Creating A Manufacturing Career Path System in Cook County

By the

Chicago Federation of Labor and the
Center for Labor and Community Research

December 2001

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Preface

In the spring of 2000 the Chicago Federation of Labor (CFL) Workers Assistance Committee (WAC), in collaboration with the Center for Labor and Community Research (CLCR), received a grant from the United States Department of Labor to (1) analyze the training and education needs of Cook County's manufacturing economy; (2) assess our current education and training system for manufacturing; and (3) develop a plan to improve this system in partnership with the region's key business, labor, government, and education institutions.

Much has changed since we initiated our work. The nation's economy, which began sliding into a recession early in 2001, has been further jolted by the aftershocks of the terrorist attacks against New York City and Washington, D.C., on September 11. It now seems clear that our regional manufacturing sector cannot avoid being significantly impacted by the continuing national economic slowdown.

As a result, some of the economic assumptions used in this report may prove to have been optimistic. On the other hand, the increased economic uncertainty of the times simply reinforces the relevance of the the report's analysis and proposals. The more challenging the economic conditions, the greater the need becomes to focus attention on manufacturing workforce development. A healthy and sustainable manufacturing sector is vital to the nation's well-being and stability in unsettled times at home and abroad.

This project has been one of our largest and most complex undertakings. We deeply appreciate the confidence and support extended to us by the Department of Labor and our local partners. We are proud of what we have accomplished. We encourage critical reviews of our work and we hope to spur an ongoing discussion among the stakeholders of our manufacturing economy and education system. An informed and spirited debate is a necessity if we are to bring about the major changes that are needed.

This report reflects the participation of hundreds of individuals, organizations, and agencies throughout our region, from around the nation, and from abroad. Although the CFL and CLCR take full responsibility for the findings and recommendations of this report, we want to thank all those involved for their enormous contributions. We look forward to building on these partnerships as we work to create a Manufacturing Career Path System in Cook County.

Following are the members of the Manufacturing Workforce Development Project Advisory Committee who joined us in this project, providing critical counsel and support. I extend my deepest thanks to them for their assistance.

Don Turner, President, Chicago Federation of Labor

Members of MWDP Advisory Committee

Jerry Baginski, Vice President, Tooling & Manufacturing Association
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Brian Banks, Policy Action Research Project
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Amy Sherman was the Executive Director of the MWDP and provided leadership and critical assistance in all aspects of this endeavor including building the consortium, project management, research, and in writing the report. She was assisted in this effort by Tim Leahy, Assistant to the President of the CFL.

The Research Team was led by Bob Ginsburg, Research Director of CLCR; and included Mike Jin and Ken Blum of the CLCR Research Staff; Stephanie Sommers, Sommers Consulting; Elisabeth Solomon, Solomon and Associates; Steve Everett, Consultant; Ray Pendergast, Consultant; Aaron Sojourner, CLCR Associate Director, and Robert Skowronski, MWDP intern. Judy Leff of the Educational Development Center of Newton, MA provided critically important assistance in the design of the project, the development of the proposal and the first phase of the project.

The principal Editor/Writer of this Report was Dan Swinney, Executive Director of CLCR. The Assistant Editors/Writers were Dave Pfleger of Thornton Pfleger, Inc. and Jim Jacobs, Macomb Community College, Warren, Michigan. We had the generous assistance of Steve Holt, Holt and Associates Solutions, Milwaukee; Tom Bethell, Washington, D.C.; Nicole Thorne, CLCR Office Manager; Friederika Kaider, Director of the Candy Insitute; Paul LeBreton, CLCR Assistant; Sam Mitrani, CLCR Assistant; and Virginia Carlson, University of Wisconsin-Milwaukee.

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I. Introduction

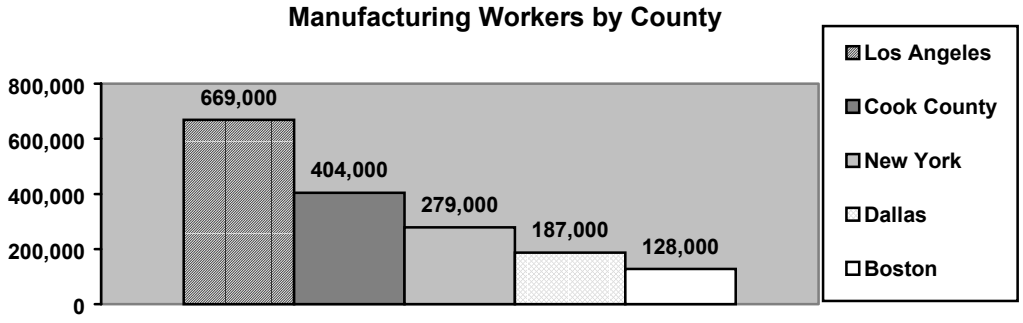
Chapter 1: Overview

Cook County manufacturers create more than 10,500 new or replacement jobs annually — jobs generally offering good wages and benefits.[1] But Cook County's education and training system does not provide adequate numbers of skilled people to fill those jobs, even though large numbers of area residents, particularly youth and those living in our poorer communities, are eager for opportunities for work.

All told, there are some 404,000 manufacturing jobs in Cook County.[2] In a sense, all of them are being put at risk by our failure to ensure that regional manufacturers can count on finding workers with the right skills to fill job openings. How we close this and other gaps in our workforce education and training system will determine whether or not we will retain, sustain and develop the tremendous power of our manufacturing sector. Cook County faces a crisis in training and education for our manufacturing economy. We have important decisions to make.

A Highly Skilled Workforce is Essential for Companies and Communities

Manufacturing is the economic foundation of Northeast Illinois. The six-county region has 670,000 manufacturing workers — a larger number of workers than all but seven states. Los Angeles County is the only county in the nation with a larger manufacturing workforce.



For Cook County manufacturers the economic environment both nationally and globally is increasingly competitive. The Chicago area is in competition not only with traditional manufacturing centers elsewhere in the United States and in Europe and Asia, but also with newly developing enterprises and economies worldwide. To remain competitive, manufacturers must constantly innovate. Here as elsewhere, manufacturing has been transformed by the introduction of new technologies that are continually being replaced by even newer technologies. A modern manufacturing economy must have a highly skilled workforce able to engage in continuous and lifelong learning. Even an entry-level

[1] See Chapter 3 for details of calculation.
[2] US Bureau of Census, County Business Patterns - 1998

job in manufacturing requires skills in reading, writing, and basic computer operation, along with the motivation to come to work and to continue to learn. The scarcity of workers with such skills means, among other things, that jobs paying $50,000 to $60,000 per year are going unfilled.

These unfilled jobs represent a direct threat to Cook County's economic future. There are widening gaps between the needs of companies for skilled workers and the educational community's ability to provide them. There are widening gaps between the aspirations of area residents and their ability to find good jobs. There are widening gaps between the desire and commitment of the public sector to address these issues and its ability to forge a strong and mutually beneficial linkage with the private sector. All of these widening gaps must be analyzed and addressed if Cook County is going to retain the economic and social benefits of its manufacturing strength and keep pace with the competition.

The Manufacturing Workforce Development Project

In this context, the Chicago Federation of Labor[3] Worker Assistance Committee (CFL-WAC), in collaboration with the Center for Labor and Community Research (CLCR)[4], sought and received funding from the U.S. Department of Labor to create a broad, representative regional consortium in Chicago and Cook County to develop a plan to prepare a skilled workforce for several industries within the manufacturing sector, working closely with a larger circle of business, labor, government, education, and community-based organizations in Cook County. [5] We titled our project the Manufacturing Workforce Development Project. Our objectives were to:

- Analyze information about the region's manufacturing base, and identify particular industries with high potential growth and high wages;
- Identify the worker skill needs of employers in key manufacturing industries;
- Identify the specific training and related support needs of both incumbent and prospective workers from target populations;
- Identify and document the gaps that exist between the need for skilled workers and the work skill levels of the target populations;
- Identify and assess existing education and training resources (schools, colleges, training programs), that prepare workers for skilled, high-wage jobs and careers;

[3] CFL's web site is <www.cflonline.org>
[4] CLCR's web site is <www.clcr.org>
[5] The Educational Development Center, Inc. (EDC) of Newton, MA joined the CFL and CLCR in the application for funding and was initially involved in the project.

- Determine the gaps that exist between the education/training capacities of current institutions and the capacities that must be developed to prepare people for skilled jobs and careers in high-growth manufacturing industries;

- Develop a plan for utilizing and augmenting existing education and training resources to meet the needs of employers, incumbent and future workers, and the Cook County regional economy, and recommend specific next steps to implement this plan; and

- As resources and consortium consensus permit, initiate specific projects consistent with the plan.

In the course of the past 18 months we have completed the above objectives, aided by a broad and dynamic Advisory Committee including representatives of over 40 organizations from business, labor, the educational and training community, city and county government and its training programs, and community-centered organizations. Our research, analysis and recommendations are presented in this report.

The Requirements for Change: Shared Responsibility, an Effective Long-Term Vision, and Immediate Action

This report and its recommendations are based on several key points. Our research found that most of the parts of the present system to recruit, train, and educate workers to prepare them for modern manufacturing are not working effectively. As a result, the foundation upon which our healthy economy has been built is at risk. All of the major institutions and organizations involved in the present system share responsibility for its failures and shortcoming. Just as none of us is without blame, so must we all be part of the solution. At the same time, it needs to be recognized that within the overall system there are specific programs and initiatives that are working. Some are discussed in this report. We should build on their success.

Some of the problems and challenges we face are large, complex, and deeply rooted. To bring about fundamental change in some of our institutions, and to systematically strengthen their resources and capacities, may require decades of determined work. Similarly, it may take years to change attitudes about the desirability of manufacturing jobs and the skills needed to make a go of manufacturing work. And it will certainly take years to establish the private and public funding streams that are required for a modern manufacturing workforce development system. But the very fact that these challenges are daunting means that there isn't a minute to waste. We must begin building the system now with the resources and partnerships that are available. Success in these initial efforts will fuel the momentum essential for long-term success.

What We Learned

We are guided by the following conclusions, shaped by what we learned about Cook County's needs as well as what we learned in studying other local, national, and international experience. Workforce training and education can and should be a key driver of economic and community development in our region. We need:

- A formal, well-organized system that meets the needs of all partners in the community and economy;
- A workforce training and education system that focuses on basic employability skills including critical thinking and technical skills;
- A comprehensive system that can link the employers' needs for skills with the desire of Chicago's growing minority and immigrant community for jobs;
- Clearly defined and appropriate roles for the participants in the system; and
- Meaningful certification for employees and prospective employees based on input from companies, labor, and educational institutions.

Part of the Broader Effort to Retain, Modernize, and Improve our Manufacturing Sector

In this report we focus solely on workforce training and education and its importance to economic and community development. Yet it must be complemented and linked to a variety of other initiatives to retain and develop our manufacturing economy and to increase the linkages of this economy to our county's residents and communities. The availability of a skilled workforce is one of many variables facing companies and employees. Many manufacturing companies face problems in:

- Ownership succession: many small firms are at risk because of owners retiring with no apparent successor capable of sustaining an otherwise viable company;
- Capital availability;
- Space availability;
- Meeting environmental standards;
- Financial and production management;
- Establishing strong export markets; and
- Facing predatory competition or acquisition threats.

In many cases, addressing issues of employee skills within a company reveals the presence of other problems that may be even more serious. It is important to recognize rather than ignore this linkage of skills issues to other problems.

Directly related to workforce training and education are the challenges of continually modernizing manufacturing. These include understanding and utilizing new technologies as well as developing a workforce that can make effective use of them to enhance productivity and competitiveness.

Equally important are the issues of work organization and new forms of management that confront every manufacturing company. The traditional approach to production — that there was "one best way" to perform a task and that workers should be trained to do only that task, and only that way — has been overtaken by events. New approaches to work organization and management are required and are evolving. Skill at working as part of a team is now as important as having a technical skill, particularly with new technologies emerging every few months.

In short, efforts to develop a world-class workforce development and education system must be directly and closely linked to other initiatives addressing workforce retention, manufacturing modernization, and management reform. They must all be part of a common effort.

How this effort will be undertaken remains to be seen. There are basically only two approaches to managing a company (and, by extension, an economy): the Low Road and the High Road. The Low Road strategy seeks a return on investments by:

- Emphasizing short-term gains, even if they mean postponing or sacrificing improvements in the productive capacity of the company or sector;

- Keeping wages and benefits at the lowest possible levels;

- Managing by intimidation, undermining employee initiative as well as efforts to exercise the right to organize; and

- Ignoring the needs and concerns of those beyond the most short-sighted and powerful shareholders, investors, and/or managers.

The High Road strategy, on the other hand, seeks a return by:

- Making a long-term commitment to reward high performance with high wages and incentives;

- Making a commitment to continually enhance employees' skills and training;

- Making a commitment to increase employee participation in the operation of the company, including recognizing the right to organize; and

- Making a commitment to the community as well as to shareholders.

Although the High Road strategy is obviously preferable, pursuing it can be difficult if not impossible for a company acting alone. To succeed, a strategy that benefits the broader community requires the involvement of all the major stakeholders. Labor and community organizations, as well as government, must participate. They no longer have the luxury of concerning themselves only with the redistribution of wealth. They must also be concerned with its creation, and with creating the conditions in which the business community can flourish. Building a Manufacturing Career Path System, as we propose for the Chicago area, is one part of a broader vision for building a High Road economy. The necessary underpinning is a strong and effective partnership among business, labor, government, educators, and community organizations.[6]

It should be noted that certain key aspects of the workforce development system were beyond the scope of this project and are not addressed in this report and in our proposals. Each of the following issues needs to be taken up in depth as we build the Manufacturing Career Path System:

- **Specific national, state, and county legislation:** We gathered information on the impact of existing legislation in general but did not attempt statute-specific analysis and recommendations. To illustrate, the federal Workforce Investment Act (WIA) went into effect on July 1, 2000, while this project was under way. Although WIA is having a profound impact on the workforce system, attempting an in-depth assessment of its impact was not feasible within the time constraints of this project, nor would such an assessment have been particularly relevant at this stage of developing an improved workforce development strategy. This was also the case with other legislation. Going forward, however, statute-specific analysis and recommendations will be essential.

- **Funding for the Manufacturing Career Path System**: As one of our readers commented, "Who is going to pay for all of this? How much will it cost to design the system and implement it? Who should pay for it? Employers? The city? The county? The state? The federal government? Are there existing funds that need to be re-directed? Is there a role for philanthropy?" These are critical questions that must be confronted — once there is the necessary consensus to proceed with the Career Path System.

- **Private Sector Performance:** This report focuses on the performance of the public side of the workplace development system in meeting the needs of the private sector as well as the other stakeholders. We engaged employers to better

[6] For a broader discussion of this strategy, see *Building the Bridge to the High Road*, by Dan Swinney, Center for Labor and Community Research, www.clcr.org

understand their needs, but did not conduct a detailed analysis of their specific approaches to training and education within their companies, their level and value of investment, and their options. According to the American Society for Training and Development, annual private investment in training totals $63.3 billion for companies with more than 50 workers.[7] An analysis of the value received from this investment, and of the strengths and shortcomings of private-sector training, must be part of any long-term effort to reform workforce development.

Our Report in Brief

Our report is intended for those who shape strategy and policy for the workforce development field, locally and nationally. It is anchored in a detailed analysis of the specific conditions and challenges that face employers, employees, educators, trainers, and local government, and presents our research, analysis, and recommendations as follows:

Chapter 2: Manufacturing Matters. We present our case for the continuing importance of this sector despite popular misconceptions about its alleged disadvantages and decline.

Chapter 3: The Research Methodology and Foundation. We explain our methodology and what we learned from a review of existing literature and studies, interviews, original surveys, focus groups, study tours, and other sources. We based our research on a sectoral approach that examines groups or clusters of companies.

Chapters 4 through 9: The Gaps in Our System. We examine the various gaps that exist between employers, educational institutions and training organizations, older youth, workers, and residents — all of which must be bridged if we are to have a modern and competitive workforce development system for manufacturing.

Chapter 10: Our Proposal. We propose an alternative model for manufacturing training that correlates particular manufacturing job types with necessary skills and arranges the resulting "skill clusters" into an interlocking hierarchy of manufacturing occupations and related skills. This hierarchy begins with "foundation" employability and common manufacturing skills, the foundations for higher "core" and "advanced" skilled positions.

This hierarchy matches literacy, critical thinking, interpersonal, and technical skills with grouped job clusters that, as a set, provide a useful framework for identifying career paths, training paths, and appropriate sites for training and education including the classroom, the laboratory, and the worksite. This hierarchy:

- Defines career and training paths;

[7] *Workforce Economics*, published by the National Alliance of Business, Vol. 7, Issue 1, Spring 2001, p. 8.

- Provides a framework for clearly defined roles within the system;

- Provides a framework for curriculum development that integrates key classification systems; and

- Provides a framework for credentialing and certification.

This Manufacturing Career Path System describes the activities and objectives that can be provided by any training or education center that has the appropriate capacity to become certified, to recruit students, and to create the essential linkage with the next level of education provider or employers. Our goal is to create a career path that goes from lower-skill to higher-skill level jobs, and to take into account the areas of overlap that occur as a worker moves from entry-level jobs to more skilled occupations, e.g., machine repairers, maintenance mechanics, etc. Our skill clusters also encompass high-tech and knowledge-based occupations such as computer-assisted design and manufacturing. The system is designed to maximize the involvement and effectiveness of the various stakeholders and to facilitate moving workers from lower to higher skill levels.

Our Manufacturing Career Path System has the following key characteristics:

- It is anchored in a sectoral analysis;

- It groups job and skill clusters in the context of a career path as the foundation for the training and education system;

- Training and education curriculum are developed in the context of industry standards and employer requirements;

- Training and education lead to certification;

- It relies on a partnership of business, labor, government, and educators to develop all aspects of the system, including its objectives, standards, design, and implementation; and

- It is flexible and able to respond to changing economic developments as well as changing needs among the stakeholders.

Chapter 11: How Do We Get There? We describe general steps to establish the Manufacturing Career Path System that can be adopted and implemented in various ways by various institutions. We also advance our specific plans as a network of organizations to build this system in Cook County starting with a number of projects. These include:

- Continuing research into labor, race, international experience, private sector initiatives, policy, and other key issues connected to workforce development;

- Creating and/or supporting intermediary organizations in the three manufacturing sectors that are the focus of our proposal;

- Developing a curriculum for career paths in these sectors;

- Creating a Chicago Public High School Career Academy in technology and manufacturing organized on the Small School model;

- Creating a manufacturing and technology demonstration center at City Colleges of Chicago;

- Expanding negotiated labor-management training and education programs in area companies;

- Launching an ambitious public relations and public education campaign to further the objectives of this project; and

- Expanding the public policy and legislative initiatives linked to the objectives of this project.

Chapter 12: Conclusion. This report calls for fundamental change in the Cook County workforce development system. Change is critical to the future of our regional economy, our communities, and the employment prospects of our residents. The need is great and the time is now.

About the Advisory Committee

In our proposal to the Department of Labor we committed to creating a consortium of key business, labor, community, education, and governmental organizations to work with us in developing our analysis and understanding of the current system and to join with us in developing and initiating projects consistent with the objectives of the project.

Following up on this proposal, we created an Advisory Committee representing more than 40 organizations (identified on pp. 4-5). The formation and involvement of this network of organizations has been of great value to the project. Although the conclusions in this report are the views of the CFL and CLCR, we obtained the advice and input of this network of leaders in:

1. Developing the analysis and proposal for change as reflected in this report; and

2. Serving as partners in specific projects designed to move toward development of a modern, world-class workforce education system.

Developing the analysis and proposal: This report is the result of intensive collaboration with a broad range of leaders in the field. In the early stages we benefited from working

with Judy Leff of the Educational Development Center of Newton, MA. Judy helped us shape the design of the project and develop the proposal in key ways. Following a period of intensive research into the broad features of the manufacturing economy and education system, we reached out to a group of leaders from local universities and agencies to help us design the refinement of our research approach and our contact with employers and training providers.

At a February 2001 meeting we received invaluable assistance from Virginia Carlson, then the Research Director of World Business Chicago; Nik Theodore, the Executive Director of the Center for Urban Economic Development at the University of Illinois-Chicago; and Jim Jacobs of Macomb Community College in Warren, Michigan.

By April 2001 we had compiled our initial results from focus groups and meetings with employers and training providers; and our initial thoughts of what our proposal and report should include. Again we gathered together our research advisors, adding Steve Everett, Ray Pendergast, Stephanie Sommers, Elisabeth Solomon, and Tim Leahy of the CFL in a three-day retreat to brainstorm with us about the essential elements and requirements of a proposal for change. Their views challenged some of our assumptions while encouraging others, and deeply impacted our approach.

In May we took a delegation to Europe to study workforce development systems there — a trip described in Chapter 8, with a full report in the Appendices. At that time we also discussed our initial outlines and approach with the delegation and received essential feedback on our working assumptions about what was wrong with the current system and what was important going forward, as well as on the kinds of initiatives we should undertake to start the process of building the Career Path system.

By July we had completed most of our research and had developed an outline of the report. We gathered our initial research advisors plus a larger network of practitioners to review and discuss our work in a day-long meeting. This larger team included Tom Burress of the Working for America Institute; Davis Jenkins, Executive Director of the Great Cities Institute at the University of Illinois-Chicago; Mike Klonsky of the Small Schools Workshop-UIC; Marva Williams of the Woodstock Institute; Brian Banks of the Policy Action Research Group; and Ric Gudell, President of the Regional Manufacturing Collaborative and the Chicago Manufacturing Institute.

By the end of August we had completed a first draft, which we sent to our research advisors in Chicago and to national readers including Barry Bluestone, Director of the Center for Urban and Regional Policy at Northeastern University in Boston, and Gary Herrigel of the University of Chicago. We received a number of suggestions, corrections, and thoughtful criticisms that we sought to address as we revised our draft of the report.

Finally, in October 2001, we sent the new draft report to our entire Advisory Committee for review and feedback. Many members of the committee then gathered with us on October 26, 2001 for a presentation and discussion of the report.

Each of these meetings shaped the content of the report and our plans going forward in valuable ways. Our core team was continually reminded of the benefit of broader consultation and exchange. As we encountered views at odds with our initial findings and assumptions we were forced to dig more deeply into the issues and to be both more creative and more practical in our proposals. The result, we believe, is a higher quality product.

Building alliances: At the outset of this project neither the CFL nor CLCR had extensive expertise in the workforce development field, although we do have such experience in manufacturing — including the need for high performance — and in addressing the concerns of working people. We sought to identify and utilize the expertise that already existed in Cook County. Although the report describes the many problems we found in the workforce development system, it must be emphasized that we also found a remarkable reservoir of talent, expertise, experience, and commitment.

From the beginning, we made it clear that we were not interested in using public funds to duplicate the research and analytical work that had already been done by others. Instead we sought to direct attention to their analyses. We have the same perspective regarding programmatic work. Where we find projects consistent with our recommendations, our goal is to lend support to such initiatives rather than consider duplicating them.

It became clear to us that in the field of workforce development there is more work to be done than there is capacity to meet the demand. Accordingly, everything is to be gained by making the extra effort to find common ground with those in the field, recognizing that by working together we can have a much greater impact in improving the capacity of companies and the opportunities that are available both for present employees and for those seeking good jobs. This was the rationale behind the formation of our Advisory Committee and our emphasis on collaboration. We are confident that persistence in this approach will build the trust and confidence within a growing network of organizations and agencies that will result in bringing innovative approaches to workforce development to fruition.

Programmatic partners: When we first started this project, we were focused on the weaknesses of the current system in Cook County. We cannot bring about substantial reform without absolute candor and honesty. All of the participants in the present system have, with the best of intentions, contributed to its weaknesses, including labor, employers, educators, local government, and community-based organizations. We all share the blame. With the aid of candid self-assessment, however, we can move forward. And there is much good work to build on. In the course of our research we became aware of the enormous strengths of local projects and local leaders in the field. Not only are they doing pioneering work that has a local impact; but they are recognized by others across the country as leaders in the field. They represent many of the qualities we see as essential for our new system. It is worthwhile to note that they have been supported and encouraged by local government and by Chicago-based foundations such as the John D. and Catherine T. MacArthur Foundation, the Joyce Foundation, the Chicago Community Trust, and others.

These projects are important to build upon, expand, and learn from. They typically represent a partnership approach. They have brought employers, training providers, educational institutions, community-based organizations, and government together in specific programs that value skill-training and, particularly, opportunity for those typically excluded or underserved. We have gotten to know these programs, organizations, and leaders and are exploring ways to be helpful and involved in their initiatives, and are eager to increase our work with them. They include the organizations, projects, and companies that are described in greater detail in Chapter 9. In Chapter 12, we discuss our plans for moving forward in partnership with employers, educators, city and county agencies, and community-based providers.

Following are examples of the partnerships that we developed in the course of the Manufacturing Workforce Development Project:

The Regional Manufacturing Training Collaborative (RMTC): As described in Chapter 9, RMTC is a network of community-based training organizations in Chicago that have been the pioneers in trying to overcome the costly gaps between employers who need skilled workers for good jobs, training providers, and low-income residents and dislocated workers. RMTC was successful in securing a Department of Labor grant to train and place dislocated workers, and has now recruited a number of organizations and grown. One of the first organizational visits of the MWDP was to RMTC. CLCR, representing the MWDP, joined RMTC and the Board of Directors and we have lent our support to their initiatives and learned from their experience.

Mayor Richard M. Daley, the Chicago Workforce Board, the Mayor's Office of Workforce Development, and City Colleges of Chicago: In consultation with the Chicago Workforce Board and the Mayor's Office of Workforce Development, we met with Mayor Daley's staff and proposed an active joint relationship around the objectives of the MWDP. On February 1, 2001, Mayor Daley held a press conference at a local manufacturing company announcing his support for the MWDP as well as funding for three training programs in local manufacturing companies that would be organized by the Candy Institute. Some of the training has taken place at City College facilities. The three companies are:

a) *Eli's Cheesecake*, with 200 employees, has initiated two training programs, with five others to follow.

b) *Able Electro-Polishing*, with 100 employees, has already successfully completed a program on Team Building and Problem Solving. Twenty workers completed the training. Two have received pay increases and two have been promoted. All were retained despite recent layoffs at the company. Teamsters Local 738 initiated this program.

c) *Schulze-Burch Bakery*, with 400 employees, is starting programs in Quality Control. BCTGM Local 1 initiated this project.

We have continued to build this partnership with the City. Linda Kaiser, Executive Director of the Chicago Workforce Board, joined the MWDP delegation to Europe this spring and facilitated access to Tax Incremental Financing funding for training. The MWDP successfully proposed the creation of a Manufacturing Committee of the Employer Demand Committee of the Chicago Workforce Board. This Committee is now functioning and is co-chaired by Don Turner, President of the CFL, and Peggy Luce, Vice President of the Chamber of Commerce. Other joint initiatives are in the works.

The Food Union Network for Education and Training (FUNET): Key to building an effective workforce development system is promoting an active and informed role by organized labor. In September 2000, the MWDP convened a meeting of local unions representing workers in the food industry in Chicago. Attending the meeting were leaders of Bakery Confectionery Tobacco and Grain Millers Union Local 1, Teamsters Local 738, Union of Needle, Industrial, Industrial and Textile Employees (UNITE), Food and Commercial Workers Local 881, and Service Employees International Union Local 1. This group of union leaders discussed the project and agreed to increase their efforts to further the goals of the project and meet the needs of the members and the companies where their members worked. Members of FUNET joined the MWDP in a trip to Milwaukee to study several strong projects with strong labor participation in the city. BCTGM Local 1 and IBT Local 738 have initiated active training and education programs in partnership with management at companies where their members work, including Able Electro-Polishing and Schulze-Burch Bakery.

