

**ROOT CAUSES  
FOR  
CRITICAL SKILL SHORTAGES IN  
MANUFACTURING**

**July 2004**



**The Workforce Boards**  
OF METROPOLITAN CHICAGO

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## Executive Summary

**T**he manufacturing industry in the Chicago Metropolitan region has a problem: at a time when increasingly global competition is fiercer than ever, the region is plagued by critical skill shortages, with no obvious source of relief in sight.

Here is what firms are saying about how skill shortages manifest themselves in the region:<sup>1</sup>

- “I can’t find skilled craftspeople – welders, mechanics, machinists, carpenters, or electricians. When the economy was good, I couldn’t find applicants for these jobs at all. Now I’m flooded with resumes, but not from the skilled workers I need.”
- “Many of my employees are on the verge of retirement – and I don’t really have a next tier. The guys who are leaving have been here for years. They hold a lot of knowledge and experience – they are masters. I don’t know how I’m going to extract what they know and pass it along to their replacements; and I don’t know where I’m going to find their replacements.
- “In my plant, I’m introducing new technologies at every level. I’m desperate for my employees to take advantage of them, but many fear the loss of their jobs – and, for some, those fears are justified.”
- “My people are good workers – but they don’t understand quality. It’s not just about following directions or adopting a new process. I want their ideas about how to make better products, and make them more efficiently.”
- “I worked my way up to management, so did most of my peers. But I have a hard time trying to figure out which employees on the shop floor are ready for that, or would even be interested. It’s more work now than it used to be, I know. But we need new young talent – not MBAs, but the kind that know the products and know how they’re made.”
- “Why can’t I find young people who can show up on time? I have some good workers – most of them immigrants. But when I try to hire young people for entry-level jobs, they don’t last, even though I’ve got model employees for them to look to.”
- “We’re going global. We’re trading in different time zones, and I like that our workforce reflects that – we’ve got the United Nations in our plant. However, it really complicates training. We’ve got too many languages to do something like ‘workplace English for Spanish speakers,’ and it’s hard

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<sup>1</sup> These are not direct quotes but the paraphrased sentiments of numerous employers who participated in interviews and focus groups. Comprehensive findings are summarized in reports available through the Workforce Boards of Metropolitan Chicago.

to tell the difference between the need for language skills and the need for technical skills.”

- “I offer tuition reimbursement, but my employees aren’t really interested. A few have used it, but it’s been a while.”

Employees in manufacturing expressed concerns about skills issues as well, some of which were shared by their employers.

- “When I joined the company, we had an orientation, but it didn’t really cover a lot of what I needed to know. We learned a lot about the company itself and the product, but I didn’t learn to read a blueprint until my boss threw one at me.”
- “We’re doing a lot of team work now, so we need people with good communication skills. I’m not sure they’re screening for that in HR, because we sure get a lot of people who don’t listen, and worse, don’t share information.”
- “They are putting computers everywhere – I’m a couple years from retirement and hoping to lay low until I can go. I don’t want my whole job to change.”
- “Good judgment. I don’t know how you prove you have it, but I wish more people did. We work on a fast production line – you have to be smart and decisive. It’s so frustrating when people aren’t – and that includes the higher-ups.”
- “I like my job, and on the whole, I think this is a good place to work. I’d like to know about opportunities to move up and get a raise – but I’m not sure how you find out. Lots of jobs are filled even before they post them.”
- “If I got help with the cost, sure I’d go to school.”<sup>2</sup>
  - “I’d take classes directly related to my current job” (42%).
  - “I’d take classes for personal fulfillment” (24%).
  - “I’d enroll in training so I could advance in my company” (23%).
  - “I’d take classes toward a certificate, diploma, or degree” (13%).

Our previous report, **Critical Skill Shortages in Manufacturing in the Chicago Metropolitan Region** (June 2004), documented specific shortage areas. This report describes the root causes of those shortages. There are four of them:

- Increased demand for advanced skills in manufacturing sectors, at all levels;
- An aging manufacturing workforce;
- The manufacturing industry’s poor image; and

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<sup>2</sup> Only 7% of respondents indicated that they were not interested in training or coursework.

- Specific information gaps that prevent skill needs from being met and prevent new talent from building manufacturing careers.

The next step is finding solutions.

# Introduction

This report is a product of the **Critical Skills Shortage Initiative (CSSI)**, a project undertaken by the Workforce Boards of Metropolitan Chicago. The project is designed to:

- Assess the occupational and skill needs of firms in the Chicago metropolitan region's key industries; in metropolitan Chicago, **health care, manufacturing**, and the umbrella industry comprising **transportation, warehousing, and logistics** were the three key industries around which the CSSI project initially focused;
- Identify (current and emerging) critical needs and challenges among firms in these industries that threaten to undermine their competitiveness;
- Identify the root causes of these unmet needs and challenges (short- and long-term); and
- Engage a wide range of stakeholders, led by employers and key industry associations, in developing and implementing solutions to these critical challenges.

Ultimately, this work is intended to help project partners, including the Workforce Boards, the region's colleges, training and employment programs, employers and industry associations, and the philanthropic community make smart investments in people, firms, and communities that enhance the economic vitality of the region and the state of Illinois.

In addition, and of equal importance, the project is intended to catalyze innovative public/private partnerships that seek to make a difference for the region's firms and workers moving into the future.

The Workforce Boards of Metropolitan Chicago have managed the project since its inception in January 2004. The Workforce Boards of Metropolitan Chicago is a collaboration of nine Workforce Boards providing policy expertise and investing in services in 11 northern Illinois counties, Cook, DeKalb, DuPage, Grundy, Kane, Kankakee, Kendall, Livingston, Lake, McHenry, and Will.

The CSSI project requires that the Workforce Boards submit a series of four products to the State of Illinois for each of the key industries selected for participation. These include:

- A Critical Skill Shortage Report
- A Root Cause Report
- A Solutions Report; and
- An Evaluation Report



This report is the **Root Causes Report** for the **manufacturing** industry. Drawing on the data summarized in the **Critical Skill Shortages Report**, this product synthesizes the results of the multiple qualitative and quantitative intelligence gathering activities completed from March–June 2004, and focusing on the areas of need described in the **Critical Skill Shortages Report**, identifies the key root causes of these shortages.

Importantly, moving from shortages or needs to causes was not always a straightforward exercise. In many cases it required some level of analysis and judgment. Many of the firms with whom we spoke were able to articulate how hiring and recruiting had changed over time, identifying specific policies and practices such as new employee assessments or changes in work schedules, and described the impact on their ability to recruit, retain, and develop talent. But this was not always the case. For example, a number of the firms we interviewed stated that the primary reason they were unable to recruit appropriately skilled workers was the poor quality of the local education system. However, when we reviewed quantitative data (surveys) from the same firms, we found that several were paying far below the prevailing wage levels for similar jobs in their areas; others were not recruiting workers who were educated locally; and still others maintained a workforce far too old for the local education system to be relevant, or insisted on a level of experience that was impossible for young workers to have achieved.

In addition, the experiences and needs of firms were more diverse than can possibly be reflected in an aggregate analysis. For example, we convened focus groups in which 60% of the participating firms identified similar critical needs, while the remaining 40% identified needs unique to them. These unique needs are no less critical for the (mostly small) firms that identified them than are the shared needs of the majority of firms. However, the former will not feature as prominently in the summary analysis since they were identified less frequently.

For these reasons, we have woven statements, quotes, and anecdotes from interviews and focus groups throughout the report. These testimonies reveal some of the complexity inherent in our 21<sup>st</sup> century labor markets, and explain some of the difficulties individuals, firms, and communities have in navigating them—supply and demand are hard to align.

### **This report describes:**

- **The methodologies used to gather intelligence** about occupation and skill shortages, human resource, and training needs of the manufacturing industry in the Chicago metropolitan region;
- **The processes used to engage industry and community partners** in the intelligence gathering component of the CSSI project, and to begin developing partnerships with the capacity to address key areas of unmet need over time;

- **The root causes of critical skill shortages** (and related human resource and training needs), and how these causes were identified.

This report is *not* intended as a comprehensive assessment of the health of the manufacturing industry or its needs. Rather, it focuses on needs relating to shortage occupations, skill gaps, and related human resource and training issues. Discussion of broad industry, organizational, and demographic shifts are presented as context, but are not the focus of the report.

Finally, during our discussions, interviews, surveys, and meetings, a broad range of stakeholders (firms and workers, public and private) provided thoughtful, honest, and sometimes difficult observations on behalf of their firms and industries; many also provided tours of their facilities, or hosted events. We thank them for their insight, hospitality, and for the hard work they do in our region every day.

## Methodology

The CSSI project seeks to identify critical skill shortages, determine the root causes of those shortages, and craft solutions that address the needs of firms and employees, create opportunities for new workers, and enhance the economic vitality of the manufacturing industry and of the Chicago metropolitan region. In order to identify areas of need and determine root causes, the project used a range of methods, incorporating both primary and secondary sources. Primary research was conducted locally, while secondary research included reviews of literature that focused on the manufacturing industry generally, or on relevant national, regional, or state trends, projects, or initiatives.

**Four themes** emerged throughout this research:

1. The manufacturing industry is undergoing dramatic changes that impact (or will ultimately impact) the knowledge, skills, and practices of its entire workforce;
2. The manufacturing workforce is aging, creating a host of challenges for meeting today's demands, while planning for an unknown future;
3. Manufacturing has an image problem. It is not seen as a sector that is attractive to young people or to career changers. While this is not a new problem, a "perfect storm" of new pressures has worsened an already troubling situation.
4. A host of specific information gaps exist that prevent firms and workers from making business and career decisions that would ultimately benefit them. At an industry-wide level, these information gaps inhibit employee retention and career advancement, while exacerbating the industry's skill shortages.

Specific methodologies from which these findings emerged are reviewed below.

### Primary Research

A variety of primary research methods were used to generate intelligence from the following key sources:

- **Manufacturing firms** – The project focused on 10 key sectors (see Figure 1), and sought information from human resource directors or other senior-level executives in small, medium, and large firms throughout the region.
- **Individuals working in the manufacturing industry** – About 75% of the employees with whom we had contact worked for firms participating in the project. As a result, employees also represented the 10 key manufacturing sectors.

