chemical Manufacturing
- NAICS 3252 – Resin, Synthetic Rubber, and Artificial and Synthetic Fibers and Filaments Manufacturing
- NAICS 3253 – Pesticide, Fertilizer and other Agricultural Chemical Manufacturing
- NAICS 3254 – Pharmaceutical and Medicine Manufacturing
- NAICS 3255 – Paint, Coating and Adhesive Manufacturing
- NAICS 3256 – Soap, Cleaning Compound, and Toilet Preparation Manufacturing
- NAICS 3259 – Other Chemical Product and Preparation Manufacturing

Petroleum Refining and Related Products

- NAICS 3241 – Petroleum and Coal Products Manufacturing

Rubber and Miscellaneous Plastics Products

- NAICS 3261 – Plastics Products Manufacturing
- NAICS 3262 – Rubber Products Manufacturing

The manufacturing sector in Northeastern Illinois has been identified as a targeted industry by Workforce Boards of Metropolitan Chicago. This assessment has been verified independently by Hudson Institute through additional target industry analysis. Findings from this analysis are available in this report.

1. Critical Occupations Analysis

“Critical occupations” are those that are vitally important to the overall health of an industry. Critical occupations are those that experience strong employment demand, provide good wages, are critical to industry competitiveness, and are appropriate for targeting for the workforce system.

WORKFORCE BOARDS OF METROPOLITAN CHICAGO has access to two sets of critical occupations generated by different methods. One is the Hudson Institute’s analysis of critical occupations conducted for this report. The other is an analysis by IDES for their survey of manufacturing employers in the region. Hudson’s analysis identified 20 critical occupations, while IDES’s research identified 20 critical occupations in each sector.

Hudson Institute’s methodology for identifying critical occupations in targeted industries melds data from several different sources and measures occupations using factors that determine the impact of the occupation on the industry as a whole. The critical occupations model utilizes five secondary data sets:

- i. Regional Employment by Industry: Covered Employment and Wages Program, 2002. Bureau of Labor Statistics; statistical adjustment performed by Minnesota IMPLAN Group, Inc.
 1. This data set is available at the county level, and has been aggregated across the 10-county region. Because of disclosure issues, Hudson Institute utilized data from the Minnesota IMPLAN group, which adjusts industry employment to overcome disclosure issues. This data set is the most complete available for this level of geography. This data is also more recent than that available through the IDES, from which data was initially sought. It is available online at http://www.bls.gov/oes/oes_dl.htm#2002.
 2. Disclosure issues at the county and PMSA geographic level prohibited use of region-specific staffing patterns, which identify the percentage of an

- industry occupied by a particular occupation. In addition, because the industry data utilized in the study is organized by four-digit NAICS (North American Industry Classification System), staffing patterns corresponding to NAICS were needed. Staffing patterns were not available for either the region or state using NAICS.
3. Industry-specific occupational employment is determined by compiling regional employment by industry data and national staffing patterns. The product of this compilation will be referred to as “Magnitude,” and is a measure of the employment demand of an occupation in the industry. Magnitude is identified by Standard Occupational Classification code, or SOC. All occupational analysis in this report will be conducted according to SOC.
- ii. Wages: Median Annual Wages in the Northeast Illinois Economic Development Region, 2003 Quarter Three. Provided by the Illinois Department of Employment Security.
 1. The wages measured in the critical occupation analysis are regional-level. The wages are not industry-specific, meaning that the wages listed for Registered Nurses are not specific to hospitals or clinics; these wages are an average of Registered Nurse wages across all industries in which that occupation is employed. Wages correspond to the SOC.
 - iii. Projections: Occupational Employment Projections in Chicago PMSA for a base year of 2000 and a projected year of 2010. Illinois Workforce Info Center. Available online at <http://wic.ilworkinfo.com/analyzer/session/occupation.asp?cat=OCC>
 1. The IDES provided occupational projections for the Chicago PMSA for the years 2000 through 2010. The projections include a growth rate for the occupation across the ten-year period, and the total number of jobs opening each year as a result of industry growth and replacement needs (retirement, turnover, etc.). Projection data is organized by SOC.
 - iv. Job Zones: Job Zones from the O*NET 5.1 database. National O*NET Consortium. Available online at <http://www.onetcenter.org/database.html#download>.
 1. O*Net, the US Department of Labor’s Employment and Training Administration database, identifies the general education and training levels required for job performance for each occupation in the Standard Occupational Classification system.

When available, all data is aggregated across the ten-county region. While, to some extent, data at the county level is available, the analysis recognizes the fact that economies and workforces, particularly those in metropolitan areas, supercede county lines. Workforces in particular are highly mobile and efforts taken to train workers in one county will affect the entire region.

In measuring critical occupations, four factors are weighed. Each factor contributes to the overall competitive rating of the occupation.

Magnitude: The total occupational employment in the industry. This factor measures the current employment demand of the occupation in the industry.

To apply scores for Magnitude, the average of all occupational employment in the industry was determined. Scores were given according to distribution above the mean.

- a) Returns falling below the mean received a score of zero
- b) Returns falling between the mean and .5 standard deviation above the mean received a score of six
- c) Returns falling between .5 standard deviation and one standard deviation above the mean received a score of seven

- d) Returns falling between one standard deviation and 1.5 standard deviation above the mean received a score of eight
- e) Returns falling between 1.5 standard deviation and two standard deviation above the mean received a score of nine
- f) Returns falling above two standard deviation above the mean received a score of 10

Annual Wage: The average annual wage/salary of the occupation in the region. This factor measures the earning strength of occupations in the industry.

To apply scores for Annual Wages, the average of all wages in the industry was determined. Scores were given according to distribution above the mean

- a) Returns falling below the mean received a score of zero
- b) Returns falling between the mean and one standard deviation above the mean received a score of three.
- c) Returns falling between one standard deviation and two standard deviations above the mean received a score of four
- d) Returns falling above two standard deviations above the mean received a score of five
 - (1) Scores for wages were not highly distributed because, while higher wages do contribute to the overall health of the industry and economy, they do not necessarily imply the “criticalness” of an occupation. For example, the highest paid occupations in the Healthcare industry are MDs and executives, yet few would argue that either of those occupational groups are “critical” in terms of recruiting efforts. However, those occupations which earn very little money may not be critical either, as they require very little training and may be easily filled.

Projections: The number of annual openings from 2000 to 2010 for each occupation in the region. Projections are not industry-specific. The projected number of job openings includes those generated by industry growth and replacements: workers needed to replace those who have retired, quit, changed careers, etc. This factor measures the future demand of an occupation.

To apply scores for Projections, the average of all projected job openings in each occupation was determined. Scores were given according to distribution above the mean.

- a) Returns falling below the mean received a score of zero
- b) Returns falling between the mean and .5 standard deviation received a score of one
- c) Returns falling between .5 standard deviation and one standard deviation received a score of two
- d) Returns falling between one standard deviation and 1.5 standard deviation received a score of three
- e) Returns falling between 1.5 standard deviation and two standard deviations received a score of four
- f) Returns falling above two standard deviations received a score of five
 - (1) Projections scores were not highly weighted because many occupations, such as Registered Nurses, have exceptionally high employment in the healthcare industry and as such, will have exceptionally high annual job openings. However, smaller occupations that are very hard to fill but do not have high numbers of annual openings may be just as critical to the industry.

JobZone Training Levels: The training or education requirement identified by the US Department of Labor’s Employment and Training Administration. This factor measures the training competitiveness in each occupation; occupations requiring high levels of education and training will ultimately be more difficult to fill.

To apply scores for JobZone Training Levels, the level indicated was simply utilized as a score. Thus, a JobZone level of five received five points.

- Level 1 - Requires a high school diploma or GED certificate. May require some formal training to obtain licensing.
- Level 2 - Usually requires a high school diploma in addition to some vocational or on-the-job training.

- Level 3 - Requires on-the-job training, vocational education or an associate's degree. Some positions may require a bachelor's degree.
- Level 4 - Most positions require a four-year bachelor's degree, but some do not.
- Level 5 - Minimum requirement is a bachelor's degree. Some positions may require graduate school, such as Ph.D., MD, JD, etc.

The total score by which each occupation was ranked is a sum of the above factor scores. The total number of points possible was 25.

Z-statistics were calculated for the Total Score for each occupation. Those occupations with a Z-statistic of greater than 0.8427 are considered critical.

2. Documentation of Skills and Important Attributes Analysis

The US Department of Labor's Employment and Training Administration's Occupational Employment Network, O*Net, is the only available data tool with which one can conduct large scale occupational skills analysis. O*Net is a survey-based data tool that reports on job attributes and activities that one will be expected to possess and perform during job performance. For the purposes of this project, two data sets were utilized: Knowledge Areas and Skills Areas.

O*Net profiles 33 Knowledge areas and 35 Skill areas, and assigns to these attributes a "level" score, which indicates the proficiency which with the worker needs to possess the attribute. Knowledge areas can be understood to be academic or "hard" skills mainly learned on the job or during training. Skills areas may be understood as traits or "soft" attributes that an employee generally possesses before starting the job, but are required for sufficient job performance.

Both Knowledge Areas and Skills Areas are important for workforce development efforts. When looking at either individual occupations or groups of occupations, it is valuable to determine the types of knowledge and skills each worker will need in order to perform his or her job at a sufficient level; it can assist in the targeting and recruitment of workers in critical occupations and can assist human resources directors in interviewing and subsequently hiring workers with the appropriate knowledge and skill levels. This type of analysis is also helpful in curriculum development efforts. To combat worker shortages, educational institutions in the area may begin offering programs to encourage students to go into these occupations or programs to train incumbent workers up the career ladder. While the attributes profiled through O*Net are not occupation-specific, curriculum developers may discover attributes required that have been lacking in previous programs. For instance, Registered Nurses require a high degree of competence in Reading Comprehension. To ensure that RNs reach their industry destination, educational institutions may wish to require competency testing in reading skills. Likewise, nearly every clinical occupation requires a great deal of strength in Customer and Personal Service. Workers must start their jobs knowing how to interact with people. To affectively teach Customer and Personal Service to new healthcare employees, educational institutions may require more internships or practical experiences.

Attributes for individual occupations are divided into two levels. The first will be referred to as Primary Attributes. These are Knowledge Areas and Skills Areas which require a high level of competence respective to all of the attributes required of the occupation. The second, referred to as Important Attributes, are those which require higher than average levels of competence respective to all of the attributes required of the occupation.

To determine Important Attributes for individual critical occupations, the average "level" score for all 33 Knowledge Areas or 35 Skill Areas was determined. All attribute "level" scores falling above the average are considered Important Attributes. Generally, these attributes fall into the top 40 to 50 percent of the attributes listed.

To determine Primary Attributes, the standard deviation for all 33 Knowledge Areas or 35 Skill Areas was determined. All attribute "level" scores falling above one standard deviation above the mean are considered Primary Attributes. These attributes, then, fall into the top 27 percent of the attributes listed.

3. Determining Important Attributes for Occupational Groups

Because training efforts may include targeting a group of occupations with a focus on developing career paths, this report includes an analysis of the Important Attributes for occupational groups. Because of the varying capacities each of the critical occupations, we have completed eleven separate occupational group attributes analyses:

- § Business, Financial and Administrative Occupations
- § Computer Occupations
- § Engineering Occupations
- § Sales Occupations
- § Life and Physical Sciences Occupations
- § Administrative Production Occupations
- § Production Occupations
- § Production Occupations (other)
- § Transportation Occupations
- § Maintenance Occupations
- § Management Occupations

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Important Attributes analysis for a group of occupations takes into account both the level of competence with which occupations are required to perform an attribute, as well as the size of the occupation in the industry. Ultimately, the Important Attributes scores indicate the Knowledge and Skill Areas that require the highest level of competence from the greatest number of workers currently employed in the industry. In curriculum development terms, these attributes will be the academic and training areas in which the greatest number of students should be instructed at the highest levels.

Determining Important Attributes for a group of occupations is a four-step process:

1. Multiply “level” score by occupational industry employment across attributes
2. Compile results from Step One by attribute
3. Rank results from Step Two by attribute, creating a ranked list of attributes

Divide all scores in the ranked list by the greatest score in that list, creating an index score, and multiply by 100. The highest possible score will be 100.

Appendix K: Critical Occupations Scoring Sheets

Durable Goods Manufacturing

occ_co de	occ_title	Employment	Employment SCORE	Mean Annual Wage	wage SCORE	2000-2010 proj annual % Change	Annual Pct Change SCORE	2000-2010 proj annual total growth + rep	Annual Total Change SCORE	Job Zone	Job Zone SCORE
111021	General and Operations Managers	3601.6	10	89314	5	1.2	0	2405	5	5	5
111011	Chief Executives	933.66	6	142019	5	1.5	0	1339	3	4.5	5
113031	Financial Managers	1062.6	6	88657	5	1.7	0	870	2	4.5	5
151031	Computer Software Engineers, Applications	1141.1	6	69751	4	6.7	0	1483	4	4	4
151041	Computer Support Specialists	666.59	6	45211	4	6.0	0	1387	4	4	4
414012	Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	2321.6	8	53171	4	0.3	0	1631	4	2	2
511011	First-Line Supervisors/Managers of Production and Operating Workers	7468.9	10	47697	4	0.1	0	657	1	3	3
514041	Machinists	10208	10	33754	3	0.4	0	369	1	4	4
112022	Sales Managers	1029.7	6	90226	5	2.4	0	684	2	4	4
119041	Engineering Managers	1693.5	7	90595	5	0.5	0	209	0	5	5
132011	Accountants and Auditors	1244.5	6	53159	4	1.4	0	1077	3	4	4
172141	Mechanical Engineers	2813.9	9	64866	4	0.8	0	293	0	4	4
431011	First-Line Supervisors/Managers of Office and Administrative Support Workers	1344.1	7	44768	4	0.7	0	1170	3	3	3
434051	Customer Service Representatives	1827.4	7	31349	3	2.5	0	2695	5	2	2
436011	Executive Secretaries and Administrative Assistants	1577.9	7	36550	3	1.0	0	1307	3	4	4
514111	Tool and Die Makers	3453	9	45547	4	-0.2	0	155	0	4	4
519061	Inspectors, Testers, Sorters, Samplers, and Weighers	5152	10	29191	3	-0.2	0	374	1	2.8	3
112021	Marketing Managers	686.49	6	86837	5	2.5	0	385	1	4	4
113051	Industrial Production Managers	2242.9	8	76585	4	0.1	0	122	0	4	4
151032	Computer Software Engineers, Systems Software	854.12	6	86353	5	5.5	0	457	1	4	4
172071	Electrical Engineers	1703.6	7	68102	4	0.3	0	88	0	5	5
173023	Electrical and Electronic Engineering Technicians	2167.3	8	43292	4	1.7	0	289	0	4	4
433031	Bookkeeping, Accounting, and Auditing Clerks	2357.9	8	31845	3	0.4	0	1161	3	2	2
435071	Shipping, Receiving, and Traffic Clerks	3501.2	10	27071	3	0.6	0	767	2	1	1
499042	Maintenance and Repair Workers, General	3261.9	9	36418	3	0.5	0	647	1	3	3
514121	Welders, Cutters, Solderers, and Brazers	5523.4	10	33889	3	1.8	0	607	1	2	2
537062	Laborers and Freight, Stock, and Material Movers, Hand	3381.1	9	20775	0	1.1	0	3612	5	1.3 3	2

131023	Purchasing Agents, Except Wholesale, Retail, and Farm Products	1807.5	7	49955	4	0.7	0	179	0	4	4
172072	Electronics Engineers, Except Computer	1245	6	66554	4	1.5	0	119	0	5	5
172112	Industrial Engineers	1957.3	7	64547	4	-0.3	0	78	0	4	4
419031	Sales Engineers	753.84	6	67206	4	0.5	0	93	0	5	5
472111	Electricians	742.06	6	51026	4	1.7	0	747	2	3	3
491011	First-Line Supervisors/Managers of Mechanics, Installers, and Repairers	625.7	6	57228	4	1.3	0	393	1	4	4
514011	Computer-Controlled Machine Tool Operators, Metal and Plastic	4077.8	10	31444	3	1.2	0	288	0	2	2
514031	Cutting, Punching, and Press Machine Setters, Operators, and Tenders, Metal and Plastic	6679	10	25947	3	-0.9	0	248	0	2	2
514033	Grinding, Lapping, Polishing, and Buffing Machine Tool Setters, Operators, and Tenders, Metal and Plastic	3305	9	28933	3	0.2	0	89	0	2.5	3
131051	Cost Estimators	619.68	6	52342	4	1.7	0	283	0	4	4
173013	Mechanical Drafters	1179.7	6	42580	4	0.7	0	64	0	4	4
414011	Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products	1147.7	6	60723	4	0.4	0	501	1	2.5	3
435061	Production, Planning, and Expediting Clerks	2214.5	8	32464	3	1.6	0	474	1	2	2
435081	Stock Clerks and Order Fillers	1632.7	7	21574	0	0.4	0	2271	5	1.5	2
436014	Secretaries, Except Legal, Medical, and Executive	1405.5	7	31741	3	-0.1	0	868	2	2	2
512041	Structural Metal Fabricators and Fitters	1641.3	7	36625	3	1.1	0	60	0	4	4
514034	Lathe and Turning Machine Tool Setters, Operators, and Tenders, Metal and Plastic	2494.5	8	29253	3	-0.8	0	150	0	3	3
514081	Multiple Machine Tool Setters, Operators, and Tenders, Metal and Plastic	2036.5	8	28669	3	0.9	0	74	0	2.5	3
291111	Registered Nurses	12.909	0	51536	4	1.9	0	2811	5	4	4
439061	Office Clerks, General	2326.6	8	24633	3	1.4	0	3377		2	2
472211	Sheet Metal Workers	1034.7	6	53562	4	2.1	0	311	0	3	3
512022	Electrical and Electronic Equipment Assemblers	7654.7	10	23878	0	-1.3	0	301	0	3	3
512092	Team Assemblers	14773	10	24412	0	0.0	0	643	1	2	2
514193	Plating and Coating Machine Setters, Operators, and Tenders, Metal and Plastic	1701.3	7	25253	3	0.6	0	77	0	2.2	3
519083	Ophthalmic Laboratory Technicians	379.88	9	22215	0	-0.6	0	53	0	3.5	4
173026	Industrial Engineering Technicians	753.92	6	41872	3	0.5	0	60	0	3	3
372011	Janitors and Cleaners, Except Maids and Housekeeping Cleaners	1208.5	6	22758	0	1.4	0	2841	5	1	1
499041	Industrial Machinery Mechanics	892.26	6	37513	3	0.8	0	217	0	3	3
512031	Engine and Other Machine Assemblers	1125	6	30100	3	0.2	0	66	0	3	3