Policy Initiatives: Chicago Jobs Council (CJC), Chicago Association of Neighborhood Development Corporations (CANDO), the Policy Research Action Group Policy Initiatives (PRAG), and the Council for Adult and Experiential Learning (CAEL) — representing community-based organizations, training providers, workforce development intermediaries, and community development corporations — have been engaged in a sustained effort on the local, state, and federal level to develop and advocate policy that expands workforce development and education programs, builds capacity of neighborhood organizations to involve residents in these programs, and particularly prioritizes the availability of these programs to low-income individuals. We have joined with these organizations and explored ways in which we can specifically increase the support of organized labor at the state as well as county level, while also contributing to the formulation of their policy initiatives.

Public Education Initiative on Manufacturing: From the very first days of our project and our consultations with organizations and policy leaders, we recognized that any effort to reform and build our workforce education system in manufacturing had to be accompanied with a massive public education and public relations campaign around the character and value of manufacturing. Even in the most sophisticated policy circles, we found widespread skepticism about the future of manufacturing, along with a remarkable underestimation of its value. In February 2000, the MWDP and its Advisory Committee members hosted international business writer and journalist Eamonn Fingleton for two days of presentations and public forums on the value of manufacturing. Fingleton is the

author of a new book, *In Praise of Hard Industries*.[8] We arranged presentations for Mr. Fingleton at a joint breakfast of the Chamber of Commerce and the Chicago Workforce Board; and at a panel organized by Global Chicago. The main event was a public forum held at the Methodist Temple with a presentation by Fingleton, and a response panel including Demetria Gianissis, President of the Chicago Manufacturing Center; Paul O'Connor, President of World Business Chicago; Bob Ginsburg, Research Director of CLCR, and Tom Klier of the Federal Reserve Bank.

We also organized a public seminar with the Chicago Workforce Board on Food Manufacturing Career Paths, featuring Australian John Christensen, who presented the Australian model.

The MWDP European Delegation to Study "Best Practice": Chicago is a global city, and is deeply integrated into the global economy. It competes with international companies from virtually every nation in the world. Understanding "best practice" in workforce development and education is of fundamental importance. With the support of the German Marshall Fund of the U.S., the MWDP took a delegation to Europe to study the German, Dutch, and Danish workforce education systems. We learned a great deal about their systems and approach, and were deeply influenced by what we saw, as summarized in Chapter 8. But the trip had even a greater impact in building our partnership with key leaders in our workforce education system. The delegation included Don Turner, President of the CFL; Amy Sherman, Executive Director of the MWDP; Dan Swinney, Executive Director of CLCR; Linda Kaiser, Executive Director of the Chicago Workforce Board; Diedra Lewis, Vice Chancellor of City Colleges of Chicago; Peggy Luce, Vice President of the Chicagoland Chamber of Commerce; Ric Gudell, President of the Chicago Manufacturing Institute and the Regional Manufacturing Training Collaborative; Brian Banks of the Policy Research Action Group; and Friederika Kaider, Director of the Candy Institute. We spent six days in the Ruhr Valley area of Germany, and two days each in the Netherlands and Denmark. It was an intensive learning experience, but also a rich opportunity to get to know each other, to develop a shared vision of what could be created in Chicago, and to create a level of trust and confidence that will be indispensable in creating new partnerships and new projects as we go forward.

From all of these projects we have learned that there is intense interest in "building the road as we travel" — that is, in engaging in the work of reforming the system, and creating active partnerships encompassing a diverse network of existing leaders within the field. Their involvement, support, and critical feedback has been of enormous value to the success of this project, and we look forward to many more collaborations on behalf of a workforce development system worthy of Chicago, Cook County, and the nation.

[8] *In Praise of Hard Industries*, Eamonn Fingleton,, Houghton Mifflin Company, 1999.

Chapter 2: Manufacturing Matters!

Introduction

At a time when many experts envision the new information economy as the nation's major source of employment growth, why should Chicago focus on promoting old-fashioned rust-belt manufacturing? What is to be gained from trying to preserve and strengthen manufacturing jobs and careers?

This chapter seeks to answer these questions by exploring the myths and facts of modern manufacturing, in the Chicago area and other manufacturing centers in the United States. A better understanding of contemporary manufacturing will provide the necessary framework within which to assess current education and training activities in Chicago.

Why Emphasize Manufacturing: Good Jobs for Individuals

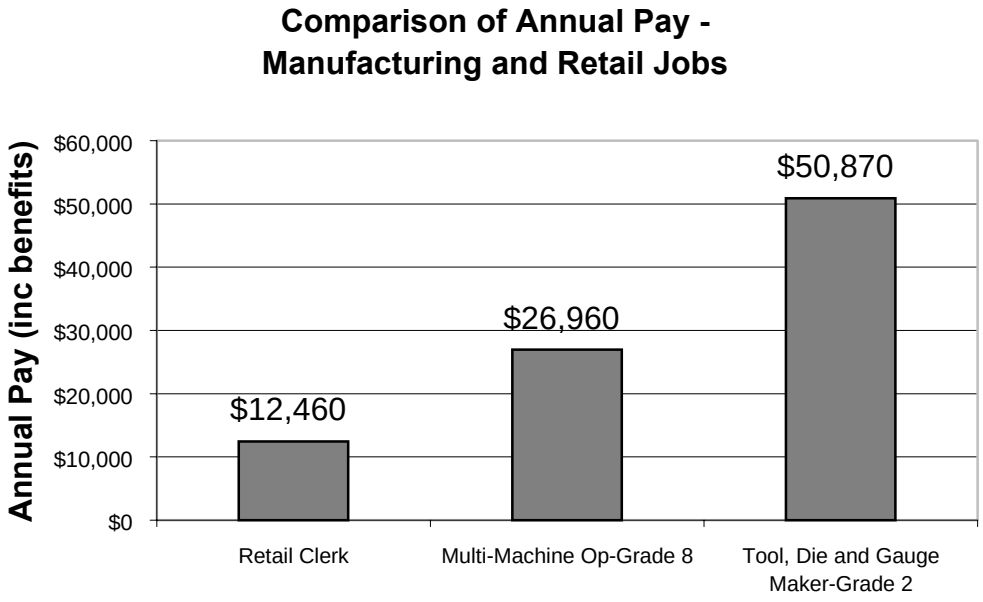
First — and most importantly from a worker's standpoint — manufacturing jobs are good jobs. Manufacturing workers earn more money and better benefits than workers in most other sectors of the economy, including many fast-growing service and retail sectors. Nationally, the average full-time manufacturing worker's total compensation package is 20 percent greater than that of the average U.S. worker.[9] According to U.S. Department of Commerce statistics, in 1997 the average manufacturing worker earned $39,300 a year in wages, with an average total compensation (salary plus benefits, bonuses and Social Security contributions) of $48,000. The average U.S. worker earned $33,500 a year, with total compensation of just over $40,000. In general, manufacturing offers higher pay and fringe benefits than construction, services, and retail trade.[10]

To get a sense of wage levels in Chicago manufacturing, consider some figures from machining — one of the sectors targeted in this report. In 1999, the median hourly pay for machine operators in the Chicago region was $11.64, with the bottom 10 percent earning $6.03 or less and the top 10 percent making $19.77 or more. Higher-skilled workers, such as tool and die makers, were earning more. Their median hourly wage was $26.10, with the bottom 10 percent earning $18.10 or less and the top 10 percent earning $29.20.[11]

As is the case nationally, Cook County manufacturing workers are higher-paid than workers in most other industries. According to 1997 Census data, the average annual salary for Cook County manufacturing workers was $40,840. In contrast, Cook County service- sector workers averaged $32,251, and retail workers averaged just $17,045. Manufacturing salaries averaged 127 percent of service salaries and 240 percent of retail

[9] The White House, Office of the Press Secretary, *Why Manufacturing Matters to the U.S. Economy,* February 5, 2000.
[10] U.S. Department of Commerce, Bureau of Economic Analysis statistics from *The Facts about Modern Manufacturing* by the National Association of Manufacturers,2000.
[11] Information summarized from Amy Glasmeier, Candace Nelson and Jeffery Thompson, *Jane Addams Resource Corporation,* Washington D.C.: Aspen Institute, 2000. p. 18.

salaries.[12] This relationship has been maintained despite an average 3.9-percent drop in the real wages of Chicago area-manufacturing workers since 1992.[13]



See Footnote[14]

Crain's Chicago Business recently provided information on the wage levels of various occupations in our manufacturing economy showing the potential material rewards for a Manufacturing Career Path System.[15]

[12] This is consistent with the findings of the Policy Research Action Group's (PRAG) December 2000 report, "Opportunities In Manufacturing: A Future for Our Region and its Workers." When PRAG compared wages in the six-county Chicago PMSA's biggest manufacturing sector occupational clusters to wages in other sectors, it found, "(Manufacturing) wages tended to be higher than the service sector and comparable to construction, without the seasonal disadvantages." (p. 14).

[13] Illinois Department of Employment Security, Current Employment Statistics.

[14] Pay calculations were calculated by combining average hourly wage, average work week and average benefit levels according to the 1999 Bureau of Labor Statistics (BLS) and Crain's Wage Survey 2000.

[15] Mean annual wage range estimates based on *Tooling & Manufacturing Association* 1/1/99 Wage Survey, and *Crain's Chicago Business,* 1999 Wage & Salary Survey.

Not just the wages but also the misnamed "fringe" benefits are significant. Nationally, manufacturing workers are far more likely than other workers to have access to benefits that contribute substantially to social and economic stability, such as health and life insurance, disability, retirement benefits, paid vacations and sick leave. For instance, in 1997 over 70 percent of manufacturing workers received direct health care coverage through their employers. Only government workers enjoyed a similar level of coverage. Fewer than half of all other private-sector companies offer direct health coverage. As for retirement benefits, more than 78 percent of all manufacturers make contributions to workers' retirement accounts.[16]

Moreover, in the mix of manufacturing jobs located in Cook County, the future is bright for some specific high-paying jobs. In the years ahead, there will be more openings for high-paying manufacturing jobs than low-paying ones, suggesting that average earnings in U.S. manufacturing jobs will climb.[17] It is true that there are fewer manufacturing occupations, but those that remain are generally with highly productive firms which have the ability to pay considerably more than the national average.

All jobs in and associated with manufacturing — not just the "front-line" jobs — tend to be relatively well compensated. For example, within the area of business services, the occupations associated with wholesale trade — the selling of raw materials and equipment to manufacturers — have substantially higher salaries and benefits than retail sales. The mean salary for all occupations in the wholesale trade section for durable goods was $58,080, while for non-durable good wholesale trade the average wage was $43,098, over 33 percent percent less. [18]

There are straightforward reasons why manufacturing pays better wages and benefits. First, manufacturing workers are generally more productive than workers in retail or service industries, in part because manufacturing is relatively capital-intensive. The ability to use capital to maximize efficiency and output by coupling skilled workers with advanced equipment makes it possible to remain competitive even while paying workers well. Second, unionization is more widespread among manufacturing workers than among other workers (aside from government workers). Over the years, this has helped ensure that increased profits from productivity increases are at least to some extent shared with workers in the form of higher pay and better benefits rather than being simply passed along to executives and shareholders. Workers in the less organized service and retail sectors have been much less able to protect their interests in this way.[19]

The importance of these jobs is not because they are plentiful. There has been a consistent decline in the number of direct, hands-on manufacturing work over the past

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[16] Employee Benefit Research Institute, 1998 from *The Facts about Modern Manufacturing* by the National Association of Manufacturers, 2000.

[17] Research by Chief Economist Kenneth P. Voytek of the National Institute of Standards & Technology's Manufacturing Extension Partnership presented to the Southwestern Pennsylvania Manufacturing Summit in April 2001 using unpublished data from the U.S. Bureau of Labor Statistics.

[18] U.S. Bureau of Census, *County Business Patterns, 1999.*

[19] A look at health insurance coverage rates supports this conclusion. Government workers, with the highest level of unionization, also enjoy the highest level of employer-provided health insurance coverage.

five decades. However, much of that decline has occurred among semi-skilled and less-skilled workers, and those jobs that remain are generally more skilled and tied to firms that have made substantial investments in machinery and productivity growth. As a worker in one of our focus groups put it:

> Manufacturers are going through the process of making changes. Less people and more machines is one of them. But you're going to find that the people who are left are going to have to be a lot more skilled. And they're going to have to be multi-talented. You might be one person running an entire department, and you've got to know how to do everything in there and run that place.[20]

Finally, and perhaps most relevant to those who advocate preparation for the occupations of the new economy, manufacturing in Chicago is part of that new economy. The new manufacturing is based around the use of the computer to design, develop, produce, and often diagnose and repair manufacturing processes. Computers allow for formerly discrete functions of manufacturing, design, inventory control, and monitoring of quality to be merged together, often using the same data to drive the processes. In short, the computer in manufacturing is like electricity: it controls the entire process and has served to increase the productivity of firms. Modern manufacturing firms continue to increase their capital purchases of computer equipment. A database of small and medium sized manufacturing firms indicated that the most productive firms were those that maintained computer terminals on the shop floor.[21]

This perspective should alter what we consider high technology jobs and industry to be. Too often, definitions of information technology jobs start by assuming they exist only in the computer manufacturing and software industries. If, however, we use an alternative definition of high technology which considers industries which have high percentages of engineers, scientists, technicians, and systems analysts, then industries such as special industrial machinery, electronic components and accessories, engineering service firms, and engineers and turbine production are all listed in the top 30 high tech industries. Using this analysis, a recent study by the University of Minnesota identified Chicago as the urban center possessing the highest number of high-tech industry jobs in the nation. [22] Thus, rather than counterposing manufacturing and information technology, we should think of them as intextricably linked. That is why one of the essential manufacturing skills is the ability to operate a computer.

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[20] Quotations from focus groups are essentially verbatim but in some instances have been edited for brevity and clarity.

[21] The database of small and medium sized manufacturing firms reveals that over 60% of the employees in the firms in the mean top 10% used computers, while in the 50% of the firms in the mean, only 48% of the employees regularly used a computer. See: Dan Luria, "How the Top Performers Are Different," unpublished data sheet, September 2001.

[22] See: Ann Markusen, et. al., "High-Tech and I-Tech: How Metros Rank and Specialize," The Hubert H. Humphrey Institute of Public Affairs, University of Minnesota, August 2001.

Are 10,500 New Jobs Each Year Enough To Worry About?

Chicago-area manufacturers need to fill more than 10,500 new or replacement job slots annually. To some, this may not sound like a large number, especially at a time when the news media are continually reporting layoffs at area manufacturing plants. It is certainly true that layoffs have been a constant feature of manufacturing employment for decades. So it's reasonable for a student or parent to ask: "Why should I (or my son or daughter) pursue a manufacturing career?"

First of all, manufacturing is here to stay. Prospects for moderate growth from a base of about 400,000 jobs mean that manufacturing will continue to account for a huge part of Cook County's economy. As long as people want things, someone will make them — and why not in Cook County? Despite inroads by foreign competitors, most of the products that Americans buy are manufactured domestically.[23] The relatively small proportion of manufacturing job losses that can be attributed to foreign competition is concentrated among low-skilled workers.[24] Manufacturing workforce development is thus a particularly effective strategy to combat this problem.

It is true that competition and consumer demand for value (high quality at a low price) is driving manufacturers relentlessly to increase productivity. While this reduces the number of jobs per unit of output it also raises living standards. Although manufacturing represents a smaller *share* of the economy, its output is increasing in absolute numbers. This is somewhat obscured by the fact that productivity improvements are often passed on to customers in the form of lower prices. One recent study found that after factoring out inflation, the "average annual growth of real GDP in durable goods industries was 7.6 percent, more than double the rate for the overall private economy and for the FIRE (finance, insurance and real estate) and service sectors" between 1992 and 1997.[25] Precisely because Cook County manufacturers are productive they expect to need more workers. So while there will be ups and downs in manufacturing, the manufacturing sector appears to offer as much security as any other sector.

Secondly, manufacturing is integrally linked to other sectors of the economy, such as information technology and health care (manufacturers make the instruments, equipment and pharmaceuticals utilized by healthcare providers), finance and services. Learning skills needed in manufacturing provides a strong foundation for many areas of endeavor and positions an individual to take advantage of job opportunities in other fields. The hard technical skills needed in manufacturing are often transportable, and the basic and soft skills required are always useful in other sectors.

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[23] Deindustrialization is a fact but it has very little to do with foreign competition. Productivity improvement is a more important factor than foreign competition. At most, 15 percent of the decline in manufacturing can be attributed to foreign competition. For an accessible discussion see Paul Krugman, *Pop Internationalism*, (Cambridge MA, MIT Press, 1997).

[24] Steven J. Davis, John C. Haliwanger & Scott Schuh, *Job Creation and Destruction*, (Cambridge MA, MIT Press, 1996). This is an important book for all who wish to understand manufacturing job changes.

[25] Joel Popkin, *Producing Prosperity- Manufacturing Technology's Unmeasured Role in Economic Expansion*, (McLean VA, The Association for Manufacturing Technology, 2000).

These 10,500 new jobs per year are most certainly vital to the county economy as a whole — not because the absolute number of new jobs is great, but because if employers cannot fill those jobs locally they will relocate to a place where they can. A manufacturer who cannot find qualified workers does not just move the unfilled jobs; he moves an entire unit. Not having adequate talent to fill the 10,500 jobs therefore puts at risk the 400,000.

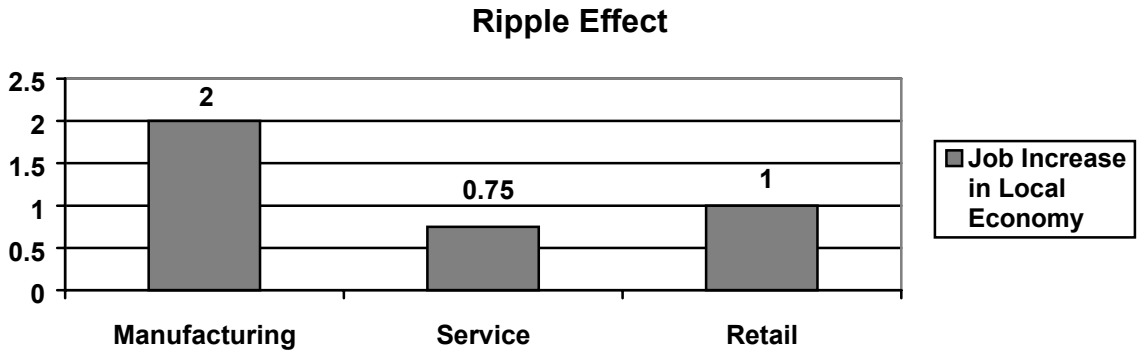
Manufacturing and Communities

Manufacturing's importance is not simply a matter of high pay, good benefits, and interesting work. There are also significant benefits to communities:

- Higher wages provide for greater spending in the community and stimulate the local economy;
- Manufacturing companies tend to create clusters of other service and supplier companies around them; and
- Manufacturing provides career path opportunities.

Community benefits from higher wages: Higher wages provide individuals with disposable income, which they spend on consumer goods and services. Manufacturing companies also purchase goods and services. The production of goods in a factory requires the purchase of raw materials, parts, power, and transportation from within the area. In Chicago, a $1 increase in payroll in manufacturing yields an additional $1.41 in benefits to other sectors. *An increase of one job in manufacturing results in an increase of two additional jobs in other sections of the economy.* This is the powerful positive ripple effect of manufacturing in our economy. In contrast, an increase of one job in the service economy only results in an increase of three-quarters of a job in the wider economy, and an increase of one job in the retail sector only results in an increase of one additional job in the economy.[26] Moreover, every 100 new manufacturing jobs generate seven new retail establishments and 64 non-manufacturing jobs.[27]

[26] U.S. Department of Commerce Bureau of Economic Analysis, *Regional Multipliers*, 1992.
[27] Network for Excellence In Manufacturing, *Fundamentals of Manufacturing*, Michigan Manufacturing Technology Center, 1996.



Number of Jobs Created in Local Economy by an Increase in One Job

Community benefits from manufacturing clusters: An important linkage is the interrelationship among the manufacturing firms themselves. Most manufacturing companies make products for one another – specializing in their specific processes and products creating demands for the services and products of each other. A plastic manufacturer depends on the skill of a moldmaker to make the dies to use in the injection-molding machine. The gear manufacturer needs a source for high-quality specialty processed steel. An engineering service firm is called upon to simulate proposed parts to computer-test their reliability before a prototype is made. Manufacturing is an activity that requires large numbers of products and services, developing vast internal markets that the public rarely sees or appreciates.

These interrelationships exist because of the "clustering" of manufacturing firms that increases employment opportunities, and insures the development of a miniature "sub-economy" anchored within a community. These interrelationships between suppliers and customers help to combat the tendency of firms to pick up and leave.[28] Specialization and interdependence are not easy to re-create elsewhere. This includes human capital. The flow of goods and services between the firms creates not only economic growth but also a continuing demand for workers with specialized skills.[29] It is for this reason that we have developed the concept of firm "clusters" in our research (see Chapter 3). As we will show, some Cook County manufacturing sectors have the "critical mass" to grow faster than the same sectors elsewhere.

[28] Despite the ability of computer-based technologies to send data anywhere, there has been little dispersion from specific geographical concentrations. Indeed, the strategy of "lean manufacturing" used by many firms relying on "just-in-time" inventories makes it important for suppliers to locate their facilities close to the firms they supply. A recent study of auto suppliers conducted by the Chicago Federal Reserve indicated that spatial distribution of firms today closely resembled previous patterns. See Thomas H. Klier, "Geographic Concentration In U. S. Manufacturing: Evidence from the U. S. Auto Supply Industry," December 1998.

[29] See: P. B. Doeringer, and D. G. Terkla. "Business Strategy and Cross-Industry Clusters," *Economic Development Quarterly* 9, (3). August 1995, Pp. 225-37.

Obviously, this benefits individual workers who can spend time learning skills which not only allow them to find a job with one employer, but to know that these same skills are needed by many other employers in the same area. It serves to anchor individuals within specific communities, because their skills will allow them to find other opportunities for work. Moreover, the existence of large specialized industrial clusters provides an opportunity for communities to prioritize and focus their resources. School boards can provide education and training on sets of generalizable skills within a manufacturing sector that will not only help students find jobs but will also lower the costs to local firms for recruitment, assessment, and training, thereby increasing their competitive edge. Research and development on new manufacturing processes can be conducted through public institutions and shared jointly with local firms in the hopes of maintaining them within the community. Maintaining clusters of firms increases community strength and stability.

Community benefits linked to career paths in manufacturing: As with other employment clusters, manufacturing has many "career pathways" by which individuals can start at one occupational point within the company and move up to more skilled and higher-paying jobs. There are innumerable examples of workers starting on the shop floor and moving into management. Many of the owners of Chicago manufacturers began their careers as skilled tradesmen. Developing a patent, invention, or innovation, they made an impact and moved upward within the organization. Manufacturing is an area where success is still possible for those who may have never finished college.

Career pathways are not unique to manufacturing. All occupational sectors of the economy have them. But what is characteristic of manufacturing, and important from a social perspective, is that manufacturing career pathways are less dependent on formal education than most others. In manufacturing, formal education has little to do with whether you get the job or advance internally within a company. Far more important are the skills you can demonstrate on the job. For individuals who lack a formal education – such as many newly arriving immigrants, or individuals who may not have done well in n high school – manufacturing is an important second-chance system, offering opportunities not often found in other fields with more restricted career pathways.

A recent investigation into career paths confirms that many workers become stuck in low-wage industries, particularly the service sector, because the first job they take provides little or no access to advancement.[30] Manufacturing, on the other hand, can offer a way for young people to avoid becoming trapped in a low-wage, dead-end job.[31] Even relatively low-paying manufacturing jobs often have the potential for overtime and some fringe benefits which gives workers much greater total compensation compared to service work. Manufacturing is also a place where minorities and women can find high-paying work. According to a recent study by the Illinois Department of Employment

[30] See: Annette Bernhardt, Martina Morris, Mark Handcock and Marc A. Scott, *Divergent Paths: Economic Mobility In the New American Labor Market.* New York: Russell Sage, 2001. Pp. 176.

[31] For a discussion of fast-food workers and their career pathways within an urban center see: Katherine S. Newman, *No Shame in My Game.* New York: Russell Sage, 1999.

Security, in the Chicago area over 19 percent of all operators were African American. Twenty-eight percent of all operators were women.

New Immigrants and Manufacturing

The growing concentration of Hispanics within area manufacturing is significant. Hispanics now fill 40 percent of all manufacturing jobs in Chicago, and the fact that the area's Hispanic population has doubled in the past 20 years suggests that they will account for an ever more significant percentage of the overall workforce. Hispanics now number 735,644 residents in Chicago, of whom 530,000 are of Mexican origin. A key challenge for Cook County manufacturing is the question of how successful it will be in meeting the needs of and integrating this population into the workforce.[32] "For those companies that intend to stick around, I don't think there's any other solution" than to train and develop Hispanic labor, said Davis Jenkins of the Great Cities Institute of the University of Illinois in a recent *Crain's Chicago Business* feature on the expanding Hispanic population.[33]

Manufacturing's career pathways can offer low-income immigrant workers a way to escape poverty.[34] Jesus Garcia, executive director of the Little Village Community Development Corporation (which serves Chicago's Mexican community) notes: "Manufacturing is a good place to be. Manufacturing wages are higher than many of the service-sector jobs, and they generally provide benefits."[35] It is true, however, that most Hispanics currently work in low-wage, low-skill positions in labor-intensive industries. Some employers view Hispanics as a major source of low-wage labor, and only about 17 percent of this workforce is organized in unions.[36] According to Davis Jenkins, "There's no question that some of the manufacturers are targeting them…by hiring one Hispanic and bringing in members of the family."[37]

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[32] *Crain's Chicago Business*, June 25, 2001, p. 15.
[33] *Ibid*, p. 17.
[34] This is not to argue manufacturing is free from racial or gender issues which need to be addressed. Our focus groups reveal the following types of situations. Two African-American participants reported about a Hispanic supervisor who tended to favor Hispanic workers. One participant stated he left a company, in part because he believed that Hispanic workers would be asked to train new white employees and then those new employees would be promoted over the Hispanic workers. As one African-American participant noted, "I had to learn everything on my own. Once in a while they would send someone in to train on the machines for a few hours but that was not the training you needed. There were a few people who had most of the training." When asked if he thought that there was discrimination involved, he responded that it depended on whom the supervisors like and added, "I was black and all of the bosses were white." He said most of the time whites had greater access to training.

In addition, women in manufacturing can face difficulties gaining acceptance and hands-on experience in male-dominated workplaces. For example, a product designer related how she spent the bulk of her time doing secretarial tasks at a company while her male counterparts were getting hands-on experience using solid modeling software (Pro Engineering) to design tools, and the manufacturing process of them, on a computer. She reported that she finally left the company for a job where she is now doing almost 100% design work.
[35] *Crain's Chicago Business*, June 25, 2001, p.17.
[36] *Ibid*, Nik Theodore, p. 18.
[37] *Ibid*, Davis Jenkins, p. 17.

On the other hand, there is growing participation by Hispanics in available manufacturing training programs for skilled positions. Between 1990 and 1997, Hispanics accounted for 11 percent, on average, of the graduates of the Tooling and Manufacturing Association's tool-and-die training program. By 1999, the figure had risen to 16 percent. At the Illinois Institute of Technology, 40 percent of the students in the manufacturing management and technology bachelor's degree programs are Hispanic.[38]

Immigrants in general make up a large proportion (28 percent) of the manufacturing workforce. Chicago's immigrant population is 33-percent European, 46-percent Latino, 13-percent Asian, and 3-percent Black.[39] These immigrants often have language barriers that prevent them from entering skilled positions, yet many of them had skills training in their native countries. They are an important resource to develop for our regional manufacturing economy. Employers have found that they often do not have the negative views about manufacturing that are so common among Americans; they have a strong work ethic; and they are highly motivated to succeed.[40]

Manufacturing and Race

Race has been and remains a major social and economic concern for the area's manufacturing economy, particularly in relation to African Americans and Latinos. Over the course of the 20th century Chicago's dynamic industrial economy attracted hundreds of thousands of African Americans and Latinos, particularly from rural communities in the South and from outside the United States. Their experience has been mixed, as reflected by the story told to us by a retired African American industrial worker:

> I couldn't support my new family growing cotton on the farm outside of Jackson, Tennessee. Relatives that were living in Chicago told me that there was plenty of work and good money in the city. My father sold a pig so I could buy a train ticket. I arrived with $8.00 in my pocket. I was 18. Within three days, I had a job in a factory where my uncle worked. My wife, then pregnant with our first child, followed shortly and we moved into a tenement at 37th and Michigan Avenue. This was the spring of 1951.
>
> I had a job sealing boxes and making $1.25 an hour, one of the lowest paying and hardest jobs in the company. Whites had all of the higher skilled and better paying jobs. Finally a white supervisor gave me a chance to apprentice as a maintenance mechanic. Whites had usually had these jobs but were leaving for other companies that paid more. I spent my career at this company, was able to buy a house in Roseland, and send three of my kids to college.