- **Individuals changing jobs or careers**—Some of these individuals had been laid off and were preparing for new careers, others had chosen to pursue new career interests, while still others were returning to work after prolonged illness or time away from the workforce. All of them were making decisions about new jobs, and in many cases, new fields of interest.
- **Young people just beginning to think about jobs and careers**— These students were enrolled in a variety of public school programs, including career academies, college preparatory programs, and alternative programs.
- **Industry associations** representing manufacturing generally and those representing specific key manufacturing sectors.
- **Community or technical college and/or training or employment provider professionals**— These individuals work with traditional and non-traditional college students and with employers seeking specific training programs. Because their customers tend to be very local, they are attuned to the demands of workers and firms within the region.
- **Economic development professionals and executives from industry** or sector-specific staffing firms providing services to new and/or expanding firms in the 10 key sectors.

**Figure 1: CSSI Target Manufacturing Sectors in Metropolitan Chicago<sup>3</sup>**

<b>Durable Goods</b>	
	Primary Metals
	Fabricated Metals
	Industrial Machinery and Equipment
	Electrical Equipment
	Professional and Scientific Instruments and Supplies
<b>Non-durable Goods</b>	
	Food and Kindred Products
	Printing, Publishing, and Allied Products
	Chemical and Allied Products
	Petroleum Refining and Related Products
	Rubber and Plastic Products

<sup>3</sup> These sectors were selected using specific criteria that identified them as “strong performers,” with growth potential or currently in growth mode, and among the industries with a greater than average impact on the regional economy. For more information on the selection criteria, see *The CSSI Critical Skill Shortages Report* (June 2004).

The project used three primary methods for gathering intelligence from these sources: **focus groups, interviews** (telephone and in-person), and **surveys** (telephone, mail-in, web-based). These methods generated both quantitative and qualitative data and enabled some degree of validation. Specific descriptions of data collection approaches relative to key sources follow.

- **Job Vacancy Survey.** In May 2004, the Illinois Department of Employment Security, in collaboration with Brandt Information Services and the Workforce Boards of Metropolitan Chicago, conducted a region-wide survey of over 3,000 employers in the 10 key manufacturing sectors.<sup>4</sup> The objective was to identify manufacturing occupations for which there were high vacancy rates, and begin to ascertain some of the reasons for these shortages. The survey also collected information about job requirements, wage levels, benefits, and reasons for apparent hiring difficulties.
- **Employer focus groups, interviews and surveys.** During April and May 2004, the Corporation for a Skilled Workforce (CSW), in collaboration with the Workforce Boards and the Manufacturing Industry Council, convened a series of focus groups (multiple firms), small group interviews (multiple executives affiliated with the same firms), and individual interviews with executives representing the 10 key manufacturing sectors. Surveys (paper and web-based) were made available to industry representatives who were unable to participate in other data collection activities. In total, 104 executives representing 85 firms in all of the 10 key sectors shared information about occupation and skill shortages, hiring, retention and training practices, and specific areas of need in their firms or sectors.
- **Employee focus groups, interviews, and surveys.** During the same timeframe, CSW collaborated with the Workforce Boards to elicit employee views and experiences using similar methods. Eighty-three individuals living and or working in the Chicago metropolitan region who are employed by firms in the manufacturing industry participated in focus groups, interviews, or completed surveys, sharing information about their jobs and perspectives on their firms, their industries, and their career prospects. About 75% of these employees worked for firms that participated in other CSSI activities; the remainder were contacted with the assistance of the Chicago Federation of Labor and their union partners, and the Center for Labor and Community Research, or through existing organizations and working relationships.
- **Career changer and student focus groups and surveys.** In collaboration with the Workforce Boards and key stakeholder partners,

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<sup>4</sup> The Job Vacancy Survey Final Report is available through the Workforce Boards of Metropolitan Chicago, see <http://www.workforceboardsmetrochicago.org/index.cfm>

including schools, One-Stop Centers, and community colleges, CSW also convened a series of focus groups with individuals making career decisions – both career changers, and young people making career choices for the first time – to ascertain their awareness of jobs and careers in manufacturing and their perceptions of them. One-hundred and twenty-two individuals participated in these focus groups.

- **Focus groups and surveys with key industry experts.** Finally, one focus group comprising exclusively economic development and business and industry training professionals was held in the southern part of the region (at Moraine Valley College). Individuals representing these same areas of expertise in other parts of the region attended focus groups or participated in telephone surveys. About 20 such professionals participated in the CSSI effort this way. They shared information about trends they are observing in their industries and in their local areas, relative to the manufacturing industry.

A series of reports providing detailed findings from these efforts is available through the Workforce Boards of Metropolitan Chicago. The reports include:

**Results of Employer Focus Groups, Interviews, and Surveys in the Manufacturing Industry (June 2004)**

**Results of Employee Surveys and Focus Groups in the Manufacturing Industry (June 2004)**

**CSSI Awareness and Perception Focus Groups (June 2004)**

During the course of our research, a number of events, meetings, or activities occurred that were not directly linked to the CSSI project, but were clearly focused on the same issues. Project representatives attended several such events, using them both to listen to key stakeholders and to conduct additional interviews where possible. For example, McHenry County convened a workshop in which employers representing key sectors shared information about their industries, available career opportunities, and needs with high school and college career and vocational education instructors and program managers. During this event, we interviewed one employer and invited several others to one of the CSSI focus groups.

## **Secondary Research – Review of Industry Reports, Workforce Research, and Integration of JOWE<sup>®</sup> Data**

**I**n addition to gathering intelligence locally through primary sources, the project also used a variety of secondary sources to provide context and to validate local findings. Secondary research methods used included:

- Reviewing key industry reports – local, regional, national, and, in some cases, reports specific to key sectors.
- Reviewing key findings from recent workforce-focused studies; most of these were national in scope or focused on demographic changes by sector or geography.
- Integrating findings from a proprietary database (JOWE<sup>®</sup>) belonging to the Hudson Institute’s Center for Economic Competitiveness.

The industry reports pointed to specific changes occurring in the manufacturing industry that are dramatically altering the landscape in which firms and workers seek to remain competitive – the integration and application of new technologies, global trade and international supply chains, and the intensifying pressure to move new innovations to market faster than the competition.

The workforce literature review pointed to two key trends:

1. The changing demographics of the American (and global) workforce – it’s diversifying, aging, and living longer.
2. The changing skill demands of the 21st century labor market; skill demands at all levels are increasing, but there are also signs of a “hollowing out” of the workforce in which there are fewer mid-level jobs either to absorb career advancers or to catapult employees into senior level positions.

These trends are described in more detail in the root causes analysis. In addition, a bibliography identifying key secondary sources is included as Appendix A.

A few sources also addressed student and career changer perceptions of jobs and careers in the manufacturing industry.

Finally, the Hudson Institute’s Center for Economic Competitiveness analyzed the IDES Job Vacancy Survey using JOWE<sup>®</sup>, a proprietary database that uses correlations from the following secondary data sources:

- Employment Survey 202 (Covered Employment and Wages)
- Bureau of Labor Statistics Occupational Employment
- Bureau of Labor Statistics Employment Survey Occupational Projections
- The Occupational Information Network (O\*Net)

Hudson was able to establish correlations between the JOWE<sup>®</sup> database and the IDES survey data that enabled the Workforce Boards to identify current and probable areas of occupation and skill shortages with a high degree of confidence. This information was used (and largely validated) to guide discussions in employee and employer focus groups, as well as those comprising job seekers and students.

## Regional Coalition and Industry Partner Engagement

The Workforce Boards of Metropolitan Chicago have engaged a broad range of manufacturing industry professionals from the 10 key sectors, in addition to key stakeholders representing the following constituent groups:<sup>5</sup>

- Professional and trade associations
- Labor unions
- Public high schools, colleges, universities and training programs
- Private training providers, employment programs and staffing firms
- Community organizations and interest groups
- Local government
- Economic development professionals
- Workforce professionals

The Workforce Boards have established both a formal structure for industry and community participation in CSSI planning and invited participation in informal ways since the project's inception.

### Partnership Structure

The project's formal partnership structure includes a number of entities whose roles are described as follows:<sup>6</sup>

- 1. The CSSI Leadership Council.** The Leadership Council membership comprises the private-sector Board Chairs and the Chief Local Elected Officials (or their designees) associated with the local Workforce Boards who are members of the Metropolitan Chicago (regional) partnership. The Council provides oversight to the CSSI project, and ultimately, the implementation of CSSI initiatives or programs.
- 2. The CSSI Regional Council.** The Regional Council's members include a broad range of industry, labor, and government professionals – the State Departments of Human Services, Commerce and Economic Opportunity, and Employment Security, the Illinois Community College Board, Labor organizations, Economic Development and Workforce Professionals, the Chair and Vice Chair

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<sup>5</sup> A number of contractors and consultants were involved in the specific research components of the CSSI project. In most cases, these contractors were also involved in meetings, summits, and scheduled events. They are cited throughout the Appendices attached to this report.

<sup>6</sup> Membership lists for these groups are included as Appendix B.



of the Industry Sector and One-Stop Councils, Foundations, Workforce Board Chairs, Community College Presidents, and other private-sector industry experts. During the planning phase of the CSSI project, they assisted in all aspects of information dissemination, intelligence gathering, etc. And as the project progresses, it is this group that will be expected to lead an effort to redirect resources to better meeting the needs of firms and workers in Metropolitan Chicago's manufacturing industry.

- 3. The CSSI Manufacturing Council.** The Manufacturing Council includes a range of industry and trade association professionals, together with economic development, Chambers of Commerce, and labor leaders. The Council is charged with providing intelligence, outreach and networking assistance in support of CSSI research activities, as well as validating CSSI findings, helping the Workforce Boards interpret these findings, and developing and helping to implement solutions to the critical challenges identified through the CSSI project.
- 4. The CSSI One-Stop Council.** The One-Stop Council includes representatives from One-Stop partners in each local workforce area. The Council is focused on sharing best practices in program design and sector strategies, implementation of CSSI findings and solutions, and providing feedback and input on regional efforts to the Workforce Boards and other key investors.
- 5. CSSI Stakeholders and Community Groups.** While there is no formal stakeholder *membership* list, an array of stakeholder and community groups has participated in all CSSI activities. The Workforce Boards maintain a growing mailing list to inform stakeholders.