514012	Numerical Tool and Process Control Programmers	625.34	6	41232	3	1.0	0	30	0	3	3
514021	Extruding and Drawing Machine Setters, Operators, and Tenders, Metal and Plastic	1440.1	7	27661	3	0.4	0	79	0	2	2
514032	Drilling and Boring Machine Tool Setters, Operators, and Tenders, Metal and Plastic	1634.2	7	28062	3	-0.2	0	160	0	2	2
514035	Milling and Planing Machine Setters, Operators, and Tenders, Metal and Plastic	925.14	6	28625	3	-1.3	0	38	0	3	3
514072	Molding, Coremaking, and Casting Machine Setters, Operators, and Tenders, Metal and Plastic	1657.7	7	26670	3	0.0	0	144	0	1.8	2
514191	Heat Treating Equipment Setters, Operators, and Tenders, Metal and Plastic	983.59	6	27506	3	0.7	0	40	0	2.3 3	3
514194	Tool Grinders, Filers, and Sharpeners	611.43	6	30528	3	-1.2	0	29	0	3	3
519081	Dental Laboratory Technicians	1117.7	6	33846	3	0.4	0	29	0	3	3
519121	Coating, Painting, and Spraying Machine Setters, Operators, and Tenders	1758	7	26541	3	0.9	0	113	0	1.5	2
519198	Helpers--Production Workers	3062.8	9	18544	0	0.5	0	985	2	1	1
533033	Truck Drivers, Light or Delivery Services	726.68	6	32374	3	1.4	0	990	2	1	1
537051	Industrial Truck and Tractor Operators	1895.8	7	30625	3	1.0	0	450	1	1	1
113021	Computer and Information Systems Managers	587.19	0	92160	5	3.4	0	609	1	5	5
434151	Order Clerks	732.22	6	27005	3	-1.0	0	295	0	2	2
514022	Forging Machine Setters, Operators, and Tenders, Metal and Plastic	990.66	6	28959	3	0.2	0	117	0	2	2
514023	Rolling Machine Setters, Operators, and Tenders, Metal and Plastic	1002.8	6	\$39,163	3	-0.4	0	138	0	2	2
514122	Welding, Soldering, and Brazing Machine Setters, Operators, and Tenders	1264.5	6	30995	3	1.3	0	104	0	2	2
537064	Packers and Packagers, Hand	1910.2	7	19009	0	1.4	0	1323	3	1	1
113040	Human Resources Managers	440.47	0	80115	5	1.7	0	415	1	4	4
119121	Natural Sciences Managers	6.9001	0	99780	5	0.5	0	15	0	5	5
131111	Management Analysts	175.14	0	84941	5	1.9	0	406	1	4	4
151011	Computer and Information Scientists, Research	32.544	0	80618	5	2.0	0	24	0	5	5
151021	Computer Programmers	521.22	0	63422	4	1.2	0	711	2	4	4
151051	Computer Systems Analysts	467.31	0	69856	4	4.4	0	1283	3	3	3
192012	Physicists	5.4545	0	87530	5	0.8	0	16	0	5	5
291020	Dentists	11.437	0	84020	5	-0.1	0	80	0	5	5
291041	Optometrists	2.0794	0	85192	5	2.2	0	63	0	5	5
499043	Maintenance Workers, Machinery	708.93	6	37039	3	0.3	0	94	0	1	1
512023	Electromechanical Equipment Assemblers	1542.6	7	24398	0	0.1	0	90	0	3	3

519022	Grinding and Polishing Workers, Hand	741.09	6	28426	3	0.9	0	32	0	1	1
519141	Semiconductor Processors	751.7	6	\$28,100	3	2.3	0	54	0	1	1
533032	Truck Drivers, Heavy and Tractor-Trailer	497.18	0	40247	3	1.8	0	2118	5	1.5	2
537063	Machine Feeders and Offbearers	875.82	6	25002	3	-1.3	0	156	0	1	1
113011	Administrative Services Managers	327.83	0	54331	4	1.9	0	576	1	4	4
119111	Medical and Health Services Managers	6.3406	0	76622	4	2.4	0	254	0	5	5
132051	Financial Analysts	217.35	0	63368	4	1.8	0	271	0	5	5
151071	Network and Computer Systems Administrators	300.61	0	62524	4	5.8	0	638	1	4	4
172011	Aerospace Engineers	143.28	0	62127	4	2.0	0	30	0	5	5
172021	Agricultural Engineers	1.3809	0	45396	4	-0.5	0	0	0	5	5
172041	Chemical Engineers	84.743	0	69679	4	-0.6	0	29	0	5	5
172111	Health and Safety Engineers, Except Mining Safety Engineers and Inspectors	115.83	0	57382	4	0.9	0	17	0	4.3 3	5
172131	Materials Engineers	344.44	0	67283	4	-0.2	0	14	0	5	5
191021	Biochemists and Biophysicists	1.0909	0	68491	4	1.6	0	27	0	5	5
191022	Microbiologists	3.1191	0	49889	4	3.2	0	51	0	5	5
192041	Environmental Scientists and Specialists, Including Health	1.0909	0	49649	4	1.6	0	34	0	5	5
231011	Lawyers	31.811	0	\$28,100	3	1.3	0	478	1	5	5
273042	Technical Writers	203.89	0	51442	4	2.0	0	95	0	5	5
299010	Occupational Health and Safety Specialists and Technicians	23.273	0	47156	4	2.1	0	50	0	5	5
331021	First-Line Supervisors/Managers of Fire Fighting and Prevention Workers	2.9972	0	60879	4	0.4	0	51	0	4.5	5
472031	Carpenters	85.73	0	46802	4	0.8	0	868	2	2.8 3	3
472061	Construction Laborers	16.86	0	41329	3	3.2	0	1566	4	2	2
492095	Electrical and Electronics Repairers, Powerhouse, Substation, and Relay	23.686	0	43750	4	-0.3	0	13	0	5	5
493023	Automotive Service Technicians and Mechanics	46.499	0	\$46,086	4	1.8	0	982	2	2.5	3
112011	Advertising and Promotions Managers	84	0	77109	4	2.6	0	193	0	4	4
112031	Public Relations Managers	13.058	0	72572	4	3.0	0	114	0	4	4
113061	Purchasing Managers	502.24	0	65178	4	-0.4	0	191	0	4	4
113071	Transportation, Storage, and Distribution Managers	182.19	0	64039	4	1.4	0	161	0	4	4
119021	Construction Managers	27.229	0	78209	4	1.6	0	211	0	4	4
131021	Purchasing Agents and Buyers, Farm Products	2.62	0	50542	4	0.5	0	20	0	4	4
131041	Compliance Officers, Except Agriculture, Construction, Health and Safety, and Transportation	58.602	0	52704	4	0.8	0	87	0	3.5	4
131073	Training and Development Specialists	224.73	0	52198	4	2.0	0	263	0	4	4
131121	Meeting and Convention Planners	2.5746	0	49471	4	1.8	0	60	0	4	4
132031	Budget Analysts	79.695	0	52443	4	1.9	0	108	0	4	4
132041	Credit Analysts	54.578	0	48253	4	0.7	0	70	0	4	4
151061	Database Administrators	134.57	0	58423	4	4.8	0	275	0	4	4

151081	Network Systems and Data Communications Analysts	111.65	0	63193	4	5.7	0	263	0	4	4
152031	Operations Research Analysts	27.76	0	63607	4	1.9	0	76	0	4	4
172031	Biomedical Engineers	43.037	0	63908	4	2.5	0	17		4	4
172051	Civil Engineers	37.959	0	63591	4	1.0	0	191	0	4	4
172061	Computer Hardware Engineers	576.23	0	70185	4	2.1	0	29	0	4	4
172081	Environmental Engineers	43.91	0	67435	4	2.0	0	38	0	4	4
173021	Aerospace Engineering and Operations Technicians	36.549	0	57341	4	0.2	0	8	0	4	4
173022	Civil Engineering Technicians	6.317	0	44029	4	2.0	0	192	0	4	4
173024	Electro-Mechanical Technicians	391.16	0	49113	4	0.3	0	35	0	4	4
192021	Atmospheric and Space Scientists	2.1818	0	51612	4	1.3	0	4	0	4	4
192031	Chemists	100.07	0	59663	4	1.3	0	164	0	4	4
192032	Materials Scientists	21.372	0	76082	4	2.1	0	9	0	4	4
193021	Market Research Analysts	288.21	0	45981	4	1.6	0	164	0	4	4
232011	Paralegals and Legal Assistants	6.7325	0	43594	4	1.6	0	110	0	4	4
271011	Art Directors	4.7023	0	73256	4	2.2	0	86	0	4	4
271013	Fine Artists, Including Painters, Sculptors, and Illustrators	1.4986	0	45682	4	1.1	0	28	0	4	4
271014	Multi-Media Artists and Animators	9.6894	0	43083	4	2.5	0	188	0	4	4
271021	Commercial and Industrial Designers	153.11	0	52470	4	1.4	0	27	0	4	4
271024	Graphic Designers	102.67	0	42583	4	2.5	0	213	0	4	4
272012	Occupational Health and Safety Specialists and Technicians	0.525	0	63152	4	1.9	0	46	0	4	4
273041	Editors	14.563	0	52476	4	1.8	0	220	0	4	4
274011	Audio and Video Equipment Technicians	7.9159	0	42638	4	1.1	0	48	0	4	4
291121	Audiologists	1.0909	0	52154	4	3.9	0	25	0	4	4
292011	Medical and Clinical Laboratory Technologists	0	0	43113	4	1.4	0	156	0	4	4
436012	Legal Secretaries	1.8728	0	45074	4	0.9	0	355	1	3	3
471011	First-Line Supervisors/Managers of Construction Trades and Extraction Workers	125.04	0	53067	4	1.0	0	321	0	3.5	4
472011	Boilermakers	64.76	0	55375	4	0.6	0	30	0	4	4
472152	Plumbers, Pipefitters, and Steamfitters	232.53	0	63586	4	1.0	0	430	1	3	3
474021	Elevator Installers and Repairers	8.3734	0	62929	4	1.5	0	33		4	4
492022	Telecommunications Equipment Installers and Repairers, Except Line Installers	25.729	0	47675	4	-1.2	0	33	0	3.2	4
492091	Avionics Technicians	3.2727	0	\$50,698	4	1.1	0	14	0	4	4
493011	Aircraft Mechanics and Service Technicians	23.57	0	51746	4	1.5	0	197	0	3.6	4
499021	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	75.125	0	50023	4	1.6	0	83	0	3.5	4
499044	Millwrights	351.87	0	45696	4	0.1	0	70	0	4	4
512021	Coil Winders, Tapers, and Finishers	1110.1	6	22185	0	0.2	0	45	0	2	2
515021	Job Printers	0	0	36785	3	0.2	0	50	0	5	5

518012	Power Distributors and Dispatchers	1.091	0	53510	4	0.9	0	28	0	4	4
519111	Packaging and Filling Machine Operators and Tenders	655.87	6	23009	0	1.7	0	557	1	1	1
532012	Commercial Pilots	2.1306	0	59084	4	1.7	0	7	0	4	4
534031	Railroad Conductors and Yardmasters	0.6566	0	\$44,451	4	-0.5	0	83	0	4	4
131022	Wholesale and Retail Buyers, Except Farm Products	85.926	0	51096	4	-0.6	0	140	0	3	3
131071	Employment, Recruitment, and Placement Specialists	121.85	0	49375	4	1.5	0	193	0	3	3
131072	Compensation, Benefits, and Job Analysis Specialists	150.08	0	52314	4	1.4	0	102	0	3	3
152091	Mathematical Technicians	1.0909	0	39973	3	0.0	0	0	0	4	4
173012	Electrical and Electronics Drafters	388.29	0	35853	3	0.8	0	55	0	3.5	4
173027	Mechanical Engineering Technicians	550.14	0	42447	3	0.6	0	41	0	4	4
254021	Librarians	1.0909	0	39474	3	0.7	0	111	0	4	4
271022	Fashion Designers	2.0794	0	51356	4	0.7	0	5	0	3	3
273031	Public Relations Specialists	46.721	0	41569	3	3.2	0	269	0	4	4
274014	Sound Engineering Technicians	4.305	0	49173	4	1.3	0	12	0	3	3
274032	Film and Video Editors	9.66	0	41915	3	1.7	0	19	0	4	4
292021	Dental Hygienists	2.0794	0	57486	4	2.9	0	224	0	3	3
292081	Opticians, Dispensing	19.754	0	27639	3	1.6	0	114	0	4	4
319092	Medical Assistants	0	0	26924	3	4.2	0	453	1	3	3
371011	First-Line Supervisors/Managers of Housekeeping and Janitorial Workers	37.487	0	36939	3	1.1	0	242	0	3.5	4
411011	First-Line Supervisors/Managers of Retail Sales Workers	59.459	0	37701	3	0.8	0	944	2	2	2
411012	First-Line Supervisors/Managers of Non-Retail Sales Workers	359.23	0	59843	4	0.5	0	228	0	3	3
412031	Retail Salespersons	61.432	0	22872	0	0.8	0	5207	5	2	2
413011	Advertising Sales Agents	2.5225	0	48877	4	2.4	0	288	0	3	3
433011	Bill and Account Collectors	30.008	0	30983	3	2.1	0	744	2	2	2
439031	Desktop Publishers	1.0909	0	39913	3	4.8	0	132	0	4	4
472021	Brickmasons and Blockmasons	5.6896	0	57124	4	1.2	0	243	0	3	3
472073	Operating Engineers and Other Construction Equipment Operators	16.642	0	59349	4	0.7	0	206	0	2.5	3
472081	Drywall and Ceiling Tile Installers	0	0	44184	4	1.2	0	65	0	3	3
472121	Glaziers	18.557	0	59297	4	1.3	0	26	0	3	3
472130	Insulation Workers	3.2561	0	48150	4	1.5	0	52	0	3	3
472141	Painters, Construction and Maintenance	219.06	0	40339	3	1.1	0	328		4	4
472171	Reinforcing Iron and Rebar Workers	16.604	0	53815	4	1.7	0	11	0	3	3
472181	Roofers	1.9534	0	51024	4	1.6	0	175	0	3	3
472221	Structural Iron and Steel Workers	167.66	0	60129	4	1.5	0	50	0	3	3
474011	Construction and Building Inspectors	3.6624	0	51901	4	0.3	0	28	0	3	3
492011	Computer, Automated Teller, and Office Machine Repairers	58.495	0	35066	3	1.6	0	108	0	3.3 3	4

492092	Electric Motor, Power Tool, and Related Repairers	86.051	0	44563	4	0.4	0	19	0	2.67	3
492094	Electrical and Electronics Repairers, Commercial and Industrial Equipment	422.93	0	45327	4	1.4	0	67	0	3	3
492098	Security and Fire Alarm Systems Installers	5.5867	0	65685	4	1.9	0	69	0	3	3
493042	Mobile Heavy Equipment Mechanics, Except Engines	56.244	0	40302	3	0.8	0	50	0	4	4
499011	Mechanical Door Repairers	3.9068	0	56326	4	-1.4	0	1	0	3	3
499012	Control and Valve Installers and Repairers, Except Mechanical Door	7.493	0	\$50,626	4	-0.4	0	26	0	2.67	3
499031	Home Appliance Repairers	0	0	39306	3	1.2	0	68	0	3.5	4
499052	Telecommunications Line Installers and Repairers	25.673	0	45016	4	1.6	0	158	0	3	3
499061	Camera and Photographic Equipment Repairers	1.0909	0	39395	3	0.7	0	5	0	4	4
514061	Model Makers, Metal and Plastic	134.38	0	\$28,872	3	-1.1	0	12	0	4	4
514062	Patternmakers, Metal and Plastic	135.89	0	36182	3	-1.5	0	5	0	4	4
515022	Prepress Technicians and Workers	38.913	0	41091	3	-2.3	0	110	0	3.85	4
517031	Model Makers, Wood	1.2927	0	34581	3	1.0	0	8	0	4	4
517032	Patternmakers, Wood	58.771	0	32532	3	0.9	0	14	0	4	4
518021	Stationary Engineers and Boiler Operators	38.179	0	55369	4	-0.1	0	67	0	2.5	3
518031	Water and Liquid Waste Treatment Plant and System Operators	15.759	0	42836	4	1.2	0	74	0	3	3
519071	Jewelers and Precious Stone and Metal Workers	8.6175	0	36240	3	-0.6	0	69	0	3.17	4
519195	Molders, Shapers, and Casters, Except Metal and Plastic	77.795	0	26532	3	0.1	0	36	0	3.14	4
531031	First-Line Supervisors/Managers of Transportation and Material-Moving Machine and Vehicle Operators	105.42	0	48008	4	1.6	0	182	0	3	3
536051	Transportation Inspectors	1.0909	0	35988	3	2.8	0	56	0	3.17	4
173011	Architectural and Civil Drafters	95.855	0	35811	3	1.6	0	130	0	3	3
173025	Environmental Engineering Technicians	28.983	0	37896	3	2.2	0	15	0	3	3
194031	Chemical Technicians	109	0	36215	3	0.7	0	94	0	3	3
194091	Environmental Science and Protection Technicians, Including Health	31.969	0	37879	3	1.4	0	54	0	3	3
274021	Photographers	1.0909	0	34887	3	0.8	0	71	0	3	3
292071	Medical Records and Health Information Technicians	1.0397	0	\$44,451	3	3.7	0	279	0	3	3
292091	Orthotists and Prosthetists	31.191	0	38359	3	1.2	0	1	0	3	3
332011	Fire Fighters	8.1496	0	45329	4	0.5	0	241	0	2	2
412011	Cashiers	4.1588	0	17072	0	1.0	0	5403	5	1	1
433021	Billing and Posting Clerks and Machine Operators	423.5	0	30214	3	0.5	0	455	1	1.67	2
434171	Receptionists and Information Clerks	480.97	0	22683	0	1.9	0	1390	4	2	2
439011	Insulation Workers	165.36	0	39161	3	-1.7	0	119		3	3
439111	Statistical Assistants	12.416	0	\$50,626	4	-0.1	0	5	0	2	2
492021	Radio Mechanics	2.294	0	27632	3	-3.7	0	2	0	3	3