[38] *Ibid*, p. 19.
[39] "Workplace Conditions of Immigrants in the Chicago Metro Area," Robert Ginsburg and Rebekah Levin, Testimony presented to the Illinois Immigrant Policy Project, Oct. 11, 2001.
[40] "Comments on MWDP Report," Davis Jenkins, October 5, 2001.

> Before I retired, I wanted to train some of the younger black men in the shop to learn the job. I couldn't get anyone to take the opportunity seriously. They didn't have the patience to do the training to gain the skill and get the higher pay, and they began to have attendance problems. There were drugs in our community. By the mid '80s, we began to have a lot more Mexican workers. They were eager to work and learn.

Manufacturing jobs were the entry into the middle class for thousands of African Americans, Europeans, and later Mexicans, Puerto Ricans, and other nationalities who came to the city. They came into the industry as low-cost labor, and sometimes as strikebreakers. They were used to hard, back-breaking work in the fields. They came eager to work, but faced huge obstacles in getting into the skilled and good-paying jobs.

They lived in the working class communities that surrounded the steel mills, the meat packing companies, and the electronic and assembly companies. During the heyday of these industries in the '40s, '50s, and '60s, local schools had vocational education programs — a mixed blessing. The programs linked school to work, but also helped channel African American and Latino youth into the low-end jobs in manufacturing.

Good-paying jobs generated disposable income to spend in the community creating markets for new African American and Latino-owned business —another good/bad news situation. While there were growing opportunities for business ownership for African American and Latinos, they were limited to the service and retail sectors. One of the most visible markers of discrimination is in the ownership of manufacturing companies. As noted, these are the companies that can make substantial profits in comparison to the retail and service sector. Yet in a city that is 60 percent of color, *less than three percent of its manufacturing companies are owned by African Americans and Hispanics.*[41]

Equally mixed was the experience African Americans and Latinos had with the labor movement in manufacturing and in working class communities. On one hand, the industrial unions such as the Steelworkers', the Machinists', the Autoworkers', Garment Workers', and Electrical Workers' unions were champions in the battles for civil rights legislation, and defended workers' contractual rights. On the other hand, these same unions and some of the craft unions perpetuated discriminatory practices — externally and internally. Some unions were forced by federal courts to sign agreements to better represent workers of color. The leadership of many unions still does not reflect the diversity of the membership.

As Chicago and Cook County faced the dramatic decline in manufacturing that began in the late 1970s, African Americans and Latinos were disproportionately affected as they lost good jobs and their neighborhoods deteriorated. Once-vibrant communities such as Austin, Garfield Park, and Humboldt Park declined swiftly and dramatically.

[41] U.S. Bureau of the Census, 1997 Economic Census: Minority and Women-Owned Business Enterprises.

As the economy tightened, these same workers faced discrimination and barriers in getting jobs that remained, and certainly were excluded from the new economy. The Annie E. Casey Foundation summarized studies on discrimination and work:

> According to the Washington, DC-based Fair Employment Council nearly one out of every four employers discriminates on the basis of race or ethnicity or perceived race-based differences. Through face-to-face testing, the council found that the rate of overall discrimination for Latinos is roughly 22 percent and for African Americans, 24 percent. In tests where black and white applicants were offered the same job, nearly 20 percent of the white applicants were offered a higher starting rate.
>
> The Russell Sage Foundation's multi-city study of urban inequality, which surveyed more than 8,600 African-American, Asian-American, Hispanic, and white household members and 3,200 employers in Atlanta, Boston, Detroit, and Los Angeles found that employers are less likely, based on racial attitudes and bias, to hire black men compared with every other group and were, in fact, more likely to turn down blacks who applied for jobs. [42]

Discrimination in housing in Cook County and adjacent counties has contributed to yet another "gap" that prevents motivated and skilled residents from getting good wages in exchange for providing skilled work in suburban companies. African American and Latino workers face barriers in finding affordable housing close to suburban manufacturing jobs.

All of these issues are complex but are increasingly recognized as problems that must be addressed by residents, employers, unions, community organizations, and local government. In the crisis we address in this report, there looms enormous opportunity, particularly for African American, Latino, and other disadvantaged communities.

The Manufacturing Career Path System that we propose will open up new possibilities and the prospects of rewards for all. But success will require a deliberate and creative focus on the issues of exclusion and discrimination as practices that our region cannot afford from any perspective, whether economic, social, or moral. This report can only touch on these issues, but our efforts to build the Career Path system must deal with them in depth — exploring their origins, their stubborn persistence, the toll they take, and what must be done to find positive, workable solutions.

If Manufacturing Is So Important, Why Aren't There More Jobs?

Relatively speaking, manufacturing creates fewer new jobs than other sectors. This is especially true of manufacturing in central urban centers. Manufacturing employment in

[42] *Taking the Initiative on Jobs & Race: Innovations in Workforce Development for Minority Job Seekers and Employers,* publication of the Annie E. Casey Foundation 2001, <ww.aecf.org>

Cook County has been shrinking. From 1985 until 2000, the number of manufacturing jobs fell from a little over 509,000 to about 404,000. The loss of over 100,000 manufacturing jobs constitutes a substantial decline, which has impacted hundreds of thousands of families. Perhaps more important is that the manufacturing that remains is shifting to the suburban areas of Cook County. In 1979 the city of Chicago had 354,000 manufacturing jobs; in 1999 it had 150,000 — a loss of 204,000 jobs or 58 percent of the 1979 base. There are 83,000 unemployed workers living in the city of Chicago and a total of 215,000 in the Chicago metro area. The current unemployment rate in the city of Chicago is 7.1 percent, compared to the nationwide rate of 4.1 percent.[43]

The reasons for this decline are many, and important to understand.

- Some employers have found that they can pay lower wages in other states or countries.

- Some firms leave urban areas to avoid unionization.

- A small number of firms are lost because of competition from foreign employers and substantial decline of their industries. These were often unable to adjust to the demands of international competition.

- There can be job loss because of increasing productivity in manufacturing if there is no increase in demand or market share. But if greater productivity leads to increased market share, employment levels in the firm can remain the same or even increase. The good news is that what remains is more highly valued and more sustainable in the long run. Higher productivity rates allow the firms to pay better wages.[44]

- Many small firms fail to remain in business because the CEO of the company — often the firm's founder — lacks a successor and the company simply closes.

- An individual owner may sell the business, typically to a larger, multinational firm that moves the firm to a suburban or rural area. In the Midwest, one of the central strategies employed by larger firms is to spread their facilities into far suburbs and sometimes rural areas to take advantage of cheaper development

[43] U.S. Department of Labor, Bureau of Labor Statistics; *Employment Situation*, September 7, 2001; Local Area Unemployment Statistics.

[44] This is not a one-directional phenomenon. As Dan Luria notes, the high-wage more-productive firms are still in the minority among small and medium sized manufacturing firms. Thus there are many small manufacturing enterprises with stagnant or even falling productivity rates that often receive public subsidies in training and technical assistance, and simply maintain themselves. He calls for policies that can "change the mix," and more clearly support the more productive firms. See: Dan Luria, "Toward Lean or Rich: Small-Manufacturer Performance, and Some Implications for Extension Centers, *The Bench Press*, December 1996; Luria AACC Journal.

costs. [45] This is having significant repercussions for their labor force strategies and for the redevelopment of manufacturing within the central city.

High Road in Competition with the Low Road

Manufacturing jobs have been lost in the Chicago area for a variety of reasons. Many policymakers and opinion-shapers assume this loss was the "inevitable" byproduct of globalization, new technology, and the easy availability of low-cost labor in the developing world. Certainly some jobs have been lost to these causes, but most have been lost for reasons that could have been successfully addressed with some creativity and flexibility by the business community, labor, local government, and the other stakeholders in our manufacturing economy.

Some companies and jobs have been lost because of the shortsighted Low Road corporate strategies noted in Chapter 2 — jobs that could have been preserved if a High Road approach had been taken. In sport-shoe manufacturing, for example, companies such as Nike and Reebok took the Low Road, outsourcing almost all of their production to the lowest-wage countries they could find. In contrast, Boston-based New Balance chose a High Road strategy aimed at being smarter and more efficient in producing U.S.-made goods. New Balance continues to produce competitively in the U.S. because it has partnered with the Massachusetts Institute of Technology and other engineering-oriented universities in the area to continually develop advanced manufacturing techniques and because it maintains a highly skilled workforce trained to operate such sophisticated equipment.[46]

Other companies and jobs have been lost because the public sector was on the Low Road — passive about providing sophisticated support for and investment in High Road business practices that create wealth and strengthen communities. The weaknesses in our education and training system, widely recognized years ago, were not addressed. For example, a 1989 study for Chicago's Economic Development Commission pointed out the risk to literally hundreds of companies employing thousands of people because of ownership succession problems — the kind of problem that in many cases can be solved by proactive community development strategies. [47] Twelve years later this problem is still inadequately addressed.

Similarly, the labor movement in its bargaining strategies remained focused on redistribution of wealth rather than responding to management proposals for workforce

[45] See: William Testa, Thomas H. Klier and Richard H. Mattoon, "Reversal of Fortune: Understanding the Midwest Economy," *Economic Perspectives,* Chicago Federal Reserve, June 1997.This strategy was undertaken to avoid unionization. Among auto supplier firms the rate of unionization dropped from 60% in the late 1960's to less than 23% a decade later. See: H.C. Katz and O Darbishire, *Converging Divergences: World Wide Changes in Employment Systems.* Ithaca: Cornell University Press, 2000.

[46] "Comments on 'Creating a Manufacturing Career Path System in Cook County,'" October 5, 2001, Barry Bluestone, Center for Urban and Regional Policy, Northeastern University.

[47] "Intervening with Aging Owners to Save Industrial Jobs," A Report to the Economic Development Commission Foundation of Chicago, Center for Labor and Community Research, 1989.

training, job flexibility, and greater reliance on technology — innovations that were badly needed to help manufacturers preserve their competitive edge.

For its part, government at both the city and state level has often provided subsidies to companies without clearly understanding how the company would actually benefit the regional economy, how to enforce agreements to use subsidies to create jobs, or how to recover public funds when such agreements are violated. Much more energy and money has been focused on attracting companies than on retaining companies. In short, the public sector has not always used its scarce dollars in ways aimed at ensuring "the biggest bang for the buck" — a basic operating principle for the private investment community.

In this report we argue that the time has come to embrace a High Road strategy for the workforce development system, as part of a broader effort to replace Low Road strategies throughout the economy. We need to encourage and support high-performance practices in manufacturing, deliberately and systematically rewarding those companies that pursue this approach to business. We need to promote and encourage the development of a high-skilled workforce that can work with minimal supervision and with a high degree of motivation. We need to promote a proactive and sophisticated approach to the challenges of business by the public sector. Above all, we need to tap into the energy and creativity of the citizens of our region.[48]

Being proactive and engaged increases our region's ability to retain and even expand our manufacturing base. To fully restore our strength in manufacturing to previous levels will require changes in national economic policy, including changes in federal trade and monetary policy.[49] This report assumes that for the next five years, the principal issue confronting us is the preservation and sustaining of manufacturing jobs, which while relatively small in number will be more stable and will provide a corridor out of poverty and low-wage work. We view efforts to sustain manufacturing firms within the urban sector as one of the principal means of dealing with urban economic problems.[50] How we work to sustain current levels will determine whether or not we can succeed in rebuilding and expanding our manufacturing sector.

Manufacturing Is Changing

The manufacturing sector today is not simply a diminished version of the past. Three major trends have significantly altered manufacturing, affecting the education and training needs of those involved.

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[48] Op cit., *Building the Bridge to the High Road.*

[49] To appreciate the complexity and difficulty of successfully stimulating regional economic development, bear in mind that the Chicago metropolitan area includes 265 separate municipalities, 1,200 separate tax districts, and parts of six different counties. It would be a major challenge to create a regional overseer of manufacturing for this area. See: Daniel D. Luria and Joel Rogers. *Metro Futures: Economic Solutions for Cities and Their Suburbs.* Boston: Beacon Press, 1999, p. 25.

[50] For a paper that makes this argument in broad form see: Luria and Rogers, *Ibid.*

First, individual business units are increasingly smaller. Not only is work being subcontracted to smaller units of production, but also many larger firms now attempt to maintain units which in size emulate a small- to medium-size firm.[51] More and more manufacturing is being performed in smaller operations that must continually provide parts and services to larger firms. For example, although the auto industry still employs about one million workers, how they are deployed has changed dramatically. In 1979 (a peak year for auto and light truck sales), over 750,000 worked for the large original equipment manufacturers (OEM), with the rest working for supplier firms. Twenty years later the ratio was almost reversed as a result of automakers outsourcing their activities to smaller supplier firms. These smaller firms cannot readily increase productivity within their markets. To do so, they must be intimately familiar with the marketplace and able to marshal the engineering, marketing and other technical and administrative resources they need to be able to exploit marketplace opportunities.

Second, manufacturing has merged with the information economy. Computers are increasingly commonplace throughout the production process, and the most productive firms leverage their advantages by developing accurate market information and relentlessly using data to drive the deployment of their resources. How information is used — from the data developed for computer simulation of a part-making process to an inventory control system — determines the fate of the process and the product. Dependence upon data means, of course, that there must be skilled workers who know how to interpret and act upon the data. This, in turn, creates an impetus for teamwork and for decentralized decision-making.

Third, present-day manufacturing looks different — largely because of the previous two trends. While in some instances it is still dirty and dangerous, conditions in most plants have significantly improved over the past 20 years. Fewer workers stand in place along assembly lines; more work in teams and are able to have a general impact upon the production process. Where once it might have been enough just to show up for work, expectations of workers are higher now. As a worker in one of our focus groups explained:

> Working in a team is always like cooperating with each other, communicating with each other and if you can help each other out, you help each other. Where I used to work, I was working by myself. If I said to somebody, can you help me out, they don't want to help. Over here it's real different. If you ask somebody for help, they will help you. Every month they have a meeting to explain what is going on in our teams, to see what we need. I think it's great because when you try to do it by yourself, it's frustrating — you don't learn.

Today, new technologies and market realities make modern U.S. manufacturing cleaner, safer, and less physically demanding. Workplace injuries and illness in manufacturing

[51] Luria finds that small plants of larger firms are as productive as larger units, suggesting that productivity is more a function of expertise, resources, and pricing than plant size. See: Dan Luria, "Is it Plant or Company Size that Matters?" *The Bench Press*, October 1998.

fell by 30 percent during the 1990s.[52] Today's products and processes demand great sophistication and exacting standards. Factories that make computer chips are more sanitary than hospital operating rooms. Government, labor, and corporate policies have created tighter safety practices and stronger environmental controls. Squeezed by government regulation, employees' demands, and competitive pressures, companies are either automating the hardest, most repetitive parts of the manufacturing process or are shifting them to lower-wage, less-regulated countries.[53] As a result, yesterday's image of working conditions in U.S. manufacturing is becoming obsolete.

Not only are these developments making production work cleaner and safer, they are also making it more interesting. The deadeningly repetitive assembly-line jobs that typified manufacturing through most of the 20th century were created at a time when production workers were valued solely for brawn, not brains. Over the past quarter-century a different philosophy has increasingly taken hold, with companies gradually giving production workers greater decision-making responsibility. In many Cook County workplaces, unions deserve credit for working with management to define an arrangement that satisfies the needs of labor and management for increased productivity, empowerment, and compensation. A recent Chicago *Tribune* article highlighted these kinds of changes at a Caterpillar tractor factory near Peoria, IL.

> "Twenty-eight years ago when I hired in, they put you on a machine and said, 'Here are the buttons to push.' You weren't here to know. You were here to produce," said manufacturing worker Robbie Ingle. Factory general manager James Desplain said the company's strategy for production has changed. "The days of the worker checking his brain at the door and picking it up on the way home are over."

Workers decide when and how to fill orders, suggest ways to improve the process and product, recommend maintenance schedules, and even negotiate vacation times among teams of workers.[54]

True, not every Cook County factory works like Caterpillar. Too many area manufacturing workers still toil in cramped, hot, dangerous conditions, working at boring and repetitive jobs for low wages. A recent study of sweatshop employment among the most vulnerable Chicagoans found that machine operators, factory workers, and garment workers were among the occupations most likely to work in sweatshops. However, other common occupations open to people without much formal education — such as food preparation/restaurant worker, driver, tradesperson, maid/laundry worker, janitor, and

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[52] This is for the years from 1989 to 1997, according to *The Facts about Modern Manufacturing* from the National Association of Manufacturers, 2000.

[53] An April 22, 2001 Chicago *Tribune* article, "Mixed Blessing for Midwest," describes one example of this at the "spotless" Caterpillar plants near Peoria. "Caterpillar has automated tasks that people used to do. For example, mobile robots able to read bar codes thread their way through a plant in East Peoria, delivering partly finished parts to workers. That and other investments helped Caterpillar's plants here become as productive as the company's plants in Brazil, France and Japan."

[54] Chicago *Tribune*, "Mixed Blessing for Midwest," op.cit.

daycare worker — showed even higher rates of abuse.[55] Unlike many other industries, manufacturing is experiencing a strong trend toward empowering workers. This means that the life-quality of many manufacturing jobs is becoming richer and more satisfying.

Unions have played a significant role in altering the face of manufacturing. Through collective bargaining, problems associated with many specific working conditions in manufacturing have been addressed. In addition, unions have raised wages. Even in smaller unionized manufacturing shops, workers make an average of $1.50 an hour more than their non-union counterparts. Perhaps most important is that unionized shops have higher productivity per worker. Indeed, higher wage scales encourage management to introduce more machinery and to invest in increasing the skill of the workforce in order to increase productivity — all of which helps modernize the workplace.[56]

Changes in Workforce Needs

Changes in workforce needs in manufacturing occurred in the past quarter-century as the result of a major reconstitution of the industry and its practices. For most of the 20th century the technology and work organization changes in industry did not alter the skill requirements of front line production workers very much. As late as the 1970s, most firms maintained traditional assessment and selection processes to hire production workers. In essence, they were looking for the "ideal" model established by Frederick Taylor nearly a century ago: poorly educated individuals who were willing to follow orders and leave their brains at the plant gate. Most manufacturing workers were unskilled or semi-skilled — which meant they were trained on the job to perform certain operations. Only about 10 percent of the hourly workforce received more systematic education and training through the skilled trades' agreements sometimes adopted in the union-management-initiated system. [57]

A small number of engineers and other white-collar workers were expected to provide the technological expertise necessary for the industry. These individuals were increasingly expected to have college backgrounds. However, in the smaller shops many were still recruited from other firms because they "knew the industry," i.e., had hands-on experience with production. Many were attracted to manufacturing because it involved the leading edge of mechanical engineering; these were the "gearheads" who lived to tinker with machines and invent new ways of processing metal. They were the equivalent of today's software developers, people who were attracted to the technology in part because of its impact on American culture. As industries developed in size and sophistication, however, engineering programs developed at universities and colleges,

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[55] *Sweatshops in Chicago: A survey of working conditions in low-income and immigrant communities,* Rebekah Levin and Robert Ginsburg, CLCR, p 18. For a copy of the study, see <www.clcr.org>

[56] The Performance Benchmarking Service database of small and medium size firms indicates that next to capital-intensity, unionization is the best predictor of highly productive firms. See: Kristin Dziczek, Daniel Luria, & Edith Wiarada: "The Role of Unions In SME Productivity: A Brief Review."

[57] For a discussion of the traditional practices see: Eileen Appelbaum, Thomas Bailey, Peter Berg and Arne Kalleberg, *Manufacturing Advantage,* Ithaca: Cornell University Press, 2001. Pp. 25-46.

preparing individuals for technical careers. A common career pathway was for a worker (perhaps an assembler) who learned on the job to operate a screw machine. During his work life he might become a union official or a supervisor.

Attracting non-college-trained individuals to manufacturing was rarely seen as a difficult task. Despite the physical difficulty of the work and the often erratic work schedules, the assumption was that high wages and fringe benefits of a union contract (medical benefits, pension, etc.) would attract a sufficient number of people to work in the Chicago plant. Their education and training would then be conducted within the industry. Since the organization of work was very hierarchical, the idea of using local decisions or developing worker input into the system was rarely present.

Education and training of these hourly manufacturing employees played little role in industry as a competitive advantage issue. Most of the required training of the hourly workforce was easily accomplished within the facilities. Even the education of apprentices and skilled-trades workers was conducted inside the shops, especially in the non-union companies, which feared unionization. The few technical and engineering employees in the small manufacturing firms tended to be self-taught individuals who entered the field from other professional fields. In many smaller shops, they were called engineers, but possessed no college engineering degrees. They learned their skills through trial and error. In the large manufacturing companies, the university-based engineers tended to dominate all technical decision-making. The assumption of the engineers was they were the source of all technical knowledge in the industry. Because of the rapidity with which manufacturing became a major part of the American economy, relatively little emphasis was given to the education and training of the workforce, in comparison to other factors which might generate productivity and greater profits.

This system of manufacturing workforce development was transformed by three factors. First was the impact of international competition. The practices of the Japanese and Western European firms were based around substantial training of the hourly workers and some attempts to involve workers in decision-making processes. This view stressed selection and assessment techniques, emphasizing the need for all workers to possess significant technical and "soft skills" such as teamwork and communication skills. The advantage of these approaches was the ability to run "lean" enterprises, which depended upon the ability of the workers to be highly productive. [58]

Second was the impact of computer-based technologies. Not only did the introduction of Computer Numerical Control (CNC) and Computer Aided Design (CAD) and Programmable Local Controllers (PLC) introduce and require new skill sets for hourly workers, but also they permitted significant new forms of data exchange between production design, suppliers, and Original Equipment Manufacturers (OEM). While raising the skill levels of hourly employees and making them more productive, it also added the needs for good administrative coordination of the process, transportation between supplier and OEM, and the ability to make and build changes in designs quickly.

[58] An influential book outlined these processes for the auto industry: J. Womack, et. al. *The Machine That Changed the World.* New York: Rawson and Associates, 1990.

Even small firms were faced with a need to develop more technically experienced people in their front offices — who could understand the production flow of good and services.

The third trend was the growing significance of the small and medium size firms that needed technology, but also needed the people with skills to run the technology. In the past they literally hired everyone off the street, they were not faced with the challenge of up-skilling their work forces.

As some firms began to invest more in training and education of their workforce, they experienced a significant return on investment. Recently the American Society for Training and Development (ASTD) completed a study of 575 firms which found that companies that invested $680 more in training per employee than the average improved their total stockholder return the next year by 6 percent. Those in the top half of the group had an average total stockholder return of 36.9 percent, compared to those in the bottom half, who had a 19.8-percent return and an S&P return of 25.5 percent. Looking at gross profit, ASTD found firms in the top quarter that invested $1,595 per employee experienced a 24-percent higher gross profit margin; and 218-percent higher income per employee than companies in the bottom quarter, which invested on average $128 per employee.

Growing demand for more skilled hourly workers was developing just when young people were beginning to perceive that manufacturing was not an attractive career option. The widespread layoffs and disruptions within manufacturing in the 1979-1984 period, when thousands of steelworkers, autoworkers, and machinists were thrown out of work — with major area facilities such as South Works, Zenith, and Stewart Warner vanishing virtually overnight — sent a powerful message to young people and their families. Manufacturing was not going to be their career pathway of choice.

This left industrial work to the "non-college-bound" — often young people who barely completed high school and possessed marginal fundamental skills. Immigrants were attracted to manufacturing because few formal education credentials were needed and it was relatively easy to start at the bottom of the career ladder. Meanwhile, the vocational system within the schools had become a dumping ground for troubled youth and was not preparing a stream of qualified students for the job market. Voc-ed "graduates" were often unsuited for the work for which they applied and were rejected by large companies capable of screening out poorly educated people. The smaller manufacturing firms then faced the dilemma of how to obtain sufficiently trained individuals from pools of people who did not possess these skills.

At the same time, skill needs for manufacturers were increasing — forcing employers to look for workers with greater levels of foundation and technical skills at the very time when fewer and fewer of these individuals were choosing manufacturing as a career pathway. During the economic growth period of the 1990s, when jobs were relatively plentiful in the service and financial sectors, students overwhelmingly selected these career pathways over manufacturing despite generally lower wages and benefits. Even

apprenticeship programs — traditional gateways to highly skilled work — found it difficult to recruit candidates.

What Are the Training and Education Needs Now?

The increase in educational and training needs does not mean a return to the training and education that has worked in the past. Since most of the growth in modern manufacturing is coming from smaller-sized plants, there is a particular need to relate the training to these facilities. Even within specific clusters of work, these firms are often extremely diverse in their management styles, use of occupational terms, and production processes. To learn more about their training needs, we conducted a series of focus groups with different manufacturing firms.[59] What follows is a summary of their views, augmented by quotations from workers.

1. Foundation skills matter: In smaller shops, communication skills — listening, speaking, and reading — matter greatly. There are no big departmental barriers and the work processes are varied. Change occurs regularly, and individuals need to be sensitive to these changes. They also need to have the ability to understand and digest numerical information, feel comfortable reading charts, and have at least a basic understanding of fractions and decimals. For some of the more technical shops, algebra and trigonometry concepts as applied to manufacturing processes are needed by those working the machines. Some shops work in small teams; others informally develop work procedures through teams. There is a close integration between the front office and the shop floor. All of this requires that employees can communicate, a significant barrier for non-English-speaking workers. It also means that younger workers fresh from high school may find themselves directing workers twice their age. Good manufacturing preparation programs thus must emphasize foundation skills, including the ability to work effectively with co-workers and customers.

2. The ability to use computers matters: Everything we learned confirms that the most successful firms are those that make the most effective use of computers in their processes. This means that all workers need to be familiar with computers and how they work. They need to be able to turn on a computer and to select, run, and close a program. They also need to be able to access information by working with a spreadsheet program and/or downloading information from the Internet, and in some firms the ability to communicate by e-mail is also desirable. While many of today's younger students may

[59] Four focus groups were held during the spring and summer of 2001 to collect evidence of skill needs and hiring practices; individual interviews were also held. In addition, 56 survey responses were collected from another 41 firms drawn from a sample of firms identified by the Illinois Manufacturers Association. All in all, over 100 separate firms provided information. These employer contacts are synthesized here. Given the diversity of manufacturers, no claim is made that these views represent those of all manufacturers in the Chicago area. However, the findings are consistent with both national and local surveys of employers. See: Davis Jenkins, and Nik Theodore, "Survey of Hiring Needs and Practices of Chicago Manufacturers: Summary of Findings, " University of Illinois at Chicago, Great Cities Institute and Chicago Urban League, January 1998; Peter Cappelli, et. al. *Change At Work*, New York: Oxford University Press, 1997; Paul Osterman, *Securing Prosperity.* Princeton: Princeton University Press, 1999.

at least have access to all of these skills through their public school courses, many adults — especially immigrant workers — have not mastered the use of computers.

From our focus group notes:

> Computers and technology training top the list of the training desired by the participants. Participants want more exposure so they can keep up with the latest technology and understand the whole production process.

3. Knowledge of materials matters: Whether it is metal, plastic, paper, or candy, knowledge of the materials used in the manufacturing process matters. In the main, the important sectors of Chicago manufacturing deal with metal forming and shaping. Thus, familiarity with these machining processes and the tools used is important. Even first-line workers need to know about standard, milling, and turning centers, what set-ups are, and the significance of tolerances. They need to know how machines turn on and off; how to recognize the signs of machine wear; and how to avoid unsafe conditions. Blueprint reading — both the American and European systems — is a useful skill. Even more useful, as well as harder to teach, are the basic skills of metallurgy. For printing-industry workers, learning about the composition and characteristics of paper is vitally important, as is familiarity with the chemistry of confectionery for workers in the candy industry. The context of the manufacturing process is critical knowledge for workers.