## Engagement Activities

While the Workforce Boards had been engaged in regional activity for some time, including convening a region-wide industry-sponsored Manufacturing Summit in May 2003, the CSSI project provided an opportunity to engage industry, education, labor, and community partners more broadly and in more diverse, meaningful, and sustainable ways.

The 2003 Manufacturing Summit generated **three Action Teams** on specific topics that emerged as important challenges facing metropolitan Chicago manufacturers – **Image and communication, Government and Policy, and Career Paths**. These teams became the anchors for the broader CSSI infrastructure. The Leadership and Regional Councils met on April 14, 2004 to assess the state of CSSI activities and begin working through the content that had emerged to date from preliminary surveys and focus groups.

In fall 2003, the Workforce Boards convened three regional events over a two-day period to introduce the CSSI project, and began to develop a region-wide approach to managing CSSI over time. One hundred twenty individuals representing the workforce and training provider communities, the research community, and key industry experts participated in these events, and developed the initial CSSI project “blueprint” intended to guide the research approach, and the industry and community engagement process, and establish a formal oversight structure to insure accountability and follow-through.

The stakeholder/community groups were invited to public forums convened on April 26 and June 7, 2004. They were provided an opportunity to comment on and lend insight to the planned data collection processes developed to date, and identify ways to contribute to the CSSI project and products between meetings and events.

The Manufacturing Sector Council convened on May 10, 2004 to discuss:

- The preliminary selections of critical skills occupations.
- Preliminary findings of surveys, interviews, and focus groups with manufacturing industry experts and employees; and
- The process by which root causes of critical skills shortages would be determined.

The Leadership and Regional Councils re-convened on May 24, 2004 to finalize the list of critical shortage occupations using a process that involved both modified voting and consensus.

The Manufacturing Sector Council re-convened on June 22, 2004 for a work session in which the results of the CSSI data collection efforts were finalized and the occupational shortages and causes of those shortages were discussed, debated, and ranked to validate their accuracy and determine their relative importance.

The Leadership and Regional Councils then met again on June 28, 2004 to review and discuss root causes contributing to a shortage of skilled workers for critical manufacturing occupations identified through their earlier quantitative research.

Importantly, participation from all local areas in the region was high, despite the time commitment and travel distances for some of the more remote parts of the region.

## Informal Engagement

**I**n addition to the formal engagement structure, the Workforce Boards welcomed informal input through a variety of channels.

First, materials were liberally disseminated at every event; employers and stakeholders were encouraged to take extras back to colleagues who were unable to attend, but could share insight, opinion, or experience in writing, by email, or by telephone or fax.

Second, the web-site of the Workforce Board partnership was referenced on nearly every hand-out linked to the CSSI project. Industry and community stakeholders were encouraged to make use of the site on which the contact information, including direct email links, for all the local Workforce Boards is also available.

Third, materials were prepared specifically for dissemination by the members of the various councils to their peers not directly involved in CSSI, but who may have been interested or may have been willing to participate in an interview or focus group. This included professional and trade associations, many of whom generously communicated with their membership about CSSI activities.

Fourth, throughout the process, the researchers encountered individuals interested in but not connected to CSSI, and made a conscious effort to link these individuals with either their local Workforce Boards or with CSSI project activities, as appropriate.

Finally, the CSSI project coordinators (both the regional staff and the local Workforce Boards) used e-mail extensively to disseminate information and invite input into the CSSI process, and to share this input with each other. Importantly, at no time did any of the local Boards submit information or try to influence findings as a local Board or local area. The coordination, research, input processes, and decision-making processes were all regional.

Project partners feel that this process yielded good data and set the right priorities for the next phase of CSSI, and are pleased with the level of support that was generated through this process.<sup>7</sup>

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<sup>7</sup> Letters of support – for the process and its findings to date – from key industry experts who participated in the CSSI planning process were submitted with this report. Copies are attached in Appendix D.

# Description of Root Causes

## Identification of Critical Skills Shortage Occupations

During the research phase of the project, a large number – in excess of 70 – job titles were identified as critical skill shortage occupations by the 2,500 participating manufacturing employers. This list was narrowed using a number of different factors:

- The frequency with which vacancy rates were reported;
- The hiring difficulty associated with specific vacancies;
- The wage levels, educational requirements, and benefits associated with reported shortage occupations;
- The number of openings or increased demand expected over time;
- The potential for career development associated with these occupations;
- The current and expected performance of the sector(s) with which shortage occupations are affiliated; and
- The likely impact of Workforce Board and partner investments on firms or individuals currently employed, or with the potential to be employed, in these occupations.

A full description of the methodology used to develop the target list can be found in the **CSSI Critical Skill Shortages Report on the Manufacturing Sector for the Northeastern Illinois Region** (June 2004).

The final list of Critical Skills Shortage Occupations appears in Figures 2 and 3. The first table comprises production-focused occupations that typically require fewer skills or credentials; the second table comprises more advanced positions that typically require higher levels of education.

**Figure 2. Critical Skills Shortages-Production**

<b>Production Occupations</b>
Production, Planning and Expediting Clerks
General and Operations Managers
Packers and Packagers, Hand
Helpers – Production Workers
First-Line Supervisors/Managers of Production and Operating Workers
Maintenance and Repair Workers, General
Team Assemblers
Welders, Cutters, Solderers, and Brazers

<b>Production Occupations</b>
Packaging and Filling Machine Operators and Tenders
First-Line Supervisors/Managers of Mechanics, Installers, and Repairers
Inspectors, Testers, Sorters, Samplers, and Weighers
Machinists
Electrical and Electronic Equipment Assemblers
Computer-Controlled Machine Tool Operators, Metal and Plastic
Electrical and Electronic Engineering Technicians

**Figure 3. Critical Skills Shortages-Advanced**

<b>Production Occupations</b>
Mechanical Engineers
Cutting, Punching, and Press Machine Setters, Operators, and Tenders, Metal and Plastic
Metal Workers and Plastic Workers, All Other
Industrial Machinery Mechanics
Graphic Designers
Printing Machine Operators
Chemists
Tool and Die Makers
Lathe and Turning Machine Tool Setters, Operators, and Tenders, Metal and Plastic
Bakers
Bindery Workers
Mixing and Blending Machine Setters, Operators, and Tenders
Molding, Coremaking, and Casting Machine Setters, Operators, and Tenders, Metal and Plastic
First-Line Supervisors/Managers of Helpers, Laborers, and Material Movers, Hand
Rolling Machine Setters, Operators, and Tenders, Metal and Plastic

The reasons these shortages have emerged in Chicago’s manufacturing industry are complex, and many are not unique to the Chicago metropolitan region. The shortages are the sum total of decisions made (or not made) by individuals and firms, students and schools, governments and trade associations, and private funders and policy makers, all in the context of an industry undergoing dramatic change in the midst of a serious and protracted economic downturn.

## Context: What's Happening in Manufacturing?

The manufacturing industry worldwide is in the midst of structural change – **technology, globalization** and **competition** are permanently changing what gets manufactured, as well as how, where, and by whom. While these frequently cited and interrelated dynamics are not unique to manufacturing, their combined and simultaneous impact on the industry, exacerbated by the 2000 recession, has been formidable.

### Technology

**Manufacturing has been fundamentally reshaped by the remarkable improvements in computing, communications, and distribution.**

*Manufacturing in America, US Department of Commerce, 2004*

The shop floors of many firms in diverse manufacturing sectors would be unrecognizable to employees from a decade ago. Computers are now ubiquitous, touching every aspect of product design, development and delivery in many leading edge firms, and raising standards of performance across sectors and whole industries, worldwide.

The results have been extraordinary and jarring.

- Since 1975, annual increases in manufacturing productivity have averaged more than twice<sup>8</sup> that of other sectors.
- Currently, manufacturing is responsible for the largest share of annual productivity growth – one-third.<sup>9</sup>
- Between 1992 and 2000, manufacturing was the largest contributor to the nation's economic growth and was responsible for the largest share of R&D investment among sectors.<sup>10</sup>
- In 2001, American manufacturing output fell by 6%, “possibly the most wrenching period [in manufacturing] since the great depression – over two-million employees lost their jobs.”<sup>11</sup>

In a typical manufacturing firm, the demands for talent are evolving in response to these technologies:

- The skill demands of entry-level employees are increasing – technological literacy *is* the new literacy.
- Repetitive jobs are being automated, reducing demands for unskilled labor, and reducing the total number of jobs.<sup>12</sup>

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<sup>8</sup> “The disappearance of manufacturing?” *Federal Reserve Bank of Chicago*, 2003.

<sup>9</sup> “The Facts About American Manufacturing,” *The Manufacturing Institute*, 2003.

<sup>10</sup> “The Facts About American Manufacturing” 2003.

<sup>11</sup> “Manufacturing’s Performance and Prospects,” Zandi, 2004.

- Firms are finding new ways to distinguish themselves through innovation, creating new demands for creative and entrepreneurial talent.
- Changing markets and new tools are creating a demand for people who can adapt quickly – and *repeatedly* – to new processes or environments.

## **Globalization**

**It has been said that arguing against globalization is like arguing against the law of gravity.**

*Kofi Annan, United Nations Secretary General*

**I**n part because of new technologies, more firms are trading internationally, manufacturing internationally, or are part of global supply networks. While “outsourcing” and “off-shoring” have dominated the headlines in recent months, international supply chains or networks have been emerging for decades – first through trade relationships, then through the outsourcing of labor-intensive activities such as assembly work, then through the outsourcing<sup>13</sup> of manufactured parts, and increasingly through more complex international partnerships that jointly manage a range of back office functions, and even R&D.

A participant in one of our focus groups observed, “It’s not as simple as ‘buy American’ anymore. What do you say about a Toyota assembled in Kentucky with Canadian and Mexican parts?”

The new interconnected world has increased the unpredictability and volatility of the modern economy, and presented firms and workers with some difficult challenges.

- Firms competing on cost of production are changing their business models, or closing their doors.
- Firms have increasing access to new markets and new business partners, but are re-engineering the way they conduct business to accommodate time zones, language and cultural differences, protect network security, intellectual property, and address a host of other issues.
- Foreign firms are expanding their reach into U.S. markets; global producers now supply one-third of the products and services American

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<sup>12</sup> 80% of current job loss in manufacturing is structural, see *Learning Partnerships: Strengthening American Jobs In the Global Economy, A Report of the Task Force on Workforce Development*, The Albert Shanker Institute and the New Economy Information Service, April 2004.