492093	Electrical and Electronics Installers and Repairers, Transportation Equipment	19.053	0	41282	3	0.3	0	9	0	3	3
492096	Electronic Equipment Installers and Repairers, Motor Vehicles	4.2776	0	31651	3	0.9	0	4	0	3	3
492097	Electronic Home Entertainment Equipment Installers and Repairers	24.797	0	38683	3	-2.3	0	16	0	3	3
493031	Bus and Truck Mechanics and Diesel Engine Specialists	30.765	0	39888	3	0.9	0	244	0	3	3
493041	Farm Equipment Mechanics	7.3648	0	32721	3	0.4	0	42	0	3	3
493043	Rail Car Repairers	0.5628	0	33767	3	-0.4	0	23	0	3	3
493053	Outdoor Power Equipment and Other Small Engine Mechanics	23.373	0	30864	3	1.0	0	21	0	3	3
499062	Medical Equipment Repairers	22.397	0	37691	3	1.1	0	29	0	3	3
499064	Watch Repairers	3.2727	0	28429	3	0.6	0	9	0	3	3
499096	Riggers	20.345	0	35470	3	1.2	0	3	0	3	3
514192	Lay-Out Workers, Metal and Plastic	271.02	0	38205	3	-1.0	0	11	0	3	3
515023	Printing Machine Operators	157.08	0	30612	3	0.2	0	199	0	2.7	3
516093	Upholsterers	3.1191	0	25824	3	-2.3	0	18	0	3	3
517011	Cabinetmakers and Bench Carpenters	11.994	0	31595	3	0.7	0	83	0	3	3
519131	Photographic Process Workers	2.4064	0	27718	3	-1.0	0	29	0	3	3
519194	Etchers and Engravers	75.644	0	38179	3	0.1	0	9	0	2.3	3
531021	First-Line Supervisors/Managers of Helpers, Laborers, and Material Movers, Hand	242.86	0	41527	3	1.0	0	141	0	3	3
534021	Railroad Brake, Signal, and Switch Operators	0.938	0	\$46,086	4	-8.0	0	52	0	1.5	2
537072	Pump Operators, Except Wellhead Pumps	1.3132	0	50807	4	-0.7	0	5	0	2	2
537121	Tank Car, Truck, and Ship Loaders	2.5663	0	38321	3	0.9	0	20	0	3	3
194021	Biological Technicians	4.1588	0	31562	3	2.2	0	55	0	2	2
292012	Medical and Clinical Laboratory Technicians	8.3176	0	32365	3	1.4	0	168	0	2	2
319093	Medical Equipment Preparers	3.1191	0	25235	3	1.3	0	29	0	2	2
339032	Security Guards	200.97	0	\$50,698	4	3.7	0	2194		1	1
412022	Parts Salespersons	15.239	0	26913	3	-0.3	0	186	0	2	2
433051	Payroll and Timekeeping Clerks	355.58	0	32763	3	0.2	0	206	0	2	2
434021	Correspondence Clerks	19.273	0	28232	3	1.1	0	66	0	2	2
434161	Human Resources Assistants, Except Payroll and Timekeeping	356.39	0	31717	3	1.8	0	300	0	2	2
435032	Dispatchers, Except Police, Fire, and Ambulance	6.1842	0	35362	3	2.0	0	216	0	2	2
436013	Medical Secretaries	9.3573	0	36102	3	1.5	0	190	0	2	2
439022	Word Processors and Typists	26.796	0	30132	3	-2.0	0	162	0	2	2
473013	Helpers--Electricians	0	0	29532	3	1.2	0	23	0	2	2
474031	Fence Erectors	0.469	0	27838	3	0.2	0	26		2	2
499091	Coin, Vending, and Amusement Machine Servicers and Repairers	5.612	0	33455	3	1.0	0	59	0	2	2
512093	Timing Device Assemblers, Adjusters, and Calibrators	93.042	0	\$26,447	3	0.1	0	10	0	2	2

514051	Metal-Refining Furnace Operators and Tenders	371.65	0	30167	3	0.3	0	24	0	2	2
514071	Foundry Mold and Coremakers	493.88	0	29692	3	-1.3	0	22	0	2	2
516092	Fabric and Apparel Patternmakers	0	0	25599	3	-1.4	0	5	0	2	2
517021	Furniture Finishers	0	0	26859	3	0.7	0	30	0	2	2
518091	Chemical Plant and System Operators	14.241	0	39329	3	-0.5	0	54	0	2	2
519011	Chemical Equipment Operators and Tenders	108.58	0	35074	3	1.0	0	84	0	2	2
519032	Cutting and Slicing Machine Setters, Operators, and Tenders	143.94	0	28414	3	-0.3	0	33	0	1.5	2
519041	Extruding, Forming, Pressing, and Compacting Machine Setters, Operators, and Tenders	183.03	0	30040	3	0.3	0	53	0	1.5	2
519082	Medical Appliance Technicians	245.58	0	31340	3	1.6	0	51	0	2	2
519122	Painters, Transportation Equipment	57.086	0	38709	3	1.9	0	46	0	2	2
519132	Photographic Processing Machine Operators	3.9814	0	25147	3	0.8	0	46	0	2	2
519196	Paper Goods Machine Setters, Operators, and Tenders	2.9358	0	26132	3	-1.0	0	105	0	2	2
534013	Rail Yard Engineers, Dinkey Operators, and Hostlers	5.5342	0	\$39,163	3	-2.3	0	6	0	2	2
537021	Crane and Tower Operators	283.09	0	40696	3	0.2	0	46	0	2	2
372012	Maids and Housekeeping Cleaners	1.75	0	18111	0	0.9	0	1021	3	1	1
373011	Landscaping and Groundskeeping Workers	24.33	0	22483	0	2.7	0	1311	3	1	1
419011	Demonstrators and Product Promoters	7.4259	0	31380	3	1.7	0	116	0	1	1
433061	Procurement Clerks	254.41	0	33630	3	-1.2	0	43	0	1	1
434041	Credit Authorizers, Checkers, and Clerks	9.5323	0	31937	3	0.2	0	43	0	1	1
435111	Weighers, Measurers, Checkers, and Samplers, Recordkeeping	244.75	0	26234	3	0.8	0	66	0	1	1
439071	Office Machine Operators, Except Computer	23.167	0	24736	3	-2.0	0	77	0	1	1
473012	Helpers--Carpenters	0	0	25417	3	0.4	0	130		1	1
473014	Helpers--Painters, Paperhangers, Plasterers, and Stucco Masons	10.072	0	33622	3	1.3	0	41	0	1	1
475013	Service Unit Operators, Oil, Gas, and Mining	0	0	\$21,531	0	-0.8	0	1	0	4	4
499045	Refractory Materials Repairers, Except Brickmasons	32.155	0	39642	3	-0.7	0	1	0	1	1
499098	Helpers--Installation, Maintenance, and Repair Workers	251.57	0	26505	3	1.3	0	253	0	1	1
514052	Pourers and Casters, Metal	262.37	0	27308	3	0.5	0	17	0	1	1
516052	Tailors, Dressmakers, and Custom Sewers	1.0397	0	23539	0	-0.9	0	30	0	3.5	4
519012	Separating, Filtering, Clarifying, Precipitating, and Still Machine Setters, Operators, and Tenders	76.957	0	34638	3	0.0	0	23	0	1	1

519021	Crushing, Grinding, and Polishing Machine Setters, Operators, and Tenders	313.24	0	28172	3	0.9	0	27	0	1	1
519031	Cutters and Trimmers, Hand	27.253	0	26090	3	-0.3	0	17	0	1	1
519051	Furnace, Kiln, Oven, Drier, and Kettle Operators and Tenders	93.905	0	28600	3	0.1	0	16	0	1	1
519191	Cementing and Gluing Machine Operators and Tenders	12.628	0	27709	3	-0.2	0	15	0	1	1
519192	Cleaning, Washing, and Metal Pickling Equipment Operators and Tenders	149.7	0	27112	3	-0.5	0	14	0	1	1
533031	Driver/Sales Workers	3.1191	0	28124	3	0.7	0	236	0	1	1
537011	Conveyor Operators and Tenders	74.31	0	29298	3	0.5	0	52	0	1	1
319091	Dental Assistants	21.834	0	23001	0	2.9	0	398	1	2	2
399011	Child Care Workers	1.0397	0	19852	0	1.0	0	706	2	1	1
412021	Counter and Rental Clerks	1.1962	0	21036	0	1.4	0	810	2	1	1
512011	Aircraft Structure, Surfaces, Rigging, and Systems Assemblers	51.292	0	23268	0	0.8	0	6	0	3	3
516062	Textile Cutting Machine Setters, Operators, and Tenders	3.1191	0	21455	0	-0.5	0	6	0	3	3
359011	Dining Room and Cafeteria Attendants and Bartender Helpers	0	0	14275	0	-0.8	0	516	1	1	1
419041	Telemarketers	32.339	0	23609	0	2.3	0	666	1	1	1
439021	Data Entry Keyers	193.67	0	24057	0	0.3	0	315	0	2	2
439051	Mail Clerks and Mail Machine Operators, Except Postal Service	31.265	0	21004	0	1.4	0	424	1	1	1
512091	Fiberglass Laminators and Fabricators	55.959	0	\$18,734	0	0.4	0	36	0	2	2
515011	Bindery Workers	0	0	23425	0	0.2	0	150	0	1.5	2
517041	Sawing Machine Setters, Operators, and Tenders, Wood	6.4488	0	22865	0	0.7	0	27	0	2	2
517042	Woodworking Machine Setters, Operators, and Tenders, Except Sawing	57.108	0	24379	0	-0.2	0	40	0	1.5	2
537061	Cleaners of Vehicles and Equipment	24.816	0	18366	0	2.2	0	503	1	1	1
353021	Combined Food Preparation and Serving Workers, Including Fast Food	1.8728	0	14492	0	2.4	0	3799		1	1
432011	Switchboard Operators, Including Answering Service	205.65	0	23964	0	-1.8	0	213	0	1	1
434071	File Clerks	93.027	0	23400	0	0.7	0	325	0	1	1
435021	Couriers and Messengers	18.715	0	23703	0	-0.9	0	155	0	1	1
516031	Sewing Machine Operators	175.25	0	19271	0	-1.2	0	47	0	1	1
516051	Sewers, Hand	9.3573	0	21768	0	0.0	0	41	0	1	1
519023	Mixing and Blending Machine Setters, Operators, and Tenders	130.44	0	\$18,734	0	0.5	0	144	0	1	1
519123	Painting, Coating, and Decorating Workers	169.76	0	22984	0	1.1	0	26	0	1	1
533041	Taxi Drivers and Chauffeurs	2.0794	0	24324	0	1.8	0	89	0	1	1
537041	Hoist and Winch Operators	55.232	0	19441	0	0.7	0	17	0	1	1
	mean	591.92		42479.3		0.90		330.18			

Standard Deviation

	1433.5	18036.5	1.44925	682.195					
591.92	0	24442.84	0.90	330	0	0	0		
1308.69	6	33461.07	1.63	671	1	1	1		
2025.45	7	42479.31	2.35	1012	2	2	2		
2742.22	8	60515.77	3.08	1353	3	3	3		
3458.98	9	78552.24	3.80	1695	4	4	4		
	10				5	5	5		

Non-durable Goods Manufacturing

occ_code	occ_title	Employment	Employment SCORE	Mean Annual Wage	wage SCORE	2000-2010 proj annual % Change	Annual Pct Change SCORE	2000-2010 proj annual total growth	Annual Total Change	Job Zone	Job Zone SCORE
111021	General and Operations Managers	3433.2	10	89314	5	1.2	0	2405	5	5	5
414012	Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	3676.7	10	53171	4	0.3	0	1631	4	2	2
111011	Chief Executives	783.48	6	142019	5	1.5	0	1339	3	4.5	5
439061	Office Clerks, General	2611.4	9	24633	3	1.4	0	3377	5	2	2
113031	Financial Managers	826.07	6	88657	5	1.7	0	870	2	4.5	5
132011	Accountants and Auditors	1254	7	53159	4	1.4	0	1077	3	4	4
151031	Computer Software Engineers, Applications	649.21	6	69751	4	6.7	0	1483	4	4	4
151041	Computer Support Specialists	678.34	6	45211	4	6.0	0	1387	4	4	4
431011	First-Line Supervisors/Managers of Office and Administrative Support Workers	1652.2	8	44768	4	0.7	0	1170	3	3	3
436011	Executive Secretaries and Administrative Assistants	1699.8	8	36550	3	1.0	0	1307	3	4	4
511011	First-Line Supervisors/Managers of Production and Operating Workers	6736.3	10	47697	4	0.1	0	657	1	3	3
515022	Prepress Technicians and Workers	3404.5	10	41091	4	-2.3	0	110	0	3.8	4
533032	Truck Drivers, Heavy and Tractor-Trailer	1707.1	8	40247	3	1.8	0	2118	5	1.5	2
112022	Sales Managers	1065.4	6	90226	5	2.4	0	684	2	4	4
113021	Computer and Information Systems Managers	658.96	6	92160	5	3.4	0	609	1	5	5
273041	Editors	2632.2	9	52476	4	1.8	0	220	0	4	4

372011	Janitors and Cleaners, Except Maids and Housekeeping Cleaners	1838.3	8	22758	3	1.4	0	2841	5	1	1
412031	Retail Salespersons	1177.4	7	22872	3	0.8	0	5207	5	2	2
433031	Bookkeeping, Accounting, and Auditing Clerks	2337.9	9	31845	3	0.4	0	1161	3	2	2
499042	Maintenance and Repair Workers, General	3988.6	10	36418	3	0.5	0	647	1	3	3
519061	Inspectors, Testers, Sorters, Samplers, and Weighers	3515.2	10	29191	3	-0.2	0	374	1	2.8	3
537062	Laborers and Freight, Stock, and Material Movers, Hand	4870.3	10	20775	0	1.1	0	3612	5	1.3	2
112021	Marketing Managers	683.46	6	86837	5	2.5	0	385	1	4	4
113051	Industrial Production Managers	1853.7	8	76585	4	0.1	0	122	0	4	4
151021	Computer Programmers	809.25	6	63422	4	1.2	0	711	2	4	4
151051	Computer Systems Analysts	663.03	6	69856	4	4.4	0	1283	3	3	3
435071	Shipping, Receiving, and Traffic Clerks	3108.6	10	27071	3	0.6	0	767	2	1	1
512092	Team Assemblers	5172.3	10	24412	3	0.0	0	643	1	2	2
513011	Bakers	2799.6	10	22291	3	1.2	0	149	0	3	3
515021	Job Printers	2033.7	8	36785	3	0.2	0	50	0	5	5
515023	Printing Machine Operators	5940.1	10	30612	3	0.2	0	199	0	2.8	3
192031	Chemists	1633.6	7	59663	4	1.3	0	164	0	4	4
271024	Graphic Designers	1564.6	7	42583	4	2.5	0	213	0	4	4
413011	Advertising Sales Agents	2097.3	8	48877	4	2.4	0	288	0	3	3
434051	Customer Service Representatives	3318.7	10	31349	3	2.5	0	2695		2	2
434171	Receptionists and Information Clerks	767.69	6	22683	3	1.9	0	1390	4	2	2
491011	First-Line Supervisors/Managers of Mechanics, Installers, and Repairers	774.95	6	57228	4	1.3	0	393	1	4	4
513092	Food Batchmakers	2329.8	9	24927	3	0.0	0	78	0	3	3
514072	Molding, Coremaking, and Casting Machine Setters, Operators, and Tenders, Metal and Plastic	3498.8	10	26670	3	0.0	0	144	0	1.8	2
515011	Bindery Workers	3473.2	10	23425	3	0.2	0	150	0	1.5	2
519111	Packaging and Filling Machine Operators and Tenders	7826.4	10	23009	3	1.7	0	557	1	1	1
537051	Industrial Truck and Tractor Operators	3132.5	10	30625	3	1.0	0	450	1	1	1
131023	Purchasing Agents, Except Wholesale, Retail, and Farm Products	728.98	6	49955	4	0.7	0	179	0	4	4
172112	Industrial Engineers	701.2	6	64547	4	-0.3	0	78	0	4	4

191042	Medical Scientists, Except Epidemiologists	590.1	6	70313	4	1.4	0	22	0	4	4
273020	News Analysts, Reporters and Correspondents	1614.3	7	31563	3	-0.3	0	76	0	4	4
414011	Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products	947.86	6	60723	4	0.4	0	501	1	2.5	3
435081	Stock Clerks and Order Fillers	1400.9	7	21574	0	0.4	0	2271	5	1.5	2
436014	Secretaries, Except Legal, Medical, and Executive	1375.4	7	31741	3	-0.1	0	868	2	2	2
499041	Industrial Machinery Mechanics	1709.5	8	37513	3	0.8	0	217	0	3	3
513023	Slaughtering and Meat Packers	2276.5	9	23143	3	0.3	0	64	0	2	2
514041	Machinists	634.83	6	33754	3	0.4	0	369	1	4	4
519023	Mixing and Blending Machine Setters, Operators, and Tenders	3170.6	10	30231	3	0.5	0	144	0	1	1
533033	Truck Drivers, Light or Delivery Services	1836.9	8	32374	3	1.4	0	990	2	1	1
537064	Packers and Packagers, Hand	7128.5	10	19009	0	1.4	0	1323	3	1	1
194031	Chemical Technicians	1226.6	7	36215	3	0.7	0	94	0	3	3
291111	Registered Nurses	38.981	0	51536	4	1.9	0	2811	5	4	4
411012	First-Line Supervisors/Managers of Non-Retail Sales Workers	703.83	6	59843	4	0.5	0	228		3	3
435061	Production, Planning, and Expediting Clerks	1429.3	7	32464	3	1.6	0	474	1	2	2
439031	Desktop Publishers	1051.4	6	39913	3	4.8	0	132	0	4	4
514021	Extruding and Drawing Machine Setters, Operators, and Tenders, Metal and Plastic	1900.3	8	27661	3	0.4	0	79	0	2	2
519198	Helpers--Production Workers	4954.7	10	18544	0	0.5	0	985	2	1	1
537063	Machine Feeders and Offbearers	2481.1	9	25002	3	-1.3	0	156	0	1	1
412011	Cashiers	1018.5	6	17072	0	1.0	0	5403	5	1	1
433021	Billing and Posting Clerks and Machine Operators	669.91	6	30214	3	0.5	0	455	1	1.7	2
514031	Cutting, Punching, and Press Machine Setters, Operators, and Tenders, Metal and Plastic	1235.6	7	25947	3	-0.9	0	248	0	2	2
514081	Multiple Machine Tool Setters, Operators, and Tenders, Metal and Plastic	575.93	6	28669	3	0.9	0	74	0	2.5	3