4. Knowledge of controls matters: Increasingly the shop floor is dominated by processes controlled through computer devices. Maintaining and repairing these devices requires advanced skills, but all workers should understand the basic concepts behind electrical controls and how they function within work processes. This may mean some familiarity with electrical theory. Indeed, modern manufacturing appears headed for a convergence of mechanical and electrical skills — a significant development for workers.

From our focus group notes:

> In large part due to the complexity of technical manuals, they indicated that reading comprehension and technical knowledge at the associate's degree level is also needed to successfully perform their jobs. Two of the three participants reported a wish for training in heating and air conditioning. A mechanic at another company reported a need for more training in industrial electronics and in the area of controls such as PLC (programmable logic control). He stated: "There is so much technology coming in that we are just being left behind."

5. Process and context matter: All of the above technical skills are influenced by the specific processes used by the firm. There are some broad differences between batch production and one-of-a kind machine tools. Workflow issues should be understood, as well as simple quality mechanisms. Health and safety procedures must also be taught. Teamwork skills become important during the training process before entering the work environment. This also means understanding the significance of design and technical work done in the front office. More than with larger manufacturing firms, the smaller

firm typically expects workers to put in long hours, to be flexible about work rules, and to be able to get along with many people in diverse situations. Workers also need to be able to understand the process used by the firm to assess and reward performance. The training programs that best simulate the real-world shop-floor experience produce students who stay in manufacturing. From our focus group notes:

> But I know for myself I would like to have learned a little bit more about running my machine. Just getting a basic understanding of how my machine operates, why I am doing the certain things that I am doing. Because a lot of times it helps to see a completed product. How this product fits. So if someone is explaining to you 'This is how I want you to do something,' you want to know why you are doing it that way. You want to see the big picture and you want to be more involved in your job. Not just 'I'm making a part'…The reason I know more about my job is because when they need more people in other departments on other machines, then I go there and see where the product I make goes.

Conclusion

Manufacturing has been transformed by technology, creating challenging work that requires workers to upgrade their skills. In February 2000, Ford Motor Company stunned both educational institutions and corporations when the company announced that it would purchase a computer and printer for every one of its 320,000 employees in its worldwide operations. This bold step underscored the significance of workplace change in the largest manufacturing industry in the United States. However, many of Chicago's education and employment institutions still regard manufacturing as mostly a matter of traditional metal-bending processes — unstable, unchallenging, and unsatisfying. Thus insufficient resources are spent in educating parents and their children about the advantages of pursuing a manufacturing occupation. In a focus group of employers, one manager stated:

> Out in District 214 they did a study in the high schools asking 2,700 students to put down their top three careers — what they would like to with their lives… How did manufacturing fare? I have engineers, I have accountants, I have sales people, I have the whole gamut, but I could not fill one of those positions with the answers given. Doctors, lawyers, judges, pro-football players, TV announcers — that's what they want to be. The high school kids do not have a clue of what their parents do, let alone manufacturing.

These views must change in the future if manufacturing is to attract the necessary talent to survive. Lack of interest in manufacturing among young people is a worldwide issue. How we resolve it here in Chicago will be of importance to the economic future of the region — and beyond. What is needed is a commitment by both the public and private sectors to aggressively develop and pursue High Road strategies to retain and develop our region's manufacturing base.

II. Research to Identify the Gaps and the Ways to Fill the Gaps

Chapter 3: Research Methodology and Foundation

Our findings and proposals are based on research and analysis conducted by the Center for Labor and Community Research's Research Department and several consultants with assistance from the Chicago Federation of Labor. Following is a description of our approach and our key findings.

Industry Clusters and Occupations with the Greatest Expected Employment Growth

Just how much will Cook County manufacturing grow in the next ten years? In what segments will this growth occur? What specific occupations will experience growth and how much? Answers to these fundamental questions provided the focus for much of our research and the plan that ultimately grew out of the research.

Central to our methodology throughout this report is a sectoral approach or a focus on "clusters" in the local economy as a foundation for our analysis and proposals. Michael Porter of Harvard Business School offers a widely used definition of clusters:

> A cluster is a geographically proximate group of interconnected companies and associated institutions in a particular field, linked by commonalities and complementarities. The geographic scope of clusters ranges from a region, a state, or even a single city to span nearby or neighboring countries. The geographic scope of a cluster relates to the distance over which informational, transactional, incentive, and other efficiencies occur. More than single industries, clusters encompass an array of linked industries and other entities important to competition. They include, for example, suppliers of specialized inputs such as components, machinery, and services as well as providers of specialized infrastructure. Clusters also often extend downstream to channels or customers and laterally to manufacturers of complementary products or companies related by skills, technologies, or common inputs. Many clusters include governmental and other institutions (e.g., universities, think tanks, vocational training providers, standards-settings agencies, trade associations) that provide specialized training, education, information, research, and technical support.[60]

The project identified three industry clusters that are likely to account for two-thirds of the manufacturing job growth in Cook County. We also looked at the growth rate of specific occupations within these industries. Our methodology was to identify key industries within manufacturing which represent the bulk of the manufacturing capacity in the region. Employment is used as the measure of size. We then identified the key occupations in those industries to better understand what jobs are present in each of these industries and what future needs are. Only when we knew the kinds of jobs could we

[60] Michael Porter, "Location, Competition, and Economic Development: Local Clusters in a Global Economy," *Economic Development Quarterly*, Vol. 14 No. 1, February 2000, pp. 15-34.

begin analyzing the career paths and needs. Note that the central occupations in our key industries overlap substantially with each other. This section briefly explains how we went about this task

The project used projections for the U.S. economy for 2008 developed by the U.S. Department of Labor's Bureau of Labor Statistics (BLS). National projections assume that all increased demand for manufactured output will be satisfied by increased industry productivity[61], rather than increased employment.[62]

The local manufacturing job situation is brighter. The overall forecast for Cook County is a net increase of 8,000 in the number of manufacturing jobs over a decade, or 1.9 percent, according to the Illinois Department of Employment Security (IDES). Between 1996 and 2006, 72 manufacturing industries, or sectors, are expected to have increasing employment in Cook County, with a total growth over ten years of 4.6 percent. On the other hand, fifty-seven manufacturing sectors are forecast to experience either no growth or a decline, with a drop in employment of 4.3 percent.[63]

This IDES ten-year forecast is for the change in *total* employment per year. It does not take into account the *replacement* of workers in each industry as workers change industries or leave the workforce. We adjusted IDES data to take into account an approximate 2.3 percent annual replacement rate, based on BLS research.[64]

[61] Productivity is defined as output per unit of labor, so when the projected total growth in output equals the growth in productivity there will be no change in manufacturing employment.
[62] U.S. Department of Labor, Bureau of Labor Statistics, *Monthly Labor Review,* November 1999.
[63] Derived form computer runs obtained from the Illinois Department of Employment Security, Economic Information and Analysis Division, "Employment Distribution and Employment Change by Occupation 1996-2006." This was the most recent data available at the time we undertook this analysis in 2000. Some updated data has since become available, but this material is not sufficiently complete to justify redoing the analysis. In addition, changes were made in the definitions of industrial segments, making comparisons problematic. A preliminary examination of this data suggests that its use would not have affected the conclusions reached in this report.
[64] U.S. Department of Labor, Bureau of Labor Statistics, *Occupational Projections and Training Data*, Bulletin 2501, July 1998, Table 8. The replacement rate is not the same as turnover. Replacement means that workers leave the industry, either to retire or to move to another industry. Turnover includes workers who move from one firm in a given industry to another firm in the same industry, which results in no change in the number of workers needed in the industry.

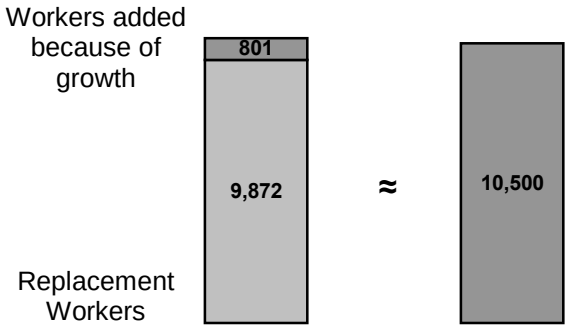
Table 1
Annual Employment Needs, Cook County, 1996-2006 Projections

	Number of Industries	Number of Workers in 1996	% of Total	Change due to: Growth	Replace-ment	Total Change	%
All Manufacturing Sectors	129	429,231	100.0 %	801	9,872	10,673	100.0 %
By Industry Size:							
Sectors with < 100 workers	14	496	0.1 %	-1	11	10	0.1%
Sectors with < 1000 workers	51	17,167	4.0 %	7	395	401	3.8%
Sectors with > 1000 workers	78	412,064	96.0 %	794	9,477	10,272	96.2%
By Potential Growth							
Sectors with > 1000 workers and projected change >100	37	313,335	73.0 %	37	7,207	8,067	75.6%
All other sectors	92	115,896	27.0 %	764	2,666	2,606	24.4%

We selected the 37 industry sectors (out of 129 in the county) that employ over 1,000 workers and will each add at least 100 workers per year. These sectors account for 75.6 percent of the new manufacturing jobs projected to be available. These 37 sectors were organized into 13 broad industry groups, reflecting the diverse industrial base in Cook County.

To further define the focus of the research, we determined which industry groups have the largest demand for workers. First, we combined three industry groups with many common occupations and machinery into a "super" group, the Fabricated Metals, Machinery and Electrical Groups ("MME"). We elected to add Motor Vehicles and Equipment to the MME super group because of the similar occupations and machinery and because of the large size and impact of the new Ford Torrence Avenue Assembly Plant on the Southside of Chicago.[65] We also selected the Food and Printing sectors. These three "industry clusters" — Food, Printing, and MME — are projected to need 6,237 new workers each year (for both new jobs and replacements). This is roughly 60 percent of the 10,673 workers needed annually in all Cook County manufacturing.

[65] A major industrial park for auto parts suppliers is expected to be built next to the plant, with a projected need for over 1,000 trained workers.



This report focuses on these three clusters, each with relatively homogenous occupations. This approach allows us to concentrate on only 37 individual industrial sectors, rather than on the entire universe of 129, while still accounting for the majority of the expected job growth in the county.

Table 2
Proposed 37 Cook County Manufacturing Industries for More Detailed Study

SIC	Industry	1996	Yearly Need All Workers
	1. Food		
201	Meat Products	7,087	174
203	Preserved Fruits and Vegetables	4,755	131
205	Bakery Products	11,108	290
206	Sugar and Confectionery Products	9,885	245
208	Beverages	4,716	120
209	Miscellaneous Foods and Kindred Products	4,041	130
	2. Printing and Publishing		
271	Newspapers	9,005	176
272	Periodicals	7,058	173
273	Books	5,628	131
274	Miscellaneous Publishing	4,511	105
275	Commercial Printing	17,281	404
278	Blankbooks and Bookbinding	5,048	108
	3. Metal		
344	Fabricated Structural Metal Products	6,398	169
345	Screw Machine Products, Bolts, Nuts	6,826	151
346	Metal Stampings	13,035	296
347	Metal Services, Nec	7,134	228
349	Miscellaneous Fabricated Metal Products	10,013	268
	4. Machinery		
354	Metalworking Machinery	14,557	284
355	Special Industry Machinery	4,459	102
356	General Industrial Machinery	6,688	161
357	Office, Computing Machinery	4,821	125
359	Miscellaneous Machinery, Except Electrical	9,081	275
	5. Electrical		
361	Electric Distributing Equipment	5,286	124

362	Electrical Industrial Apparatus	5,003	111
364	Electric Lighting and Wiring Equipment	10,746	267
366	Communication Equipment	23,044	683
367	Electronic Components and Accessories	17,999	635
371	**6. Motor Vehicles and Equipment**	8,824	171
254	**7. Partitions and Fixtures**	4,134	112
	8. Paper Products		
265	Paperboard Containers and Boxes	11,467	309
267	Converted Paper & Paperboard Products	6,428	136
	9. Chemicals		
284	Soap, Cleaners, and Toilet Goods	7,992	197
289	Miscellaneous Chemical Products	4,747	114
308	**10. Miscellaneous Plastic Products**	14,622	562
331	**11. Blast Furnaces and Basic Steel**	8,314	111
384	**12. Medical Instruments and Supplies**	4,537	106
399	**13. Miscellaneous Manufactures**	7,057	182
	TOTAL	313,335	8,067

We sought to validate our selection of these clusters using other data. Appendix I contains supporting tables. Eighteen of the 28 segments making up these targeted clusters are expected to grow faster in Cook County relative to the same sectors' growth in the rest of the U.S. (see Table I-1 in Appendix I). Out of the 28 detailed industries in the three broad industry clusters we propose to study, 21 had a relative importance in Cook County greater than their importance nationally, with 11 industries being twice as important to Cook County in terms of employment than to the nation as a whole.[66] (See Table I-2 in Appendix I).

Rapidly changing technology increases the need for well-trained workers able to take advantage of the technology and adapt to change. The best measure of technological change in an industry is the rate of productivity change. Table I-3, "Projected Change in Productivity for Selected Cook County Industries 1998 to 2008," shows that the industries in the metal-machining-electrical cluster have particularly high rates of forecasted productivity change, often above 3 percent a year. Parts of the food and printing industry also have forecast productivity changes of more than 1.5 percent a year.

The next step in the research process was to examine the occupations found in each industry under study. IDES provided breakouts showing actual numbers and projected changes through 2006 for occupations in each of the 37 industries we examined.

[66] Table I-2 entitled "Relative Importance of Leading Cook County Manufacturing Industries" shows the importance of a Cook County industry in relation to the same industry in the U.S. For example, if a certain Cook County industry sector accounts for 3 percent of Cook County total manufacturing employment and the same U.S. industry has 3 percent of total U.S. manufacturing employment, then the relative important is 3 percent/3 percent = 100 percent, and this Cook County industry has its proportionate share of the industry. If another Cook County industry has 6 percent of the Cook County share and the U.S. industry has 3 percent of the U.S. share, then the Cook County relative importance is 200 percent, and the industry has twice the proportionate share.

Each industry has more than 100 occupations. We decided to focus on production workers and technicians, and to exclude all management, professional, and sales, clerical, janitorial and security occupations. These occupations are common to manufacturing and non-manufacturing industry groups and as such are beyond the scope of a study of *manufacturing* workforce development, although they are included in the *totals* of manufacturing jobs we have been discussing. We created a database of all production and technical occupations having 100 or more workers in any one industry. This had the advantage of making the data more manageable while still accounting for 76 percent of the production workers.

Tables were produced for each of the three targeted industrial clusters showing occupations ranked by the total annual new workers needed as a result of both industrial growth and replacement needs. This data is the source of the projections about occupational job growth used throughout the remainder of this report.

Occupations can be arranged in a hierarchy based on the skills required to perform each job. Several individual occupations often require the same or similar skills. These groupings are called *occupational clusters.* While the number of new and replacement workers in any given occupation is relatively small, the numbers are much larger for occupational clusters. Since the skills are similar within a cluster it is more feasible to develop a workforce development system based around occupational clusters than around individual occupations.

Table 3 illustrates a matrix that arranges occupational clusters with the corresponding industry clusters. The light gray horizontal bars separate occupational clusters based on a skill hierarchy. The heavy gray bars separate the three major industry clusters. We confirmed in interviews and focus groups with human resource and plant management executives that these occupational clusters make sense. For an individual company these titles and job numbers may not be familiar because they are they are not thinking on an industrywide basis. Our researchers found, however, that when the terminology was translated to local company parlance, firms saw the utility of this approach.

Table 3
Skill Cluster and Industry Cluster Matrix

Industrial Cluster (Industry components of Cluster by SIC)	Occupational Cluster	Industries by SIC code that have workers in the Occupational Cluster	Total Employment in this Occupational Cluster in this Industrial Cluster	OES Code numbers contained in Cluster
METAL, MACHINERY & ELECTRICAL EQUIP. (SIC 34, 35,36, 371) SIC 34: Fabricated Metal Prods. SIC 35: Industrial Machinery SIC 36: Electronic and Electrical Equipment SIC 371: Motor Vehicles and Equipment	1. Mechanics, Repairers	346,347,354,359,364,366 367,371	2,268	85110 85123 85132 85999
	2. Machinists/Tool and Die Makers, Welding/ Fabricating Setters	344,345,346,349,354,355, 356,357,359,366,367,371	8,984	89102 89108 91702 91708 91714
	3. Precision Assemblers and Machine Builders	355,356,357,359,361,362 364,366,367	5,993	93105 93111 93114 93197
	4.CNC Ops, Combination Machine Tool Setters, Inspectors	344,345,346,347,349,354, 355, 356,357,366,367,371	6,445	83002 83005 91105 91108
	5. Welding and Metal Machine Operators	344,345,346,347,349,354, 356,359,364,367	11,851	91111 91114 91117 91302 91305 91308 91317 91321 91508 91705 91714 93914
	6. Hand and Machine Assemblers/ Fabricators	344,346,347,349,355,356 357,359,361,362,364 366,367,371	16,537	93902 93905 93908 93953 93956 93999
	7. Industrial light truck/ fork lift and material handlers	344,346,347,349,356,357 362,364,366,367,371	7,921	97947 98502 98799 98902 98999
	MM&E CLUSTER TOTAL		**60,099**	
FOOD (SIC 20)	1. Mechanics, Repairers	205,206,208	1,268	85110 85123 85132
	2. Precision Food Workers, Inspectors	201,203,205,206,208,209	2,458	83002 83005 89802 89805 89808 89899
	3. Food Manufacturing Machine Operators	201,205,206,209	2,109	92917 92921 92923 92944 92958 92971
	4. Packaging/Filling Machine Operators	201,203,206,208,209	2,866	92974

	5. Industrial light truck/ fork lift and material handlers	201,203,205,206,208,209	8,525	97947 98502 98799 98902 98999
	FOOD INDUSTRY CLUSTER TOTAL		**17,226**	
PRINTING (SIC 27)	1. Precision Printing and Printing/Binding Setters and Operators	271,272,273,274,275,278	8,256	89705 89707 89713 89717 89718 89799 92512 92515 92519 92524 92525 92529 92543 92545 92546 92549
	2. Industrial light truck/ fork lift and material handlers	271,272,273,274,275,278	5,683	97105 97947 97951 97999 98502 98799 98902 98999
	PRINTING INDUSTRY CLUSTER TOTAL		13,939	

We carefully considered which occupations to group together in a cluster. It is not necessary, however, for the reader to be familiar with the detailed description of each occupation. What is important is to understand the underlying logic of the arrangement, since it provides the foundation for much of what is to come in this report. One of the subsequent research tasks was to ask manufacturing Human Resources and Plant Management executives if this arrangement was logical and useful. The responses we received in interviews and focus groups were that it indeed did make sense.

Recapping, the expected annual need for new workers entering manufacturing in Cook County, to accommodate both growth and replacement need, is approximately 10,500. Roughly 6,200 of this annual need is accounted for by the 28 industrial segments (out of 129) that make up the Food, MME, and Printing clusters. Note that these numbers are for the total demand for new workers each year, including all blue- and white-collar occupations.

Blue Collar/White Collar Jobs?

The bulk of this report focuses on production, or blue-collar, jobs. Why, if the demand is for both blue and white-collar positions, do we focus on blue-collar occupations? One reason is that there is more demand for blue-collar jobs, as we will see shortly. An emerging and important trend in manufacturing is the thrust toward lean, horizontal management structures. To become more efficient, firms are working hard to eliminate or at least minimize hierarchy in their management ranks — another reason for the relative growth of blue-collar jobs in comparison to white-collar jobs.

More importantly, in manufacturing it is still possible, and actually common, to move from the shop floor into a management, technical, or professional occupation. Managers, sales and marketing people, engineers, customer services personnel, and materials management staff, among others, all found that the skills and product knowledge learned on the shop floor are invaluable. Of course, additional education is often required to

move from production to the office. That is why a complete manufacturing workforce development system must include provision for continuing education and a connection to two-year, four-year and graduate colleges.

There is some national research on occupational trends within manufacturing, which suggests that overall occupational growth has taken place in management and administrative jobs.[67] For example, an analysis of job growth in high-wage manufacturing sectors in the Detroit metropolitan area indicated that the numbers of managers and administrators within manufacturing increased at a much greater rate than the number of skilled or unskilled production workers.[68] An analysis of employment data in the Food, MME and Printing clusters in the Chicago area shows a different trend. Between 1990 and 1998 the proportion of workers in blue-collar jobs actually *increased* in each of these industries, while the proportion of white-collar jobs decreased. This increase was significantly greater among the higher skilled production occupations.

Table 4
Percentage of Workforce in Occupational Groups
Food, Printing & Publishing, and MME Clusters[69]

	1990	1998	Change
Operators, Fabricators Laborers	40.74	41.04	0.31
Precision Production	19.18	20.13	0.95
Subtotal Production	59.91	61.17	1.26
Executives, managers	9.38	9.15	-0.23
Professionals	6.19	7.19	1.00
Technicians	2.40	2.03	-0.37
Marketing-Sales	5.53	5.67	0.13
Administrative Support	14.39	12.62	-1.77
Subtotal White Collar	37.90	36.66	-1.24

(Does not add to 100 because of other minor categories.)

It is interesting to note that higher-skill production jobs are increasing at a faster rate than lower-skill positions in Cook County. Note also that there were some significant shifts

[67] See Anthony P. Carnevale and Stephen J. Rose, *Education for What: The New Office Economy: Executive Summary*, (Princeton: Educational Testing Service, 1998).
[68] See: David Fasenfest and James Jacobs, "Revival and Change In the Automobile Industry of Southeast Michigan," in *Uddevalla Symposium 2000: Entrepreneurship, Firm Growth and Regional Development in the New Economic Geography*. (Trollhattan, Sweden, June 15-17, 2000) pp. 257-282.
[69] Calculated from data from U.S. Department of Labor, Bureau of Labor Statistics Web Site, *General Description of the National Industry-Occupation Employment Matrix 1983-1998 Time Series*, File names: PUBMAT8398N.XLS, PUBMAT8398PI.XLS, PUBMAT8398PO.XLS, and DSPREAD.TXT, August 14, 1998.

within the white-collar jobs. There were about 12-percent fewer administrative support workers in 1998, probably because of the introduction of computers and automatic telephone answering systems and outsourcing by larger companies. At the same there was about a 17-percent increase in the number of professionals.

The opportunity for production workers is growing modestly as a percentage of overall workers in these industry clusters while at the same time the total number of workers are expected to grow. Production occupations represent a somewhat bigger slice of a slightly larger pie.

As noted, the preliminary research work discussed in this section forms the foundation of subsequent work and the plan we propose. We identified the industrial sectors that will account for the bulk of the need for manufacturing workers in Cook County over the next several years. This growth has been broken down by specific occupation, so the projected growth for each occupation in each industry is available. Occupational clusters have been developed that facilitate the design of a workforce development system. The significance of this somewhat laborious data collection and analysis process will become apparent as the narrative unfolds. County manufacturing occupations are growing, and will continue to do so. It also became apparent that we could focus our research on 28 out of 129 manufacturing sectors and on a manageable number of occupational clusters and still capture a picture that would include the bulk of the demand for workers.

The Next Steps: Employer, Worker, Youth, and Provider Gap Research

Knowing the magnitude and nature of the demand for workers was only the first step. How is that demand being filled? Who is preparing people to be qualified workers? What are potential and incumbent workers, employers and training providers doing currently? Is this adequate or are there gaps? This section gives a brief overview of the steps we took to answer these questions.

We utilized both primary original research and secondary published research to learn more about each stakeholder and current practice. In addition, we had the benefit of the insights of the project's advisory committee.

Our primary research was focused on the MME and Food clusters. Others have adequately studied the Printing and Publishing cluster, and an overview of the printing industry is found in Appendix II.

Among the things we sought to learn from employers were:

- Qualitative verification of our quantitative statistical projections about demand for workers;

- Current hiring practices sources of employees and difficulties in recruiting;

- Requirements for entry into particular occupations;
- Current training and workforce development practices;
- Evaluation of training providers; and
- Views about skill clusters and career ladders.

We conducted four employer focus groups, three of which consisted of managers from the Fabricated Metals, Machinery and Electrical (MME) cluster and one made up of Food industry executives. The kinds of companies represented were diverse: large and small, from Chicago's North and South sides and suburbs, unionized and non-unionized. While different companies have different resources to deal with the problems they face, their issues turned out to be largely the same. Appendix III summarizes each of these focus groups. We also had 29 individual interviews with manufacturing employers.

In April 2001, the Manufacturing Workforce Development Project undertook a mail survey of local manufacturers. With the assistance of the Illinois Manufacturers' Association, 1,100 questionnaires were sent to manufacturers in the Metal, Machinery and Electrical Equipment; and Food processing sectors. Fifty-six surveys (5 percent) were returned. The questionnaire was designed to elicit input from employers on a variety of issues, including skill needs, occupational projections, preferred recruitment and training mechanisms, and barriers to obtaining a sufficient workforce. See Appendix IV for the questionnaire and results. Our findings from all of our primary employer research are consistent across the interviews, focus groups and survey. Employers face a shortage of skilled workers, expect that situation to continue, and are largely disconnected from training providers, except for those providing customized training. Moreover, workers and secondary research further confirmed these findings. A discussion of these findings will be found throughout this report.

Are workers and potential workers acquiring the skills they need to meet the demand of the growing manufacturing sector? There is a good deal of data collected by others about the status of youth and incumbent workers, but we also conducted six worker focus groups. A summary is found in Appendix V. We also conducted a focus group composed of officials from local unions serving manufacturing workers in April 2001.

The skills required for an occupation can be usefully divided into three categories:

- *Basic skills:* These are the fundamental literacy and computational skills needed for all but the simplest occupations. Traditionally taught in primary and secondary schools, these skills today are also taught in a variety of remedial settings such as community colleges, community-based organizations, or, in rare cases, on the job (e.g., courses in English as a second language).

- *Employability skills:* These so called "soft skills" incorporate normative behavior around work, e.g., showing up on time, treating others appropriately, and being willing to follow instructions. They can also include higher-order skills such as the ability to function as part of a team and to learn new concepts. Long acquired from role models at home and in the community, these skills are increasingly taught by training providers and community-based organizations.

- *Technical skills:* These "hard" skills equip the worker to perform the specific vocational tasks at hand. They may be acquired on the job, in a classroom or laboratory setting, or some combination.

Each of these skill types is provided in a wide variety of settings. We needed to learn:

- What training providers existed (we sought to identify those who provided manufacturing specific skills, excluding providers who offer only basic skills or generic employability skills);

- Capacity, enrollment, and graduation rates;

- Outcomes for students;

- The standards employed; and

- Nature of connection to other education and to employers.

There was no centralized information about manufacturing training providers in Cook County. We therefore undertook the task of researching and developing a unique database of all such providers. In addition we conducted interviews with 12 major providers and studied some in depth.

With data in hand from and about employers, workers, and providers, we set about answering the core question: what gaps exist between the qualitative and quantitative capacity of training providers and the needs of workers and employers. This gap analysis is discussed in detail in Chapters 4, 5, and 6.

Significant gaps were identified, and the next task was to develop a plan to create a manufacturing workforce development system. In developing this plan we took into account those programs and activities that have been successful in the Chicago area as well as other domestic and international projects and models.[70]

Chapters Four through Nine present our findings.

[70] Foreign trips were privately funded.

Chapter 4: The Gaps For Employers

As previously noted, manufacturing employers in Cook County need over 10,500 new employees each year. Existing education and training programs do not meet the need for a reliable supply of workers equipped with the skills they need to succeed in today's manufacturing economy. Providers too often train students in the wrong skills or offer training of insufficient quality.

The chasm between the kind of workforce development system required by a vibrant Cook County manufacturing economy and the system we have today is wide and deep, but bridgeable. This chapter describes some of the disconnects.