<sup>13</sup> The issue of “outsourcing” or “off-shoring” generated considerable emotion in all of our focus groups – and participants had very different opinions about it. Suppliers or assembly plants tended to want it stopped. Larger firms or those serving niche markets were benefiting from it. This dichotomy reflects a national difference of opinion within the industry, see “Outsourcing Splits NAM Members,” Timothy Aepfel, *Wall Street Journal*, March 9, 2004. The implications for the CSSI project are considerable – Workforce Boards and other investors will want to carefully assess the kinds of firms that seek to receive training assistance, and designing programs to insure that benefits accrue to employees and communities, as well as to firms.

consumers buy (up from one-fifth 10 years ago), forcing American firms to find new products, services, or markets.

- More firms are adopting new ways of doing work through contracts, temporary staff, leased staff, consultants, etc., as they experiment with new ways to maximize value (and profit) and reduce costs.
- Individuals are pressured to work more efficiently and creatively through the application of innovative processes and new technologies.
- Individuals are working more flexibly and under less secure employment arrangements.
- Individuals are expected to take increasing responsibility for their own professional development and career advancement.
- Individuals who do repetitive or process work are increasingly vulnerable to automation or outsourcing ; they will be expected to add value in other ways.

## **Competition**

**The systematic application of new technologies, rock-bottom international wages, and a wildly successful ... global campaign to improve quality and customer satisfaction are devastating every kind of commodity producer.**

Tom Peters, *Re-imagine*, 2003

**T**he application of a vast array of technologies in the context of an increasingly global business environment has raised the competitive bar for many firms. Competition is fiercer than ever before, both because more producers are taking part and because newer producers in formerly remote parts of the globe can now access markets anywhere, anytime. These changes are causing what might be characterized as a re-sorting among many American manufacturers.

- Firms that had been successfully competing on price can no longer do so; labor costs in parts of Asia are less than one-tenth of what they are in the U.S.
- Firms that had been dependent upon a few large contracts for large quantities of the same or similar product are seeing their business automated or shipped overseas.
- Firms dependent upon R&D can now access talent from all over the world easier than ever before.<sup>14</sup>

New markets, new landscapes, new demands, and new ways of doing business present firms with the opportunity and the challenge of redefining their business models and the value they bring to their customers.

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<sup>14</sup> Trends worrying American firms and educators: the US graduates engineers at less than half the rate China, Japan, or India does, and 40% of graduates from American engineering schools are international students – largely Indian and Chinese, see “Engineering: And Indian Success,” Chidanand Rajghatta, *The Time of India*, August 30, 2003; and “Losing our Edge to China, India, Japan?” Thomas L. Friedman, *The New York Times*, April 22, 2004



For example, when Henry Ford famously quipped, “Customers can have any color ... as long as it’s black,” it was clear that carmakers were in the transportation business. Now, carmakers are selling to very different kinds of markets; customers seek cars that fit their personalities, lifestyles, and pocketbooks. Carmakers are reengineering their plants to deliver more choices, on demand, more quickly. Toyota is seeking to cut its delivery time from 70 to 14 days.<sup>15</sup>

Technology, global supplier networks, and competition are enabling many firms to remake themselves faster than ever before, while creating chaos for firms not able to keep up with the pace of change.

## How are Chicago manufacturers impacted and what are the implications?

**Chicago area factories, and those around the nation, are boosting productivity so aggressively that the manufacturing sector is poised to eclipse its record June 2000 output this summer with 17% fewer workers.**

*Crain’s Chicago Business, July 12, 2004*

**T**he manufacturing industry is critical to the economic health of the nation.

- Manufacturing jobs pay better than average – \$54,000 compared to \$45,600 annually.<sup>16</sup>
- The benefits of manufacturing jobs are better than those in any other sector but government; 84% of firms provide health insurance benefits, and the industry invests in the skills of its employees. Even among small manufacturers, 54% provide tuition reimbursement in addition to training offered on the job.<sup>17</sup>
- The “multiplier” associated with investment in manufacturing is significant; \$1 invested yields \$1.43 in economic output.
- More than one in six American jobs depends on American manufacturing

Manufacturing is *more* critical to the economic health of the Chicago metropolitan region, since a higher percentage of the workforce is employed in manufacturing in the metropolitan Chicago region than in the U.S. In addition, much of the Illinois’ large manufacturing base underpins the state’s \$17.4 billion<sup>18</sup> transportation and distribution industry, much of which is located in the Chicago metropolitan region.

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<sup>15</sup> “Just in Time Meets Just Right,” Jonathon Fahey, *Forbes*, July 2004

<sup>16</sup> “The Case for a Federal Role in Restoring Manufacturing Technology in America,” *Association for Manufacturing Technology*, 2004

<sup>17</sup> Figures cited in “The Facts about American Manufacturing,” 2003

<sup>18</sup> US Bureau of Economic Analysis, 2001.

The Chicago region also enjoys the good fortune of a diverse industrial base compared to other large metro areas, as well as a higher percentage of manufacturing employment (see Figure 4).

**Figure 4: Percentage Employment<sup>19</sup>**

Employment	USA (millions)	Illinois	Large metro areas	Chicago region
Total	129,931	5.8	40.3	4.1
Total Manufacturing	14,525	.72	3.	.5
% Employed in Manufacturing	11.2%	12.3%	11%	11.5%

While the Chicago area has seen a significant drop in manufacturing employment (14% in a decade), the industry still employs nearly half a million people in the metro area, produces two-thirds of Illinois' total exports (most of which are distributed through Chicago), and generates one of every three jobs in the state.<sup>20</sup>

Finally, metropolitan Chicago's diversity is an important aspect of the labor market on which the manufacturing industry depends.

- The state of Illinois is now home to 1.5 million Latinos, and 1.1 of them residing in Cook County alone.<sup>21</sup>
- Nearly two million African Americans call Illinois home, and over three-quarters live in the Chicago metropolitan region.
- Over half of the half-million ethnic Asians in Illinois live in Cook County.
- Another million people claiming another (non-white) race or more than one race also live in metropolitan Chicago.
- And 18% of the metro Chicago's residents are immigrants, who, for the first time, are more likely to make their homes in the suburbs than in the city of Chicago.<sup>22</sup>

This diversity is amply evidenced on the shop floor of nearly every plant from Joliet to Woodstock, where non-white workers are more than twice as likely to be working as assemblers, craftspeople, or laborers than their white counterparts.<sup>23</sup>

<sup>19</sup> US Bureau of Economic Analysis, 2003, Illinois Workforce Info Center <http://wic.ilworkinfo.com/analyzer/cesNaics.asp?cat=IND&session=INDCES&subsession=99&tableused=CES&rolIgeo=02&defaultcode=&time=20030100&currsubsessavail=&siclevel=3&naicslvl=6&incsource=&sgltime=0&AreaAbr=&geo=1702001600&areaname=Chicago%20PMSA&codeIengt>, and US Conference of Mayors, 2003. Although the publication dates different, the source data is from the same year.

<sup>20</sup> *The State of Illinois Manufacturing*, A Report to the Illinois Manufacturing Association, Center for Labor and Community Research, December 200

<sup>21</sup> Figure from the US Census 2000, American Fact Finder

<sup>22</sup> "Chicago's Immigrants Break Old Patterns," Rob Pearl, Institute for Metropolitan Affairs, Roosevelt University in the Migration Policy Institute's *Migration Information Source*, September 2003

Increasingly, language and cultural issues, together with educational credentialing challenges, will impact the productivity and competitiveness of the region's manufacturing firms.

Chicago area manufacturers must find new ways to remain competitive through quality improvement, innovation, and the identification of new markets. These strategies require the development of a flexible and highly skilled workforce; it's not just today's skills shortages that pose challenges, but tomorrow's as well.

## Root Causes of Critical Skills Shortage Occupations

**T**he **Critical Skill Shortages Report on the Manufacturing Sector** (June 2004), completed as part of the CSSI project, provides detailed analysis of critical occupational shortages in the Chicago region. The remainder of this report will address the root causes of those shortages and provide information about how individuals and firms in the region are experiencing them.

During the qualitative intelligence gathering efforts, numerous reasons for the region's multiple and diverse skill shortages were cited by firms and workers. Many could be characterized – initially – as reactionary:

- “The schools can't seem to teach people to read or add.” (employer)
- “No one wants to really work anymore.” (employer)
- “There are no training providers near me who teach what I need.” (employer)
- “I'm not good at school; I work in manufacturing because I didn't want to go to school.” (employee)
- “I keep being asked to do more, learn more, know more, but I don't get paid more.” (employee)
- “I can't stay at work later or go to school when I have three kids to raise.” (employee)

We pushed people further in an effort to get at the *root* causes; we asked “why?” and then we listened.

Four interdependent root causes were identified. These issues have been the subject of considerable attention by the media and research community during the past several years. They are not new challenges to the industry, but they continue to disrupt business as usual, making the manufacturing labor market increasingly difficult to navigate for both firms and individuals.

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<sup>23</sup> “Minding the Gap: An Assessment of Racial Disparity in Metropolitan Chicago,” *Hull House Association*, November 2003.

- Because of the manufacturing industry's fundamental restructuring, **the levels of knowledge, skills, and mastery of processes expected of the manufacturing workforce is increasing;**
- **The manufacturing workforce is aging**, creating a host of challenges for meeting today's demands, while planning for an unknown future;
- **Manufacturing has an image problem.** Neither young people nor career changers perceive the industry as attractive. While this is not a new problem, new pressures have worsened an already difficult situation.
- A host of **specific information gaps** exist that prevent firms and workers from making business and career decisions that would ultimately benefit them. Both at the industry and at the firm level, and within schools and training institutions, these information gaps inhibit employee retention and career advancement, while exacerbating the industry's skill shortages.

## Root Cause #1: More Demand for Advanced Skills

**I**n one of the focus groups, a small manufacturer of auto parts who had been transitioning his plant using a range of new technologies and high performance practices lamented, "Most of my people know what to do, but I need them to know *why* they do what they do."