518091	Chemical Plant and System Operators	1281.8	7	39329	3	-0.5	0	54	0	2	2
519011	Chemical Equipment Operators and Tenders	1498.4	7	35074	3	1.0	0	84	0	2	2
519032	Cutting and Slicing Machine Setters, Operators, and Tenders	1235.2	7	28414	3	-0.3	0	33	0	1.5	2
519041	Extruding, Forming, Pressing, and Compacting Machine Setters, Operators, and Tenders	1204.5	7	30040	3	0.3	0	53	0	1.5	2
231011	Lawyers	99.862	0	113356	5	1.3	0	478	1	5	5
419041	Telemarketers	736.35	6	23609	3	2.3	0	666	1	1	1
434151	Order Clerks	1058.8	6	27005	3	-1.0	0	295	0	2	2
514011	Computer-Controlled Machine Tool Operators, Metal and Plastic	754.71	6	31444	3	1.2	0	288	0	2	2
519196	Paper Goods Machine Setters, Operators, and Tenders	669.94	6	26132	3	-1.0	0	105	0	2	2
533031	Driver/Sales Workers	1371.2	7	28124	3	0.7	0	236	0	1	1
113040	#N/A	512.73	0	80115	5	1.7	0	415	1	4	4
119041	Engineering Managers	436.64	0	90595	5	0.5	0	209	0	5	5
119121	Natural Sciences Managers	384.3	0	99780	5	0.5	0	15	0	5	5
131111	Management Analysts	216.21	0	84941	5	1.9	0	406	1	4	4
151011	Computer and Information Scientists, Research	22.489	0	80618	5	2.0	0	24	0	5	5
151032	Computer Software Engineers, Systems Software	338.98	0	86353	5	5.5	0	457	1	4	4
152021	Mathematicians	7.9392	0	86615	5	-1.2	0	0	0	5	5
172161	Nuclear Engineers	5.7013	0	88040	5	0.8	0	4	0	5	5
172171	Petroleum Engineers	19.117	0	84902	5	-2.1	0	1	0	5	5
472061	Construction Laborers	24.046	0	41329	4	3.2	0	1566	4	2	2
499043	Maintenance Workers, Machinery	733.77	6	37039	3	0.3	0	94	0	1	1
513091	Food and Tobacco Roasting, Baking, and Drying Machine Operators and Tenders	585.01	6	28039	3	-0.7	0	7	0	1	1
513093	Food Cooking Machine Operators and Tenders	849.78	6	28491	3	0.2	0	18	0	1	1
519012	Separating, Filtering, Clarifying, Precipitating, and Still Machine Setters, Operators, and Tenders	856.03	6	34638	3	0.0	0	23	0	1	1
113011	Administrative Services Managers	349.11	0	54331	4	1.9	0	576	1	4	4
119111	Medical and Health Services Managers	45.65	0	76622	4	2.4	0	254	0	5	5
132051	Financial Analysts	177.53	0	63368	4	1.8	0	271	0	5	5
151071	Network and Computer Systems Administrators	446.07	0	62524	4	5.8	0	638	1	4	4

172021	Agricultural Engineers	4.1586	0	45396	4	-0.5	0	0	0	5	5
172041	Chemical Engineers	400.14	0	69679	4	-0.6	0	29	0	5	5
172071	Electrical Engineers	63.356	0	68102	4	0.3	0	88	0	5	5
172072	Electronics Engineers, Except Computer	10.633	0	66554	4	1.5	0	119	0	5	5
172111	Health and Safety Engineers, Except Mining Safety Engineers and Inspectors	112.12	0	57382	4	0.9	0	17	0	4.3	5
172131	Materials Engineers	83.874	0	67283	4	-0.2	0	14	0	5	5
191021	Biochemists and Biophysicists	250	0	68491	4	1.6	0	27	0	5	5
191022	Microbiologists	198.95	0	49889	4	3.2	0	51	0	5	5
192041	Environmental Scientists and Specialists, Including Health	37.904	0	49649	4	1.6	0	34	0	5	5
259031	Instructional Coordinators	9.6219	0	49530	4	2.2	0	83	0	5	5
273042	Technical Writers	164.91	0	51442	4	2.0	0	95	0	5	5
291051	Pharmacists	23.818	0	74725	4	1.7	0	350	1	4	4
291131	Veterinarians	5.9544	0	68048	4	3.0	0	60	0	5	5
299010	Occupational Health and Safety Specialists and Technicians	89.659	0	47156	4	2.1	0	50	0	5	5
339032	Security Guards	251.98	0	22418	3	3.7	0	2194	5	1	1
419031	Sales Engineers	124.03	0	67206	4	0.5	0	93	0	5	5
472031	Carpenters	90.974	0	46802	4	0.8	0	868	2	2.8	3
472111	Electricians	391.92	0	51026	4	1.7	0	747	2	3	3
513022	Meat, Poultry, and Fish Cutters and Trimmers	2117.5	8	19623	0	0.7	0	82	0	1	1
112011	Advertising and Promotions Managers	303	0	77109	4	2.6	0	193	0	4	4
112031	Public Relations Managers	64.661	0	72572	4	3.0	0	114	0	4	4
113061	Purchasing Managers	295.6	0	65178	4	-0.4	0	191	0	4	4
113071	Transportation, Storage, and Distribution Managers	372.59	0	64039	4	1.4	0	161	0	4	4
119011	Farm, Ranch, and Other Agricultural Managers	0.9713	0	44781	4	0.9	0	29	0	4	4
119021	Construction Managers	11.557	0	78209	4	1.6	0	211	0	4	4
119141	Property, Real Estate, and Community Association Managers	2.4902	0	64413	4	1.4	0	230	0	4	4
131021	Purchasing Agents and Buyers, Farm Products	39.778	0	50542	4	0.5	0	20	0	4	4
131041	Compliance Officers, Except Agriculture, Construction, Health and Safety, and Transportation	188.44	0	52704	4	0.8	0	87	0	3.5	4
131051	Cost Estimators	403.07	0	52342	4	1.7	0	283	0	4	4
131073	Training and Development Specialists	266.29	0	52198	4	2.0	0	263	0	4	4
131121	Meeting and Convention Planners	21.837	0	49471	4	1.8	0	60	0	4	4

132031	Budget Analysts	27.212	0	52443	4	1.9	0	108	0	4	4
132041	Credit Analysts	27.407	0	48253	4	0.7	0	70	0	4	4
151061	Database Administrators	185.15	0	58423	4	4.8	0	275	0	4	4
151081	Network Systems and Data Communications Analysts	155.24	0	63193	4	5.7	0	263	0	4	4
152031	Operations Research Analysts	33.101	0	63607	4	1.9	0	76	0	4	4
152041	Statisticians	47.483	0	61041	4	-0.1	0	5	0	4	4
171021	Cartographers and Photogrammetrists	11.604	0	43967	4	2.2	0	13	0	4	4
172031	Biomedical Engineers	85.346	0	63908	4	2.5	0	17	0	4	4
172051	Civil Engineers	22.737	0	63591	4	1.0	0	191	0	4	4
172061	Computer Hardware Engineers	12.554	0	70185	4	2.1	0	29	0	4	4
172081	Environmental Engineers	62.466	0	67435	4	2.0	0	38	0	4	4
172141	Mechanical Engineers	372.55	0	64866	4	0.8	0	293		4	4
172151	Mining and Geological Engineers, Including Mining Safety Engineers	1.7689	0	63408	4	1.3	0	3	0	4	4
173013	Mechanical Drafters	71.379	0	42580	4	0.7	0	64	0	4	4
173023	Electrical and Electronic Engineering Technicians	121.87	0	43292	4	1.7	0	289	0	4	4
173024	Electro-Mechanical Technicians	21.29	0	49113	4	0.3	0	35	0	4	4
173027	Mechanical Engineering Technicians	168.23	0	42447	4	0.6	0	41	0	4	4
191010	Agricultural and Food Scientists	89.315	0	56572	4	0.3	0	14	0	4	4
192032	Materials Scientists	64.295	0	76082	4	2.1	0	9	0	4	4
193021	Market Research Analysts	335.36	0	45981	4	1.6	0	164	0	4	4
193022	Survey Researchers	2.9011	0	28405	3	2.5	0	25	0	5	5
232011	Paralegals and Legal Assistants	23.431	0	43594	4	1.6	0	110	0	4	4
271011	Art Directors	117.53	0	73256	4	2.2	0	86	0	4	4
271013	Fine Artists, Including Painters, Sculptors, and Illustrators	98.536	0	45682	4	1.1	0	28	0	4	4
271014	Multi-Media Artists and Animators	103.49	0	43083	4	2.5	0	188	0	4	4
271021	Commercial and Industrial Designers	71.991	0	52470	4	1.4	0	27	0	4	4
271027	Set and Exhibit Designers	2.9011	0	37217	3	1.2	0	6	0	4.5	5
272012	Producers and Directors	20.469	0	63152	4	1.9	0	46	0	4	4
273031	Public Relations Specialists	145.15	0	41569	4	3.2	0	269	0	4	4
273043	Writers and Authors	482.88	0	54457	4	1.1	0	86	0	3.8	4
274011	Audio and Video Equipment Technicians	14.36	0	42638	4	1.1	0	48	0	4	4
274032	Film and Video Editors	2.9011	0	41915	4	1.7	0	19	0	4	4
292011	Medical and Clinical Laboratory Technologists	5.9544	0	43113	4	1.4	0	156	0	4	4

439051	Mail Clerks and Mail Machine Operators, Except Postal Service	691.33	6	21004	0	1.4	0	424	1	1	1
471011	First-Line Supervisors/Managers of Construction Trades and Extraction Workers	25.369	0	53067	4	1.0	0	321	0	3.5	4
472011	Boilermakers	7.4956	0	55375	4	0.6	0	30	0	4	4
472152	Plumbers, Pipefitters, and Steamfitters	130.51	0	63586	4	1.0	0	430	1	3	3
492022	Telecommunications Equipment Installers and Repairers, Except Line Installers	12.217	0	47675	4	-1.2	0	33	0	3.2	4
493011	Aircraft Mechanics and Service Technicians	4.2848	0	51746	4	1.5	0	197	0	3.7	4
493021	Automotive Body and Related Repairers	1.0354	0	44816	4	1.9	0	353	1	3	3
493023	Automotive Service Technicians and Mechanics	50.748	0	39055	3	1.8	0	982	2	2.5	3
499021	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	120.57	0	50023	4	1.6	0	83	0	3.5	4
499044	Millwrights	94.136	0	45696	4	0.1	0	70	0	4	4
514111	Tool and Die Makers	328.21	0	45547	4	-0.2	0	155	0	4	4
518012	Power Distributors and Dispatchers	8.9212	0	53510	4	0.9	0	28	0	4	4
518093	Petroleum Pump System Operators, Refinery Operators, and Gaugers	524.52	0	48649	4	-0.2	0	16	0	3.3	4
532012	Commercial Pilots	5.2736	0	59084	4	1.7	0	7	0	4	4
535021	Captains, Mates, and Pilots of Water Vessels	3.296	0	54679	4	0.1	0	8	0	4	4
119051	Food Service Managers	11.509	0	37125	3	1.2	0	274	0	4	4
131022	Wholesale and Retail Buyers, Except Farm Products	39.978	0	51096	4	-0.6	0	140	0	3	3
131071	Employment, Recruitment, and Placement Specialists	145.74	0	49375	4	1.5	0	193	0	3	3
131072	Compensation, Benefits, and Job Analysis Specialists	117	0	52314	4	1.4	0	102	0	3	3
173012	Electrical and Electronics Drafters	7.5179	0	35853	3	0.8	0	55	0	3.5	4
173026	Industrial Engineering Technicians	318.24	0	41872	4	0.5	0	60	0	3	3
173031	Surveying and Mapping Technicians	2.9011	0	37690	3	2.0	0	51	0	3.5	4
194041	Geological and Petroleum Technicians	9.888	0	51611	4	-0.1	0	2	0	3	3
194051	Nuclear Technicians	7.9392	0	75471	4	0.2	0	3	0	3	3
253021	Self-Enrichment Education Teachers	2.9011	0	35930	3	1.5	0	90	0	4	4
254021	Librarians	44.281	0	39474	3	0.7	0	111	0	4	4

271022	Fashion Designers	17.686	0	51356	4	0.7	0	5	0	3	3
274014	Sound Engineering Technicians	1.2248	0	49173	4	1.3	0	12	0	3	3
274031	Camera Operators, Television, Video, and Motion Picture	6.4383	0	39661	3	1.5	0	23	0	4	4
292061	Licensed Practical and Licensed Vocational Nurses	2.9139	0	35987	3	1.5	0	628	1	3	3
319092	Medical Assistants	5.9544	0	26924	3	4.2	0	453	1	3	3
351011	Chefs and Head Cooks	6.5768	0	28920	3	-0.1	0	50	0	4	4
371011	First-Line Supervisors/Managers of Housekeeping and Janitorial Workers	104.9	0	36939	3	1.1	0	242	0	3.5	4
371012	First-Line Supervisors/Managers of Landscaping, Lawn Service, and Groundskeeping Workers	1.9848	0	36428	3	0.8	0	44	0	3.5	4
373011	Landscaping and Groundskeeping Workers	40.204	0	22483	3	2.7	0	1311	3	1	1
411011	First-Line Supervisors/Managers of Retail Sales Workers	376.01	0	37701	3	0.8	0	944	2	2	2
433011	Bill and Account Collectors	237.25	0	30983	3	2.1	0	744	2	2	2
451011	First-Line Supervisors/Managers of Farming, Fishing, and Forestry Workers	34.412	0	28376	3	0.6	0	20	0	3.2	4
452011	Agricultural Inspectors	26.357	0	35944	3	2.0	0	13	0	4	4
472021	Brickmasons and Blockmasons	0.9888	0	57124	4	1.2	0	243	0	3	3
472073	Operating Engineers and Other Construction Equipment Operators	44.776	0	59349	4	0.7	0	206	0	2.5	3
472121	Glaziers	10.645	0	59297	4	1.3	0	26	0	3	3
472130	Insulation Workers	2.6588	0	48150	4	1.5	0	52	0	3	3
472141	Painters, Construction and Maintenance	48.654	0	40339	3	1.1	0	328	0	4	4
472211	Sheet Metal Workers	28.242	0	53562	4	2.1	0	311	0	3	3
492011	Computer, Automated Teller, and Office Machine Repairers	51.002	0	35066	3	1.6	0	108	0	3.3	4
492092	Electric Motor, Power Tool, and Related Repairers	73.29	0	44563	4	0.4	0	19	0	2.7	3
492094	Electrical and Electronics Repairers, Commercial and Industrial Equipment	208.48	0	45327	4	1.4	0	67	0	3	3
493042	Mobile Heavy Equipment Mechanics, Except Engines	3.1422	0	40302	3	0.8	0	50	0	4	4

499012	Control and Valve Installers and Repairers, Except Mechanical Door	18.23	0	\$50,626	4	-0.4	0	26	0	2.7	3
499031	Home Appliance Repairers	17.967	0	39306	3	1.2	0	68	0	3.5	4
499052	Telecommunications Line Installers and Repairers	5.8022	0	45016	4	1.6	0	158	0	3	3
512041	Structural Metal Fabricators and Fitters	14.193	0	36625	3	1.1	0	60	0	4	4
514012	Numerical Tool and Process Control Programmers	46.674	0	41232	4	1.0	0	30	0	3	3
514061	Model Makers, Metal and Plastic	89.789	0	40377	3	-1.1	0	12	0	4	4
514062	Patternmakers, Metal and Plastic	39.031	0	36182	3	-1.5	0	5	0	4	4
515012	Bookbinders	318.43	0	33201	3	0.3	0	4	0	4	4
516052	Tailors, Dressmakers, and Custom Sewers	3.5372	0	23539	3	-0.9	0	30	0	3.5	4
517031	Model Makers, Wood	3.5483	0	34581	3	1.0	0	8	0	4	4
517032	Patternmakers, Wood	7.0966	0	32532	3	0.9	0	14	0	4	4
518021	Stationary Engineers and Boiler Operators	180.05	0	55369	4	-0.1	0	67	0	2.5	3
518031	Water and Liquid Waste Treatment Plant and System Operators	72.142	0	42836	4	1.2	0	74	0	3	3
518092	Gas Plant Operators	15.92	0	\$49,272	4	-1.0	0	13	0	2.5	3
519195	Molders, Shapers, and Casters, Except Metal and Plastic	234.2	0	26532	3	0.1	0	36	0	3.1	4
531021	First-Line Supervisors/Managers of Helpers, Laborers, and Material Movers, Hand	515.59	0	41527	4	1.0	0	141	0	3	3
531031	First-Line Supervisors/Managers of Transportation and Material-Moving Machine and Vehicle Operators	425.41	0	48008	4	1.6	0	182	0	3	3
173011	Architectural and Civil Drafters	3.5483	0	35811	3	1.6	0	130	0	3	3
173025	Environmental Engineering Technicians	20.794	0	37896	3	2.2	0	15	0	3	3
194091	Environmental Science and Protection Technicians, Including Health	56.759	0	37879	3	1.4	0	54	0	3	3
271026	Merchandise Displayers and Window Trimmers	45.315	0	28011	3	1.6	0	56	0	3	3
273091	Interpreters and Translators	18.378	0	32066	3	1.9	0	32	0	3	3
274021	Photographers	286.85	0	34887	3	0.8	0	71	0	3	3
292052	Pharmacy Technicians	17.863	0	23237	3	2.9	0	386	1	2	2
292056	Veterinary Technologists and Technicians	11.909	0	28087	3	3.2	0	73	0	3	3