Some may argue that the present system works. Products get made, individuals get paid, and many manufacturers remain and even expand their work in Cook County. This is obviously true, but this report argues that the present system is inefficient and ineffective in supporting workers and manufacturers: inefficient because it consumes both private and public resources wastefully — resources that could contribute to increased productivity and competitiveness — and ineffective because manufacturing is not meeting its potential as a source of work for Chicago's working and poor populations, and at the same time manufacturers cannot find the skilled workers they need.

For some of the participants in the current system — which, as we will demonstrate, is really a non-system — the conditions that we identify as gaps are just business as usual. Participants may identify a problem or difficulty that they are facing but not regard it as a systemic issue. County manufacturers spend countless hours coping with issues of worker selection and training, issues that most employers in many other countries do not have. This chapter will place problems and issues identified by individuals into a systemic context. The fact that manufacturers and workers cope is not a good reason to avoid fixing the system. Coping costs employers money that could be spent on wages, profits or productivity-enhancing investment. It also costs workers and would-be workers dearly in the form of forgone wages and living standards.

What Employers Say

The overwhelming message we heard from employers is that there are simply not enough qualified people to fill jobs.[71] Manufacturers cannot find qualified production workers for positions at all levels. Entry-level workers typically lack the reading, language, and math skills required for even basic production tasks. There are not enough skilled people to fill large numbers of good paying positions now held by people about ready to retire.

[71] This section is based on our focus groups, individual employer interviews, and survey of employers. The conclusions from this primary research are in accord with work published by others. Demand for workers varies depending on economic conditions, of course, and there are times when few employers are hiring anyone. It should be noted, however, that although most of our interviews were conducted at the beginning of a downturn, employers still spoke in terms of not being able to find qualified people.

Highly skilled positions often go unfilled for long periods of time. Manufacturers fear that their output and competitiveness may suffer as a result, but they also fear costly errors by less skilled workers. Manufacturers sometimes invest in equipment that then remains unused or underutilized because of the lack of suitably qualified workers. As an employer in one of our focus groups said:

> We know we have 300 people who will be retiring in the near future. How are we going to replace those people? We have automated a lot of things over the past few years… We use systems that measure virtually every parameter of our product… How do we train people, predominantly with a fifth- or sixth-grade education, to manage that kind of stuff?

This shortage of skilled job seekers does not arise because the county lacks a pool of available workers. Up to 85,000 16-to-21-year-olds are out of school and out of work (as we shall see subsequently) The problem is that the available workers are not equipped with the necessary skills. The lack of both a common understanding of the skill needs and a training infrastructure effective at communication and the ability to implement the required system lie at the heart of the dilemma. On the demand side manufacturers are held back by an inadequate supply of workers, and for the most part lack the resources to rectify the deficiencies on the supply side.

When people are hired who lack the necessary skills they are more likely to fail at the job, resulting in unacceptably high turnover through discharge or resignation. (Turnover rates as high as 80 percent were reported for unskilled workers.) Turnover of the qualified workers also happens as firms compete for scarce talent. This results in pay premiums for the skilled workers most in demand. In some cases these workers become in such high demand that employers attempt to "steal" them from each other. Employers often call this practice "poaching" or "raiding" employees. The fear of having a trained employee poached has the perverse effect of providing a rationale for *not* spending money on training. As one manufacturer quipped in a focus group:

> Well, that's how you get trained people nowadays, you let someone else train them and then you try to steal them.

Firms fail to train because they do not want a competitor to obtain a "free ride" on their investment. This practice significantly bids up their wages and produces an inequitable wage gap between them and lower skilled workers.

But for the most part workers are hurt as companies react to skill shortages by de-skilling their production processes and/or failing to grow. When employers cannot find enough moderately skilled workers they reconfigure jobs so that the majority of workers need fewer skills — and earn lower wages — while a minority of workers require even higher skills to design, build and maintain the automated equipment that makes deskilled jobs possible. For example, a plant manager we interviewed told us that his company had increased its capital investment by 50 percent in recent years to compensate for the lack of basic skills in its applicant pool:

> We created processes and a job description in which a person with minimal skills can do what formerly was a higher-skilled job…We try to use computer-enhanced manufacturing practices to make decisions for the operators so all the intricacies to make a precision product are not required anymore.

In the long run, this strategy widens the gulf in pay and status between the highly-skilled and the low-skilled. This also becomes a self-perpetuating process: once the investment in automated equipment is made the employer will no longer have the need for the same number of moderately skilled workers, even if they became available. Arguably this process is part of the reason for the increasing income inequality in the U.S. Thus, the "solution" for the individual firm is often not what would be best for the community as a whole.[72]

Some observers have associated the shortage of skilled workers only with boom times when employers must compete for workers who can easily find alternative work. This is not the case. Most of the field research for this report was conducted in the spring of 2001 as much of Chicago manufacturing was sliding into recession. Still, employers confirmed that they expected to continue to face difficulty finding qualified employees. The situation is expected to get worse because, as this reports seeks to demonstrate, potential manufacturing workers are not being prepared by the education and training system within the region. There are simply too few individuals acquiring the necessary skills, even in a period of recession.

The skills that companies need include basic skills, soft skills and technical skills. In fact, manufacturing jobs are fast requiring an increased level of technical skills as new technology and methods transform industry. The spread of standards such as ISO 9000—an international standard for production quality--requires enhanced reading and writing levels. (For example, ISO 9000 audits require workers to be able to access documentation and describe the rationale for processes to auditors.) Employers do not respond to these problems, other than in an idiosyncratic way that perpetuates the chaotic nature of the local "system." Each company tends to see itself as a unique case with unique needs. Training is most often sporadic and insufficient.

Most employers rely on on-the-job (OJT) training to impart missing technical skills. On-the-job training is costly, because it takes experienced workers away from production to act as trainers and ties up equipment. Trainee errors and inefficiencies are also expensive. As one employer said:

> A lack of skills has a big impact. Well, just look at OJT training. Right there you have two people doing the work of one.

[72] Note that automating to de-skill is quite different from automating to increase productivity. As described by employers we talked to, de-skilling is a response to an inadequate supply of skilled labor and may have a negative impact on the firm as well as the employee. Productivity improvements may have a negative effect on some workers but overall have a positive effect on workers as consumers.

Moreover, on-the-job training does not yield reliable results. Some companies do develop their own internal training programs in the absence of adequate offerings from local outside providers. These can be quite elaborate and comprehensive. A full career ladder of manufacturing training is offered internally at S&C Electric, for example, including machining, CNC, quality assurance, etc. S&C is now looking to have courses articulated with City Colleges—S&C courses that will be formally recognized for credit at City Colleges. This is an example of an employer taking the high road and investing heavily in the development of its employees. While genuinely laudable, the S&C program is a "work-around" of an inadequate system.

There is a relevant sidebar to the S&C story. For years S&C offered students from Senn High School's machining program paid internship opportunities within the structured S&C program. S&C used to heavily recruit new hires from this high-school population. Recently, however, increased college-prep requirements in other areas have *lowered* students' mastery of basic applied math skills. New interns are now too low-skilled to hire. The Tool Manufacturers Association obtained a grant to work with Senn to better recruit and prepare students for work. The Senn High School/ S&C Electric/TMA collaboration is a useful model for high school and employer cooperation.

On-the-job and internal training is *firm-specific* and not based on uniform requirements or standards. Employers who think about this may make the argument that they wish to invest in training for their needs only and for nothing else. They may fear that another firm will poach employees trained to an externally recognized standard. While these arguments have some validity given the present difficult circumstances, lack of uniform standards makes it impossible for an employer to know if a prospective employee is technically qualified or not, without actually trying him/her out. Without standards it is nearly impossible for training providers to divine what companies need, so prospective employees will continue to be enrolled in training that may not be what employers want. And the best way to address the practice of "poaching" is to have a sufficient pool of skilled workers.

Some individual companies (usually larger) have relationships with outside training providers that deliver company-specific training. Our research clearly showed that companies prefer training that occurs within the walls of the firm. If training takes place outside the preference is for firm specific customized courses. Local community colleges (Harper and Triton) or universities (Northern Illinois University) that are experiencing growth in manufacturing-related areas report that customized training is growing rapidly while traditional classes are shrinking.

Companies use a wide range of recruitment strategies. Referral from existing employees is the most widely utilized (90 percent of firms responding to our survey used this method, as did almost every employer in our focus groups and interviews) and regarded as the most successful, method of recruitment. This method is less successful for high-skill occupations. Most manufacturers do not use training providers as a source of employees (only 24 percent in our sample). Firms do work with selected community colleges and community groups to find workers, but typically only with those with whom

they have developed a solid relationship so that the employer can be reasonably confident that the person being referred will actually have basic qualifications. Note that both of these methods rely on a kind of ad-hoc credentialing. The referring employee or organization is, in essence, certifying that the prospective employee is worth hiring. Because the existing employee or referring organization wants to retain a positive relationship with the employer, there is an incentive to promote a successful hire. Interestingly, less than 10 percent of employers in our sample use government agencies (including the Department of Employment Security) as a recruitment source.

Temporary agencies are also used as a recruitment strategy by employers and are increasingly playing an important role as part of our workforce development system. Some firms recruit a very high percentage of their entry-level workers from these agencies and increasingly depend on them to provide workers with certain skills. We heard about this frequently in our discussion with employers. In many ways, the temporary agency has taken on the role of providing a "probationary period" for workers. The role of these agencies needs to be further explored, and developed in a way that meets both the needs of employers needing flexibility and employees needing good, stable jobs with benefits and predictability.

Focus-group discussions indicated that generally size and/or unionization are positively correlated with a wider repertoire of employee retention strategies and higher wages. We found that companies that were able to articulate a clear career path within their companies had far fewer employee turnover issues. This is hardly surprising, since recognition, advancement, and achievement are powerful motivators for employees. "High-quality jobs — jobs that offer autonomy, learning opportunities, meaning, and a chance to get ahead — energize employees and win their commitment."[73] Employers and employees in our focus groups fully supported this view. One manufacturer commented:

> We developed some very specific and detailed training programs that we had to put into place to make sure we had people in key positions like machinists, bench press operators, tool and dye makers, and even assemblers because we have specific processes to ourselves. Doing this has worked for us — it has paid dividends even though we had to pour all kinds of resources, time, and money into doing it. Now we are reaping a benefit because from a retention point of view when people can look and see that there is a career ladder that they can hold in their hands and know it is a tangible thing, that has kept them and minimized our loss in people…

In short, we found that manufacturers and training providers were fragmented in their approach to training and in their relationships with each other.

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[73] James T. Bond, Ellen Gallinsky and Jennifer E. Swanberg, *The 1997 National Study of the Changing Workforce,* (New York: Families and Work Institute, 1998). For the classic discussion see Frederick Herzberg, *Work and the Nature of Man,* (New York, World, 1966). There is much confirming evidence in management literature. See, for example Sandra E. Black and Lisa M. Lynch, *How to Compete: The Impact of Workplace Practices and Information Technology on Productivity,* National Bureau of Economic Research, Working Paper No. W6120, (Cambridge, MA, August 1997).

Chapter 5: The Gaps For Workers

Workers pay a high price for the fragmented nature of the system. On-the-job or firm-specific classroom training provides no portable credentials that can be used to gain employment elsewhere. And employability elsewhere isn't just a matter of seeking self-improvement — it's a necessity. Jobs are constantly being created and destroyed, and it is no longer likely that a worker will stay with one firm throughout his/her entire career. Workers move from company to company for small wage increases or other advantages without creating careers in the field.

Spaces are available in local manufacturing training programs, but workers and potential workers tend not to enroll. According to providers, factors include the poor public image of manufacturing as a career (discussed later); the lack of a portable credential as the result of training; cost; location; transportation; childcare; scheduling of classes; the lack of prerequisite skills; and the lack of knowledge about the existence of these programs. Participants in our worker focus group told us almost the same thing when they reported that the major obstacles to pursuing additional training were:

- Lack of time (due to family responsibilities and already long commute times);
- Location of the training;
- The time of day of the training;[74]
- Lack of prerequisite English skills;
- Lack of transportation;
- Lack of childcare; and
- Cost of the training.

Although workers report difficulty in attending training, it is still important to them, especially if tied to advancement. Workers commented on the value of training that gave them insight in how their particular jobs fit into the overall production process. And they were realistic about the connection between training and advancement.

> …The opportunity for advancement…is going to happen, but if you don't have the training and skills for that, then you will not see it happening.

Echoing what employers and the literature[75] told us, over half of the participants in our worker focus groups think that training — if tied to advancement — is a major factor in their remaining in their job.

[74] Most employees prefer to train at the company. Participants stated that it would be best if training was on company time or at least close to the end of their shift.

> [Company training] is basically why I am there, because I see what step I can go on to next and next and next. I go to some of the classes and orientations [that the company offers] and they show you how you can advance yourself if you take so and so classes. So that is a big factor as to why I am there and why I am staying there.

Some participants stated that the lack of opportunity for training was a major factor in a decision to leave a company.

Half of the companies represented in the worker focus groups offer or have offered employee-training programs and/or benefits. However, access to and the quality of the training are inconsistent. For example, an employee from a North Side manufacturer with an extensive training program complained about not receiving the necessary supervisory recommendation to take company classes. She left the company to join a building trades apprenticeship with Sheet Metal Workers Local 73 because she believed that she would not move up in the company without the training.

The applicability of the training to the job and a sense that it leads to advancement impact the success of the training. As one participant notes:

> [Workers] do not mind giving their time but they want to see what reward they will get for doing all of this. So the training has to be tied to some kind of monetary reward. The money does not have to be immediate. There has to be a career path. I noticed when I got hired that in some areas people couldn't move up so they leave the company. I would say that 75 percent would be interested in training if they had some sense of advancement linked to that training and on company time. If it were not on company time then only 35 percent would do it.

Poor-quality training can lead to a lack of interest by workers. For example, participants described an English-as-a-second-language class offered by a large food manufacturer that failed because the class was conducted entirely in English by an instructor who was not sensitive to the needs of the participants. On the other hand, quality training can lead to greater job satisfaction. A worker from the same company spoke of the benefits of a problem-solving class:

> When I took the problem-solving class, I learned how to focus on the problem, do brainstorming to fix the problem… I learned how to communicate better with the supervisor and how to make a decision on my own instead of calling him for everything… The more training you get, the better it is.

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[75] Articles about the link between training and employee retention include Peter Strozniak, "Survey Finds Training Improves Retention, Recruitment," *Industry Week,* September 16, 1998, and "Training, Lifestyle Benefits Boost Employee Retention," *Industry Week*, June 10, 1999, both at www.industryweek.com/IWGC/newswire.

Many workers in the focus groups expressed fear of losing their jobs either to automation or because they lack the skills required by today's manufacturing. "The way these new machines work," one worker said, "you won't need operators, just packers. It worries me — if it happens, we'll lose our jobs." These workers see the writing on the wall and are struggling to find ways to upgrade their skills while continuing in their jobs and taking care of their families.

Participants also spoke of vast increases in productivity over the past decade due in part to technology but also due to increased expectations of workers by management. Several participants spoke of two or three jobs being combined into one and of the resulting stress experienced by the workers who survived the workforce reduction. As one participant put it, "They're expecting more and we're making less."

Some also complained about increased stress resulting from increased production due in part to automation. As one participant put it, harking back to "the old days":

> There wasn't stress back then — it wasn't a dog-eat-dog world like it is now. People used to love each other. Now the manager's scared, the workers are scared.

Several participants saw the critical need for training to keep domestic manufacturing competitive. At one large manufacturer, workers talked about how new machines are being put into production with essentially no training, even for the maintenance workers. As one mechanic commented:

> Manufacturing is moving ahead and the workforce is lagging behind. They have to spend money on training, whether they like it or not — that's the labor force nationally. That is the key to the whole thing. The countries with skilled labor forces are the ones that are going to move ahead… [My company] will invest in equipment but not personnel.

Workers recognize that skills, and the training required to get those skills, is a way to combat this fear of an ever more automated future:

> A lot of the people at [my company] do not have the training or skills for the changes that are about to take place there. So a lot of them will be out of work, because they do not have the skills or the training — or probably not the opportunity, notification, or time to *get* the training — for the changes about to take place.

While experiencing frustrations and apprehensions, many workers we talked with also had positive things to say about their work:

> I like the work because it is not frustrating, they are not after you. [At the restaurant where I used to work] it was a lot of pressure on you and you felt like you needed to get out of it. I could not take it any more. Over here I enjoy what I

> do and they do appreciate what you do for them… You feel really good about it when somebody comes up to you and says, "You're doing great" — and teamwork: you have to have a buddy here, you have to work as a team, you have to communicate.

Several spoke of the satisfactions of manufacturing:

> I would recommend a manufacturing career for young people or just exposure to it because if you look at the world itself you need to learn how to make some of the things that makes the world go round. Just to turn a doorknob is part of manufacturing. I also think that it is a good life and there is always going to be a need for manufactured products. I like manufacturing because I like doing things with my hands and it gives me satisfaction to see a product that I made and to see it being used by another person knowing that I had a part in making it. It's fun — we get to make things that people all around America are using.

Others talked how work in a manufacturing company is changing for the better:

> One thing I remember is how clean that [first company] was, it really blew me away. They also had a lot of women, in fact a department of women…
>
> Manufacturing is cleaner today than it was and they have more machines to help you do the lifting… The products are different, they are more complicated, and they are made from different materials, especially plastic. It's also safer because people are being more careful and you are being trained to be aware of the safety issues.

Manufacturing still helps some people fulfill their own personal "American dream":

> I always dreamed about having a house for my family. I came from a real poor family. I was living in Mexico and it was real hard. To me, whatever place you go, you have to learn the language in order for you to move on and then you take it from there… I got this opportunity to work here close to my house, I like what I am doing, and I am moving up.

If the status quo is problematic for workers, at least they are employed or have an employment history. For those who are outside the workforce seeking to gain admission, circumstances are grim indeed.

A word needs to be said about would-be workers with multiple barriers to employment. Manufacturers are often willing to hire multiple-barriered applicants *if they have the required skills.* Persons with histories of substance abuse, mental illness, domestic violence, and incarceration will often be accepted for employment if the past problem is under current control and adequately explained. Adequate skill training that meets the real needs of employers is of particular importance to this group. People with multiple barriers generally also require on-going intensive case management support to deal with

the sometimes overwhelming number of problems assaulting this fragile group. Although programming that is adequate to move these people into work is relatively expensive, it is certainly more cost-effective than public subsidy or incarceration.[76]

Conclusion

Workers pay a very high price for the inadequacies of the current system. They increasingly recognize the absolute necessity for increasing their skills, to retain their current job or to be able to get another job. If they receive firm-specific or task-specific training by a company, it rarely results in portable credentials that they can carry with them to other companies — a key asset in today's labor market. When there are training programs, workers frequently face a number of barriers to their participation including cost, language skills, transportation, and time. Both the employee and the employer lose from the current situation.

[76] There are a number of good studies that set forth the best practices for helping multiple barriered job seekers achieve success. Among these are: Robert P. Giloth, ed., Jobs *& Economic Development,* (Thousand Oaks, CA: Sage Publications, 1998); Amy Rynell, *Help Wanted: Low-Income Single Adult Job Seekers and the Programs Serving Them,* (Chicago, Heartland Alliance, 2001); Tony Proscio and Mark Elliott, *Getting In, Staying On, Moving Up,* (New York, Public/Private Ventures, 1999); Cynthia M. Gibson, *Stronger Links: New Ways to Connect Low-Skilled Workers to Better Jobs,* (Baltimore: Annie E. Casey Foundation, 2000); and Chicago Jobs Council, *Picture of Health,* (Chicago, 1998).

Chapter 6: The Gaps For Youth

Who will fill the 10,500 manufacturing jobs expected to become available in the area each year? One obvious answer *should* be: young people. But the 16-to-21-year-olds in Cook County, especially in the City of Chicago, are not fully taking advantage of the opportunities available in the area's manufacturing economy. Our secondary schools, particularly in Chicago, are failing to provide young people with an adequate educational foundation; too many students are leaving school before they graduate; and our culture discourages young people from seeing manufacturing as a viable career option.

There are some differences in data about this age group that merit mention. But these differences do not affect fundamental conclusions.

Table 1
Ages 16-21 School and Labor Force Status 1998
City of Chicago Only
Based on October 1998 Current Population Survey-Supplement on School Enrollment[77]

Total population	257,248	100.0%
Total in School	117,387	45.6
Not in School	139,862	54.4
Employed and Not in School	74,686	29.0
Unemployed	13,465	5.2
Not in Labor Force or School	51,711	20.0
In School and Employed	33,622	13.1
Not in School; Not working	65,176	46.6

Forty-six percent of the Chicago young persons not in school are also not employed, according to this source. More recent data in Table 2, using different data two years later, shows that 39 percent of Chicago young persons not in school are also not working. (In addition to possible differences in the data sets used, the higher labor market participation rate in 2000 accords with the strong economy. Unfortunately an early analysis of data from 2001 shows the slowing economy is having a disproportionate negative effect on young persons.[78] A comparable 37 percent of 16 – 21 year olds living in suburban Cook County who are not in school are not working, although a much higher proportion of suburban young persons are in school.)

[77] Kuby, Ali & Pergamit, *Assessing Labor Market Needs for City of Chicago Youth*, (Chicago, National Opinion Research Center), presented to the Chicago Workforce Board on January 23, 2001.
[78] Andrew M. Sum, Neeta P. Fogg, Robert Taggart & Sheila Palma, *Labor Market Conditions Among 16-24 Year Old Adults in the U.S., Illinois and the Chicago Area at the End of the 1990s*, (Boston, Center for Labor Market Studies, Northeastern University, June 2001).

Table 2
Ages 16-21 School and Labor Force Status 2000
Based on Year 2000 Index of Need to DCCA and ISBE[79]

	City of Chicago		Suburban Cook	
County				
Total population	246,191	100.0%	212,276	100.0%
Total in School	138,289	56.2	160,571	75.7
Not in School	107,902	43.8	51,705	24.3
Employed and Not In School	65,726	26.7	32,222	15.2
Unemployed	32,167	13.1	7,940	3.7
Not in Labor Force or School	9,774	4.0	11,362	5.4
In School and Employed	84,425	34.3	100,847	47.5

The majority of youth who are out of school and out of work are either African-American or Hispanic, based on Chicago Public Schools (CPS) dropout data. This conclusion is supported by the National Opinion Research Center study that estimated that 89 percent of the population aged 16 to 21 not enrolled in school and without a job was African American or Hispanic. There are over 61,000 youth countywide out of school and not working.

Slightly older adults face a similar situation. In Chicago there were 59,200 out-of-school and out-of work 20-24 year olds in 1999. In the Chicago Standard Metropolitan Statistical Area (which includes all counties in the metropolitan area — not just Cook) there were 86,200 disconnected young persons.[80]

The most recent educational outcome data available is for the cohort of young persons who were scheduled to graduate high school in 2000.

Table 3
Chicago Public Schools Class of 2000 Student Census[81]

	Total	White	Black	Hispanic	Asian/ Pac. Islander	Native American
Grade 9 – Sept. 1996	33,285	3,095	18,774	10,327	997	92
Grade 12 – Sept. 1999	15,139	1,903	7,595	4,796	819	26
Change	-54.5%	-38.5%	-59.5%	-53.6%	-17.9%	-71.7%

[79] David Ault, data produced under contract for the 2000 Index of Need for Illinois State Board of Education and Illinois Department of Commerce and Community Affairs, University of Southern Illinois, Carbondale.
[80] Sum *et al*, *op cit.* This important recent study is generally in line with the other studies cited here, although the numbers are slightly different because of selection of slightly different cohorts.
[81] Chicago Public Schools, Department of Research Assessment and Quality Review, Office of Accountability. October 12, 2000 Presentation to Chicago Workforce Board on January 23, 2001.

Note the 54.5-percent decline in census between September of the cohort's freshman year and September of the senior year. That decline was disproportionately large for black and Hispanic students. Table 4 shows this cohort's performance on standardized tests.

Table 4
Chicago Public Schools Class of 2000 Test Scores and Educational Level[82]

Test, Grade and Date	Number Tested	At or Above National Norm	
		Number	Percent
Reading			
Grade 9 – Sept. 1996	21,827	3,951	18.1%
Grade 12 – Sept. 1999	12,482	4,693	37.6%
Math Concepts and Problem Solving			
Grade 9 - Sept. 1996	22,086	4,329	19.6%
Grade 12 - Sept. 1999	12,485	5,319	42.6%

In September 1996, 21,827 Chicago Public School students in the 9th grade took reading tests. In math and problem solving, 18.1 percent were at or above national reading norms and 19.6 percent were at national norms or above in math and problem solving. By the time this cohort was retested in September of their 12th grade year, only 12,482 took the test. Although 37.6 percent *of those taking the test* attained national norm reading scores, this amounts to only *21.5 percent of the original tested cohort.* The difference is the result of the very high drop in high school enrollment. Since reading ability is a powerful predictor of dropping out of school, it is logical that the remaining students were able to score higher on the test. Of this remaining cohort 24.1 percent scored at or above national norms on the 12th grade test of math and problem solving.

The fact that the vast majority of Chicago young persons lack a high school diploma and/or the ability to perform at national norms in literacy and numeracy represents a critical gap in the area's workforce development system. There is simply no way for these individuals to move into modern manufacturing occupations without substantial remediation.

The educational level of suburban youth is less dire. Eighty-six percent of those enrolled in the class of 2000 in 9th grade graduated. Sixty-seven percent of suburban 10th graders taking the Illinois State Aptitude Test (ISAT) reading test scored at or above national norms.[83] Nevertheless over 9 percent of suburban 16-to-21-year-olds are unemployed and not in school, as Table 2 shows.

[82] Ibid.
[83] Data calculated from *Illinois School Report Cards* for all Cook County school districts having high schools, Illinois State Board of Education Website, August 28, 2001.

The National Opinion Research Center study prepared for the Chicago Workforce Board[84] summarized the obstacles to youth employment:

1. Public schools are not preparing youth, in particular disadvantaged youth, for work. Literacy and numeracy problems severely limit employment opportunities. While finishing high school is certainly an important step toward gaining a manufacturing job, it is important to note that more than 60 percent of the Chicago Public School students in 12th grade were below national reading norms and more than 55 percent were below national math norms. Many of these students suffer from a literacy-numeracy gap similar to dropouts.

In one focus group conducted for the Manufacturing Workforce Development Project, an employer bluntly said, "I don't trust anyone with a Chicago Public Schools diploma." Disappointment in the CPS was echoed throughout our focus groups and employer interviews. This mistrust of CPS high school diplomas is rational: a recent Chicago study reports that 33 percent of job seekers who *self-reported* literacy problems *had a high school diploma!*[85]. A study by Mark Braza confirms that the gap for high school graduates is real. In the Bridge[86] program studied, pre-testing revealed that the participants had on average completed the 11th grade but that literacy and numeracy levels were at the 8th and 9th grade levels. (Happily the Braza study also found that the Bridge program could help such people reach a level needed to get manufacturing jobs.)[87]

A reader of an early draft of this chapter asked: "Wasn't Chicago school reform supposed to solve these problems?" The answer is that the results of school reform have been disappointing. A recent study by Northwestern University professor G. Alfred Hess, commissioned by the CPS, found that high schools have shown "little significant change" despite reform.[88] In the early days of reform there was much enthusiasm, including among major employers and business leaders. A fascinating sidebar to our research is the fact that employers simply don't mention school reform anymore. Of course there are some good teachers and programs in the Chicago public schools. But what is interesting is that these programs are singular. That is, someone speaking of such a program will typically say, "There is this *one* program," or "There is this *one* teacher." The exemplary programs are exemplary precisely because they stand in contrast to the system or operate independently of it.