This comment echoed the sentiments of the vast majority of employers participating in the CSSI project. While employers did report workforce shortages in some critical occupations, such as skilled crafts, skill deficiencies among their *current employees* were of much greater concern to them<sup>24</sup> for two reasons. First, the industry as a whole is shrinking, not growing. As a result, most new hires will be replacing current workers, not filling new jobs. Second, firms are *transitioning*; they need advanced skills their current workers lack, but they also need the expertise, experience, and knowledge of tenured employees who know their firms' products, machines, and people.

Many firms pointed to specific practices that were raising their skill demands:

- **Automation.** The integration of new technologies on the factory floor has been, and will continue to be, relentless. Economists<sup>25</sup> argue that any manufacturing job that can be broken down into repeatable tasks will soon disappear. The new jobs will be fewer, and will require more

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<sup>24</sup> A 2001 survey by the National Association of Manufacturers found similar results. Successive 2002 and 2003 Center for Workforce Preparation/US Chamber of Commerce surveys found skills shortages even in the midst of an enormous industry slow-down.

<sup>25</sup> "The Future of Work," *Business Week Special Report*, March 2004.

sophisticated skill sets. Automation – from robots to RFID<sup>26</sup> tags – is not about “learning to use the new computer.” Increasingly, firms expect employees to be able to learn to operate, integrate, and manage new equipment on an ongoing basis, and to look for ways these technologies could be made better, faster, or be applied elsewhere as part of a lean, high-quality production process.

- **Quality initiatives or processes.** Lean Manufacturing<sup>27</sup> and Six Sigma<sup>28</sup> or Zero Defect initiatives were common<sup>29</sup> processes firms participating in the CSSI project were introducing into their operations. A few firms also cited ISO 9000 and 14000.<sup>30</sup> While these firms were at very different levels of progress, they shared the recognition that new quality improvement methods were increasing the skill levels expected of employees. All of these quality improvement processes rely on measurement, analysis, and problem-solving. They demand that employees see their roles in relation to the whole manufacturing process and be able to own and improve the variables over which they exercise control.
- **New (and more diverse) customer demands.** Manufacturers are demanding more of their suppliers as their customers demand more of them. Firms are increasingly expected to adhere to a greater variety of standards and processes to which they must adapt with increasing speed and accuracy. This constant change requires employees who are flexible and ever willing to learn, and able to contribute new ideas as their firms seek to remain competitive in the new economy.

Importantly, as skill requirements for new jobs increase, the workforce is also becoming more diverse, ethnically, racially, linguistically, and otherwise. This diversity can be an asset as it helps firms prepare for business in the 21<sup>st</sup> century. Firms that take diversity seriously have advantages in identifying and entering new markets, attracting employees from a broader talent pool, and getting work done in better and more creative ways.<sup>31</sup>

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<sup>26</sup> Radio-frequency identification tags; many of the firms with whom we met are using more and more of this technology at the request of their customers.

<sup>27</sup> Lean manufacturing comprises a series of techniques used to eliminating waste (or non-value added activities or processes) by continuously improving the processes used to move the product from design to customer.

<sup>28</sup> Six-Sigma is disciplined, systemic approach to improving efficiency by reducing error in the manufacture of products to zero.

<sup>29</sup> Familiarity and practice with these tools did vary by sector. The food manufacturing sector, for example, had less experience with these tools than the durable goods manufacturing sectors.

<sup>30</sup> ISO is the International Standards Organization that defines and certifies a wide range of industry standards. ISO 9000 is the first in a series of standards around quality, while ISO 14000 reflects the inclusion of sustainable business practices.

<sup>31</sup> “Why Diversity is an Opportunity,” *Working Knowledge* (HBSWK), May 17, 2004

However, diversity poses challenges as well. Firms participating in the CSSI project, while placing a high value on diversity,<sup>32</sup> pointed to several challenges impacting their ability to raise the skill levels of their workers:<sup>33</sup>

- **Determining the skill levels of non-English speakers**—“How much of what employees need to learn is English and how much is technical skills?” (small manufacturer of medical devices)
- **Identifying workers with the potential and inclination to advance.**
- **Helping diverse employees move from production to management**—“It’s like a chasm! I’ve got really good people, but getting them to anticipate, to really manage when things don’t go well that’s a problem” (small manufacturer of auto parts).
- **Translating credentials**—“It’s not just educational credentials from other countries that are a problem, but certificates from programs right here—like ‘work readiness certificates’ or even certificates from non-college training programs—what do they mean?” (small tool and die manufacturer, repeated by large mechanical equipment manufacturer).

### ***Specific Skill Sets in Short Supply***

**E**mployers pointed to three specific skills sets for which they are experiencing unmet demand:

- Higher-order logic and reasoning;
- Workplace communication skills (among *both* English and non- or limited English speakers); and
- Mechanical or technical skills or aptitude.

Importantly, firms that adopt the kinds of processes and practices described above also tend to experience a shift in company culture toward more shared ownership, improved and more frequent team work, and accountability. This may at least partially explain another important skills shortage area they identified—workplace basics.<sup>34</sup>

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<sup>32</sup> There were exceptions—representatives from two larger firms did not feel their diversity programs were much more than “window dressing.” Overall, however, at least half of the employers in each of the focus groups could point to specific actions their firms had take to support diversity—from setting up “mom rooms” and “prayer rooms,” to altering shift start times, to paying (female) employees for time spent in firm-sponsored English classes, to creating multicultural mentorship programs and installing adaptive equipment.

<sup>33</sup> A host of additional challenges were also mentioned that did not relate directly to skills but are of equal importance—promoting women over men on a production line, promoting skill over seniority—even in non-represented workplaces, issues of perceived “special treatment,” etc.

<sup>34</sup> We defined workplace basics as “the set of rules or expectations that most employers in most industries have in common.” Generally, timeliness, appropriate dress and behavior, and preparedness fell into this category.

Many of our employer respondents complained about the lack of workplace basics among current employees as well as new hires. Many specifically pointed out that using college as a proxy did not help; in their experience, college graduates were just as likely to lack these skills as non-college graduates.<sup>35</sup>

At first, employers pointed to schools, culture, etc. as the cause of the problem, but when pushed, some did admit that their standards had also increased in recent years; they simply expect more from employees at all levels.

Finally, not only are the skill requirements of manufacturing jobs increasing, but the screening tools firms are using in the hiring process are becoming more sophisticated. Nearly all of the firms who were asked reported using a greater range of more sophisticated screening tools during the past five years than previously. Skill-based assessments – especially electronic assessments – are increasingly common, and security and credit checks are growing in popularity. This, too, may partially explain the frustration our respondents expressed about the shortage of workplace basics; firms have a hard time testing for these skills and behaviors compared to the success they’ve had screening out other typical skill shortage areas (e.g., literacy).

A large manufacturer in the rubber and plastics sector was quite candid about this shift, “We used to worry about things like literacy and basic skills, but now we screen those problems out; people with those issues don’t make it through the hiring process. We’ve become pretty good at screening for technical skills and even aptitude. But work ethic? Finding people who will show up reliably? It’s still a problem.”

This is a concern for community leaders and policy makers as manufacturing still employs 16% of the non-college educated workforce at better-than-average wages.<sup>36</sup> This demographic will have an increasingly difficult time finding well-paid employment in the sector as the skill requirements associated with these jobs increase.

The demand for training resulting from increased skill requirements in the industry raises a host of additional issues that can raise barriers for some firms and some workers in certain circumstances.

- Who will pay for training?
- When will it happen? On the clock? Or on workers’ personal time?
- How much choice do employees have about what kind of training?
- Do workers need computers at home for homework or to access virtual assistance?

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<sup>35</sup> Interestingly, almost universally, employers claimed that immigrants were very attractive because they so rarely lacked this skill set.

<sup>36</sup> “Securing America’s Future: The Case for a Strong Manufacturing Base,” Joel Popkin and Company for NAM, 2003.

- Does the training lead to a recognized credential?
- How much does the training cost?
- How long will it take?
- What are the support mechanisms/consequences for workers who don't do well?
- Will employees leave for better jobs once they've been trained?

None of these challenges are simple, but with the right combination of people and resources, they are manageable.

## Root Cause #2: The Manufacturing Workforce is Aging

The U.S. population is getting older; the fastest growing demographic today is the population over 85 years of age. In 2000, the median age in the U.S. was 35.3, the highest ever recorded.<sup>37</sup> The U.S. workforce is also aging; in 2005, the median age of an American worker will exceed 40, up from 34.7 in 1979.<sup>38</sup> This is particularly true in manufacturing, where more than one in five workers (and one in three male workers) ages 55-64 are employed as Operators, Fabricators, Laborers, Production Workers, or Craftspersons.<sup>39</sup>

The state of Illinois predicts that Illinois manufacturers will need over 15,000 new employees annually; about 75% of them will be replacing workers who retire, fall ill, or seek other employment. These occupations represent numerous manufacturing sectors and diverse work environments. Appendix D contains a select list of occupational projections ranked by their expected percentage change in employment.

Manufacturing firms participating in the CSSI project expressed concern about their aging employees, but they were more likely to describe the problem of bifurcation; they had older workers as well as younger ones, but few in between. Many reported employing large numbers of younger workers (18-30), few people in their 30s or 40s, while their master craftspeople, plant managers, operations officers or senior executives were all nearing retirement, and holding "vast amounts of expertise and institutional knowledge in their heads."

There is a lively, if immediately unresolvable debate, about the impact of the aging workforce on the industry. While the *National Association of Manufacturers*, and many reputable scholars and analysts warn of an impending crisis,<sup>40</sup> other

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<sup>37</sup> U.S. Census, 2000.

<sup>38</sup> "Workforce Management: The Challenge," (an occasional paper series), Watson Wyatt World Wide

<sup>39</sup> Undoubtedly more are employed in manufacturing's management and executive occupations, see "Aging and Work – A View from the United States", Sarah Rix, *AARP*, 2004.

<sup>40</sup> *Impending Crisis* is also the name of a book (Herman, Olivo, Gioia, 2002) on the same subject.



experts predict no such thing,<sup>41</sup> since labor participation rates of older workers are increasing, and Americans are living longer and healthier generally. We cannot predict with any real certainty whether large numbers of the 77-million strong “boomer” generation will retire permanently at 65 or not. But the preponderance of large numbers of older workers in critical manufacturing occupations creates challenges for firms *today*.