332011	Fire Fighters	1.8238	0	45329	4	0.5	0	241	0	2	2
351012	First-Line Supervisors/Managers of Food Preparation and Serving Workers	119.92	0	27280	3	1.3	0	611	0	3	3
352021	Food Preparation Workers	434.97	0	16153	0	1.5	0	2250	5	1	1
353021	Combined Food Preparation and Serving Workers, Including Fast Food	534.94	0	14492	0	2.4	0	3799	5	1	1
353031	Waiters and Waitresses	87.889	0	15870	0	1.7	0	4184	5	1	1
399032	Recreation Workers	2.9011	0	22761	3	1.6	0	312	0	3	3
439011	Computer Operators	316.16	0	39161	3	-1.7	0	119	0	3	3
472044	Tile and Marble Setters	10.645	0	56049	4	0.9	0	23	0	2	2
472053	Terrazzo Workers and Finishers	3.5483	0	40173	3	0.3	0	3	0	3	3
472071	Paving, Surfacing, and Tamping Equipment Operators	26.368	0	51999	4	1.4	0	40	0	2	2
474041	Hazardous Materials Removal Workers	2.0732	0	41030	4	3.0	0	75	0	2	2
475031	Explosives Workers, Ordnance Handling Experts, and Blasters	5.183	0	48372	4	0.4	0	1	0	2	2
493031	Bus and Truck Mechanics and Diesel Engine Specialists	148.49	0	39888	3	0.9	0	244	0	3	3
493041	Farm Equipment Mechanics	23.688	0	32721	3	0.4	0	42	0	3	3
499062	Medical Equipment Repairers	5.9544	0	37691	3	1.1	0	29	0	3	3
499096	Riggers	1.0108	0	35470	3	1.2	0	3	0	3	3
512022	Electrical and Electronic Equipment Assemblers	76.208	0	23878	3	-1.3	0	301	0	3	3
512023	Electromechanical Equipment Assemblers	47.138	0	24398	3	0.1	0	90	0	3	3
512031	Engine and Other Machine Assemblers	10.645	0	30100	3	0.2	0	66	0	3	3
513021	Butchers and Meat Cutters	263.48	0	25416	3	-0.7	0	102	0	3	3
514033	Grinding, Lapping, Polishing, and Buffing Machine Tool Setters, Operators, and Tenders, Metal and Plastic	250.17	0	28933	3	0.2	0	89	0	2.5	3
514034	Lathe and Turning Machine Tool Setters, Operators, and Tenders, Metal and Plastic	68.789	0	29253	3	-0.8	0	150	0	3	3
514035	Milling and Planing Machine Setters, Operators, and Tenders, Metal and Plastic	102.9	0	28625	3	-1.3	0	38	0	3	3
514121	Welders, Cutters, Solderers, and Brazers	142.57	0	33889	3	1.8	0	607	1	2	2

514191	Heat Treating Equipment Setters, Operators, and Tenders, Metal and Plastic	142.53	0	27506	3	0.7	0	40	0	2.3	3
514192	Lay-Out Workers, Metal and Plastic	53.213	0	38205	3	-1.0	0	11	0	3	3
514193	Plating and Coating Machine Setters, Operators, and Tenders, Metal and Plastic	84.479	0	25253	3	0.6	0	77	0	2.3	3
514194	Tool Grinders, Filers, and Sharpeners	18.209	0	30528	3	-1.2	0	29	0	3	3
516063	Textile Knitting and Weaving Machine Setters, Operators, and Tenders	33.6	0	25005	3	1.3	0	7	0	3	3
517011	Cabinetmakers and Bench Carpenters	7.0966	0	31595	3	0.7	0	83	0	3	3
519131	Photographic Process Workers	105.56	0	27718	3	-1.0	0	29	0	3	3
519194	Etchers and Engravers	90.137	0	38179	3	0.1	0	9	0	2.3	3
537032	Excavating and Loading Machine and Dragline Operators	32.53	0	52331	4	1.8	0	125	0	2	2
537071	Gas Compressor and Gas Pumping Station Operators	4.2959	0	38903	3	0.8	0	4	0	3	3
537072	Pump Operators, Except Wellhead Pumpers	62.368	0	50807	4	-0.7	0	5	0	2	2
537121	Tank Car, Truck, and Ship Loaders	112.45	0	38321	3	0.9	0	20	0	3	3
131061	Emergency Management Specialists	3.6256	0	40073	3	1.2	0	13	0	2	2
194011	Agricultural and Food Science Technicians	149.16	0	34432	3	1.6	0	17	0	2	2
194021	Biological Technicians	473.06	0	31562	3	2.2	0	55		2	2
254031	Library Technicians	2.9011	0	23764	3	1.7	0	190	0	2	2
271023	Floral Designers	1.6442	0	23758	3	0.6	0	72		2	2
292012	Medical and Clinical Laboratory Technicians	31.757	0	32365	3	1.4	0	168	0	2	2
319093	Medical Equipment Preparers	3.9696	0	25235	3	1.3	0	29	0	2	2
352014	Cooks, Restaurant	4.9326	0	20176	0	2.0	0	770	2	3	3
353022	Counter Attendants, Cafeteria, Food Concession, and Coffee Shop	474.8	0	18106	0	1.2	0	1405	4	1	1
373012	Pesticide Handlers, Sprayers, and Applicators, Vegetation	9.8814	0	30029	3	1.1	0	35	0	2	2
412022	Parts Salespersons	1.0924	0	26913	3	-0.3	0	186		2	2
433051	Payroll and Timekeeping Clerks	369.8	0	32763	3	0.2	0	206		2	2
434021	Correspondence Clerks	28.248	0	28232	3	1.1	0	66	0	2	2

434161	Human Resources Assistants, Except Payroll and Timekeeping	353.23	0	31717	3	1.8	0	300	0	2	2
435032	Dispatchers, Except Police, Fire, and Ambulance	45.586	0	35362	3	2.0	0	216	0	2	2
439021	Data Entry Keyers	504.64	0	24057	3	0.3	0	315	0	2	2
439022	Word Processors and Typists	169.54	0	30132	3	-2.0	0	162	0	2	2
439081	Proofreaders and Copy Markers	372.61	0	28147	3	-0.2	0	54	0	2	2
439111	Statistical Assistants	21.266	0	37673	3	-0.1	0	5	0	2	2
452091	Agricultural Equipment Operators	76.419	0	22405	3	2.0	0	13	0	2	2
499091	Coin, Vending, and Amusement Machine Servicers and Repairers	102.93	0	33455	3	1.0	0	59	0	2	2
512021	Coil Winders, Tapers, and Finishers	20.473	0	22185	3	0.2	0	45	0	2	2
514022	Forging Machine Setters, Operators, and Tenders, Metal and Plastic	337.09	0	28959	3	0.2	0	117	0	2	2
514023	Rolling Machine Setters, Operators, and Tenders, Metal and Plastic	253.03	0	28837	3	-0.4	0	138	0	2	2
514032	Drilling and Boring Machine Tool Setters, Operators, and Tenders, Metal and Plastic	124.74	0	28062	3	-0.2	0	160	0	2	2
514051	Metal-Refining Furnace Operators and Tenders	14.173	0	30167	3	0.3	0	24	0	2	2
514071	Foundry Mold and Coremakers	54.59	0	29692	3	-1.3	0	22	0	2	2
514122	Welding, Soldering, and Brazing Machine Setters, Operators, and Tenders	17.388	0	30995	3	1.3	0	104	0	2	2
516092	Fabric and Apparel Patternmakers	7.0744	0	25599	3	-1.4	0	5	0	2	2
517041	Sawing Machine Setters, Operators, and Tenders, Wood	17.742	0	22865	3	0.7	0	27	0	2	2
517042	Woodworking Machine Setters, Operators, and Tenders, Except Sawing	17.742	0	24379	3	-0.2	0	40	0	1.5	2
519121	Coating, Painting, and Spraying Machine Setters, Operators, and Tenders	504.4	0	26541	3	0.9	0	113	0	1.5	2
519132	Photographic Processing Machine Operators	102.58	0	25147	3	0.8	0	46	0	2	2
531011	Aircraft Cargo Handling Supervisors	5.8022	0	41647	4	2.3	0	20	0	1	1
535011	Sailors and Marine Oilers	0.1448	0	26824	3	0.3	0	17	0	2	2
537021	Crane and Tower Operators	23.522	0	40696	3	0.2	0	46	0	2	2

537033	Loading Machine Operators, Underground Mining	3.5372	0	23945	3	0.1	0	6	0	2	2
359031	Hosts and Hostesses, Restaurant, Lounge, and Coffee Shop	2.6796	0	17266	0	1.1	0	378	1	3	3
419011	Demonstrators and Product Promoters	85.641	0	31380	3	1.7	0	116	0	1	1
419091	Door-To-Door Sales Workers, News and Street Vendors, and Related Workers	163.38	0	28302	3	0.8	0	170	0	1	1
432011	Switchboard Operators, Including Answering Service	290.91	0	23964	3	-1.8	0	213	0	1	1
432021	Telephone Operators	0.6124	0	31838	3	-5.7	0	84	0	1	1
433061	Procurement Clerks	170.71	0	33630	3	-1.2	0	43	0	1	1
434041	Credit Authorizers, Checkers, and Clerks	44.497	0	31937	3	0.2	0	43		1	1
434071	File Clerks	182.77	0	23400	3	0.7	0	325	0	1	1
435021	Couriers and Messengers	194.27	0	23703	3	-0.9	0	155		1	1
435111	Weighers, Measurers, Checkers, and Samplers, Recordkeeping	378.68	0	26234	3	0.8	0	66	0	1	1
439071	Office Machine Operators, Except Computer	305.92	0	24736	3	-2.0	0	77	0	1	1
475081	Helpers--Extraction Workers	8.7033	0	22778	3	0.8	0	87	0	1	1
493093	Tire Repairers and Changers	47.246	0	23184	3	0.5	0	61	0	1	1
499098	Helpers--Installation, Maintenance, and Repair Workers	230.75	0	26505	3	1.3	0	253	0	1	1
514052	Pourers and Casters, Metal	3.5483	0	27308	3	0.5	0	17	0	1	1
516091	Extruding and Forming Machine Setters, Operators, and Tenders, Synthetic and Glass Fibers	281.19	0	29064	3	0.1	0	6	0	1	1
519021	Crushing, Grinding, and Polishing Machine Setters, Operators, and Tenders	381.69	0	28172	3	0.9	0	27	0	1	1
519022	Grinding and Polishing Workers, Hand	126.1	0	28426	3	0.9	0	32	0	1	1
519031	Cutters and Trimmers, Hand	321.77	0	26090	3	-0.3	0	17	0	1	1
519051	Furnace, Kiln, Oven, Drier, and Kettle Operators and Tenders	190.32	0	28600	3	0.1	0	16	0	1	1
519123	Painting, Coating, and Decorating Workers	140.96	0	22984	3	1.1	0	26	0	1	1

519191	Cementing and Gluing Machine Operators and Tenders	313.35	0	27709	3	-0.2	0	15	0	1	1
519192	Cleaning, Washing, and Metal Pickling Equipment Operators and Tenders	281.53	0	27112	3	-0.5	0	14	0	1	1
519193	Cooling and Freezing Equipment Operators and Tenders	127.25	0	31503	3	-0.2	0	1	0	1	1
519197	Tire Builders	173.42	0	\$40,583	3	-0.3	0	22	0	1	1
533041	Taxi Drivers and Chauffeurs	3.9696	0	24324	3	1.8	0	89	0	1	1
537011	Conveyor Operators and Tenders	415.44	0	29298	3	0.5	0	52	0	1	1
537081	Refuse and Recyclable Material Collectors	3.5372	0	40536	3	1.3	0	296	0	1	1
319096	Veterinary Assistants and Laboratory Animal Caretakers	25.802	0	19433	0	3.2	0	130	0	3	3
352011	Cooks, Fast Food	9.8854	0	15855	0	0.0	0	473	1	2	2
352012	Cooks, Institution and Cafeteria	2.2134	0	21383	0	0.7	0	362	1	2	2
372012	Maids and Housekeeping Cleaners	5.4255	0	18111	0	0.9	0	1021	2	1	1
412021	Counter and Rental Clerks	187.69	0	21036	0	1.4	0	810	2	1	1
516062	Textile Cutting Machine Setters, Operators, and Tenders	30.265	0	21455	0	-0.5	0	6	0	3	3
516064	Textile Winding, Twisting, and Drawing Out Machine Setters, Operators, and Tenders	71.63	0	19900	0	0.8	0	3	0	3	3
359011	Dining Room and Cafeteria Attendants and Bartender Helpers	6.4857	0	14275	0	-0.8	0	516	1	1	1
359021	Dishwashers	95.401	0	14947	0	-1.0	0	566	1	1	1
512091	Fiberglass Laminators and Fabricators	147.46	0	\$18,734	0	0.4	0	36	0	2	2
516011	Laundry and Dry-Cleaning Workers	5.4798	0	19776	0	1.3	0	258	0	1.7	2
516021	Pressers, Textile, Garment, and Related Materials	35.372	0	19282	0	0.9	0	64	0	1.3	2
537061	Cleaners of Vehicles and Equipment	526.9	0	18366	0	2.2	0	503	1	1	1
352015	Cooks, Short Order	25.698	0	18864	0	0.4	0	201	0	1	1
396021	Tour Guides and Escorts	4.6593	0	19855	0	0.0	0	27	0	1	1
434121	Library Assistants, Clerical	5.8022	0	21974	0	1.6	0	178	0	1	1
452041	Graders and Sorters, Agricultural Products	205.83	0	20764	0	0.1	0	12	0	1	1
452092	Farmworkers and Laborers, Crop, Nursery, and Greenhouse	77.497	0	19028	0	1.3	0	34	0	1	1

452093	Farmworkers, Farm and Ranch Animals	109.71	0	17399	0	1.6	0	37	0	1	1
516031	Sewing Machine Operators	263.87	0	19271	0	-1.2	0	47	0	1	1
516051	Sewers, Hand	3.5372	0	21768	0	0.0	0	41	0	1	1
516061	Textile Bleaching and Dyeing Machine Operators and Tenders	7.0744	0	\$16,873	0	5.3	0	26	0	1	1
537041	Hoist and Winch Operators	10.612	0	19441	0	0.7	0	17	0	1	1

mean 540.07 40973.7 0.96 335.0
5 6
Standard Deviation 1100.3 18791 1.33 693.3

540.07	0	22182.7	0	0.96	0	335	0	0	0
1090.2	6	31578.2	3	1.62	0	682	1	1	1
1640.3	7	40973.7	3	2.29	0	1028	2	2	2
2190.5	8	59764.7	4	2.95	0	1375	3	3	3
2740.7	9	78555.7	4	3.62	0	1722	4	4	4
	10		5		0		5	5	5

Appendix L : List of Critical Occupations & Scores Identified Through JOWE©

Durable Goods Manufacturing

SOC	Occupation	Score (Out of 25)
111021	General and Operations Managers	25
111011	Chief Executives	19
113031	Financial Managers	18
151031	Computer Software Engineers, Applications	18
151041	Computer Support Specialists	18
414012	Sales Reps, Wholesale and Mfg, Except Tech and Scientific Products	18
511011	First-Line Supervisors/Managers of Production and Operating Workers	18
514041	Machinists	18
112022	Sales Managers	17
119041	Engineering Managers	17
132011	Accountants and Auditors	17
172141	Mechanical Engineers	17
431011	First-Line Sup/Managers of Office and Administrative Support Workers	17
434051	Customer Service Representatives	17
436011	Executive Secretaries and Administrative Assistants	17
514111	Tool and Die Makers	17
519061	Inspectors, Testers, Sorters, Samplers, and Weighers	17

Non Durable Goods Manufacturing

SOC	Occupation	Score (Out of 25)
111021	General and Operations Managers	25
414012	Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	20
111011	Chief Executives	19
439061	Office Clerks, General	19
113031	Financial Managers	18
132011	Accountants and Auditors	18
151031	Computer Software Engineers, Applications	18
151041	Computer Support Specialists	18

SOC	Occupation	Score (Out of 25)
431011	First-Line Sup/Managers of Office and Administrative Support Workers	18
436011	Executive Secretaries and Administrative Assistants	18
511011	First-Line Supervisors/Managers of Production and Operating Workers	18
515022	Prepress Technicians and Workers	18
533032	Truck Drivers, Heavy and Tractor-Trailer	18
112022	Sales Managers	17
113021	Computer and Information Systems Managers	17
273041	Editors	17
372011	Janitors and Cleaners, Except Maids and Housekeeping Cleaners	17
412031	Retail Salespersons	17
433031	Bookkeeping, Accounting, and Auditing Clerks	17
499042	Maintenance and Repair Workers, General	17
519061	Inspectors, Testers, Sorters, Samplers, and Weighers	17
537062	Laborers and Freight, Stock, and Material Movers, Hand	17
112021	Marketing Managers	16
113051	Industrial Production Managers	16
151021	Computer Programmers	16
151051	Computer Systems Analysts	16
435071	Shipping, Receiving, and Traffic Clerks	16
512092	Team Assemblers	16
513011	Bakers	16
515021	Job Printers	16
515023	Printing Machine Operators	16
192031	Chemists	15
271024	Graphic Designers	15
413011	Advertising Sales Agents	15
434051	Customer Service Representatives	15
434171	Receptionists and Information Clerks	15
491011	First-Line Supervisors/Managers of Mechanics, Installers, and Repairers	15
513092	Food Batchmakers	15
514072	Molding, Coremaking, Casting Machine Operators Metal and Plastic	15
515011	Bindery Workers	15
519111	Packaging and Filling Machine Operators and Tenders	15
537051	Industrial Truck and Tractor Operators	15
131023	Purchasing Agents, Except Wholesale, Retail, and Farm Products	14

SOC	Occupation	Score (Out of 25)
172112	Industrial Engineers	14
191042	Medical Scientists, Except Epidemiologists	14
273020	News Analysts, Reporters and Correspondents	14
414011	Sales Reps, Wholesale and Mfg, Technical and Scientific Products	14
435081	Stock Clerks and Order Fillers	14
436014	Secretaries, Except Legal, Medical, and Executive	14
499041	Industrial Machinery Mechanics	14
513023	Slaughterers and Meat Packers	14
514041	Machinists	14
519023	Mixing and Blending Machine Setters, Operators, and Tenders	14
533033	Truck Drivers, Light or Delivery Services	14
537064	Packers and Packagers, Hand	14
194031	Chemical Technicians	13
291111	Registered Nurses	13
411012	First-Line Supervisors/Managers of Non-Retail Sales Workers	13
435061	Production, Planning, and Expediting Clerks	13
439031	Desktop Publishers	13
514021	Extruding and Drawing Machine Operators, Metal and Plastic	13
519198	Helpers--Production Workers	13
537063	Machine Feeders and Offbearers	13

Appendix M: Industry-Specific Critical Occupations

Due to the large number of related industries included in the manufacturing analysis, industries have been grouped according to the NAICS classification system. The top ten occupations in each industry group will be listed.