2. School dropouts face even more difficult barriers in finding employment. They generally have more severe literacy and numeracy deficits, and employers worry that past

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[84] Kuby, Ali & Pergamit, *op cit.*
[85] Rynell, *op.cit.*
[86] Bridge Programs prepare educationally disadvantage adults for entry-level skilled positions through education in basic math, reading, writing, and communications skills with hands-on introductions to technology and technical manufacturing skills.
[87] Mark Braza, *Employment Outcomes of Chicago Manufacturing Technology Bridge Graduates*, (Washington, DC Academy for Educational Development, January 2001). Submitted to the Great Cities Institute, University of Illinois at Chicago.
[88] See, for example, Michael Martinez and Ray Quintanilla, "Despite reforms, city's high schools failing, study says," *Chicago Tribune*, March 10, 2001, p.1.

behaviors will be reflected on the job. Youth from unsettled environments are more likely to drop out of high school and thus face serious barriers to employment. The risk factors for dropping out of school include: attending several different high schools, having a sibling who dropped out of high school, attendance problems in high school, a grade point average below 2.0, and being over-age for grade level.[89]

3. Weak or non-existent employment network. Most youth find out about jobs through family, peers, or adults in the neighborhood. Low-income youth are more likely to live in neighborhoods with high unemployment and so do not come into contact with people working in manufacturing.

4. Youth lack role models of wage earners making family supporting wages. Youth who drop out of school have an unrealistic expectation of what it takes to work in manufacturing or other areas. Several employers in our focus groups and interviews spoke about the unrealistic expectations of youth when it comes to work. As one plant manager in our study noted, "Kids today do not want to work on assembly — they want to start in my job." (A recent Chicago metropolitan area study found that many high school seniors believe they can attain their goal of going to and graduating from college despite low high-school achievement. To them, high school is irrelevant. Yet the same researcher found that academic performance in high school is a powerful predictor of success at college.[90])

5. Youth face negative stereotypes. Youth face obstacles to employment because of limited communication skills, difficulty with the application process, lack of etiquette, and employers' stereotypes about youth. This, combined with racial profiling by employers, constitutes a huge cultural and social barrier, particularly to inner-city youth.

6. Transportation is a serious barrier for youth and especially for low-income and minority youth both because of the distances they have to travel and because of inadequate public transportation.

7. Our cultural view of manufacturing is negative, and this has a particularly large impact on the aspirations and values of today's youth. Manufacturing exists in a societal context. To some extent qualified employees avoid manufacturing because of how society views it. As one employer put it:

> It seems to me that the issue at stake is to raise the bar on what it means to be in the [manufacturing] trades in society. In Europe it's wonderful to be in the trades, you're considered at par with other respected trades. It is just another path that you have chosen for your career. Here it's, "Oh, you work in a factory — gee,

[89] Manpower Demonstration Research Corporation, *Career Academics: Impact on Student's Engagement and Performance*, (2000).
[90] James Rosenbaum, "Unrealistic Plans and Misdirected Efforts: Are Community Colleges Getting the Right Message to High School Students?" *CCRC Brief*, Number 4, (New York Community College Research Center, Columbia University, October 1999).

> I'm sorry to hear that." We need to change that, and that is largely a cultural issue…

Society holds manufacturing in low esteem. High-school students, career counselors, and parents do not see manufacturing as an attractive career option, and thus it is difficult to recruit interest in the field. High schools have become college-prep-oriented, in essence turning their backs on the fact that although manufacturing requires large numbers of college-educated workers, it also offers important opportunities to those who have not gone to college. One consequence of this passive bias is that immigrant populations are increasingly relied on for both unskilled and skilled positions

A survey we conducted of high-school counselors in the CPS Education-to-Careers program affirmed the low prestige of manufacturing.[91] Asked to rate eight occupational groups on several factors, counselors scored manufacturing lowest on "social status," second lowest on "income" and "job satisfaction" (only transportation was lower), and third lowest on "working conditions" and "career advancement" (above transportation and construction). Accordingly, it is not surprising that counselors do not discuss manufacturing careers with students as often as they do the more favored fields.

One employer made a succinct suggestion: "We need a good sitcom starring an engineer."

[91] The survey was conducted in collaboration with the CFL-WAC, the CPS Education-to-Careers unit, and the Chicago Workforce Board in April 2001.

Chapter 7
The Training Landscape in Chicago

The Knowledge Supply Chain

Knowledge — technical, organizational, and entrepreneurial — is a vital commodity for manufacturing firms seeking to succeed in today's competitive environment. Knowledge becomes a basic input into the enterprise, just like land or capital. To a considerable degree, most manufacturing firms must rely on other institutions to supply the knowledge that will guide their enterprises. The process of supplying this commodity has been called the knowledge supply chain.[92]

Critically important to this process is the training and education of the future workforce. Because manufacturing processes are similar all over the world and firms have access to comparable technologies, the human factor becomes the key variable in determining whether a firm will have a competitive edge.

As we saw in the last chapter, the need for appropriately trained individuals is great — and ongoing. In order for manufacturing to survive and sustain itself in Chicago and Cook County, the area must have a competent group of education and training units capable of annually producing most of the 10,000-plus skilled workers sought by area manufacturers. This chapter explores the size, scope, practices, and content of the education and training institutions in the Chicago area.

Necessarily, this is a broad overview of the landscape. While we interviewed many of the staff of these programs, and in some cases participants, it should be noted that we did not attempt either detailed case studies or a definitive review of the outcomes of the individual programs. Such activities were beyond the scope of this project, but they are absolutely necessary to the success of any sustained effort to improve the workforce development process.[93]

It should also be emphasized that our critique is directed at the system level, and is not intended as criticism of the many dedicated individuals — staff, instructors, and administrators — whom we were privileged to observe in action. We can testify to the many heroic efforts being made by individual instructors within the Chicago schools and by community-based organizations demonstrating many of the specific competencies we advocate for the entire system. Our concern is that these good works are effectively undermined by an irrational and dysfunctional system.

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[92]For a discussion of the underpinnings of this concept see: David Hansen. "The Knowledge Supply Chain," *National Alliance of Business (1998),* Vol. 15, Issue 5.

[93] For an exemplary case study of an important community-based organization see: Amy K. Glasmeier, Candace Nelson and Jeffery W. Thompson, *Jane Addams Resource Corporation: A Case Study of a Sectoral Employment Development Approach.* Washington DC: Aspen Institute, December 2000.

The Problem with the Knowledge Supply Network

Even the casual observer can appreciate the size and diversity of the education and training institutions that could potentially supply training and education services to Chicago manufacturers:

- *The Chicago public school system:* With over 400,000 students, the Chicago system is the second largest in the nation, and suburban Cook County has an additional 70-plus high schools affiliated with 30-plus school districts.

- *Community colleges:* Seven community colleges in Chicago and ten in suburban Cook County offer manufacturing programs.

- *Community-based organizations:* Operating within the area are at least 50 community-based organizations that conduct some form of manufacturing-related training for clients.

- *Other entities:* In addition to these public or quasi-public providers, the Chicago area has many private training institutes, private high schools and colleges, employment service firms and individual consultants providing education and training services for specific firms.

- *Trade associations:* Finally, the area has many trade associations, such as the Tooling and Manufacturing Association and the Precision Metal Forming Association, which also offer training and education to member firms.

To help coordinate the public side of these functions, and also to distribute monies for specific programs, there are three Workforce Investment Boards (WIBs) in Cook County that set policy and develop local plans for workforce development; 15 One-Stop Centers that provide WIB services to citizens in Cook County; seven Education for Employment regions (a mechanism for disbursing career/technical funds to high school districts); and 11 Area Planning Councils charged with the development of three-year plans for adult education in Illinois.

Despite the large number of training providers, however, we found in our interviews with employers that they are continually frustrated with their inability to recruit and maintain workers. Typical was this comment by one manager from our focus groups:

> It is a big deal that we are having such a hard time finding people to work on packaging lines, because we are having to look at further automating the lines. But the more automation that we have and are forced to do, because of the laws or a shortage of labor supply, [the more we need] skilled people to run computerized packaging equipment… and they are not around. There is definitely a void between what we need or are going to need and what we have or are going to have.

Firms are less than satisfied with the individuals that apply for work. A company personnel manager commented:

> I also recruit for the entry-level positions more often than the upper-level skilled positions. What I look for in the applicant is basic math and reading. I look for the ability to follow directions and comprehend instruction. Part of our recruiting process is also a drug test, and that also is a big challenge. What I get is applicants who speak little or no English, who are illiterate, who don't pass a drug test, and who have difficulties with transportation or home issues and have huge attendance problems because of various things.

It is not simply that managers find the variety of training providers inadequate for their needs, but workers interviewed rarely mentioned participation in any of the programs as the source of their skills. From our notes from a focus group of workers:

> The vast majority of participants report that they learned how to do their work on the job. Most were taught job tasks by either their supervisor or their more experienced co-workers. Several workers report the importance of having a mentor, typically a senior employee, to show them the ropes. For example, one participant spoke about how his brother taught him how to spin metal, a process that requires skill and judgment.

While the workplace can and in many instances should be the place where skills are mastered, it was striking that workers rarely spoke of their educational backgrounds as having in any specific way prepared them for their work.

The conclusion is inescapable that despite the wide range of organizations and their collectively vast resources, employers remain hard-pressed to find the trained individuals they need and workers find it difficult to learn how to perform their jobs. There is a disconnect between the needs of manufacturers and workers and the suppliers of training and education.

What accounts for this disconnect?

The major difficulty with this vast array of organizations and schools, we found, is the absence of a comprehensive approach to the topic of education and training. Supply-chain theory would assume that there is some central list of all available manufacturing education and training programs (there is not) and that public school systems and community colleges would introduce demand-targeted programs in coordination with one another (they do not).

In reality, public schools and community colleges organize their activities with little regard or knowledge of each other's activities. It could be reasonably expected that those organizations would use a common language to describe the curriculum and skills obtained. Instead, there is no common language describing programs, the degree of mastery, and the other important issues related to education and training. Where it might

be anticipated that there would agreements on outcome and measurements, in reality this educational marketplace has no common framework.[94]

In other words, the area's educational and training institutions exist in a generally privatized, chaotic, unorganized and ineffective market. Programs are described through size and dollars expenditures, but rarely in outcomes obtained, i.e., the number of people who find employment and retain a job after completing the program. Lacking this universal yardstick, it is extremely difficult to categorize the various programs, let alone use universal comparisons. To do so requires a common language in use for all programs and an agreed-upon method for gathering and evaluating evidence on their outcome performance. Planning must occur between different units so that repetition and coherence become major priorities. Finally, there must be comprehensive marketing of these programs, so that area firms can easily access the programs or their graduates. [95]

These deficiencies are especially troubling when we consider the significance of manufacturing to Cook County and the importance of opening up career opportunities for the area's substantial low-income population. These programs should be serving as a way for the Chicago schools to help the many young people who are currently dropping out of the system or graduating with minimal employable skills. And, for the various community-based organizations that are concerned about industrial disinvestments, a coordinated approach to training should be a top priority as a means of stabilizing a local employment base for their neighborhoods.

Unfortunately, this rationality is not present in the Chicago knowledge supply chain.[96] Rather than a system of training providers with a common framework and lexicon who

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[94] For those wishing to test these broad statements in greater detail, an examination of *America's Learning Exchange*, the Department of Labor's Training and Education Data Base, may be instructive. This is a federal voluntary program which encourages educational and training entities to submit information about their training courses and programs to be posted on an Internet site. The system is part of an effort by DOL to make resources available for the broad public as well as the unemployed. The information is organized around broad subject matter categories — such as manufacturing — and by modes of learning delivery (classroom, Internet etc.), and type of training provider (community college, CBO, private training organization). An examination of the database for the state of Illinois retrieved few programs that dealt with metalworking, and none in the Chicago area. There were also few entries from community colleges in customized training fields. Information regarding depth and scope of the programs offered was unreliable: for example, courses offered from one day to six months claimed the same mastery of the subject matter. See: http: www.dol.gov.

[95] Evidence that this can be done on an area-wide and even statewide basis comes from Florida, which currently tracks the progress of every student who enters a public community college and publishes the results. The state thus has the capability to know where every graduate of a machining program is working and the quarterly wages she or he is earning. While this system has many flaws (for example it cannot track specific occupation, only to the firm level), it provides the state with good working data on the effectiveness of programs serving over 400,000 students. Texas and North Carolina have similar systems in place. Evidence from these systems will be utilized in the National Assessment of Vocational Education, *Final Report (forthcoming, 2002).*

[96] In anticipation of the Workforce Investment Act, a careful study of 64 job training programs in Chicago called for the establishment of uniform definitions of program completers, noting that some programs considering a "completer" as finishing the program while others considered job placement as evidence of completion. In addition, the study called for consistent definitions of case management between the programs for better means of comparisons and achieving good data by which consumers can make choices

sell their services to manufacturers, we have an educational and training sector that sells a great number of programs that are disconnected and disorganized. Absent common terminology and common outcome measurements, it is impossible for students or employers to evaluate the relative merits of competing offerings. Rarely do these institutions interact with each other, and thus no common lexicon or definitions exist for occupations, the skills training appropriate to them, or other basic parts of the system. Many programs have existed for years with few if any direct links with industry.

Thus our effort to simply identify the landscape of training programs and institutions was no simple undertaking. Lacking any central source cataloging and describing workforce development in the county, it was necessary for us to conduct a major research effort to gather this basic information.

We relied on two major sources for the data:

1. The Illinois Commission on Intergovernmental Cooperation (ICIC) assisted the CFL and CLCR (with the support of Senator Emil Jones) by sending a request to all state agencies. The request, mailed on April 25, 2001, asked for "information and data regarding the pass-through of federal funds and/or expenditure of state funds for the purposes of workforce development and training with a specific emphasis on Chicago and suburban Cook County." It was not feasible to limit our request to funding for manufacturing-related workforce development and training. Thus the data received included funding for non-manufacturing-related training (although non-manufacturing programs will not be reported here). We received the complete set of responses by July 13, 2001. [97] This data had not been compiled previously.[98]

All state agencies responded, but only the following agencies had any significant funding for workforce development and training:

Prairie State 2000 Authority
Illinois Department of Employment Security
Illinois State Board of Education
Illinois Department of Human Services
Illinois Department of Commerce and Community Affairs
Illinois Community College Board

Other state agencies that provide some funding are:

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on programs. See: James Lewis and Nikolas Theodore, *Measuring the Performance of Job Trainers Under WIA: Results of a Survey of Chicago Providers," Chicago Workforce Development Partnership, February 2000, p. 5.*

[97] The assistance and cooperation of Leroy Whiting, Executive Director of ICIC, and Betty Husky, Federal Aid Coordinator for ICIC, was essential in obtaining this information.

[98] This is not an attempt at measuring performance through detailed interviews with program directors, such as conducted by James Lewis and Nikolas Theodore from Great Lakes Cities Institute, cited above. Rather this is an attempt to define the parameters of the training community in manufacturing.

Illinois Department of Labor
Office of Secretary of State – FY2000 Illinois State Library Workforce Training Grants
Illinois Occupational Information Coordinating Committee
Illinois Department of Children and Family Services

After the data was received, CLCR grouped recipients into provider categories and grouped funding streams into appropriate functional segments.

2. Data on the number of manufacturing-related programs, enrollment, and reported graduation rates were calculated from the provider database created as part of this project. To our knowledge no other inventory such as this exists — further evidence of the difficulty of having a thoughtful discussion of the programs. (Appendix VII has additional information about the Training Provider Database.[99])

Tables 1 through 4 below lay out the training landscape as depicted by this research. We have broken down this landscape into four major functional segments of workforce development and then indicated which types of providers are involved in each segment. The functional segments utilized in the approach are:

A. Recruiting and preparing manufacturing workers (mostly focusing on remedial training and people out of school);

B. Training and/or retraining new manufacturing workers (vocational education, School to Work, dislocated worker training);

C. Training incumbent workers (heavy emphasis on customized training, apprenticeships, etc.); and

D. Connecting trained people with jobs (placement, assessment).

While there is an obvious overlap in these functions, and in funding streams, the goal was to arrive at a broad understanding of (1) the size and scope of training programs in Chicago and Cook County including the number of manufacturing workforce development programs, the number of people are enrolled in these programs, and the number of graduates; and (2) the kinds of institutions that receive funding and what functional segments receive funding. Because there was inevitably some uncertainty in categorizing programs and funding, these numbers are necessarily approximate, but we are confident that they are sufficiently accurate to indicate patterns.

A few notes of caution, however. The facts about the existence of each program and the graduating numbers have been supplied by the agencies that operate the programs themselves. We have not attempted to independently corroborate these figures or examine the annual reports of these agencies in detail. With the exception of interviews

[99] This data base will be referenced as E. Solomon, Data Base Documentation, July 25, 2001.

performed with some staff, no attempt has been made to examine or assess the actual functioning of each program.

A Review of the Landscape

Our analysis divides the programs by those operating in Chicago and those operating in suburban Cook County. While there are differences in the target audiences of these programs based on this geography, it is also true that firms and individuals seek out jobs within a labor market that is large and crosses the jurisdictional lines of city and suburb.

Table 1
Summary Result of State and Federally Funded Programs for Chicago (2000)

	CBO's *(Community Based Organizations)*	**High Schools** *(Chicago Public High Schools)*	**Chicago City Colleges**	**Private Schools** *(includes universities, private trade schools)*	**Trade Associations**	**Apprenticeships** *(Apprenticeship training is normally reported by CBO's where non-on-the-job training occurs)*	**Customized Training by or for companies in Chicago** *(Direct training or use of outside training provider such as City or community colleges)*	**Workforce Investment Board**
Recruiting and Preparing Manufacturing Workers ① *(TANF, Welfare to Work, Earnfare, ESL, GED, Adult Ed.)*	MfgPrgms=12 Enroll=529 Grads=181				MfgPrgms=1 Enroll=47 Grads=47		MfgPrgms=17 Enroll=986 Grads=NR	
Training or Retraining New Manufacturing Workers ② *(Voc Ed, School-To-Work, Tech Ed. Dislocated Workers)*	MfgPrgms=20 Enroll=561 Grads=272	MfgPrgms=544 Enroll=1,625 Grads=635	MfgPrgms=94 Enroll=1,416 Grads=215	MfgPrgms=20 Enroll=2,860 Grads=950		MfgPrgms=2 Enroll=35 Grads=30		
Training Incumbent Workers ③							MfgPrgms=11 Enroll=594 Grads=94	
Connecting Trained People with Jobs ④								

Funding Agencies:
① IDHS, Secretary of State (Library), DCCA, ISBE, ICCB
② ISBE, ICCB
③ DCCA, Prairie State 2000, ICCB
④ ISBE, IDES

MfgPrgms = Number of Manufacturing Programs
Enroll = Manufacturing Enrollment
Grads = Manufacturing Graduates reported to state agencies

Table 2
State and Federal Funding Levels of Workforce Development Programs for Chicago (2000)

	CBO's *(Community Based Organizations)*	**High Schools** *(Chicago Public High Schools)*	**Chicago City Colleges**	**Private Schools** *(includes universities, private trade schools)*	**Trade Associations**	**Apprenticeships** *(Apprenticeship training is normally reported by CBO's where non-on-the-job training occurs)*	**Customized Training by or for companies in Chicago** *(Direct training or use of outside training provider such as City or community colleges)*	**Workforce Investment Board**
Recruiting and Preparing Manufacturing Workers ① *(TANF, Welfare to Work, Earnfare, ESL, GED, Adult Ed.)*	$24,723,986		$10,792,892	$212,899		$10,000	$573,832	
Training or Retraining New Manufacturing Workers ② *(Voc Ed, School-To-Work, Tech Ed. Dislocated Workers)*		$18,162,920	$7,651,384					
Training Incumbent Workers ③	$493,896		$504,108		$149,243		$2,763,327	
Connecting Trained People with Jobs ④		$696,182						$32,100,000

Funding Agencies:
- ① IDHS, Secretary of State (Library), DCCA, ISBE, ICCB
- ② ISBE, ICCB
- ③ DCCA, Prairie State 2000, ICCB
- ④ ISBE, IDES

Chicago Public Schools: The first broad conclusion is that within the city of Chicago there are many manufacturing programs and relatively few students. The Chicago Public Schools system has 544 manufacturing programs in which 1,625 students were enrolled in 2000 — less than 1 percent of total student enrollment. There were 635 graduates of CPS programs, or fewer than 40 percent of attendees. Many of these programs exist in name only. In many of the areas of the metal trades — often subjects of great interest to local firms — there are few instructors with industrial experience, and many programs have no operational equipment for hands-on learning. There are only five high schools within the system that have operating manufacturing production programs. In addition,

these courses appear unconnected to either foundation technical competencies — such as trigonometry or reading — or some information technology classes such as word processing skills. None of the high school programs have their own advisory boards, leaving it to the teachers to make direct connections with employers.

There are no follow-up studies to indicate whether or where students got jobs, whether they retained them, or which employers accessed the program and with what results.[100] The programs do not generally appear to be related to any work-based learning component such as internships or apprenticeships. In 2001, only 93 suburban Cook County high school students and 29 Chicago Early School Leaver (Adult Education) program participants participated in manufacturing-related work/learning experiences.[101] CPS manufacturing programs spend $18 million of local and federal funds for equipment and salaries. One funding source — the Perkins Act — calls for annual evaluation reports, which have not been filed for the past five years. (See Glossary in Appendix IX for a detailed program description).

And there are other problems in the public schools. There are other pre-high-school programs that discuss career preparation and offer students information on manufacturing, but these are not interwoven within the regular programs of the district. While we found that some very good machining programs were still operating in a few high schools, and employers mentioned that they did obtain students from these programs, these were the products of the efforts of individual vocational instructors who were very close to retirement. It is highly unlikely that these programs will be maintained after the instructor retires. And traditionally urban vocational classes have been utilized as a dumping ground for hard-to-serve students, segregating them from the general and college prep student bodies.[102]

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[101] "Facts, Adult Education and Literacy," Illinois Community College Board, May 2001; and "High-Technology School-to-Work Act" (SB845), Illinois General Assembly, 2001.

[102] For a discussion of this tendency see the: Final Report to Congress, *National Assessment of Vocational Education (NAVE),* (Washington DC, 1994), Vol. II, and pp. 27-30.

Table 3
Summary Result of State and Federally Funded Programs for Suburban Cook County (2000)

	CBO's *(Community Based Organizations)*	**High Schools**	**Community Colleges**	**Private Schools** *(includes universities, private trade schools)*	**Trade Associations**	**Apprenticeships** *(Apprenticeship training is normally reported by CBO's where non-on-the-job training occurs)*	**Customized Training by or for companies in Suburban Cook County** *(Direct training by companies or use of outside training provider such as community colleges)*	**Workforce Investment Boards**
Recruiting and Preparing Manufacturing Workers ① *(TANF, Welfare to Work, Earnfare, ESL, GED, Adult Ed.)*							MfgPrgms=17 Enroll=2,600 Grads=NR	
Training or Retraining New Manufacturing Workers ② *(Voc Ed, School-To-Work, Tech Ed. Dislocated Workers)*		MfgPrgms=303 Enroll=2,616 Grads=1,595	MfgPrgms=202 Enroll=4,895 Grads=262	MfgPrgms=12 Enroll=1,558 Grads=365		MfgPrgms=47 Enroll=718 Grads=161		
Training Incumbent Workers ③			Program data not broken out from above category		MfgPrgms=12 Enroll=28 Grads=28		MfgPrgms=15 Enroll=6,320 Grads=3,020	
Connecting Trained People with Jobs ④								

Funding Agencies:
- ① IDHS, Secretary of State (Library), DCCA, ISBE, ICCB
- ② ISBE, ICCB
- ③ DCCA, Prairie State 2000, ICCB
- ④ ISBE, IDES

MfgPrgms = Number of Manufacturing Programs
Enroll = Manufacturing Enrollment
Grads = Manufacturing Graduates reported to state agencies

Table 4
State and Federal Funding Levels of Workforce Development Programs for Suburban Cook County (2000)

	CBO's *(Community Based Organizations)*	**High Schools**	**Community Colleges**	**Private Schools** *(includes universities, private trade schools)*	**Trade Associations**	**Apprenticeships** *(Apprenticeship training is normally reported by CBO's where non-on-the-job training occurs)*	**Customized Training by or for companies in Suburban Cook County** *(Direct training by companies or use of outside training provider such as community colleges)*	**Workforce Investment Board**
Recruiting and Preparing Manufacturing Workers ① *(TANF, Welfare to Work, Earnfare, ESL, GED, Adult Ed.)*	$2,080,182	$1,082,512	$6,422,784				$234,006	
Training or Retraining New Manufacturing Workers ② *(Voc Ed, School-To-Work, Tech Ed. Dislocated Workers)*		$7,568,004	$11,977,128					
Training Incumbent Workers ③			$1,656,865				$2,683,449	
Connecting Trained People with Jobs ④		$92,500						$13,592,772

Funding Agencies:
① IDHS, Secretary of State (Library), DCCA, ISBE, ICCB
② klSBE, ICCB
③ DCCA, Prairie State 2000, ICCB
④ ISBE, IDES

Suburban Public Schools: The situation in the suburban school districts is only a little better. There were 303 programs in 2000, enrolling 2,616 students and graduating 1,595. Just over $11 million was spent by these school districts. A few of these programs utilize the metalworking standards from the National Institute of Metalworking Standards (NIMS). This program was developed by private-sector firms, and stresses the ability to actually utilize machining to make specific parts. The NIMS programs tend to assume significant basic skills and serve as a means of preparing students for pre-apprenticeship

programs. But most of these classes appear to be more of what vocational education has largely become — a dumping ground for the "non-college-bound" and troubled youth — and thus mainly attract individuals who lack the appropriate skills for success. There is thus all the more need for, but largely an absence of, training in the foundation skills to get these students into careers in manufacturing.

City Colleges of Chicago: The differences between city and suburban schools are also reflected in the community colleges. The seven City Colleges of Chicago include 96 programs relating to manufacturing activities including apprenticeships, which enrolled 1,451 students in 2000, graduating 245 (17 percent). Over $7.6 million is spent within these programs. There is no data to indicate how many of these students were once part of the CPS vocational education system.

The national Tech Prep program, which is designed to foster a seamless transition between high school and post-secondary systems, does not appear to have generated significant formal articulation agreements—giving college credit for specific high school courses--between the secondary and post-secondary systems in Chicago.[103] There is no evidence that city college students obtained work after the completion of their courses. Indeed, many of the technical classes are found in the regular catalogue and far removed from the remedial education classes in the college's Adult Learning Skills Program.

A few employers cited the programs at Daley College as sources of their new employees. In May 2001 the college won an award as a Learning Centered Institution from the Illinois Community College Board.

Suburban Community Colleges: Among the ten suburban community colleges**,** there are 249 programs, enrolling 5,613 students in 2000 and graduating 423 (7.5 percent). Specific employers cited some of these programs at colleges such as Triton, Moraine Valley and DuPage as important sources of new workers. While these programs may be open to all students, there is a strong likelihood that suburban residents from districts outside of Cook County have been the primary beneficiaries of the program.

Virtually all the public school programs in suburban Cook County — both at the high school and community college level — have advisory boards of employers to help articulate the needs of industry. However, the impact of the private sector is very uneven, and in general employers know very little about the programs, what they teach, and what the skills are that students allegedly have upon completion. Our research did not gather information on how much money is devoted to recruitment of students, assessment of their skills, and marketing the students to the firms. This is a significant issue because in these community-based and private-agency programs expenditures per student led to

[103] The Chicago schools have been granted an articulation waiver, which allows them not to develop articulation programs. The need for a 2 + 2 program that links 2 years of work in high school with 2 years of work in community colleges in manufacturing had been long been identified as an issue. See: Joan Fitzgerald, "Making School to Work Happen In Inner Cities," Great Cities Institute-UIC, January 1996, pp. 40-41.

higher wages at the placement.[104] Nor is it clear that these programs, which are serving students looking for careers in manufacturing, are effective for incumbent workers. Nationwide, most students enrolling in post-secondary manufacturing programs already have jobs in the manufacturing sector. They are using the program to upgrade their skills and their careers.[105] This utilization of the programs does increase the competency of the workforce, but does not increase the pipeline of workers for manufacturing.