Larger firms expressed more concerns about replacing their aging and experienced workers than small firms, in part because of the sheer numbers of employees they predicted would retire. A human resource director for a large multinational firm reported, “Even if the number of positions I have to fill is cut in half through automation or outsourcing, we’re still talking about *hundreds* of people for positions I have trouble filling now, one or two at a time.”

Larger firms also reported sketchy knowledge about the skills of tenured employees; they suspect significant literacy and other skill issues among employees nearing retirement, and reported working to identify timeframes for the introduction of new technologies or processes to which most workers would be able to adapt.

Smaller and medium sized firms reported several different concerns:

- **Losing or replacing in-house experience and expertise** – Knowing when or how to hire replacements, finding ways to formally capture and house the knowledge “in peoples’ heads,” and managing the expense of both hiring and providing intensive training to new employees or to current employees seeking advancement
- **Identifying workers to “invest in”** – Making sure that the employees who are offered training, promotion, and mentorship opportunities are the ones best positioned to take advantage of them. Smaller employers in particular felt constrained by the lack of training resources at their disposal and felt pressure not to make a mistake (by training someone who then finds a new job elsewhere, and takes the investment with them).
- **Finding ways to help older workers learn new technologies** and processes in ways that didn’t appear to “shove them out the door.” One employer in a telephone interview confessed to having done this badly already.

Smaller employers in particular also reported having difficulty managing the cost of health insurance, which is more expensive with an older workforce. One small printing and graphics firm recounted having been cancelled by two different insurance carriers in two years because two older employees were stricken with cancer. As a result, all employees have had to change carriers for

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<sup>41</sup> “Will There Really Be a Labor Shortage?” Peter Cappelli, 2003; see also “The Labor Shortage Myth,” Alison Overholt, *Fast Company*, August 2004.

three years in row, while paying 35% more for less coverage. This respondent stated, “I know it’s wrong, and I actually need the skills and experience, but I can’t hire anyone over 50 because I can’t pay the insurance premiums, and I can’t ask any more of my other employees.”

Employers of all sizes shared three general concerns:

1. They can’t find skilled and experienced “craftspeople”<sup>42</sup> to replace their valuable older workers; they fear that a generation will retire without passing along these skills.
2. They lack experience creating a workplace environment that invites participation and fosters creativity among diverse employees, including older workers.
3. They reported facing a dilemma in knowing how to prepare their current (older) workers and future (much younger) workers for the 21<sup>st</sup> Century. On the one hand, there is a movement toward specific skill standards<sup>43</sup> that would enable schools and training providers to align their programs with specific needs. On the other hand, they know from experience that as soon as you can identify standards, the jobs with which the standards are associated are likely to change.

### **Root Cause #3: The Perception of Manufacturing is Poor**

**T**hroughout the U.S., manufacturing suffers from a poor public image. The National Association of Manufacturers found that “the sector’s image was ... heavily loaded with negative connotations and universally tied to a stereotype of the “assembly line.” As well, it was perceived to be in a state of decline.<sup>44</sup> These findings were echoed in the focus groups and interviews conducted with employers, job seekers, and students in the Chicago metropolitan region.

This is not a new problem; many studies, reports, and even casual observers have pointed to the industry’s worsening image among the general public over the past decade or more. However, long-term neglect in combination with the massive – and negative – coverage of the industry since the inception of the 2000 recession, has exacerbated an already troubling situation, and made it more difficult for manufacturing firms to attract the talent they need both today and in the future.

The results of this image problem are now, in hindsight, obvious.

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<sup>42</sup> Every craft in the category was mentioned at least once during the CSSI intelligence gathering effort – machinist, master carpenter, welder, mechanic, electrician, electrical mechanic, etc.

<sup>43</sup> For information about standards by sector, see the National Skills Standards Board at <http://www.nssb.org/>

<sup>44</sup> “Keeping America Competitive,” 2003.

Common observations and experiences of Chicago area firms as reported in CSSI interviews and focus groups follow:

- **Schools, both K-12 and community colleges, have decreased their investments in manufacturing-related education** (vocational and technical programs, as well as internships, mentorships, and single events such as field trips or “industry days.”). They are simply responding to market signals: fewer parents, teachers, or students are interested in manufacturing or see it as a viable career path, and more feel that the direct route to college or university is, increasingly, a necessity. As a result, fewer students are exposed to manufacturing jobs, careers, or even firms, tools, and technologies. And fewer seek jobs or careers in the industry. Those who do tend to have family connections or perceive themselves to have few alternatives. Many manufacturing firms are perceived as employers of last resort by individuals coming out of school and not seeking executive positions.<sup>45</sup>
- **The industry’s image problem impedes the ability of firms to attract high performers** (or even average performers). If new labor market entrants have employment alternatives, they may pursue them rather than seeking work with an industry about which they feel negatively (even if the job is actually better than the alternatives). Many employers pointed to this as a partial explanation of the dearth of workplace basics among young recruits. They observed that the majority of the individuals applying for positions right out of high school were probably not the “cream of the crop,” as they may have been during previous decades.
- **The industry’s poor image also encourages current workers to seek employment in other industries**, and imposes invisible limits on the effort or performance of workers who stay (e.g., ‘losers get jobs in manufacturing, I’m in manufacturing, therefore I’m a loser, so I guess I’ll just put in my time and get a paycheck’). Even workers who enjoy their manufacturing careers tended to differentiate their individual firms from the manufacturing *industry* when they discussed their work, positioning their firms or jobs as positive exceptions to the negative rule. Alternatively, some workers admitted that they tended not to talk about work at all, allowing the negative messages to dominate discussions about work. There is also a pervasive feeling that manufacturing careers are for “other people” or “other people’s kids.”<sup>46</sup>

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<sup>45</sup> Without exception, the firms reporting good partnerships with local schools or training programs attributed success to specific individuals who “carried the torch in spite of their environment[s] not because of [them].”

<sup>46</sup> We were surprised that some of the most forceful advocates of vocational education participating in our focus groups, admitted that they would actively discourage their *own* children from pursuing manufacturing careers—even as engineers.

- **The image problem also makes it more difficult for firms to implement high performance practices or pursue innovation** because many employees, bombarded with negative messages about the industry, don't believe they can or will succeed.

In addition, a few firms admitted that there remain “plenty of firms that live up to the negative images,” and “plenty of people who work in and complain about them.” This is a problem for the industry. In an already negative public relations environment, those bottom-tier firms carry more weight than they should; they reinforce the industry's negative image and drive up the costs of countering it.

Finally, because a smaller percentage of people work in manufacturing today than a generation ago, there are fewer people with direct links to or direct knowledge of jobs and careers in the industry. Even in the absence of the excessively negative recent press coverage, manufacturers will still need new ways to tell their stories and sell their industry to the diverse talent of the new economy.

## Root Cause #4: Information Gaps

**A**t almost every point along the career decision making continuum, there are pervasive information gaps that are both caused and exacerbated by the first three root causes and also exist independently of them. These gaps are preventing firms, job-seekers, and workers from making decisions from which they might ultimately benefit. In some cases, the information gaps are truly gaps – we don't have the information to fill them. But in most cases, the information gaps are bridgeable; we do have the information, but it is not reaching the individuals who could make effective use of it.

The information gaps identified during the CSSI intelligence gathering effort are identified below. It is not an exhaustive list. Rather, we have identified key issues raised repeatedly by individuals and firms participating in the CSSI project, and put them in context so their impact might be made clear.

### ***Information Gaps Identified by Firms***

- **A majority of firms reported feeling uncertain about the kinds of skills they should be investing in to prepare current workers for the future.**<sup>47</sup> They were less concerned about skills specific to equipment, machinery, or processes, than about skills that would “insulate” employees from lay-offs, and provide them with the tools they would need to weather the changes anticipated in their firms and industries. These firms are having

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<sup>47</sup> A recent survey conducted by TEC International found that 27% of CEOs of small and mid-sized firms will be outsourcing part of their operations within 3 years, 2/3 by the end of 2004. The frequency and scope of such changes may partially explain why human resource directors lack confidence in identifying their firms skill needs.

trouble making decisions about how to develop their employees – particularly high performers whose jobs were vulnerable.

➤ **Firms that were concerned about specific technical skill sets were often uncertain about how or whether to train on them.**

While they needed these skills today, they couldn't be certain that they would need them in the future, or that an investment in training today would pay off for their firms or their employees. Most of the skills sets they cited did not lend themselves to "some" training; rather, it was all or nothing (e.g., certification or not). These firms are having trouble making decisions about specific training investments, both short and long term.

➤ **Many larger firms reported having downsized their outreach and community relations departments,** compromising their relationships with schools, colleges and universities, training programs, and community organizations which they used to both recruit and combat the "image problem." Many of these firms are no longer connected to school- or college-based programs and do not know, except in general terms, whether schools are teaching the skills in demand in their industry. They reported difficulty recruiting efficiently; "the economic downturn has created a flood of resumes, and we screen people out, but we don't actually know where to go to get more positive hits."

➤ **Many smaller firms reported having trouble recruiting or difficulty with specific skill shortages,** but also have fundamental business issues from which those shortages arise. For example, a few firms were so concerned about cash flow, they were unable to focus on a future more than a few days out. Others paid far below market rates and did not know where their workers were coming from or (going to).

➤ **Smaller firms more often cited weak professional networks and organizational linkages than did larger firms.** They lacked information about firms in their areas that might be engaged in similar quality processes or initiatives (even if in other sectors) with whom coordination would be mutually beneficial,<sup>48</sup> and few maintained regular contact with trade associations, schools, or training institutions. There were notable exceptions where small firms had established a recruiting relationship with a small number of reputable institutions (e.g., the Milwaukee School of Engineering) and reported using those networks for much more than simply recruiting engineers.

➤ **Smaller firms reported a greater need for assistance in interfacing with intermediaries,** public and private, workforce,

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<sup>48</sup> As an example, during one of our focus groups, a representative from a small firm reported that he had successfully raised the English language skills of many of the female non-native English speaking employees. Three other small firms in different manufacturing sectors began questioning him and, ultimately, exchanging contact details in order to follow-up on the issue.

business, and education. They lacked information about what kind of assistance was available and from whom, and they lacked knowledge of (or patience with) grant application processes or reporting requirements.