Electrical Equipment

- General and Operations Managers
- Computer and Information Systems Managers
- Sales Managers
- Financial Managers
- Computer Software Engineers, Applications
- Marketing Managers
- Financial Analysts
- Computer Systems Analysts
- Computer Software Engineers, Systems Software
- Network and Computer Systems Administrators

Electronics Equipment

- General and Operations Managers
- Computer Software Engineers, Applications
- Engineering Managers
- Computer Software Engineers, Systems Software
- Electronics Engineers, Except Computer
- Electrical Engineers
- Financial Managers
- Computer Support Specialists
- Executive Secretaries and Administrative Assistants
- First-Line Supervisors/Managers of Production and Operating Workers

Fabricated Metal Production

- General and Operations Manager
- Financial Managers
- First-Line Supervisors/Managers of Production and Operating Workers
- Sales Representatives, Wholesale and Mfg., Except Technical and Scientific
- Office Clerks, General
- Machinists
- Truck Drivers, Heavy and Tractor-Trailer
- Accountants and Auditors
- Executive Secretaries and Administrative Assistants
- Customer Service Representatives

Industrial Machinery and Equipment

- General and Operations Managers
- Computer Software Engineers, Applications
- Financial Managers
- Sales Representatives, Wholesale and Mfg, Except Technical and Scientific

- Mechanical Engineers
- First-Line Supervisors/Managers or Production and Operating Workers
- Tool and Die Makers
- Engineering Managers
- Office Clerks, General
- Machinists

Motor Vehicle Parts

- General and Operations Managers
- Financial Managers
- Materials Scientists
- Mechanical Engineering Technicians
- Accountants and Auditors
- Electrical Engineers
- Computer Hardware Engineers
- First-Line Supervisors/Managers of Housekeeping/Janitorial Workers
- Water and Liquid Waste Treatment Plant and System Operators
- First-Line Supervisors/Managers of Office and Administrative Workers

Primary Metal

- General and Operations Managers
- First-Line Supervisors/Managers of Production and Operating Workers
- Laborers and Freight, Stock and Material Movers, Hand
- Maintenance and Repair Workers
- Electricians
- Inspectors, Testers, Sorters, Samplers and Weighers
- Grinding, Lapping, Polishing and Buffing Machine Tool Setters, Operators
- Industrial Production Managers
- Tool and Die Makers
- Machinists

Confection Production and Bakeries

- General and Operations Managers
- Retail Salespersons
- Laborers and Freight, Stock, Materials Movers, Hand
- First-Line Supervisors/Managers of Production and Operating Workers
- Office Clerks, General
- Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific
- Cashiers
- Food Batchmakers
- Bakers
- Stock Clerks and Order Fillers

Food and Kindred Products

- General and Operations Managers
- Laborers and Freight, Stock, Materials Movers, Hand
- Truck Drivers, Heavy and Tractor-Trailer

- First-Line Supervisors/Managers of Production and Operating Workers
- Sales Representatives, Wholesale and Mfg, Except Technical and Scientific
- Office Clerks, General
- Janitors and Cleaners
- Maintenance and Repair Workers
- Food Batchmakers
- Executive Secretaries and Administrative Assistants

Printing, Publishing and Allied Products

- General and Operations Managers
- Sales Representatives, Wholesale and Mfg, Except Technical and Scientific
- Customer Service Representatives
- Office Clerks, General
- First-Line Supervisors/Managers of Production and Operating Workers
- Job Printers
- Editors
- Computer Support Specialists
- Computer Software Engineers, Applications
- Executive Secretaries and Administrative Assistants

Chemical and Allied Products

- General and Operations Managers
- Laborers and Freight, Stock, Material Movers, Hand
- Customer Service Representatives
- Executive Secretaries and Administrative Assistants
- Stock Clerks and Order Fillers
- Office Clerks, General
- Sales Representatives, Wholesale and Mfg, Except Technical and Scientific
- Maintenance and Repair Workers
- First-Line Supervisors/Managers of Production and Operating Workers
- Chemists

Petroleum and Coal Products

- General and Operations Managers
- Truck Drivers, Heavy and Tractor-Trailer
- Office Clerks, General
- Laborers and Freight, Stock, Material Movers, Hand
- First-Line Supervisors/Managers of Production and Operating Workers
- Petroleum Pump System Operators, Refinery Operators and Gaugers
- Executive Secretaries and Administrative Assistants
- Maintenance and Repair Workers
- Accountants and Auditors
- Industrial Machinery Mechanics

Rubber and Misc. Plastics

- General and Operations Managers
- Laborers and Freight, Stock, Material Movers, Hand

- Maintenance and Repair Workers
- First-Line Supervisors/Managers of Production and Operating Workers
- Packers and Packagers, Hand
- Truck Drivers, Heavy and Tractor-Trailer
- Stock Clerks and Order Fillers
- Office Clerks, General
- Customer Service Representatives
- Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific

Appendix N: Skills and Knowledge Attributes of Critical Occupations

Business, Financial and Administrative Occupations

Skills Attribute Title	Index Score	Knowledge Attribute Title	Index Score
Active Listening	100	Clerical	100
Reading Comprehension	97	Mathematics	69
Writing	89	Economics and Accounting	67
Speaking	87	English Language	65
Mathematics	86	Computers and Electronics	60
Coordination	75	Customer and Personal Service	58
Monitoring	73	Administration and Management	53
Critical Thinking	70	Education and Training	48
Active Learning	68	Law and Government	46
Judgment and Decision Making	68	Personnel and Human Services	43

Business, Financial and Administrative Occupations include Accountants, Bookkeepers, Office Clerks, Executive Secretaries, and other critical occupations in the administrative field. These occupations are generally responsible for managing either human or financial resources. The attributes listed below include attribute findings specific to these occupations.

Computer Occupations

Computer Critical Occupations include Computer Support Specialists, Computer Software Engineers and other computer-related occupations. These occupations are generally responsible for managing IT facets of manufacturing industries. The attributes listed below include attribute findings specific to these occupations.

Skills Attribute Title	Index Score	Knowledge Attribute Title	Index Score
Programming	100	Computers and Electronics	100
Troubleshooting	100	Mathematics	81
Active Learning	97	Engineering and Technology	64
Mathematics	91	Education and Training	58
Reading Comprehension	91	Design	58
Operations Analysis	90	English Language	50
Installation	89	Clerical	48
Science	88	Administration and Management	48
Equipment Selection	85	Telecommunications	45
Judgment and Decision Making	85	Customer and Personal Service	45

Engineering Occupations

Engineering Critical Occupations include Mechanical Engineers, Electrical Engineers and other engineering-related critical occupations. These occupations are generally responsible for the creation and improvement of products and production processes. The attributes listed below include attribute findings specific to these occupations.

Skills Attribute Title	Index Score	Knowledge Attribute Title	Index Score
Mathematics	100	Engineering and Technology	100
Reading Comprehension	87	Computers and Electronics	87
Active Learning	86	Mathematics	81
Critical Thinking	85	Physics	78
Science	84	Design	77
Technology Design	83	Building and Construction	63
Operations Analysis	82	Production and Processing	60
Equipment Selection	79	English Language	52
Writing	75	Mechanical Administration and Management	51
Complex Problem Solving	72		46

Sales Occupations

Sales Critical Occupations include Sales Representatives, Retail Salespersons, and other sales-related occupations. These occupations are generally responsible for the marketing and sale of products, and require a great deal of person-to-person interaction. The attributes listed below are specific to these occupations.

Skills Attribute Title	Index Score	Knowledge Attribute Title	Index Score
Speaking	100	Sales and Marketing	100
Active Listening	96	Communications and Media	78
Writing	91	Computers and Electronics	74
Reading Comprehension	91	Mathematics	72
Active Learning	87	Customer and Personal Service	72
Persuasion	86	Law and Government	69
Negotiation	82	English Language	56
Social Perceptiveness	80	Psychology	55
Critical Thinking	79	Engineering and Technology	53
Instructing	79	Economics and Accounting	49

Life and Physical Sciences Occupations

Life and Physical Sciences Critical Occupations include Chemists and Chemical Technicians. These occupations are generally responsible for scientific exploration and innovation, research and development, and require a high degree of scientific knowledge. The attributes listed below are specific to these occupations.

Skills Attribute Title	Index Score	Knowledge Attribute Title	Index Score
Science	100	Chemistry	100
Reading Comprehension	96	Mathematics	83
Writing	91	English Language	68
Active Learning	87	Engineering and Technology	50
Critical Thinking	86	Biology	48
Mathematics	86	Computers and Electronics	48
Judgment and Decision Making	78	Physics	44
Complex Problem Solving	74	Administration and Management	38
Active Listening	74	Production and Processing	36
Quality Control Analysis	74	Communications and Media	33

Administrative Production Occupations

Administrative Production Critical Occupations include Stock Clerks and Order Fillers and Shipping and Receiving Clerks. These occupations are generally responsible for ensuring the timely shipment and transaction of goods. The attributes listed below are specific to these occupations.

Skills Attribute Title	Index Score	Knowledge Attribute Title	Index Score
Reading Comprehension	100	Clerical	100
Mathematics	95	Economics and Accounting	62
Critical Thinking	88	Mathematics	59
Writing	84	Computers and Electronics	53
Active Listening	82	English Language	52
Service Orientation	80	Production and Processing	51
Speaking	78	Administration and Management	41
Coordination	73	Transportation	41
Complex Problem Solving	71	Customer and Personal Service	35
Management of Material Resources	66	Mechanical	29

Production Occupations

Production Critical Occupations include Tool and Die Makers, Electric and Electronics Equipment Assemblers and other production-related occupations. These occupations are generally responsible for the assembling and fabrication of goods. The attributes listed below are specific to these occupations.

Skills Attribute Title	Index Score	Knowledge Attribute Title	Index Score
Operation and Control	100	Mechanical	100
Equipment Selection	96	Production and Processing	73
Mathematics	94	Design	67
Quality Control Analysis	93	Engineering and Technology	62
Equipment Maintenance	92	Mathematics	56
Operation Monitoring	91	Computers and Electronics	50
Installation	91	Physics	46
Reading Comprehension	80	Building and Construction	42
Repairing	80	English Language	42
Troubleshooting	75	Chemistry	30

Production (Other) Occupations

Other Production Critical Occupations include Crushing and Grinding Machine Operators, Extruding and Forming Machine Operators and other occupations related to the preparation of materials and finishing of products. The attributes listed below are specific to these occupations.

Skills Attribute Title	Index Score	Knowledge Attribute Title	Index Score
Operation and Control	100	Production and Processing	100
Operation Monitoring	97	Mechanical	96
Quality Control Analysis	91	Mathematics	65
Equipment Maintenance	86	English Language	62
Repairing	77	Engineering and Technology	57
Equipment Selection	76	Clerical	45
Reading Comprehension	74	Computers and Electronics	39
Mathematics	72	Physics	37
Troubleshooting	67	Chemistry	34
Speaking	63	Public Safety and Security	33

Transportation Occupations

Transportation Critical Occupations include Truck Drivers, Laborers and Freight Movers, and other occupations related to the movement and transportation of goods. The attributes listed below are specific to these occupations.

Skills Attribute Title	Index Score	Knowledge Attribute Title	Index Score
Operation and Control	100	Production and Processing	100
Equipment Selection	99	Mechanical	83
Reading Comprehension	93	Clerical	72
Writing	91	English Language	54
Active Listening	79	Mathematics	54
Mathematics	74	Physics	51
Installation	68	Engineering and Technology	48
Monitoring	68	Transportation	43
Equipment Maintenance	64	Public Safety and Security	31
Operation Monitoring	64	Chemistry	31

Maintenance Occupations

Maintenance Occupations include Maintenance Workers and Janitors and Cleaners. These occupations are generally responsible for maintenance of building, grounds and equipment. The attributes listed below are specific to these occupations.

Skills Attribute Title	Index Score	Knowledge Attribute Title	Index Score
Installation	100	Mechanical	100
Repairing	98	Building and Construction	84
Equipment Maintenance	93	Engineering and Technology	52
Equipment Selection	82	Public Safety and Security	47
Troubleshooting	81	Chemistry	46
Quality Control Analysis	74	Design	41
Operation and Control	73	Mathematics	40
Operation Monitoring	65	Physics	40
Reading Comprehension	64	Computers and Electronics	38
Mathematics	62	Customer and Personal Service	35

Management Occupations

Management Occupations include General and Operations Managers, Financial Managers, and other management-related occupations. These occupations are generally responsible for the management of personnel and resources at the highest levels of business. The attributes listed below are specific to these occupations.

Skills Attribute Title	Index Score	Knowledge Attribute Title	Index Score
Coordination	100	Administration and Management	100
Monitoring	98	Mathematics	99
Judgment and Decision Making	96	English Language	80
Reading Comprehension	94	Computers and Electronics	78
Critical Thinking	92	Economics and Accounting	77
Complex Problem Solving	91	Education and Training	76
Time Management	90	Personnel and Human Resources	73
Active Learning	89	Customer and Personal Service	73
Operations Analysis	88	Sales and Marketing	70
Speaking	86	Production and Processing	69

Appendix O: Short- and Long-Term Projections for Critical Occupations

Six Year Projections

SOC	Occupational Title	Estimated Total Percent Change 2004-2010	Employment Change, 2004-2010
Management			
111021	General and Operations Managers	7%	6279
112021	Marketing Managers	16%	1606
112022	Sales Managers	15%	2809
113021	Computer and Information Systems Managers	22%	2730
113031	Financial Managers	10%	2929
113040	Human Resources Managers	11%	1321
113051	Industrial Production Managers	1%	51
119041	Engineering Managers	3%	317
Business & Financial Occupations			
131111	Management Analysts	12%	1775
132011	Accountants and Auditors	8%	3299
Building & Grounds			
372011	Janitors and Cleaners, Except Maids and Housekeepin	9%	7923
Computers & Mathematics			
151021	Computer Programmers	7%	1650
151031	Computer Software Engineers, Applications	48%	9380
151032	Computer Software Engineers, Systems Software	38%	2780
151041	Computer Support Specialists	42%	8836
151051	Computer Systems Analysts	30%	7217
151071	Network and Computer Systems Admin	40%	4042
Engineering			
172071	Electrical Engineers	2%	78
172112	Industrial Engineers	-2%	-81
172141	Mechanical Engineers	5%	403
Life & Physical Science Occupations			
194031	Chemical Technicians	4%	134
Arts, Design, & Media			
273041	Editors	11%	509
Sales & Related			
412031	Retail Salespersons	5%	5863
414012	Sales Representatives, Wholesale and Manufacturing,	2%	1112
Administrative Production Personnel			
431011	First-Line Supervisors/Managers of Office and Administ	4%	1942
Customer Service & Clerical			
433031	Bookkeeping, Accounting, and Auditing Clerks	2%	1212
434051	Customer Service Representatives	16%	13048
436011	Executive Secretaries and Administrative Assistants	6%	3036
439061	Office Clerks, General	9%	9258
Installation, Maintenance, & Repair			
499041	Industrial Machinery Mechanics	5%	300
499042	Maintenance and Repair Workers, General	3%	1059
Production			
511011	First-Line Supervisors/Managers of Production and Ope	0%	102
512022	Electrical and Electronic Equipment Assemblers	-8%	-844
512092	Team Assemblers	0%	-77
513023	Slaughterers and Meat Packers	2%	49
513093	Food Cooking Machine Operators and Tenders	1%	10
514011	Computer-Controlled Machine Tool Operators, Metal an	8%	481
514031	Cutting, Punching, and Press Machine Setters, Operato	-5%	-654
514033	Grinding, Lapping, Polishing, and Buffing Machine Tool	1%	36
514041	Machinists	3%	386
514072	Molding, Coremaking, and Casting Machine Setters, Op	0%	-24
514111	Tool and Die Makers	-1%	-83
515022	Prepress Technicians and Workers	-13%	-543
515023	Printing Machine Operators	1%	101
517011	Cabinetmakers and Bench Carpenters	4%	97
519041	Extruding, Forming, Pressing, and Compacting Machine	2%	40
519061	Inspectors, Testers, Sorters, Samplers, and Weighers	-1%	-175
519195	Molders, Shapers, and Casters, Except Metal and Plast	1%	8
519198	Helpers--Production Workers	3%	931
Transportation & Material Moving			
533032	Truck Drivers, Heavy and Tractor-Trailer	11%	7837
537062	Laborers and Freight, Stock, and Material Movers, Hand	7%	5861
537064	Packers and Packagers, Hand	8%	2959

Two Year Projections

SOC	Occupational Title	Estimated Total Percent Change 2004-2006	Employment Change, 2004-2006
Management			
111021	General and Operations Managers	2%	2044
112022	Sales Managers	5%	892
113021	Computer and Information Systems Managers	7%	851
113031	Financial Managers	3%	944
113061	Purchasing Managers	-1%	-47
113071	Transportation, Storage, and Distribution Manager	3%	155
Business & Financial Occupations			
132011	Accountants and Auditors	3%	1070
Computers & Mathematics			
151021	Computer Programmers	2%	537
151032	Computer Software Engineers, Systems Software	11%	829
151041	Computer Support Specialists	12%	2611
151051	Computer Systems Analysts	9%	2200
151071	Network and Computer Systems Administrators	12%	1198
Arts, Design, & Media			
273043	Writers and Authors	2%	73
Building & Grounds			
372011	Janitors and Cleaners, Except Maids and Houseke	3%	2568
Installation, Maintenance, & Repair			
491011	First-Line Supervisors/Managers of Mechanics, In	3%	276
Engineering			
172072	Electronics Engineers, Except Computer	3%	111
Sales Related			
412022	Parts Salespersons	-1%	-39
412031	Retail Salespersons	2%	1922
413099	Sales Representatives, Services, All Other	4%	93
414011	Sales Representatives, Wholesale and Manufactu	1%	125
414012	Sales Representatives, Wholesale and Manufactu	1%	368
419041	Telemarketers	5%	732
432011	Switchboard Operators, Including Answering Servi	-4%	-245
Customer Service & Clerical			
433031	Bookkeeping, Accounting, and Auditing Clerks	1%	401
434051	Customer Service Representatives	5%	4139
436011	Executive Secretaries and Administrative Assistan	2%	992
439061	Office Clerks, General	3%	2999
Administrative Production Personnel			
431011	First-Line Supervisors/Managers of Office and Adr	1%	638
435032	Dispatchers, Except Police, Fire, and Ambulance	4%	249
435071	Shipping, Receiving, and Traffic Clerks	1%	350
435081	Stock Clerks and Order Fillers	1%	452
Production			
511011	First-Line Supervisors/Managers of Production and	0%	34
514033	Grinding, Lapping, Polishing, and Buffing Machine	0%	12
519199	Production Workers, All Other	6%	4130
Transportation & Materials Moving			
531031	First-Line Supervisors/Managers of Transportation	3%	163
533021	Bus Drivers, Transit and Intercity	2%	224
533022	Bus Drivers, School	3%	299
533032	Truck Drivers, Heavy and Tractor-Trailer	4%	2518
533033	Truck Drivers, Light or Delivery Services	3%	1013
533041	Taxi Drivers and Chauffeurs	4%	126
533099	Motor Vehicle Operators, All Other	2%	108
534011	Locomotive Engineers	4%	80
534031	Railroad Conductors and Yardmasters	-1%	-17
534041	Subway and Streetcar Operators	2%	14
537051	Industrial Truck and Tractor Operators	2%	390
537062	Laborers and Freight, Stock, and Material Movers,	2%	1910
537064	Packers and Packers, Hand	3%	960