Placement rate data for many local programs is also difficult to obtain, although there have been recent promising attempts made by the Chicago City Colleges to examine the economic significance of its educational programs.[106]

Private Educational Providers: In addition to these public education programs, there are a number of private educational providers both in the city and outside the city. There are 45 programs in total, which enrolled over 4,493 students in 2000 and had 1,390 graduates (31 percent). Few of these programs obtain public funds, except for the student aid programs, which support tuition. While the private schools engage in extensive follow-up studies, there is no verification of the numbers served or placed within manufacturing industries. Recent investigations into the conduct of these private schools indicate they do have extensive placement functions, which aid students in obtaining work within certain career fields. [107] Many employers cited one such program as the best for the preparation of skilled electronics and computer technicians for Chicago manufacturing: the electrical engineering program at downtown DeVry. [108]

Since manufacturing offers an important second chance for individuals, it is also important to examine the sources of manufacturing programs that exist for adults who wish to enter manufacturing. Community-based organizations in Chicago offered 22 training programs that enrolled 596 individuals in 2002 and graduated 302. Follow-up interviews performed with several of the larger community-based organizations that are involved in manufacturing preparation indicate the difficulty of basic skill preparation of individuals before they enter the workplace. Basic skill preparation in mathematics and English takes more time and focused attention than the short-term programs that often are necessitated by the "work first" policies of both the federal Workforce Investment Act and the Temporary Assistance for Needy Families legislation. Thus the community-based organizations cannot easily train individuals in the foundation skills that provide the necessary basis for training in more advanced technical skills for manufacturing.

In addition, many community-based organizations lack both the equipment and the trained staff to conduct successful manufacturing programs. They often use Chicago City College staff, with mixed results. There has been little evaluation of these programs and

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[104] Lewis and Theodore, *Ibid.* 3.
[105] National data on post-secondary occupation education indicates the age of students in manufacturing programs the highest of all the vocational programs. See NAVE study.
[106] See: City Colleges of Chicago, *Workforce Development Initiatives,* October 31, 2000.
[107] Goldie Blumenstyk, "How For-Profit Institutions Chase Community-College Students," *Chronicle of Higher Education,* December 8, 2000.
[108] For information on DeVry see: Ann Marie Borrego, "The Duo That Leads DeVry," *Chronicle of Higher Education,* June 29, 2001.

their success at bringing trained individuals to manufacturing. One report has pointed out a geographical disparity between the programs. Four of the major programs are located on the North Side and near West Side. However, the neighborhoods of greatest need are in South Side or mid-to-far West Side.[109]

One important component in the system is the effort to recruit and prepare manufacturing workers from various adult remediation programs funded through a variety of programs including Temporary Assistance for Needy Families, (TANF), Welfare to Work, English as A Second Language (ESL), and GED. Very few of these programs are connected to manufacturing. We found only 12 manufacturing programs that utilized them. Together they enrolled 529 individuals in 2001, graduating 181. The total state funding for adult remediation in Chicago exceeds $24 million.

There is also the Chicago Job Corps Center, which opened in 1999 and provides residential training for youth in bricklaying, business and computer skills, carpentry, electronic assembly, hotel clerk, machining, painting, and welding. Job Corps has been in operation nationwide for 35 years and has a good track record of preparing young people for jobs. It reaches out to all communities to attract students and its programs are intensive and of considerable duration and thoroughness. Some Job Corps programs involve unions and are pre-apprenticeship programs. Job Corps is governed by Department of Labor standards and has quantifiable evaluation techniques in place.

The Manufacturing Skills Standards Council (MSSC) nominated Chicago Job Corps as one of the first two Job Corps in the country to implement its "Introduction to Manufacturing" course in the fall of 2001. This course appears to be a good introductory program for manufacturing generally and is linked to Chicago's City College system for more advanced study. The Candy Institute[110] is working with Job Corps to add optional course components customized for food production for those interested in pursuing a career in food manufacturing. The Institute has invited local candy and food manufacturing companies and unions to provide input on the course outcomes.

Finally, many employment service firms maintain small, targeted training programs that prepare people for work within manufacturing. Unfortunately, we were not able to obtain more than anecdotal information about the extent of such training, numbers of participants, or outcomes.

Gap analysis

This brief survey suggests, among other things, that area training programs are ill-equipped to meet area manufacturers' needs for reasonably skilled workers.

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[109] Banks, p. 20.

[110] The Candy Institute is a project of the Center for Labor and Community Research. It provides a range of services for Chicago's confectionery and specialty food sector. For more information see the Institute's web site: www.candyinstitute.org

Even if each and every one of these programs was turning out superbly educated and trained individuals, collectively they would fall far short of producing the numbers needed by area manufacturers. Combined, about 5,600 students are graduating from these programs annually — just over 50 percent of the 10,500-plus needed. This is a capacity issue which will continue to force firms to pursue other strategies (including relocation) to meet their workforce requirements.

This problem is exacerbated by the existence of an extraordinary number of programs, few if any of which have sufficient enrollments to justify substantial investments in new equipment, revised curricula, and trained instructors. There is a clear need to consolidate and focus programs if only to facilitate making wise choices about which of them should be maintained and strengthened.[111]

The second issue has to do both with the number of programs and the breadth of the current curriculum, at least as suggested by the titles of the courses. Some are far too specialized, attempting to narrowly develop workers' skill sets. These courses appear to assume the existence of an industry base of thousands of firms seeking the same narrow range of skills sets — a distinctly outmoded concept. Others assume that basic foundation skills are present, but do little to link them with technical training.

Most importantly, few programs use recognizable skill standards, certification, or forms of portable credentials that will permit students to move from the programs and into employment or from employer to employer within the industry. It would be useful to focus these programs on some essential general characteristics in order to insure that both employability and technical skills are taught in the same program. In a broad sense, there is a natural division of labor between the youth programs, where the public schools should be able to emphasize the basic employability and common manufacturing skills, and post-secondary programs, where most of the technical training can be performed. There needs to be an alignment and fit between the programs.

In theory it makes good sense to have students from the CPS take more advanced classes at Chicago City Colleges — even while they are working. The generalizable skills from high school should provide the basis for the more specialized programs at Chicago City Colleges. Articulation agreements between the two education institutions are the essential component. Daley College programs have written articulation agreements with eight public high schools. Through *Excel*, a dual-credit program, over 80 CPS students study manufacturing at Daley, receiving both high-school and college credit. This is a start, but one that falls far short of meeting the needs of both employers and students.

Third, the programs do not appear to utilize much work-based contextual learning. This is a significant drawback because many smaller manufacturing firms have unique

[111] The Lewis and Theodore study reported that smaller programs were more successful than larger ones in placing clients into jobs. This generalization may not be true for manufacturing programs because of the extensive use of equipment for instruction, which might disadvantage smaller programs. See Lewis and Theodore, p. 4.

equipment and work processes that would be extremely difficult for anyone to master outside of the workplace. Moreover, it is at the work site where students get a real feel for the manufacturing setting. Employers also have a chance of viewing the performance of students at the workplace. Few of the programs cited have a specific work-based or cooperative education component as a regular part of the program. It would be more effective to have fewer programs that are more connected to employers through work-based training than is the case today.

Fourth, a review of these programs confirms that they concentrate on the teaching of specific skills important to manufacturing. This assumes an appropriate foundation of basic skills and broad awareness of technology. Without this foundation, more specific skills will be difficult to master and even more difficult to retain. These skill-specific programs need to be offered within strong programs that assess the basic skills of all students, shore them up when necessary, and build on them. A strong placement program is also required. Such programs can continually provide feedback about how industry is changing, making program adjustments to meet changing needs. In addition, students in remedial programs should learn basic skills within a context through which they can apply these skills to concrete applications of manufacturing.

On the post-secondary level, the awarding of college credit should always be considered an asset to the future of the students. However, the major concern should be the relevance of the mixture of courses to the employability of students. At this point, employers are more interested in the development of credible forms of certification than in the use of grades or college credit. The two issues are not incompatible; many community colleges elsewhere have been able to merge credit and non-credit courses and permit the students to choose between them.

Customized Training Programs: The lack of educational programs producing skilled individuals for manufacturing careers may be related to their significant involvement in customized training activities. While there are certain skills that can only be mastered at the workplace — and significant in-plant training is often an indicator of aggressive management and solid company performance — some concern is warranted when firms are undertaking a great deal of training. Such activity suggests that the system is failing to provide sufficient numbers of trained individuals, compelling the employer to train them. This raises employers' costs, weakening their competitive positions and creating the risk that the people they train may go elsewhere in search of higher compensation.

In Chicago the public subsidy of incumbent workers is through specifically designed customized training performed through the community colleges in conjunction with private training vendors. In the winter of 2000-2001 there were 11 programs with 594 enrolled and 94 graduates. These program cost over $2.7 million. Other forms of training of incumbent workers are performed by community-based organizations ($493,890), company contracts with the Chicago City Colleges, and through business trade organizations such as Illinois Manufacturers' Association. In suburban Cook County, there were 15 customized training programs enrolling 6,320 workers and graduating 3,020 workers (48 percent). These efforts cost $2.6 million. Customized training of

incumbent workers is more a suburban phenomenon and suggests that firms — both city and suburban — find the appropriate technical skills available from the suburban community colleges. Some of the customized training might be mitigated if there were more regular programs serving firms. As one manager who used customized training programs commented:

> OSHA training is needed by everyone. Instead of providing funding for training on OSHA standards through rebates or money to employers [we should] fund these programs directly. Under the current system I pay, for example, $10,000 for OSHA training and eventually get $5,000 back. Why can't I get the training for $5,000 initially? This kind of system would be much more conducive to employers using training because of the difference in perception of the cost of training, less paperwork and because it ties up a lot less money. We need training in basic skills, OSHA requirements and technology areas.

The training database, however, suggests that state efforts in this area are far less extensive than what is done by the firms on their own or in conjunction with private training vendors. National studies indicate that about 81 percent of all manufacturing companies have some form of training, ranging from 96 percent of firms with over 1,000 workers to less than 15 percent of firms with under 10 employees.[112] In addition, only 22 percent of the manufacturers used outside vendors only for their training programs, while over 72 percent used a combination of outside vendors, their own staff, and sometimes the staff of their parent companies. Companies with fewer than 100 employees used outside vendors more extensively than larger companies that were able to afford a training function.[113] In addition, almost all organizations with formal training programs (91 percent) also paid tuition for employees to take training courses, and 80 percent provided release time from work to take these courses.[114] A benchmarking study by the American Society for Training Development indicates that total training expenditures for firms rose from 1.5 percent to 2.0 percent between 1996 and 1998. [115] (However, 70 percent of the typical training dollar goes to train management-level personnel).

Finally, the data on hiring practices shows that firms do not typically obtain new employees from training providers.[116]

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[112] See Peter Cappelli, "Job Training Programs and Practices," op.cit., p. 135.

[113] *Ibid.*, pp. 146-149. This national data is confirmed by our focus group and survey results, which found that employers view most of the governmental programs as not suitable to their businesses. They did not like having employees going off-site, either through paid time off or tuition reimbursement They also use their own in-house training programs most often. For them most training was done informally, through other workers and on the shop floor.

[114] *Ibid.*, pp.149-152.

[115] Mark Van Buren and William Woodwell, Jr. *2000 ASTD Trends Report,* Alexandria: ASTD, 2000. p. 10.

[116] See Osterman, *Securing Prosperity, pp. 20-70.* In the main, Chicago employers do not hire workers from many public programs. They trust the responses of their employees for jobs. Our survey of firms indicated employers use the usual methods for finding new employees: referrals from current employees, then general word-of-mouth and newspapers. They do not use training providers or government agencies for worker recruitment. With few exceptions, this finding was confirmed in our focus groups and interviews.

Joint Labor-Management Education Programs

While the Taft-Hartley Act of 1947 restricted the power of unions, one of its provisions provided the legal framework that would later enable the emergence of joint labor-management educational programs by requiring joint governance of collectively bargained benefit programs in which employers contribute funds as part of workers' compensation. The building trades during the 1950s became the early pioneers of the joint labor-management educational program model. Beginning in the early 1970s a number of unions and employers created joint labor-management educational programs as the issue of education and training increasingly became a central component of the collective bargaining process in a number of key industries

In some of these efforts unions have taken the responsibility for creating and supporting workplace-based educational and training institutions through the vehicle of joint labor-management programs, which now serve approximately 2 million union-represented workers. During the past two decades, joint labor-management programs have become significant providers of both general and work-skills-related education and training in a variety of industries, among them auto, aerospace, building service and maintenance, construction, health care, hotel and restaurant, maritime, public service, transportation, steel, telecommunications, and other industries.

Currently a number of new joint labor-management education initiatives are emerging around the country. Hundreds of thousands of workers have voluntarily participated in these programs, engaging in a range of educational and training activities that have resulted in valuable outcomes for workers, their employers, and unions. These activities include basic literacy; English as a second language; enhancement of basic math, reading, and writing skills; preparation for college entrance; tuition assistance for technical and professional college degrees; basic technical courses to prepare workers for more advanced technical training; career development, counseling, and job search services; job-training certificate programs that prepare workers for advancement to new jobs; job-specific training that enhances and develops job skills; personal development and life skills courses; training in computers and use of other technology; and distance learning programs.[117]

In Cook County, labor has been and remains very active in training and education in the building trades — as the source of education and certification for thousands of carpenters, electricians, plumbers, and other craft workers. Unions work closely and in joint programs with trade associations and educational institutions. From the 1950s through the 1970s, unions representing manufacturing workers such as steelworkers, food workers, machinists, printers, autoworkers, and others were active in many aspects of training and education, both in an advisory capacity to the school system at various levels as well as in joint labor-management programs.

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[117] "A Collective Bargain for Lifelong Learning: Building Workplace Institutions of Worker Education and Training in the New Economy," Glenn Scott Davis, unpublished draft, June 14, 2001, p. 5.

Following the massive loss of jobs in the steel industry and other large manufacturing sectors, participation by unions in the manufacturing sector dramatically declined. Today there are relatively few active manufacturing training programs in the Chicago area in which labor plays a significant role. These include programs by the Bakery, Confectionery, Tobacco, and Grain Millers International Union; the International Brotherhood of Teamsters; Auto Mechanics Local 701 of the International Association of Machinists and Aerospace Workers; the International Brotherhood of Electrical Workers; the United Steelworkers of America; the Union of Needle, Industrial, Industrial and Textile Employees (UNITE); the United Auto Workers; and the United Food and Commercial Workers Union. Yet as this report and project reflect, labor nationally as well as regionally is taking another look at the importance of workforce training and education.

Building a Career Path System requires the active engagement and participation of all aspects of the labor movement on its own initiative as well as in partnership with management. Two unions that are prominent in our region — the International Brotherhood of Electrical Workers and the United Steelworkers of America — have well-established joint labor management programs.

International Brotherhood of Electrical Workers' Enhanced Training Opportunities Program: IBEW's Enhanced Training Opportunities Program (ETOP) provides workplace skills instruction, computer skills development, and academic career counseling specifically designed by manufacturing workers. ETOP is a joint labor-management program that seeks to add value by enhancing the relationship between the union and the company.

ETOP partners with local colleges and universities to assemble professional, full-time faculty. ETOP learning centers offer courses in Basic Skills, GED Preparation, Computer Skills, Machine Tool Technologist training, Production Technologist training, Basic Electronics, and other courses. ETOP courses are designed to provide incumbent workers with the skills they need to move up the career path.

In order for training to meet the needs of workers, as well as those of corporations, it needs to have union input to bring in the experience and creativity of the workers, themselves as is the case with ETOP.

Institute for Career Development (ICD): Located in Merrillville, Indiana, the ICD was formed in 1989 by the United Steelworkers of America and 13 member companies in the steel industry. Language in the USWA-industry agreement expresses the philosophy of the Institute: "Experience has shown that worker growth and development are stunted when programs are mandated from above, but flourish in an atmosphere of voluntary participation in self-designed and self-directed training and education."

The program is funded by an agreement between the union and company to set aside ten cents an hour for a special fund to pay for classes. This is a national program in which more than 60,000 steelworkers are eligible to participate. Over 20 percent do participate annually in the program, and 85 percent of the courses are customized for the participating local union. Programs are in the following categories:

- Basic Skills (17 percent): focusing on reading, writing, math, and communication;

- Pre-technical (36 percent): focusing on technical and computer training for materials and machines;

- Personal Development (47 percent): designed to enhance the quality of workers' lives.

Programs are designed and managed by Local Joint Committees (LJCs), with content determined by periodically surveying local union members. The LJCs submit annual budgets based on what they want to offer. Within the limits of policy and finance, the national ICD approves budgets, provides standards, and offers logistical support. Twenty percent of the LJC's budget can be used for tuition assistance up to a maximum of $1,800 per worker per year.

For more information: <www.icd-uswasteelco.org>

Conclusion

Our examination of the area's training and education manufacturing programs confirms that there are far too many of them, their curricula are often unfocused, and in many instances they operate without regard for or connection to the needs of employers, employees, job seekers, and students. Indeed, focus groups of employers revealed that they knew little about all these efforts, and in general were distrustful of them. Training and educational efforts and employers appear, in fact, to be like ships passing in the night, aware of each other but seldom exchanging signals.

Thus, despite the efforts of many good people and millions of dollars of public funds, the current system is in reality a "non-system" churning out programs that are underutilized by employers. In the absence of a genuine area-wide training system, employers must rely largely on their own employees to bring them new workers, whom they must then train — sometimes in very basic coping skills as well as more specialized process-specific skills — at company expense.

While this approach may work for some firms, it is at best costly and time-consuming, and at worst it detracts from area firms' productivity — thereby saddling them with a competitive handicap — while doing nothing to address the flaws and failures of the

present public-private training "system." Putting this another way, what may be good for an individual Chicago-area company cannot possibly be good for Chicago's citizens or for the area's economy as a whole. That being the case, the issue then becomes how the area's dysfunctional training system can be brought into line with employers' and workers' needs. For the answers, we must first look elsewhere, and then, aided by a broader perspective, at some exemplary efforts in Chicago and Cook County that can guide the development of a functional Career Path workforce development system.

Chapter 8: International and Domestic Experience in Creating Workforce Development Systems

In the course of our research we became aware of workforce development initiatives at home and abroad that merited attention. There is a wide range of experience in the field of workforce development and education linked to manufacturing. Programs and practices being pursued elsewhere need to be understood and assessed because, among other things, they demonstrate the capabilities of other participants in the competitive global economy, and because there is much that we can learn much from their strengths and weaknesses.

International Experience

We found the most developed models of systems abroad. They reflect national initiatives to proactively support and build the infrastructure necessary for success in the global economy as well as a commitment to provide a positive framework for the education and employment of their citizens and residents. They provided considerable evidence that the problems of our workforce development system can be solved with systemic, institutional approaches. We focused primarily on German, Danish, and Australian models, but found other important initiatives at work in Canada, the Netherlands, Singapore, Italy, Austria, Scotland, Ireland, and elsewhere.

Europe

In May 2001, a group of nine participants in the Chicago Manufacturing Workforce Development Project visited Germany, the Netherlands, and Denmark to study their workforce education systems. (Appendix VIII includes reports from the trip.) The experience of Germany[118] and Denmark profoundly shaped our understanding of what is needed in a workforce development system and what is possible.

Following is a summary of the key characteristics of the systems we found in Germany and Denmark:

- *Historical context:* For centuries both countries have attached great value to knowledge of skills and to skilled work. Their current workforce development systems were initiated and developed following World War II. Both countries have aggressively reformed and updated their systems in response to the changing characteristics of global competition and as they came to understand weaknesses within the systems. Today Germany and Denmark are well-positioned to make

[118] For an excellent critical description of the current German system, see: *The German Skills Machine: Sustaining Comparative Advantage in a Global Economy*, edited by Pepper D. Culpepper and David Finegold, Berghahn Books, 1999.

the most of membership in the European Union, which provides important resources and encouragement to continue to improve and expand the workforce development systems of its member countries.

- *Contemporary:* Both countries have been quick to embrace the latest successful business practices and the latest in information and communication technology. Their workforce development systems are geared to these new and emerging realities. They seek to integrate high skills with critical thinking, teamwork, and innovation.

- *Comprehensive:* Both systems are truly comprehensive. They seek to constantly link the educational initiatives of the private and public sectors together on a national, regional, sectoral and local level. Education is seen and developed in the context of an economic development and industrial retention strategy, and in relation to the social wage system. There is a continuous effort to improve the integration of academic and skills education.

- *Social partnership:* Both countries accept as a given that a social partnership between labor, employers, government, and the education community is fundamental to having a high-quality workforce development and education system. Each partner brings different qualities essential for the success of the system and each participates in the creation, design, and implementation of programs as well as directly investing in them. Labor unions generally have broad influence throughout the system, as well as in relation to the firms that employ the workers they directly represent. All employers invest in the joint system whether or not they directly and actively participate. Government provides a framework for planning, funding, and ensuring accountability.

- *A dual system:* Forming the foundation for the workforce development system are programs that provide an education for young people between the ages of 16-24. Learning takes place both in the classroom and at the workplace. The typical program is three and a half years and leads to excellent, well-paying skilled jobs in industry. Fifty percent of German youth are in such programs today.

- *Tri-partite certification:* The various educational programs are guided by nationally and/or regionally agreed-upon standards for skills and by specific curricula for specified jobs and positions developed by the tri-partite social partnership of labor, employers, and government. Individual students are tested on their ability to meet these standards. If they are successful, they receive a certificate from an agency or organization that is recognized by all of the social partners, giving the employee/student complete portability.

- *Continual reform:* We found systems that were shaped by century-old traditions and nurtured by a generally social-democratic environment. We were deeply impressed with the rigor with which these programs were being evaluated, and with the courage shown by all of the partners in seeing the need for regular

change and reform to ensure that the system kept pace with changing conditions. Efforts are under way to: enhance programmatic flexibility and ensure that students or employees can switch from skill training to academic training, if desired, with greater ease; address issues of discrimination and opportunity for women and immigrants; develop new approaches to the cultural issues of industry and work; and cultivate linkages between workforce education and other issues including work organization and management systems. Our impression was that that those engaged in these systems at the top levels are truly leaders, willing to take risks and confront complex problems. We compared their boldness to the timidity all too typical of our own field, and recognized the need for change.

Impressions from Germany and Denmark: Our visit provided an introduction to two exemplary systems rather than an in-depth study. Following are one participant's observations:

> In Germany, we spent six days in Dortmund in the Ruhr Valley. This area used to be the steel and mining center of Germany. Two weeks before we arrived, they had closed the last blast furnace in the area. The city government in partnership with the business community, the local university and school system, and labor are completely focused on developing a system for training and education in new technologies and are determined to make Dortmund the high-tech center of Germany. Their view is that training and education, based on their market analysis, will drive development in the region and they will be successful in replacing the tens of thousands of jobs they lost in the steel and mining economy with high tech jobs in manufacturing, web design, biotechnology, and other sectors. They are mobilized in a coordinated and comprehensive way. Literally in the shadow of an old blast furnace, they are building a new training center focused on a variety of skilled trades including satellite communications.
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> In the Ruhr Valley, they provide training for dislocated workers and encourage them to enter new sectors. Many young people are engaged in apprenticeship programs in area factories. They actively recruit dislocated workers for entrepreneurial programs and provide them with technical assistance and loans to create new companies. At the Opel (a subsidiary of GM) Apprenticeship Center, 100 students out of 700 applicants are admitted each year into a three and a half year program: 17 percent of the students come from immigrant (typically Turkish) backgrounds and 12 percent are women. The final test for some students includes making a robot (combining metalworking with mechanics, hydraulics, electronics, and computer technology) to solve an actual problem on the assembly line.
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> Even in the small companies, there is an active focus on training for incumbent workers. At Dorre Galvantechnik, a metal coatings company with about 40 employees, workers with six years' seniority are sent to a public technical school for 12 weeks of training over a two-year period at the owner's expense. At the end of the training, they are tested. If they pass, they are certified as journeymen. Their pay typically increases from 24 Deutsch Marks (US$10.75) an hour to 32

> Deutsch Marks (US$14.35) an hour. The Chamber of Skilled Crafts, a business organization, provides this training and education as well as certification. The company pays $38,000 a year to the Chamber for the training programs and services it makes available to the company. We were told that there is virtually no turnover of employees at this company.
>
> We found in Dortmund, as well as in the Netherlands and Denmark, a dual motivation on the part of everyone connected with the workforce education and training system. They all thought it was critical for their society to ensure that everyone was able to play a constructive and engaged role. They also consistently demonstrated a genuine concern for the individual and their development. In Denmark, for example, they have a 1-percent unemployment rate among youth, and they are still looking for ways to improve their system.

Replicability: Despite differences in history, culture, and current political structures, we feel that a variation on the European-style system is achievable in the United States. Germany and Denmark have the key components that any modern system must have if the region or nation is going to be successful in the current global economy and if there is to be a modern and progressive approach to work, education, and social partnership. Whereas their respect for vocational skill has a long tradition, the current workforce development system was formally shaped after World War II, and by many variables outside of their tradition.

These workforce education systems provide an enormous advantage for German and Danish companies. As summarized by Gary Herrigel of the University of Chicago:

> The strength of the German dual system of vocational training is that it socializes the costs of training a skilled worker. All firms engage in training because the cost to them individually is minimal, while the benefits of having skilled personnel familiar with the firm's specific productions needs are great. German firms can count on having a highly skilled workforce and hence can pursue up-market high-value-added manufacturing strategies that utilize such skill (and which generate margins capable of maintaining acceptable profits and paying higher wages). The high expense of training and shortages of skilled workers that characterize American manufacturing environments and which encourage U.S. producers to pursue market and production strategies that tend to minimize skill input, is simply not part of the German experience.[119]

It should be emphasized that these European systems, for all their advantages, are not workforce training utopias. We found stresses and strains, including patterns of discrimination against women and minorities and ingrained rigidities that became an obstacle to efforts to shift to more participatory and team approaches. Clearly closer analysis of the European experience needs to be part of any project to reform our system. Naturally and inevitably, our system will be shaped by the particular characteristics of our society and by the difficulties of instituting and implementing reforms on a national

[119] Herrigel, Gary, University of Chicago, Memo to CLCR, September 25, 2001.

scale. But there is much to be learned from the European experience, and no reason not to profit from it.

Australia

Australia has always considered itself the "lucky country" because the wealth of its mineral and agricultural resources ensured steady work and well-being for most Australians. However, the recessionary 1980s rudely awakened the country, bringing unprecedented inflation and unemployment to its shores at the same time that Australia's Asian-Pacific neighbors were offering consumer goods to the world market at much lower prices. More trade barriers and protectionist policies were not the answer, nor was moving business to lower-cost countries. A better-educated, better-trained and more competitive society was the obvious solution. Easier said than done. The existing complacent attitude toward workplace training and skills had to be replaced with the idea that the lucky country had to become the clever country: every worker in the workforce had to be involved in a skills upgrade and every prospective worker had to become optimally skilled. As a matter of policy, Australia was going to compete on the quality of its products and services and not solely on their price.

In 1988, the Hawke Labor Government gave notice of its intent to develop a national policy that would involve industry, unions and government in the provision of a highly skilled and adaptable workforce. This policy would affect industrial policy, educational policy, vocational training policy, and infrastructure supports that addressed child care, social justice, income support, wages, occupational super-annuation, occupational health and safety, equal opportunity and multicultural issues.

Much of this blueprint for industry restructuring was stimulated by the Australian Council for Trade Unions (equivalent to the AFL-CIO), which in the mid-1980s put forth "The Accord," a policy document for unions to be a major driver in modernizing and restructuring the economy in a manner which was both effective and socially responsible. This document proposed tripartite industry negotiations among employers, unions, and government to affect both macro and microeconomic reform. Promoting labor market reform and structural adjustment within industry by encouraging more appropriate work and management practices, better forms of work organization, a better trained workforce, and improved industrial relations would lead to improved productivity and efficiency and international competitiveness.