- **Smaller firms tended to have less sophisticated hiring practices and less knowledge about their relative effectiveness.** For example, less than half were able to identify their most effective hiring method. Moreover, they were less invested in web technologies<sup>49</sup> than larger firms for hiring and training, as well as for other business processes.
- **Most firms reported difficulty screening for the skills they knew they would need most in the new economy** – creativity, problem-solving, and workplace-basics.
- **Nearly all firms reported difficulty in advancing diverse workers** – Some combination of (evident) culture, language, and social barriers, together with less visible barriers (personal, familial) and challenges in both assessing skills and aptitude and providing the right training proved formidable obstacles for even firms with formal diversity programs and policies.

### ***Information Gaps Identified by Current and Potential Employees***

- Youth demonstrated a strong interest in jobs with particular characteristics – technology, benefits (life, health, dental insurance, and retirement), and opportunities for training and advancement – all of which are more common in the manufacturing industry than in any other industry with the exception of government. The young people who shared their observations, opinions, and experiences as part of the CSSI project did not know this.<sup>50</sup>
- Largely because job-seekers held negative opinions about the manufacturing industry (and had presumably not conducted research into job opportunities), they were largely unaware of the available job opportunities, wage levels, growth prospects, or professional development opportunities offered by firms in the industry.
- Employees overwhelmingly expressed feeling “in the dark” or fearful of change.<sup>51</sup> This appeared to be largely attributable to a lack of information

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<sup>49</sup> Interestingly, employees (75% of which worked for the firms who participated in the CSSI effort) were ahead of their firms in using the internet for job search – they expressed frustration and bewilderment about why their firms didn’t make better use of the web for recruiting, hiring, training, and communication with employees.

<sup>50</sup> It was clear from the reactions of the few teachers present during our focus groups that they did not know this either.

<sup>51</sup> The angst expressed by participating employees is not unique to the Chicago region or to manufacturing. A recent WFD Consulting/Opinion Research Corporation Poll found that only half of surveyed employees strongly agreed that they could manage the pressures of their work, and just over half agreed that they could maintain adequate job performance during times of change. See [http://www.e-topics.com/index.asp?layout=topic\\_story&UserID=199912221247240.4107172&topic=131&doc\\_id=p0622027.7rw&date=6%2F23%2F2004&display=Management+Consult](http://www.e-topics.com/index.asp?layout=topic_story&UserID=199912221247240.4107172&topic=131&doc_id=p0622027.7rw&date=6%2F23%2F2004&display=Management+Consult)

about the firm as a whole (rather than just their line or unit). Employees repeatedly recounted disruptions that surprised them and then ultimately impacted their jobs. As a result, few reported knowing what to do to prepare for the future, within their firm or outside of it.<sup>52</sup>

- Even among workers who reported having made decisions to pursue change (look for a new job, seek training, finish a degree, start a business, etc.), the lack of specific information or assistance (or their lack of knowledge about where to find it) had inhibited them from taking action.
- Although most employees who were asked were aware of tuition assistance programs offered by their employers, they were uncertain about their eligibility for such programs, and were hesitant to seek assistance (“If I ask about training, my boss might think I want his job” or “Will they think I’m preparing to leave and then fire me?”).
- Finally, many employees reported being unaware of the employment/career opportunities within their own firms, or were hesitant or unsure how to pursue them.

### ***Gaps Identified by Intermediaries — Schools, Training Programs, Public and Private Investors, Trade Associations, etc.***

- **Many intermediaries lack relationships with firms that would help them understand the business needs that generate training or human resource needs.**
- **Schools lack information about the needs of the manufacturing firms in their areas offering jobs or internships** in which their students may be interested.<sup>53</sup>
- **Trade associations and other intermediary business organizations lack information about effective models or solutions to talent issues** that may benefit their members, as well as information and experience in partnering with other intermediaries to solve shared issues in which local communities also have an interest.

It is not surprising that many of these gaps exist. Just as firms are experiencing tremendous change, so too are many schools, colleges, professional associations, Workforce Boards and other intermediaries.

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[ing](#). Perhaps surprisingly, despite this angst, employees reported high levels of satisfaction with their jobs and with their employers, although many of the employers did not seem to know this.

<sup>52</sup> This may partially explain why employers report little use of tuition reimbursement programs while among the employees we surveyed (75% of whom were potentially biased toward high performers), only 7% were disinterested in training, even though 50% had educational credentials that exceeded those required by their jobs.

<sup>53</sup> Several firms expressed some culpability here; they acknowledge having paid less attention to community relations in recent years, largely due to cost-cutting.

Moreover, addressing information gaps alone will not solve the challenge of critical skills shortages, and in fact, would likely raise new challenges. For instance, once an individual finds training they are interested in, they will then be faced with the challenges of paying for the training, and finding time to complete it.

However, tackling key information gaps across interest groups may uncover common ground, enabling more employers to see the benefits of raising skill levels, more workers to see the benefits of investing in themselves, and uncovering innovative ways for intermediaries to help realize these benefits, increasing the productivity of manufacturing firms, and ultimately, the strength of the industry as a whole.

### **Other Gaps**

**I**n addition to these gaps, there are other structural issues that prevent firms, in particular, human resource directors, from taking action. The most frequently cited was the difficulty of demonstrating a measurable gain in a short time to senior executives.

A Human Resource Director of a large plastics and rubber manufacturer complained, “I simply can’t get my CEO to pay attention. I can’t get results by next quarter, and I don’t know whether I can ever get the one he really wants – increased shareholder return!”

Consider this, for the same level of corporate performance, a CEO appointed between 1990 and 1996 was three times more likely to be fired than one appointed before 1980.<sup>54</sup> In March 2004, CEO departures were up 43%.<sup>55</sup>

These situations call for unique and creative solutions that begin with the ability to craft a solid business case for a new approach to investing in human capital.

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<sup>54</sup> Harvard Business School Study cited in *The Economist*, October 25, 2003, see [www.ceogo.com/CEOFACTS/QUICKSTATS/](http://www.ceogo.com/CEOFACTS/QUICKSTATS/)

<sup>55</sup> Challenger, Gray & Christmas, 2004 in *CEO Quickstats*. [www.ceogo.com/CEOFACTS/QUICKSTATS/](http://www.ceogo.com/CEOFACTS/QUICKSTATS/)



**U.S. manufacturing executives face two overarching workforce challenges during the decade:**

- 1. Introducing the American worker to a new model of manufacturing work by replacing the promise of job-for-life with a firm commitment to ongoing training and education; and**
- 2. Educating themselves about the new world of work so they can become active and responsible participants in defining a new future for American manufacturing.**

Paraphrased from “Dangerous Disconnect,”  
Jill Jusko and John S. McClenahan, *Industry Week*, July 1, 2004

## Conclusion

**The very fluidity of the new economy that makes training so useful and so necessary also mitigates against companies making big, long-term workforce investments on their own.**

*NEIS E-Bulletin*, October 2003

**S**kill shortages represent a formidable collective action problem: firms *need* higher skill levels among their employees, but feel that schools should have provided them, or fear losing a training investment if the trainee finds a new job after training; people *benefit* from increased skills if they are relevant and portable, but if they are learning content directly applicable to their jobs, they feel deserving of help from employers; colleges and universities *seek* to provide training, but often the fees they charge do not cover the cost; and Workforce Boards *seek* to invest in healthy industries and economies and good jobs, but this does not always mean meeting an immediate need (e.g., subsidizing training that will be obsolete or will not enable wage gains or increased productivity).

And as skills acquisition – *learning* – becomes a required lifelong endeavor, the time and resource pressures on all of these stakeholders increase.

In this report, we have identified and described the four interdependent root causes of the current skill shortages and those likely to impact the economic future. None of these causes is easy to remedy, but their interdependence creates opportunities to impact many by addressing one. For example, the provision of good information to young people could generate interest in manufacturing among their parents and peers, creating incentives for schools to reconnect with firms in the industry.

A skilled manufacturing workforce lies at the heart of a vibrant American economy, but today's firms and workers are struggling to remain competitive:

- **The advanced skill needs of the Chicago region's manufacturers are increasing**, and it is not obvious how current and future workers will keep up with this demand;
- **The workforce is aging**, and there is no obvious way to either transition older workers to meet the technology and management demands of the region's 21st century manufacturing firms, to advance younger workers who may lack technical skills and experience, or recruit younger and more diverse workers for jobs that lead to careers;
- **The image of manufacturing is poor**, and has suffered mightily during the recent recession. Removing the "cloud" of negativity will require sustained effort on many fronts – in firms, in schools, in the media, and among current manufacturing workers. But change is also about more than image; many more manufacturing firms will have to adhere to the high standards set by today's industry leaders.
- **Information gaps routinely impede people and firms from taking positive action**. It is clear that this effort will require time and resources.

There are no foolproof blueprints for solving the complex challenges described above, but we know no single stakeholder can do it alone.

The CSSI project has catalyzed partnerships that will deliver more innovative and effective solutions to critical industry needs in our region – and there has never been a better time to get started.