Appendix P: Comparison Between County and State Wages, Growth Rates and Replacements

Six Year Projections

SOC	Occupation	Cook	DeKalb	DuPage	Grundy	Lake	Kankakee	Kane	Kendall	McHenry	Will
151031	Computer Software Engineers, Applications	47%	26%	51%	31%	51%	36%	53%	26%	34%	50%
		6195	29	1568	18	643	40	567	9	105	211
151051	Computer Systems Analysts	29%	23%	32%	14%	29%	20%	35%	14%	23%	27%
		4763	26	1207	8	538	31	416	7	75	161
151071	Network and Computer Systems Administrators	40%	45%	43%	33%	42%	29%	48%	35%	36%	41%
		2704	23	646	8	297	19	218	6	49	95
513093	Food Cooking Machine Operator	-1%	N/A	6%	N/A	4%	-5%	8%	10%	17%	7%
		-4	N/A	6	N/A	1	-1	3	1	3	2
151032	Computer Software Engineers, Systems	37%	25%	41%	33%	41%	28%	44%	22%	32%	37%
		1861	10	457	5	188	10	152	4	38	57
112021	Marketing Managers	16%	9%	18%	0%	16%	12%	18%	10%	15%	16%
		1042	5	281	0	119	8	86	2	29	39
151041	Computer Support Specialists	42%	36%	42%	40%	43%	34%	46%	28%	35%	41%
		5904	47	1402	19	624	47	455	12	118	212
151021	Computer Programmers	7%	-1%	9%	1%	8%	0%	12%	-6%	4%	7%
		1012	-1	336	1	134	0	129	-2	12	37
113040	Human Resource Managers	10%	6%	13%	5%	11%	3%	12%	6%	7%	10%
		855	4	245	1	105	2	68	2	13	29
513023	Slaughterers and Meat Packers	1%	0%	8%	N/A	-2%	-2%	6%	0%	10%	12%
		12	0	17	N/A	-1	-1	6	0	5	6
172071	Electrical Engineers	2%	-8%	4%	10%	2%	0%	0%	0%	0%	3%
		46	-3	28	-2	7	0	0	0	1	2
119041	Engineering Managers	3%	-5%	6%	-3%	3%	-1%	0%	-8%	-2%	0%
		214	-4	97	-1	22	-1	1	-4	-5	-1
434051	Customer Service Representatives	16%	13%	16%	4%	16%	10%	16%	8%	12%	10%
		8904	51	2121	18	933	62	561	16	143	232
512022	Electrical & Electronic Eq Assembler	-8%	16%	-4%	-5%	-9%	-8%	-8%	10%	-8%	-8%
		-560	-29	-63	-1	-66	-5	-60	-5	-37	-15
519061	Inspectors, Testers, Sorters, Weighers	-1%	-9%	2%	-5%	-3%	-9%	-1%	-7%	-4%	-3%
		-95	-12	56	-3	-39	-16	-13	-8	-22	-18
514033	Grinding, Lapping, Polishing, and Buffing Machine Tool Setters, Operators, and Tenders, Metal and Plastic	1%	0%	3%	N/A	-1%	-8%	2%	2%	2%	1%
		21	0	14	N/A	-3	-2	4	1	2	1
514111	Tool and Die Makers	-2%	-1%	2%	0%	-7%	10%	2%	-1%	-1%	-3%
		-53	-1	17	0	-30	-3	7	-2	-5	-7
172141	Mechanical Engineers	5%	2%	7%	0%	2%	-4%	6%	3%	3%	2%
		234	1	102	0	16	-2	30	3	10	7
537064	Packers and Packagers, Hand	7%	6%	11%	2%	9%	2%	12%	5%	12%	8%
		1704	12	552	2	246	7	242	9	93	92

SOC	Occupation	Cook	DeKalb	DuPage	Grundy	Lake	Kankakee	Kane	Kendall	McHenry	Will
499041	Industrial Machinery Mechanics	4% 172	7% 2	8% 64	2% 1	2% 15	-1% -1	5% 18	4% 2	9% 15	6% 15
131111	Management Analysts	12% 1179	10% 4	14% 329	14% 4	14% 165	4% 3	12% 64	12% 2	12% 19	5% 17
517011	Cabinetmakers and Bench Carpenters	4% 50	4% 3	10% 27	N/A N/A	5% 5	5% 1	3% 5	0% 0	5% 3	4% 5
514041	Machinists	2% 211	1% 2	5% 123	0% 0	0% -3	-5% -5	4% 40	1% 2	2% 11	0% 2
514011	Comp-Control Mach Tool Op, M/P	7% 256	6% 6	11% 114	7% 1	2% 8	5% 2	11% 48	8% 10	7% 25	5% 13
519198	Helpers--Production Workers	3% 561	1% 2	5% 242	-2% -2	1% 43	-4% -15	3% 68	-1% -2	2% 17	1% 6
514031	Cut, Punch, & Press Mach Set, M/P	-5% -402	10% -13	-3% -61	-7% -2	-6% -62	13% -11	-5% -41	-7% -8	-7% -31	-6% -23
514072	Mold, Coremake, & Cast Mach Op, M/P	-1% -20	-1% -1	1% 10	-6% -2	-1% -10	-8% -7	0% 1	0% 0	1% 3	-1% -4
519041	Extrude, Form, Press Mach Set, Op	2% 20	7% 1	3% 6	0% 0	2% 6	0% 0	1% 2	-2% -1	4% 2	3% 2
372011	Janitors and Cleaners, Except Maids	8% 5047	5% 38	10% 1252	2% 5	10% 648	5% 34	10% 523	4% 10	7% 107	9% 254
273041	Editors	10% 314	9% 2	13% 98	7% 1	13% 31	7% 2	14% 29	8% 1	15% 19	9% 9
112022	Sales Managers	15% 1804	12% 13	16% 488	14% 7	15% 210	9% 14	17% 146	12% 9	14% 52	14% 75
537062	Laborers and Freight, Stock,Movers	7% 3715	3% 16	8% 1125	3% 10	7% 411	0% 4	9% 349	2% 7	4% 66	5% 153
439061	Office Clerks, General	9% 5972	4% 32	10% 1667	2% 8	9% 696	3% 28	10% 485	5% 18	6% 127	7% 237
194031	Chemical Technicians	5% 79	4% 1	8% 30	4% 1	2% 16	1% 1	3% 5	N/A N/A	3% 2	0% -1
515023	Printing Machine Operators	0% 20	1% 1	3% 35	0% 0	4% 17	-3% -1	4% 15	5% 1	5% 10	0% 1
533032	Truck Drivers, Heavy and Tractor-Trailer	12% 5356	10% 42	12% 1320	10% 31	10% 353	5% 40	12% 307	6% 19	9% 116	9% 246
113021	Computer and IS Managers	22% 1849	21% 13	22% 422	24% 6	22% 190	17% 15	24% 128	22% 8	19% 39	20% 59
113031	Financial Managers	10% 1928	6% 9	12% 517	10% 7	11% 234	5% 10	10% 119	7% 6	8% 39	9% 69
511011	First-Line Sup/Mgrs of Production Workers	0% 25	-1% -3	3% 90	-1% -1	-1% -14	-4% -11	1% 19	-1% -1	0% 2	-1% -12
433031	Bookkeeping, Accounting,Auditing Clerks	2% 735	-1% -4	4% 300	-2% -4	3% 102	-1% -7	3% 65	-3% -5	1% 8	1% 14
132011	Accountants and Auditors	8% 2146	7% 13	10% 605	5% 5	9% 283	4% 8	7% 110	8% 7	9% 51	8% 68

SOC	Occupation	Cook	DeKalb	DuPage	Grundy	Lake	Kankakee	Kane	Kendall	McHenry	Will
111021	General and Operations Managers	7% 3979	4% 27	8% 1136	5% 14	7% 479	3% 25	8% 311	2% 8	6% 119	6% 182
499042	Maintenance and Repair Workers, General	3% 681	0% -1	5% 236	2% 4	2% 54	-1% -4	3% 62	1% 1	1% 6	2% 22
512092	Team Assemblers	-1% -128	-4% -15	2% 97	1% 1	-1% -16	-3% -7	0% 4	0% 1	0% -3	0% -2
412031	Retail Salespersons	4% 2880	9% 81	6% 1221	6% 26	7% 691	3% 55	7% 371	8% 48	9% 228	6% 254
172112	Industrial Engineers	-2% -55	-2% -1	1% 9	-3% -1	-4% -14	-5% -2	-1% -2	-3% -1	-2% -4	-5% -7
515022	Prepress Technicians and Workers	- 14% -385	- 12% -3	- 11% -78	-9% -1	11% -25	18% -4	11% -24	N/A N/A	-9% -12	14% -12
431011	First-Line Sup/Mgr of Office & Admi	4% 1199	2% 5	6% 395	1% 2	5% 147	1% 6	4% 84	2% 3	4% 38	4% 57
414011	Sales Rep, Wholes & Man, Tech & Sci	2% 178	1% 1	3% 106	-1% -1	3% 52	-1% -1	3% 21	-1% -1	1% 5	3% 17
519195	Molders, Shaprs, & Castrs, Ec M/P	1% 5	0% 0	0% -1	N/A N/A	-1% -1	0% 0	0% -1	0% 0	3% 2	1% 1
113051	Industrial Production Managers	0% 14	0% 0	3% 28	0% 0	1% 4	-1% -1	1% 5	1% 1	1% 4	-1% -1
414012	Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	2% 529	1% 2	3% 324	-1% -2	3% 145	-1% -3	3% 71	0% 1	1% 16	2% 32

Two Year Projections

SOC	Occupation	Cook	DeKalb	DuPage	Grundy	Lake	Kankakee	Kane	Kendall	McHenry	Will
151031	Computer Software Engineers, Applications	14% 1806	8% 9	15% 453	9% 5	15% 186	11% 12	15% 163	8% 3	10% 32	14% 61
513093	Food Cooking Machine Operator & Tend	0% -1	N/A N/A	2% 2	N/A N/A	1% 0	-2% 0	2% 1	3% 0	5% 1	2% 1
151051	Computer Systems Analysts	9% 1453	7% 8	10% 366	5% 3	9% 164	6% 10	10% 125	4% 2	7% 23	8% 49
151071	Network and Computer Systems Administrator	12% 802	13% 7	13% 190	10% 2	12% 88	9% 6	14% 64	10% 2	11% 15	12% 28
151032	Computer Software Engineers, Systems	11% 556	8% 3	12% 135	10% 2	12% 56	9% 3	13% 45	7% 1	10% 12	11% 17
112021	Marketing Managers	5% 331	3% 2	6% 89	0% 0	5% 38	4% 3	6% 27	3% 1	5% 9	5% 12
151041	Computer Support Specialists	12% 1745	11% 14	12% 414	12% 6	13% 184	10% 14	13% 133	8% 4	10% 35	12% 63
151021	Computer Programmers	2% 330	0% 0	3% 109	0% 0	3% 43	0% 0	4% 41	-2% -1	1% 4	2% 12
172071	Electrical Engineers	1% 15	-3% -1	1% 9	-4% -1	1% 2	0% 0	0% 0	0% 0	0% 0	1% 1
119041	Engineering Managers	1% 71	-2% -1	2% 32	-1% 0	1% 7	0% 0	0% 0	-3% -1	-1% -2	0% 0
513023	Slaughterers and Meat Packers	0% 4	0% 0	3% 5	N/A N/A	-1% 0	-1% 0	2% 2	0% 0	3% 2	4% 2
434051	Customer Service Representatives	5% 2822	4% 16	5% 672	1% 6	5% 296	3% 20	5% 178	3% 5	4% 46	3% 75
512022	Electrical & Electronic Eq Assembler	-3% -192	-6% -10	-1% -21	-2% 0	-3% -23	-3% -2	-3% -21	-4% -2	-3% -13	-3% -5
519061	Inspectors, Testers, Sorters, Weighers	0% -32	-3% -4	1% 19	-2% -1	-1% -13	-3% -6	0% -4	-3% -3	-2% -7	-1% -6
514033	Grinding, Lapping, Polishing, and Buffing Machine Tool Setters, Operators, and Tenders, Metal and Plastic	0% 7	0% 0	1% 5	N/A N/A	0% -1	-3% -1	1% 1	1% 0	1% 1	0% 0
514111	Tool and Die Makers	-1% -18	0% 0	1% 6	0% 0	-2% -10	-3% -1	1% 2	0% -1	0% -2	-1% -2
172141	Mechanical Engineers	2% 77	1% 0	2% 33	0% 0	1% 5	-1% -1	2% 10	1% 1	1% 3	1% 2
113040	Human Resource Managers	3% 276	2% 1	4% 78	1% 0	4% 34	1% 1	4% 22	2% 1	2% 4	3% 9
499041	Industrial Machinery Mechanics	1% 56	2% 1	3% 21	1% 0	1% 5	0% 0	2% 6	1% 1	3% 5	2% 5
131111	Management Analysts	4% 379	3% 1	4% 105	4% 1	5% 52	1% 1	4% 21	4% 1	4% 6	2% 6
517011	Cabinetmakers and Bench Carpenters	1% 17	1% 1	3% 9	N/A N/A	2% 2	2% 0	1% 2	0% 0	2% 1	1% 2
514041	Machinists	1% 17	0% 0	2% 9	0% 0	0% 0	-2% -2	1% 2	0% 0	1% 1	0% 0

SOC	Occupation	Cook	DeKalb	DuPage	Grundy	Lake	Kankakee	Kane	Kendall	McHenry	Will
		70	1	40	0	-1	-2	13	1	4	1
514011	Comp-Control Mach Tool Op, M/P	2%	2%	4%	2%	1%	1%	3%	3%	2%	2%
		83	2	37	0	3	1	16	3	8	4
519198	Helpers--Production Workers	1%	0%	2%	-1%	0%	-1%	1%	0%	1%	0%
		185	1	79	-1	14	-5	22	-1	6	2
514031	Cut, Punch, & Press Mach Set, M/P	-2%	-3%	-1%	-2%	-2%	-4%	-2%	-2%	-2%	-2%
		-137	-5	-21	-1	-21	-4	-14	-3	-11	-8
514072	Mold, Core, & Cast Mach Op, M/P	0%	0%	0%	-2%	0%	-3%	0%	0%	0%	0%
		-7	0	3	-1	-3	-2	0	0	1	-1
519041	Extrude, Form, Press Mach Set, Op	1%	2%	1%	0%	1%	0%	0%	-1%	1%	1%
		7	0	2	0	2	0	1	0	1	1
372011	Janitors and Cleaners, Except Maids	3%	2%	3%	1%	3%	1%	3%	1%	2%	3%
		1638	13	405	2	209	11	169	3	35	82
273041	Editors	3%	3%	4%	2%	4%	2%	4%	3%	5%	3%
		101	1	31	0	10	1	9	0	6	3
112022	Sales Managers	5%	4%	5%	4%	5%	3%	6%	4%	4%	4%
		573	4	155	2	67	4	46	3	17	24
537062	Laborers and Freight, Stock,Movers	2%	1%	3%	1%	2%	0%	3%	1%	1%	2%
		1211	5	365	3	134	1	113	2	22	50
439061	Office Clerks, General	3%	1%	3%	1%	3%	1%	3%	2%	2%	2%
		1935	11	537	3	225	9	157	6	41	77
194031	Chemical Technicians	2%	1%	3%	1%	1%	0%	1%	N/A	1%	0%
		26	0	10	0	5	0	2	N/A	1	0
537064	Packers and Packagers, Hand	2%	2%	3%	1%	3%	1%	4%	2%	4%	3%
		554	4	178	1	80	2	77	3	30	30
515023	Printing Machine Operators	0%	0%	1%	0%	1%	-1%	1%	2%	2%	0%
		7	0	12	0	6	0	5	0	3	0
533032	Truck Drivers, Heavy and Tractor-Trailer	4%	3%	4%	3%	3%	2%	4%	2%	3%	3%
		1720	13	423	10	114	13	98	6	38	80
113021	Computer and IS Managers	7%	6%	7%	7%	7%	5%	8%	7%	6%	6%
		576	4	131	2	59	5	40	2	12	19
113031	Financial Managers	3%	2%	4%	3%	4%	2%	3%	2%	3%	3%
		622	3	166	2	75	3	38	2	13	22
511011	First-Line Sup/Mgrs of Production Workers	0%	0%	1%	0%	0%	-1%	0%	0%	0%	0%
		8	-1	30	0	-5	-4	6	0	1	-4
433031	Bookkeeping, Accounting,Auditing Clerks	1%	0%	1%	-1%	1%	0%	1%	-1%	0%	0%
		243	-1	99	-1	34	-2	22	-2	3	5
132011	Accountants and Auditors	3%	2%	3%	2%	3%	1%	2%	3%	3%	2%
		697	4	195	2	92	3	36	2	17	22
111021	General and Operations Managers	2%	1%	3%	2%	2%	1%	3%	1%	2%	2%
		1296	9	369	5	156	8	101	3	39	60
499042	Maintenance and Repair Workers, General	1%	0%	1%	1%	1%	0%	1%	0%	0%	1%
		225	0	78	1	18	-1	21	0	2	7
512092	Team Assemblers	0%	-1%	1%	0%	0%	-1%	0%	0%	0%	0%
		-43	-5	32	0	-5	-2	1	0	-1	-1