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## Appendix B: Leadership, Regional, and One-Stop Council Members

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

<b>Regional Council</b>		
<b>Name</b>	<b>Title</b>	<b>Organization</b>
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		Department of Commerce and Economic Opportunity
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
Tom Howard		International Union of Operating Engineers, Local 399



<b>Regional Council</b>		
Robert Ingraffia	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 Dev Association
Roycalee Wood	Regional Superintendent	Lake County ROE
Dave Young	President	Lake County Partners

<b>One-Stop Council</b>		
<b>Name</b>	<b>Affiliation</b>	<b>Location</b>
Carol Adams	Illinois Department of Human Services	Chicago
Roger Allen	Local 150 - Operating Engineers	Plainfield
Francisco Alvarado	Illinois Department of Human Services	Chicago
Peter Andrews	Illinois Department of Employment Security	Aurora
Geraldine Baader	Bloom Township High School District 206	Chicago Heights
James Ballee	Northwest Suburban Employment & Training Center	Arlington Heights
Deb Banker	Kane County Dept. of Employment and Education	North Aurora
Greg Battle	Illinois Department of Human Services	Waukegan
Phyllis Baxter	Illinois Department of Human Services	Villa Park
Terri Berryman	College of Lake County	Grayslake
Goldie Boldridge-Brown	Evanston Township High School	Evanston
Carole Bulakowski	College of Lake County	Grayslake
Diane Carter-Zubko	Harper College	Palatine
Marta Cerda	Chicago Workforce Board	Chicago
Mary Charuhas	College of Lake County	Grayslake
Sue Clark	DuPage County Workforce Development	Lombard
Vincent Clark	Kankakee County Community Services, Inc.	Kankakee
Pat Coleman	McHenry County College	Crystal Lake
Diane Cooper	Kane County Dept. of Employment and Education	Elgin
Margaret Cooper	KCC/Workforce Investment Act (WIA)	Kankakee
Vernon O. Crawley	Moraine Valley Community College	Palos Hills
Gloria Curtin		Chicago
George Dammer	South Suburban College	South Holland
Thomas Dardis	Three Rivers Construction Alliance	Joliet
John Day	DuPage Housing Authority	Wheaton
Mike DeWolfe	McHenry County College	Crystal Lake
Peggy Drey	Will County Workforce	Joliet

<b>One-Stop Council</b>		
Ronald L. Edgecomb	Illinois Department of Employment Security	Woodstock
Pedro Enriquez	Illinois Migrant Council	Woodstock
Carroll Evans	IDHS/Community Operations	Aurora
Ann Fettinger	IDES	Grayslake
Lynn Fieldman	Will-Grundy County Building Trades Council	Joliet
Susan Flessner	Workforce Services Division of Will County	Joliet
James A. Floyd	Housing Authority of the County of Cook	Chicago
Sandy Freeman	Elgin Housing Authority	Elgin
Joyce Gallagher	Chicago Department of Aging	Chicago
Theodia Gillespie	Quad County Urban League	Aurora
Tom Gollan	IDHS/ORS	Elgin
Patricia Granodos	Triton College	River Grove
Mitch Hallgren	DeKalb Co. Housing Authority	DeKalb
Ingrid Halvorsen	Office of Rehabilitation Services	Arlington Heights
Jean Hansen	Illinois Department of Employment Security	Joliet
Ronald Hansing	I.B.E.W., Local 117	Crystal Lake
Katherine Harris	SER, Jobs for Progress	Waukegan
Sandy Harris	Waukegan Housing Authority	Waukegan
Will Harris	Illinois Department of Human Services - Office of Rehabilitation Services	Joliet
Ashref Hashim	The Blackstone Group	Chicago
Dennis Haynes	Joliet Junior College	Joliet
Peg Hendershot	Ball Foundation	Glenn Ellyn
Julie Hennig	Harper College	Palatine
Julie Herscher	City of Kankakee Senior Services	Kankakee
Robert Holas	IDHS	Woodstock
Grace Hou	Illinois Department of Human Services	Chicago
Andre Howard	Department of Human Services – Office of Rehabilitation Services	Aurora
Terry Irby	Joliet Junior College	Joliet
Michael Irwin	National Able Network	Chicago
John Jacobs	IL Dept of Human Services/TANF	Kankakee
Gerry Jones	Aurora Housing Authority	Aurora

<b>One-Stop Council</b>		
Lucia West Jones	Northeastern Illinois Area Agency on Aging	West Chicago
Ronald Jordan	CEDA Northwest	Mount Prospect
Victoria Kanellis	Illinois Department of Human Services	Park City
Len Kaufmann	McHenry Co. Job Training	Woodstock
Robert Kilbury	Illinois Department of Human Services, Office of Rehabilitation Services	Springfield
Brent Knight	Morton College	Cicero
Jeffrey Knox	Illinois Dept. of Human Services/Office of Rehabilitation Services	Chicago Heights
Eldon Lafever	Ironworkers Local 444	Joliet
Brooks Lockhart	California Indian Man Power Consortium	Chicago
Alicia Mazur Berg	Chicago Department of Planning and Development	Chicago
Paul J. Mc Carty	Prairie State College	Chicago Heights
Sheila McCraven	Kane County Dept. of Employment and Education	Geneva
Claire McElroy	Kankakee Community College/Adult Education	Kankakee
Thomas Lee Miller		Burbank
Sandra Mol	Joliet Junior College	Joliet
Lauren Morales	Paul Simon Chicago Job Corps Center	Chicago
Glen Murrin	Illinois Department of Employment Security	Lombard
Francis Muthu	Cook County President's Office of Employment Training	Chicago
Steven Nunes	Prairie State College	Chicago Heights
Mary Ann Olson	Triton College	River Grove
Jim Pandolfi	PTW & Co. Ltd.	Oak Brook
Joyce Parnell	Workforce Development	Waukegan
Chris Picard	College of DuPage	Glenn Ellyn
Lou Piskur	NECA-IBEW #176 JATC	Minooka
Gloria Richard	Illinois Dept of Employment Security	Kankakee
Roberto Rivera	Cook County President's Office of Employment Training	Chicago
Barbara Rizzo	Oakton Community College	Des Plaines

<b>One-Stop Council</b>		
Waverly Robinson	Illinois Department of Employment Security	Chicago
Anne Marie Rosen	College of DuPage	Glenn Ellyn
Brenda Russell	Illinois Department of Employment Security	Chicago
Deb Russell	Chicago Workforce Board	Chicago
Johnetta Ryan	C.I.S.C.O.	Oak Brook
Eloy Salazar	Illinois Migrant Council	Chicago
Aida Sanchez	Illinois Dept. of Human Services	Arlington Heights
Amy Santacaterina	Mayor's Office of Workforce Development	Chicago
Al Saulys	Business and Career Services, Inc.	Arlington Heights
Rhonda Serafin	Township High School District 214, NWSAPC	Arlington Heights
Linda Shumate	Illinois Department Of Human Services South Suburban Local Office	Midlothian
Stanford Simmons	Education to Careers Partnership	Palatine
Cheryl Smith		Chicago
Michael Smith	Kankakee Federation of Labor (AFL-CIO)	Kankakee
Dennis Sorenson	Kankakee Community College/Perkins Act	Kankakee
Jennifer Stephen	IL Dept of Human Services/TANF	Kankakee
Gayle Stricklin	Illinois Department of Human Services	Joliet
Joe Strong	Plumbers and Pipefitters Union Local 422	Joliet
Jim Van Bosch	McHenry County College	Crystal Lake
Patricia Vance	Evanston Township	Evanston
Ray Vazquez	Chicago Department of Human Services	Chicago
Daniel Walsh	IDHS/Community Operations	Aurora
Joe Ward	I.U.O. E. Local 150	Joliet
Kris White	Center for Community Concerns	Joliet
Mary White	Lake County Partners	Libertyville
Amy Wiatr	Suburban Area Agency on Aging	Oak Park
Russ Wilder	McHenry County Bldg.Trades	McHenry
Luther Wren	Illinois Department of Employment Security	Chicago

# Appendix C: Employment Projections

Title	Employment		Change		Total Annual Openings	Avg. Entry Wage	Education
	2,000	2,010	#	%			
Computer software engineers, applications	15,065	28,885	13,820	91.7%	1,483	\$22.15	Bachelor's degree
Computer support specialists	16,694	29,853	13,159	78.8%	1,387	\$12.62	Associate's degree
Desktop Publishers	1,686	2,703	1,017	60.3%	132	\$11.22	Short term OJT
Production workers, all others	62,162	82,840	20,678	33.3%	3,182	\$6.22	Moderate term OJT
Customer service representative	74,415	95,058	20,643	27.7%	2,695	\$9.54	Moderate OJT
Advertising Sales Agents	6,153	7,781	1,628	26.5%	288	\$11.16	Moderate OJT
Welders, cutters, solderers, and brazers	12,844	15,308	2,464	19.2%	607	\$10.87	Postsecondary vocational school
Editors	4,249	5,066	817	19.2%	220	\$15.21	Bachelor's degree
Sales and Related Workers, all other	30,165	35,884	5,719	19.0%	1,237	\$7.09	Moderate OJT
Electrical and electronic engineering technicians	7,409	8,800	1,391	18.8%	289	\$14.03	Associate's degree
Packaging and Filling Machine Operators and Tenders	13,946	16,446	2,500	17.9%	557	\$7.22	Moderate term OJT
Packers and Packagers	33,110	37,900	4,790	14.5%	1,323	\$6.63	Short term OJT
Assemblers and fabricators, all others	22,383	25,601	3,218	14.4%	714	\$6.80	Moderate OJT
Chemists	3,667	4,159	492	13.4%	164	\$16.79	Bachelor's degree
Computer-controlled machine tool operators, metal and plastic	5,908	6,687	779	13.2%	288	\$9.10	Long term OJT
Bakers	5,271	5,927	656	12.4%	149	\$7.73	Long term OJT
General and operations managers	82,369	92,555	10,186	12.4%	2,405	\$18.92	Work Exp. + Bach Degree or higher
Laborers & Freight, Stock, and Material Movers	79,558	89,105	9,547	12.0%	3,612	\$6.60	Short term OJT
Industrial Truck and Tractor Operators	18,377	20,329	1,952	10.6%	450	\$10.27	Short term OJT
Chemical equipment ops & Tenders	2,456	2,712	256	10.4%	84	\$11.28	Moderate OJT
Mechanical engineers	7,735	8,399	664	8.6%	293	\$21.28	Bachelor's degree
Industrial Machine Mechanics	6,197	6,692	495	8.0%	217	\$12.82	Long Term OJT
Metal workers and plastic workers, all other	8,926	9,589	663	7.4%	240	\$8.39	Moderate OJT
Chemical technicians	3,113	3,333	220	7.1%	94	\$13.42	Associate's degree
Meat, Poultry & Fish Cutters and Trimmers	2,638	2,815	177	6.7%	82	\$7.81	Short term OJT
Shipping and receiving clerks	29,399	31,150	1,751	6.0%	767	\$8.89	Short term OJT
Mixing & Blending machine setters and ops	5,299	5,577	278	5.2%	144	\$10.08	Moderate OJT
Slaughterers & Meat Packers	2,313	2,395	82	3.5%	64	\$8.56	Moderate term OJT
Engine and other machine assemblers, coating, painting, and spraying machine setters and operators & tenders	3,054	3,103	49	1.6%	66	\$8.10	Short term OJT
Food Batchmakers	3,205	3,192	(13)	(0.4%)	78	\$7.92	Short term OJT

## **Appendix D: Letters of Support**