SOC	Occupation	Cook	DeKalb	DuPage	Grundy	Lake	Kankakee	Kane	Kendall	McHenry	Will
412031	Retail Salespersons	1%	3%	2%	2%	2%	1%	2%	2%	3%	2%
		947	26	399	8	225	18	121	16	74	83
172112	Industrial Engineers	-1%	-1%	0%	-1%	-1%	-2%	0%	-1%	-1%	-2%
		-18	0	3	0	-5	-1	-1	0	-1	-2
515022	Prepress Technicians and Workers	-5%	-4%	-4%	-3%	-4%	-6%	-4%	N/A	-3%	-5%
		-135	-1	-27	0	-9	-2	-8	N/A	-4	-4
431011	First-Line Sup/Mgr of Office & Administrative Workers	1%	1%	2%	0%	1%	0%	1%	1%	1%	1%
		395	2	129	1	48	2	28	1	12	19
414011	Sales Rep, Wholes & Man, Tech & Scientific	1%	0%	1%	0%	1%	0%	1%	0%	0%	1%
		59	0	35	0	17	0	7	0	2	6
519195	Molders, Shapers, Casters, except Metal Plastic	0%	0%	0%	N/A	0%	0%	0%	0%	1%	0%
		2	0	0	N/A	0	0	0	0	1	0
113051	Industrial Production Managers	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
		5	0	9	0	1	0	2	0	1	0
414012	Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	1%	0%	1%	0%	1%	0%	1%	0%	0%	1%
		175	1	107	-1	48	-1	24	0	5	11

Annual Growth Openings

SOC	Occupation	Cook	DeKalb	DuPage	Grundy	Lake	Kankakee	Kane	Kendall	McHenry	Will
151031	Computer Software Engineers, Applications	9%	5%	10%	6%	10%	7%	10%	3%	6%	10%
		918	5	231	3	95	6	83	1	16	31
513093	Food Cooking Mach Operator & Tend	0%	N/A	1%	N/A	0%	0%	3%	0%	6%	0%
		0	N/A	1	N/A	0	0	1	0	1	0
151051	Computer Systems Analysts	5%	4%	6%	2%	5%	4%	6%	2%	4%	5%
		732	4	184	1	83	5	63	1	12	25
151071	Network and Computer Systems Admin	8%	8%	8%	5%	8%	6%	9%	7%	6%	8%
		406	3	97	1	45	3	32	1	7	14
151041	Computer Support Specialists	8%	6%	8%	8%	8%	6%	9%	5%	6%	8%
		884	7	210	3	93	7	68	2	18	32
151032	Computer Software Engineers, Systems	7%	6%	8%	8%	8%	6%	8%	7%	6%	7%
		281	2	69	1	28	2	23	1	6	9
112021	Marketing Managers	3%	2%	3%	0%	3%	2%	3%	0%	3%	3%
		166	1	44	0	19	1	14	0	5	6
131111	Management Analysts	2%	2%	2%	3%	2%	1%	2%	0%	2%	1%
		190	1	53	1	26	1	10	0	3	3
273041	Editors	2%	0%	2%	0%	2%	0%	3%	0%	3%	2%
		51	0	16	0	5	0	5	0	3	2
513023	Slaughterers and Meat Packers	0%	0%	1%	N/A	0%	0%	1%	0%	2%	2%
		2	0	3	N/A	0	0	1	0	1	1
151021	Computer Programmers	1%	0%	2%	0%	1%	0%	2%	0%	1%	1%
		165	0	54	0	22	0	21	0	2	6
172071	Electrical Engineers	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
		8	0	5	0	1	0	0	0	0	0
119041	Engineering Managers	1%	0%	1%	0%	0%	0%	0%	0%	0%	0%
		35	0	16	0	4	0	0	0	0	0
434051	Customer Service Representatives	3%	2%	3%	1%	3%	2%	3%	2%	2%	2%
		1414	8	337	3	148	10	89	3	23	38
512022	Electrical & Electronc Eq Assembler	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
		0	0	0	0	0	0	0	0	0	0
519061	Inspectors, Testers, Sorters, Weighers	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
		0	0	9	0	0	0	0	0	0	0
514033	Grinding, Lapping, Polishing, and Buffing Machine Tool Setters, Operators, and Tenders, Metal and Plastic	0%	0%	0%	N/A	0%	0%	0%	0%	0%	0%
		4	0	2	N/A	0	0	1	0	0	0
514111	Tool and Die Makers	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
		0	0	3	0	0	0	1	0	0	0
172141	Mechanical Engineers	1%	0%	1%	0%	0%	0%	1%	1%	1%	0%
		38	0	17	0	3	0	5	1	2	1
113040	Human Resource Managers	2%	2%	2%	0%	2%	0%	2%	0%	1%	2%
		138	1	39	0	17	0	11	0	2	5
499041	Industrial Machinery Mechanics	1%	0%	1%	0%	0%	0%	1%	0%	2%	1%
		28	0	10	0	2	0	3	0	3	3
517011	Cabinetmakers and Bench Carpenters	1%	1%	2%	N/A	1%	0%	1%	0%	2%	1%

SOC	Occupation	Cook	DeKalb	DuPage	Grundy	Lake	Kankakee	Kane	Kendall	McHenry	Will
		8	1	4	N/A	1	0	1	0	1	1
514041	Machinists	0%	0%	1%	0%	0%	0%	1%	0%	0%	0%
		35	0	20	0	0	0	7	0	2	0
514011	Comp-Control Mach Tool Op, M/P	1%	1%	2%	0%	0%	0%	2%	2%	1%	1%
		42	1	18	0	1	0	8	2	4	2
519198	Helpers--Production Workers	0%	0%	1%	0%	0%	0%	1%	0%	0%	0%
		93	0	40	0	7	0	11	0	3	1
514031	Cut, Punch, & Press Mach Set, M/P	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
		0	0	0	0	0	0	0	0	0	0
514072	Mold, Coremake, & Cast Mach Op, M/P	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
		0	0	2	0	0	0	0	0	1	0
519041	Extrude, Form, Press Mach Set, Op	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
		3	0	1	0	1	0	0	0	0	0
372011	Janitors and Cleaners, Except Maids	1%	1%	2%	0%	2%	1%	2%	1%	1%	1%
		820	6	203	1	105	6	84	2	18	41
112022	Sales Managers	3%	2%	3%	2%	3%	1%	3%	3%	2%	2%
		287	2	78	1	33	2	23	2	8	12
537062	Laborers and Freight, Stock,Movers	1%	1%	1%	1%	1%	0%	1%	0%	1%	1%
		606	3	183	2	67	1	57	1	11	25
439061	Office Clerks, General	1%	1%	2%	0%	2%	1%	2%	1%	1%	1%
		968	5	269	1	113	5	79	3	21	39
194031	Chemical Technicians	1%	0%	1%	0%	0%	0%	1%	N/A	0%	0%
		13	0	5	0	3	0	1	N/A	0	0
537064	Packers and Packagers, Hand	1%	1%	2%	0%	2%	0%	2%	1%	2%	1%
		277	2	89	0	40	1	39	2	15	15
515023	Printing Machine Operators	0%	0%	1%	0%	1%	0%	1%	0%	1%	0%
		3	0	6	0	3	0	3	0	2	0
533032	Truck Drivers, Heavy and Tractor-Trailer	2%	2%	2%	2%	2%	1%	2%	1%	1%	2%
		861	7	212	5	57	7	49	3	19	40
113021	Computer and IS Managers	4%	4%	4%	4%	4%	3%	4%	3%	3%	4%
		289	2	66	1	30	2	20	1	6	9
113031	Financial Managers	2%	1%	2%	2%	2%	1%	2%	1%	1%	2%
		311	2	83	1	38	2	19	1	6	11
511011	First-Line Sup/Mgrs of Production Workers	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
		4	0	15	0	0	0	3	0	0	0
433031	Bookkeeping, Accounting,Auditing Clerks	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
		122	0	49	0	17	0	11	0	1	2
132011	Accountants and Auditors	1%	1%	2%	1%	2%	0%	1%	1%	1%	1%
		349	2	98	1	46	1	18	1	8	11
111021	General and Operations Managers	1%	1%	1%	1%	1%	0%	1%	0%	1%	1%
		648	4	185	2	78	4	51	1	20	30
499042	Maintenance and Repair Workers, General	0%	0%	1%	1%	0%	0%	1%	0%	0%	0%
		113	0	39	1	9	0	10	0	1	4
512092	Team Assemblers	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
		0	0	16	0	0	0	1	0	0	0

SOC	Occupation	Cook	DeKalb	DuPage	Grundy	Lake	Kankakee	Kane	Kendall	McHenry	Will
412031	Retail Salespersons	1% 474	1% 13	1% 199	1% 4	1% 113	1% 9	1% 61	1% 8	1% 37	1% 42
172112	Industrial Engineers	0% 0	0% 0	0% 2	0% 0	0% 0	0% 0	0% 0	0% 0	0% 0	0% 0
515022	Prepress Technicians and Workers	0% 0	0% 0	0% 0	0% 0	0% 0	0% 0	0% 0	N/A N/A	0% 0	0% 0
431011	First-Line Sup/Mgr of Office & Admi	1% 197	0% 1	1% 65	0% 0	1% 24	0% 1	1% 14	1% 1	1% 6	1% 9
414011	Sales Rep, Wholes & Man, Tech & Sci	0% 30	0% 0	1% 17	0% 0	1% 9	0% 0	1% 4	0% 0	0% 1	1% 3
519195	Molders, Shaprs, & Castrs, Ec M/P	0% 1	0% 0	0% 0	N/A N/A	0% 0	0% 0	0% 0	0% 0	0% 0	0% 0
113051	Industrial Production Managers	0% 2	0% 0	1% 5	0% 0	0% 1	0% 0	0% 1	0% 0	0% 1	0% 0
414012	Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	0% 88	0% 0	1% 54	0% 0	1% 24	0% 0	0% 12	0% 0	0% 3	0% 5

Annual Replacements

SOC	Occupation	Cook	DeKalb	DuPage	Grundy	Lake	Kankakee	Kane	Kendall	McHenry	Will
519195	Molders, Shapers, & Casters, Except Metals & Plastics	3% 18	0% 0	2% 4	N/A N/A	2% 4	5% 1	3% 5	4% 1	2% 1	2% 1
517011	Cabinetmakers and Bench Carpenters	3% 41	3% 2	3% 8	N/A N/A	3% 3	5% 1	3% 6	0% 0	3% 2	3% 5
515022	Prepress Technicians and Workers	2% 74	4% 1	2% 18	0% 0	3% 6	3% 1	3% 6	N/A N/A	2% 3	2% 2
172141	Mechanical Engineers	3% 132	3% 2	3% 40	6% 1	3% 19	2% 1	3% 13	3% 3	3% 9	3% 8
514011	Computer Controlled Machine Operator, Metals & Plastics	4% 118	4% 3	4% 34	0% 0	4% 16	3% 1	4% 15	3% 4	3% 11	4% 8
519041	Extruding, Forming, Pressing Machine Operator	2% 25	0% 0	2% 5	0% 0	2% 6	3% 1	2% 5	4% 1	2% 1	2% 2
273041	Editors	3% 94	4% 1	3% 22	0% 0	3% 7	4% 1	4% 7	0% 0	3% 4	3% 3
113021	Computer and IS Managers	2% 125	2% 1	2% 28	4% 1	2% 13	1% 1	2% 8	3% 1	2% 3	2% 4
513093	Food Cooking Mach Operator & Tend	2% 12	N/A N/A	2% 2	N/A N/A	3% 1	0% 0	3% 1	0% 0	0% 0	0% 0
513023	Slaughterers and Meat Packers	2% 45	0% 0	2% 5	N/A N/A	3% 2	3% 1	2% 2	0% 0	2% 1	2% 1
172112	Industrial Engineers	2% 46	2% 1	2% 12	0% 0	2% 7	3% 1	2% 5	2% 1	2% 3	2% 3
514111	Tool and Die Makers	3% 88	2% 2	2% 25	0% 0	3% 12	3% 1	2% 11	2% 3	2% 8	2% 6
515023	Printing Machine Operators	3% 121	2% 1	2% 29	0% 0	3% 11	2% 1	3% 10	0% 0	2% 5	2% 4
151051	Computer Systems Analysts	1% 120	1% 1	1% 28	2% 1	1% 14	1% 1	1% 9	0% 0	1% 3	1% 4
151071	Network and Computer Systems Admin	0% 23	0% 0	0% 5	0% 0	0% 2	0% 0	1% 2	0% 0	1% 1	1% 1
151032	Computer Software Engineers, Systems	1% 27	0% 0	1% 6	0% 0	1% 3	0% 0	1% 2	0% 0	1% 1	1% 1
112021	Marketing Managers	1% 87	2% 1	1% 20	0% 0	2% 10	2% 1	1% 6	0% 0	2% 3	1% 3
151041	Computer Support Specialists	0% 48	1% 1	0% 11	0% 0	0% 5	1% 1	0% 3	0% 0	0% 1	0% 2
151021	Computer Programmers	2% 299	2% 2	2% 71	2% 1	2% 31	2% 3	2% 20	3% 1	2% 6	2% 10
172071	Electrical Engineers	2% 46	2% 1	2% 12	0% 0	2% 7	0% 0	2% 4	0% 0	2% 2	2% 2
119041	Engineering Managers	2% 99	1% 1	2% 25	3% 1	2% 14	1% 1	2% 8	2% 1	2% 4	2% 5
194031	Chemical Technicians	2%	0%	2%	3%	2%	2%	2%	N/A	2%	2%

SOC	Occupation	Cook	DeKalb	DuPage	Grundy	Lake	Kankakee	Kane	Kendall	McHenry	Will
		38	0	8	1	17	2	3	N/A	1	3
434051	Customer Service Representatives	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
		424	3	99	3	46	5	27	2	10	18
512022	Electrical & Electronic Eq Assembler	3%	2%	3%	4%	3%	3%	3%	2%	3%	3%
		194	5	43	1	20	2	19	1	13	5
519061	Inspectors, Testers, Sorters, Weighers	2%	2%	2%	2%	2%	2%	2%	3%	2%	2%
		230	3	52	1	35	4	25	3	11	12
514033	Grinding, Lapping, Polishing, and Buffing Machine Tool Setters, Operators, and Tenders, Metal and Plastic	2%	2%	2%	N/A	3%	5%	2%	3%	3%	3%
		51	1	12	N/A	7	1	5	1	4	3
113040	Human Resource Managers	2%	2%	2%	4%	2%	3%	2%	3%	2%	2%
		137	1	31	1	15	2	9	1	3	5
499041	Industrial Machinery Mechanics	3%	3%	3%	3%	3%	3%	3%	2%	3%	3%
		105	1	21	1	17	3	9	1	5	7
131111	Management Analysts	1%	0%	1%	0%	1%	1%	1%	0%	1%	1%
		83	0	19	0	9	1	4	0	1	3
514041	Machinists	2%	2%	2%	3%	2%	2%	2%	2%	2%	2%
		178	3	49	1	26	2	19	4	12	11
519198	Helpers--Production Workers	3%	3%	3%	3%	3%	2%	2%	2%	3%	2%
		518	7	115	3	79	9	50	4	25	28
514031	Cut, Punch, & Press Mach Set, M/P	2%	2%	2%	4%	2%	2%	2%	2%	2%	2%
		153	3	35	1	20	2	18	2	9	7
514072	Mold, Coremake, & Cast Mach Op, M/P	2%	1%	2%	3%	2%	2%	2%	2%	2%	2%
		76	1	19	1	19	2	16	2	5	5
372011	Janitors and Cleaners, Except Maids	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
		1044	13	222	5	111	13	84	5	26	51
112022	Sales Managers	1%	1%	1%	2%	1%	1%	1%	1%	1%	1%
		155	1	39	1	19	2	11	1	5	7
537062	Laborers and Freight, Stock, Movers	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
		1704	16	444	10	194	27	129	11	59	91
439061	Office Clerks, General	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
		1242	14	286	7	139	18	90	6	36	62
537064	Packers and Packers, Hand	3%	3%	3%	2%	3%	2%	3%	2%	3%	2%
		555	5	124	2	63	8	46	4	19	26
533032	Truck Drivers, Heavy and Tractor-Trailer	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
		584	5	138	4	46	11	33	4	17	33
113031	Financial Managers	2%	1%	2%	2%	2%	2%	2%	1%	1%	1%
		271	2	60	1	29	3	17	1	7	10
511011	First-Line Sup/Mgrs of Production Workers	3%	3%	3%	3%	3%	3%	3%	2%	3%	3%
		394	6	90	3	59	7	40	4	20	22
433031	Bookkeeping, Accounting, Auditing Clerks	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
		634	7	145	3	71	9	43	4	20	31
132011	Accountants and Auditors	1%	2%	1%	2%	1%	1%	1%	1%	1%	2%
		368	3	85	2	42	3	21	1	8	13
111021	General and Operations Managers	2%	2%	2%	2%	2%	2%	2%	1%	2%	2%
		901	9	218	5	108	13	63	5	30	48

SOC	Occupation	Cook	DeKalb	DuPage	Grundy	Lake	Kankakee	Kane	Kendall	McHenry	Will
499042	Maintenance and Repair Workers, General	1% 310	1% 4	1% 66	1% 2	1% 37	1% 5	1% 24	1% 2	1% 11	1% 16
512092	Team Assemblers	2% 395	2% 7	2% 94	1% 1	2% 53	2% 5	2% 42	2% 6	2% 25	2% 19
412031	Retail Salespersons	4% 2655	4% 33	4% 705	4% 16	4% 378	4% 62	4% 194	4% 22	4% 96	4% 156
431011	First-Line Sup/Mgr of Office & Admi	2% 569	2% 6	2% 129	2% 3	2% 61	2% 8	2% 39	2% 3	2% 16	2% 27
414011	Sales Rep, Wholes & Man, Tech & Sci	3% 260	2% 2	3% 86	2% 1	3% 46	3% 4	3% 19	2% 1	3% 10	3% 14
113051	Industrial Production Managers	2% 70	1% 1	2% 15	0% 0	2% 12	1% 1	2% 7	2% 1	2% 4	2% 4
414012	Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	3% 890	3% 8	3% 274	3% 4	3% 122	3% 12	3% 65	2% 5	3% 34	3% 43
151031	Computer Software Engineers, Applications	1% 68	1% 1	1% 16	0% 0	1% 7	1% 1	1% 5	0% 0	1% 2	1% 2