The essence of the Accord was "award restructuring" — that is, a restructuring of work arrangements and their rewards — which proposed major changes in labor contracts to optimize industry productivity. Award restructuring included updating work practices, removal of outmoded systems and improvement and expansion of workplace skills. As one government member explained:

> Award restructuring is about change. It is about enabling people to carry out a wider range of tasks; about breaking down demarcation barriers;

> about giving people more interesting and satisfying careers, safer and more satisfying jobs, better paid jobs; and breaking down the barriers to women getting ahead in the workplace. All of those facets of award restructuring have two clear objectives: to enable us to lift our productivity and efficiency and to enable our goods and services to become more competitive at home and abroad.[120]

Award restructuring also required a review of the job classification system in the labor contract system. In the metal trades industry, for example, 300 separate job classifications were collapsed into 10, accompanied by a whole new career path system developed by both unions and employers. Career paths were developed for each industry segment, whereby employees could receive both on- and off-the-job training in industry-credentialed training programs.

These career paths allowed for both horizontal and hierarchical skills acquisition, which were rewarded with pay increases and/or promotions. Career paths were developed through a long consultative process in which unions and their members and employers and their associations established industry-wide skills standards and pathways that would benefit both workers and employers. Once the standards and ladders were established, the nation's Technical and Further Education Colleges (equivalent to City/Community Colleges) were engaged in developing curricula.

The training curricula typically were a mix of academic and vocational training in addition to on-the-job training. Industry-sanctioned credentials were awarded at the completion of training modules or programs. Many innovative training programs were established. For example, "traineeships" (condensed apprenticeships) were introduced in most industries. In the hospitality industry, the traineeship was a year long, with half the time spent in the classroom and the other half spent at a worksite, be it a large hotel like the Hyatt or a small local bar. Students received 75 percent of entry-level wages while undertaking this training and at the completion of their courses most secured jobs in the industry. The hospitality industry also established a "training hotel" which operated as a fully functioning commercial enterprise while at the same time functioning as an on-the-job training site.

Award restructuring changed the landscape of work. Jobs were classified at their highest skill levels and employees were encouraged to upgrade their skills. Promised promotions and wage gains proved to be real rewards for employees while productivity gains demonstrated a real return on investment for employers.

The Accord also sought to change the landscape of union operations and to increase organized labor's effectiveness. Steps were taken to rationalize labor by merging many small unions with larger ones. Labor had driven the award and union restructuring and now required the government and business to play their roles.

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[120] Senator Peter Morris, Hansard, Appropriation Bill (No.1) 1990-91, Second Reading, p. 2053, 18 September 1990.

The government complemented the unions' efforts by instituting parallel reforms in the fields of education and training. These included changes to the higher education system to render it more responsive to national goals; changes to how technical and further education are funded; the introduction of competency-based training on a widespread basis; the establishment of a national tripartite Training Board to develop national standards in skills and provide assistance for innovative industry training arrangements; efforts to improve the retention rate among high school students; and efforts to return the long-term unemployed to work via training programs.

In retooling its workforce and industry, Australia looked to examples abroad. European firms have been involved in structured training for many years, valuing their human resources as a major asset in becoming and remaining competitive. In addition to Germany and Denmark, countries such as Sweden, Finland, and Austria — and Singapore in Asia — all have training levies as a means to promote near-universal training among companies. Australia sought to do the same.

In 1990, further reform was promoted by the Hawke Labor Government with the introduction of The Australian Guarantee Training Scheme (AGTS) in recognition of the pressing need for more and better quality training. This time the onus was on business to play a major role in investing in training, of which it had done very little. The Australian Bureau of Statistics showed in its 1988 report that around 57 per cent of all private-sector enterprises with a payroll of above $200,000 were spending nothing on formal training. A further 10-20 percent of this group spent between zero and 1 percent.[121] The AGTS required employers to spend a prescribed minimum amount of money (1.5 percent of payroll) on training their workforce. Employers retained the right to determine how the money was spent, but if an employer failed to spend the required minimum, the shortfall was collected by the government and used to fund additional general training activities.

This training guarantee program provided a stimulus for businesses large and small to increase productivity by investing in structured training. It raised awareness of the need for and value of training as witnessed by increased implementation of training programs. The program ran into opposition, however, because of employers' reluctance to be saddled with what they perceived as unreasonable administrative burdens, and it was suspended in 1994. Still, it accomplished much: many employers have a stronger commitment to training today because they have had an opportunity to reap the benefits.

The Australian government's bold efforts to restructure the nation's work practices have put the nation in a stronger position as it competes for a fair share of Southeast-Asia / Pacific Rim and global markets on the basis of quality and performance as well as price. Systemic change came about as the result of tripartite collaboration between unions, companies, and government. The palpable return on investment in training has kept all three partners committed to making such investments in the future.

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[121] Elaine Darling, Historic House Hansard, 16 May 1990.

Replicability: As with Europe, there are aspects of the Australian political economy that do not match our own, but there are enough similarities to suggest that the U.S. can learn from the Australian experience. Indeed, we are now exploring the use of an Australian system for training in the food processing industry.

John Christensen, Manager, Business Development in Food Processing and Technology with the William Angliss Institute (WAI) of Melbourne, Australia, flew from Brussels to Copenhagen to meet with the MWDP delegation in May 2001. WAI is a college — comparable to Chicago's city and community colleges — specifically devoted to training prospective and incumbent workers in the food processing industry. It has 13 curricula for food processing, of which confectionery manufacturing is one. WAI is currently providing training at one of Mars Candy's Australian subsidiaries. Often as many as 50 percent of the trainees are from overseas.

WAI has been meeting the training needs of the confectionery industry in Australia for the past 15 years. John has been involved during the past two years, focusing on developing a new Diploma of Confectionery Manufacturing — a course developed through consultation with a group of Australia's major confectionery companies (and others) to ensure that the training serves their needs.

The program has now been accredited by WAI, and WAI is offering it on a global basis. John is negotiating with several multinational candy companies to establish a continuous learning program for their employees using WAI's curriculum. He is also meeting with European branches of local and global companies, and is training providers with a view to developing an international training benchmark, making WAI resources available to any participating training entity. We are actively exploring the possibility of adopting the WAI program in Cook County.

Domestic Experience

Nationally, we found a number of new and important initiatives in the labor movement in workforce development; a significant investment by national foundations such as the MacArthur Foundation, the Annie B. Casey Foundation, the Ford Foundation, the Rockefeller Foundation, and the Mott Foundation; innovative work by policy centers such as the Aspen Institute, Public/Private Ventures and others; and initiatives by local governments.

In each situation, our investigation provided not only important knowledge but also the opportunity for ongoing partnerships — in the general field of workforce development and with specific sectors and individual companies.

Following are brief descriptions of a few of the projects we encountered in the course of our research. These sketches are not intended as a definitive list of "Best Practice" but simply as indicators of the vitality and diversity of initiatives and experience that are

occurring nationwide. Clearly there is much to be learned from these efforts as we seek to develop an effective workforce development system in the Chicago area and beyond.

One of the major strengths of the international examples cited above is that, generally, there are uniform standards and specifications across the workforce development system. This permits anyone — workers, employers, academics, American visitors — to compare programs and outcomes. That is not the case at home. Here there are no national norms: each program is essentially idiosyncratic and defines its own standards and objectives. As we begin to build a true workforce development system, an essential first step will be to seek broad agreement on training standards and outcomes measurements such as placement and retention rates, wage rates, advancement, cost of training per student, etc.

New York City

New York has the third largest manufacturing economy in the U.S. after Los Angeles and Chicago, and is home to a number of innovative projects focused on workforce training and education and industrial retention. Several, representing innovative partnerships in which labor occupies a leading role, have influenced our thinking and are worthy of study by anyone interested in the workforce development field.

The Consortium for Worker Education (CWE): Leaders of the New York Teamsters Union founded CWE in 1985 in partnership with a small network of other unions interested in training in the healthcare field, the service sector, manufacturing, and other sectors. CWE's mission is to "train union members and their families." Participating unions include the Union of Needle, Industrial, and Textile Employees (UNITE); the American Federation of State, County, and Municipal Employees (AFSCME); the International Association of Machinists; the United Auto Workers, the New York City Building and Construction Trades Council; and others.

The CWE began providing basic training services for companies in English-as-a-second language, basic literacy, and employability skills. Once the consortium gained competency in providing these basic programs, it began to expand to other sectors and to serve a broader array of partners. CWE has grown dramatically, becoming a major force in workforce development in New York City and statewide.

In the healthcare industry, CWE works extensively with Local 1199 of the National Health and Human Services Employees Union, making excellent training available to virtually everyone who works in a hospital, from orderlies to doctors. CWE opened the Health Care Institute, which sponsors full programs in Certified Nurse's Aid, Medical Assisting, Patient Care Associate, Medical Administration, and Medical Records and Billing, and delivers skills training in specific areas such as EKG, phlebotomy, and CPR and vital signs.

In 1993, when it opened, the Institute offered 10 courses. This had grown to 74 courses in 1996-97 and has continued to expand. The Institute had 40,000 participants in classes

in 1998. It initiated Satellite Child Care Programs employing 80 Temporary Aid to Needy Families recipients in 1998 to be trained as child-care providers for 300 children — the goal being to upgrade the occupation of child-care provider while also improving the level and competence of child-care services.

CWE is a model of labor leadership in the field of workforce development that works in partnership with a broad network of organizations and has grown to impressive size and diversity of programs.[122]

The Artisan Baking Center: The New York baking industry has been going through a major transformation over the past decade, with many of the larger companies closing plants as products like white bread lost their consumer appeal. In response to changing markets, old companies converted and new companies have been created to serve the "artisan" bread market — more substantial, thick-crust French- or Italian-style breads — along with Middle Eastern, Indian, and other "ethnic" products.

Manufacturing these new products is more labor-intensive and requires a more highly skilled workforce. In response, Local 3 of the Bakery, Confectionery, Tobacco Workers and Grain Millers International Union, AFL-CIO, in partnership with the Consortium for Worker Education, has established the Artisan Baking Center, with funding from the U.S. Department of Labor.

The Center, currently in the startup phase, is the result of a proactive initiative on the part of labor to enhance the competitiveness of the industry — thereby improving job security and benefits for union members — by providing leadership in training and education a clearly targeted workforce. Union and management are working together to define career paths. Training will be provided for 150 unskilled workers, who will be brought into the industry, and for 150 semi-skilled workers, enabling them to move to higher job classifications within the industry. A smaller number of workers will be trained and certified as Master Bakers. The curriculum will be based on apprenticeship standards developed by the Baking Industry Labor Management Apprenticeship Council of Greater New York — standards that had fallen into disuse.

The Bakery, Confectionery, Tobacco Workers and Grain Millers International Union and the Working for America Institute[123] are assisting this promising project.

The Garment Industry Development Corporation (GIDC): In the early 1980s the garment industry in New York faced severe pressure from offshore competition coupled with rapidly rising real estate prices. Many companies closed. The Union of Needle, Industrial, and Textile Employees (UNITE) — then the International Ladies Garment Workers Union, or ILGWU — launched GIDC in partnership with unionized employers

[122] For more information, see: www.cwe.org.

[123] The Working for America Institute (WAI), affiliated with the AFL-CIO, is promoting and assisting new labor-related training and development initiatives nationwide, and can provide information on them, as well as a variety of publications and studies. See: www.workingforamerica.org

and city government to be a proactive force in retaining the industry and helping it adapt to changing conditions.

GIDC began with a campaign to counter the effects of gentrification in New York's Chinatown, expanded into workforce training programs, and now oversees a variety of initiatives aimed at providing training, marketing, and the modernization necessary to support and sustain advanced production in apparel. Its programs include:

- *Super Sewers Program*, taught in Chinese dialects and Spanish, which improves workers' skills and knowledge of fair, safe, and healthy working conditions;
- *Job Net*, a job placement service firms serving more than 800 job-seekers annually;
- *Apparel Skills Training*, a program providing specialized skills training for workers and management;
- *Domestic and International Marketing*, a program linking suppliers and buyers in the U.S. and abroad and providing them with marketing assistance; and
- *The Fashion Industry Modernization Center*, which promotes and showcases the latest industry technology.

GIDC business development programs are estimated to have generated more than $35 million in new sales, as well as opening new international markets. Modernization services and consultation are provided to 15 firms a year on average. GIDC's training programs have opened up new career paths and opportunities by helping workers to discover the benefits of learning, increase self-esteem, diversify skills, and work safely.[124] GIDC also served as the inspiration and model for the creation of CLCR's Candy Institute in Chicago.

Milwaukee:

One of the leading centers for innovation in workforce development and education in manufacturing is our neighbor city, Milwaukee, home to several projects involving labor, employers, the community college system, and local government. These initiatives have established competent partnerships, leveraged public and philanthropic dollars, and shaped public policy and legislation to increase investment in workforce training and education. A delegation from the MWDP visited Milwaukee in the spring of 2001 to learn more about these initiatives.

[124] This description was adapted from the *High Road Partnerships Report*, Working for America Institute, 888 16th Street NW, Washington DC 20006.

Milwaukee Graphic Arts Institute (MGAI): The Milwaukee Graphic Arts Institute is a technology-based non-profit institution sponsored jointly by labor and management in the graphic arts and printing industry. For 29 years the Institute has provided hands-on training emphasizing state-of-the-art technology coupled with training in the work habits and values that that lead to success in the workplace.

The Institute is funded by 12 contributing employers and governed by a joint Board of Trustees representing the Graphic Communications International Union, Local 577M, and management. In 2000, enrollment averaged 170 students each trimester. Course completion rates generally exceed 88 percent and attendance averages 92 percent.

As a 501(c)(3) non-profit, MGAI is open to anyone wishing to participate in its programs. In fulfilling its mission to bring together labor and management to enhance the growth and development of the graphic arts industry, MGAI offers apprenticeship, skill upgrading, re-training and customized technical programs for industry, from troubleshooting production problems to in-house training on new equipment or methods. The Institute also works closely with manufacturers to showcase new and emerging technologies in regular monthly seminars, and has established a teaching facility for electronic prepress funded by Wisconsin's Department of Commerce.

MGAI has a strong history of cooperation with the public schools in the greater Milwaukee area. As a participant in the School to Work initiative and the state-wide Youth Apprenticeship program, the Institute works to educate and train the industry's future workforce. The Institute has also been actively involved in several innovative programs with the Boys and Girls Clubs.

In addition, the Institute has provided occupational training for dislocated workers. For the past several years MGAI has also provided an introductory course for participants who are currently on public assistance or dislocated from jobs. This course runs 6-8 weeks and prepares students for entry-level jobs in the industry.

Wisconsin Regional Training Partnership (WRTP): In the late 1980s, the Wisconsin AFL-CIO, working with the Center on Wisconsin Strategy (COWS) at the University of Wisconsin in Madison, recognized that the range of programs for dislocated workers in the state was woefully inadequate. In 1991, they created the Wisconsin Regional Training Partnership as a jointly governed labor-management consortium that provides a broad range of training programs and assistance for firms in the metalworking industry. As of 2000, WRTP had 100 company members, representing tens of thousands of workers. In manufacturing alone, WRTP has 70 member companies and unions accounting for roughly 60,000 jobs, including companies such as Allen Bradley, Electromotive, Harley Davidson, John Deere, and Peterbilt. WRTP is actively engaged in community partnerships and is part of the Jobs Initiative, funded by the Annie E. Casey Foundation, which focuses on bringing low-income individuals into the workforce in jobs with starting wages at $10 an hour. Participants in the program have increased their average annual earnings from less than $9,000 to nearly $23,000.

WRTP has three working labor-management committees: Workplace Education, Modernization, and Future Workforce. WTRP serves as an intermediary that links employers and unions to public funding for workforce development and modernization services. It assists in creating on-site or multi-site learning centers, securing public funding, developing specific training programs, and addressing the specific training needs of adult new entrants and youth making the transition from school to work.[125]

[125] This description was adapted from WAI's *High Road Partnerships Report* (op.cit.) and the Annual Report for 2000 by the Wisconsin Regional Training Partnership, 208 E. Capitol Drive, Milwaukee, WI 53212, 414-906-9625, www.wrtp.org

Chapter 9: Chicago and Cook County

Our report focuses on the general weaknesses of the workforce training and education field in Cook County. Yet we must also emphasize that we found here at home what we found elsewhere in the U.S. and abroad: numerous examples of innovative and creative initiatives on the part of schools, colleges, community-based organizations, companies, labor organizations, and government agencies determined to reform and transform the workforce development system. Many of these organizations are represented on our Advisory Committee, and were the source of many of the ideas reflected in this report.

This chapter seeks to provide a representative sampling of organizations that currently participate in manufacturing workforce development in the Chicago / Cook County area. It is by no means intended to be a comprehensive overview, nor do we represent it as reflecting exhaustive research: our descriptions of organizations and programs are largely based on interviews. Rather, what we offer here are brief descriptions of some of the elements that clearly have much to offer in building a comprehensive Career Path system.

Following each of the sections on community-based organizations, high schools, and community colleges, we highlight some of the obstacles that these organizations and agencies brought to our attention. As one of our interviewers concluded: "Even the guiding lights in this field are on the verge of being extinguished, if these problems aren't addressed soon."

Community-Based Organizations

Jane Addams Resource Corporation (JARC): Founded in 1985, JARC seeks to build healthy communities through workforce, economic, and human development and through a strategic mix of industrial retention, training, and educational initiatives. This organization has a dual role: it works with the unemployed to provide them with basic job skills and get them into the labor market, and it also provides training for current manufacturing workers who want to upgrade their skills. It is linked to employers, and provides a wide range of different programs that serve diverse populations.

JARC's Adult Learning Program is an evening tutoring program that allows both workers and the unemployed to work on basic skills at their own pace. Training is targeted specifically for the metalworking sector. Classes for the unemployed combine technical training with soft skills. Incumbent worker training can be customized to meet the specific needs of specific employers. JARC also runs an alternative high school. This high school works with students who have dropped out at least once and who can benefit from a smaller environment with fewer students. The alternative high school incorporates job shadowing in metalworking and information technology—sending students to workplaces to see how work is performed

JARC has a number of positive characteristics that can be incorporated into a more comprehensive manufacturing workforce development system. It has close ties to employers, which allows it to adapt its programs to the needs of the labor market and to place its students in the jobs that exist. It also works with the chronically unemployed, and tries to match the needs of employers with the needs and abilities of unemployed people. JARC also works closely with other organizations, including the Regional Manufacturing Training Collaborative, Project Jobs, and Senn High School. JARC provides clients with information about other organizations that can be helpful. Finally, JARC works with a wide range of different people, with different needs, and has gained invaluable experience training different segments of our city's diverse population.[126]

Greater West Town Community Development Project (GWTP): Greater West Town Project is building a community-based response to the problems of unemployment and limited educational opportunities for the disadvantaged and dislocated residents of West Town, Humboldt Park, and the Near West Side. It was founded in 1988.

GWTP offers several training programs that link local residences to local industries. The Woodworkers Training Program addresses the need for technical skills training leading to careers offering decent wages, stable employment, and growth potential, and, at the same time, addresses the needs of a strategic local industry. Started in 1996, the Shipping and Receiving Training Program opens a wide range of entry-level career starting points in transportation and logistics-related careers for area residents. Other GWTP programs provide more general training and preparation for employment. The West Town Academy alternative high school provides an opportunity for former high-school dropouts from the community to complete their secondary education and prepare for college, technical training, and employment. The Academy is one of several schools in the city selected by the CPS to design and implement a School-to-Work program fully integrated into existing curricula. GWTP=s Welfare-to-Careers Program provides welfare recipients with job-readiness training, on-the-job training, and a year-long career apprenticeship program. GWTP=s Youth Employment Program provides essential education and employment opportunities for both in-school and dropout students. GWTP=s Adult Placement Programs provide a comprehensive array of services such as On-the-Job Training, Job Search Assistance, Direct Placement, and Empowerment Zone programs.

Critical to GWTP=s successful public education and advocacy efforts has been its continued ability to demonstrate to policymakers the effectiveness of community-based economic and workforce development models. GWTP is currently collaborating with Chicago Commons, Jane Addams Research Corporation, the Policy Research Action Group (PRAG), and the Management Association of Illinois in the development of a Regional Manufacturing Training Collaborative that may provide support for the future sustainability of community-based vocational training.[127]

[126] For more information: www.janeaddams.org
[127] For more information: www.greaterwesttownproject.org

Lawndale Business and Local Development Corporation (LBLDC): Responding to requests from local businesses, LBLDC is in the process of setting up a manufacturing outreach program for public high school students. Utilizing the Education to Career structure, the program facilitates students' entrance into the manufacturing workforce by giving tours of local manufacturing facilities, setting up mentor and job shadowing programs, and having employers address students about the opportunities available in this field. The organization will facilitate links between the local public school system and plating companies, metal forges, industrial laundry, and printing/binding firms. LBLDC plans to set up a full Education-to-Careers manufacturing program with local schools to better prepare students for skilled manufacturing work.

This organization maintains partnerships with a number of other training programs including JARC and Greater West Town, and with other community-based organizations. A partnership with the North Lawndale Employment Network has produced a website and brochure explaining opportunities for employers to hire in the Lawndale community.

Marquette Development Center: The Marquette Development Center is a program in a former school building that, based on a neighborhood needs assessment, was converted into an employment and training center. Working with the Mayor's Office of Workforce Development, the organization works to prepare unemployed, low-income workers for skilled work, and to build relationships with companies in order to place workers in entry-level positions.

Marquette has a sizable Lithuanian population, and a majority of the Center's clients are Lithuanian immigrant seeking ESL classes. The Center offers four different classes on week-nights and weekends in conjunction with Daley College. There are plans to create GED and literacy courses as well. The Center has established relationships with Style Master and Sweetheart in order to place workers with these employers. The training center collaborates with Project Match, using its their tracking system and database for record-keeping. This organization offers insight into the problems faced by populations with limited skills facing barriers to employment.

STRIVE/Chicago Employment Service: STRIVE/Chicago Employment Service=s mission is to help chronically unemployed, low-income workers to enter the work force and build work histories. Along with a number of training activities and placement services, the organization also supplies numerous social services to help its clients.

The organization has four general activities: a four-week attitudinal training program, job placement assistance, a two-year follow-up program, and career advancement support. It has worked with DePaul University in creating Career Advancement Technology Centers at three different sites, which provide remedial basic skills and GED preparation, as well as resume training. STRIVE/Chicago Employment Service has also worked with the Chicago Public Schools to do job readiness workshops and set up internships in cooking classes. The organization also provides pre-employment training for a 13-week City College program at Daley College, preparing city college graduates to work as bank tellers. The program is coordinated with nine banks that will be hiring graduates. A

coalition composed of the City Colleges, the Mayor's Office of Workforce Development, Great Cities and STRIVE/Chicago Employment Service conducted a printing bridge program at Kennedy King City College and the Humboldt Park satellite City College site.

STRIVE/Chicago Employment Service has 500 clients, two-thirds of whom are women. A large percentage of these are Temporary Assistance for Needy Families (TANF) recipients. Fifty-five percent do not have high school diplomas and 25 percent are ex-offenders. Seventy-five percent of STRIVE's graduates find jobs and 70 percent of those are working two years later.

STRIVE/Chicago Employment Service offers insight into the short, medium, and long-term services that are necessary to help chronically unemployed workers stay in the work force. STRIVE has also succeeded in creating partnerships with educational institutions at all levels and helping this population fully utilize the resources that are currently available.[128]

Southwest Women Working Together (SWWT) is a 26-year-old community-based not-for-profit agency that serves women and children primarily from Chicago's south and southwest sides. Its mission is to recognize and free the potential of women. SWWT provides a full continuum of programs that allow women to address life-crisis issues, set goals, and achieve self-determination. SWWT serves needs around domestic violence and sexual assault; homelessness and affordable housing; employment assessment, education, training, and placement; community organizing; and family development.

Although SWWT primarily provides soft skills training and placement, it also has a number of partnerships with other programs and organizations to provide more specific training. SWWT works closely with Daley College, GATX, local welfare offices, and local Chambers of Commerce. The organization refers clients to Daley, Kennedy King, Olive Harvey and Morraine Valley community colleges. SWWT also tracks clients at 30, 60, and 90 day, six-month and one-year intervals.

Southwest Women Working Together programs demonstrate three aspects of workforce development: First, they help women with multiple problems, and focus on soft skills. Second, they have alliances with many other organizations and refer their clients to the other places they can get training. Finally, they maintain contact with their clients after they get a job, and continue to support them beyond the initial training.[129]

Chicago Women in Trades (CWIT): Chicago Women in Trades was founded in 1981. It grew out of potluck dinners organized by Chicago Women Carpenters in 1979 and 1980 that drew together tradeswomen from different fields. In the 20 years since then, CWIT has fought to maintain affirmative action on construction sites, to provide support for women employed in the trades, and to promote high-wage, non-traditional employment opportunities for women. CWIT works closely with unions, and models its

[128] For more information: www.strivecentral.com
[129] For more information: www.swwt.org

programs to their needs. It also promotes trades among students at an early age, starting in elementary school.

CWIT offers a range of programs. Tradeswomen of Tomorrow connects female Chicago Public School students with mentors in manufacturing and building trades. There is a program for elementary school students, Girls at Work, and one for high-school students, Aspiring Tradeswomen. CWIT organizes day-long retreats at different sites, including Triton College, Daley College, Dawson Tech, and the Pipefitters union. It also offers a Technical Opportunities Program, a three-month course to provide basic skills to prepare women for apprenticeships. This program is linked closely to construction unions and prepares women to pass the union exams. Finally, CWIT has a program called Manufacturing Opportunities for Women, which is specifically focused on preparing and placing women in manufacturing careers.[130]

Obstacles faced by Community Providers

In our research and in interviews with community providers, we learned about many of the barriers they face:

- There is insufficient funding for the kind of long-term case management needed for populations with multiple barriers after job placement.
- With TANF clients, there is a disincentive to work with other agencies because they have to split funding.
- City government agencies are supportive of work but reimbursement is slow, often creating severe cash flow problems for participating organizations.
- Training and education programs are initiated by some organizations as a way to tap into funding sources, although the organization lacks the experience, capacity, and financial depth needed to succeed. These programs siphon off funds that could go to more effective organizations.
- There is a concern that the shift in policy from the Job Training Partnership Act (JTPA) to the new policies of the Workforce Investment Act (WIA) will force a "work first" approach with clients who need extensive job-readiness training for long-term success. WIA's emphasis is on getting a job as opposed to developing a family-sustaining career.
- Programmatically, these organizations must struggle to obtain
    - Up-to-date equipment;
    - Appropriately trained teachers;

[130] For more information: www.chicagowomenintrades.org

- Students with appropriate skills and motivation; and
- Offers from employers to provide job shadowing, internships, and job opportunities.

- Most of these organizations do not have relationships with manufacturers or knowledge of the sector's needs. They would welcome stronger connections because of the placement opportunities and potential for family sustaining jobs.

- Manufacturers are not always receptive to outreach efforts regarding training opportunities.

- Primary barriers for clients include lack of childcare, transportation, the need to earn income while in training, ex-offender status, mental illness, and drug-test requirements. Factors such as childcare and transportation often contribute to problems with punctuality and attendance.

- Skill gaps are a major barrier to placement. For example, 81 percent of the clients served by one of the organizations have a high school diploma or less.

In general, these organizations have a compelling need to be part of a seamless, comprehensive system that includes pre-employment training, skills training, placement, case management and support services such as daycare, transportation, and conflict resolution training.

Intermediaries

Regional Workforce Boards: Over the past year, the Workforce Boards (Workforce Investment Boards) of metropolitan Chicago have come together in an unprecedented regional strategy. The eight Workforce Boards represent the workforce areas of Chicago, DuPage County, Kane/Kendall/DeKalb County, Lake County, McHenry County, North/Northwest Cook County, South/Southwest Cook County, and Will County and are planning and implementing a strategic workforce development agenda for the region. With the staff of the Chicago metro Workforce Boards meeting and conferring on a regular basis, strategic planning held in January 2001 with the Workforce Board chairs and chief local elected officials including Mayor Daley resulted in identification of critical areas for collaboration. The strategic agenda includes: development of comprehensive industry-based workforce strategies, continuous improvement of the workforce system with a focus on the one-stop career centers, joint marketing efforts, and other regional initiatives.

The eight Workforce Boards now have a number of strategic industry-based initiatives under way. These include: building the current and future workforce for the manufacturing and healthcare industries and for technology occupations across industries. Each of the strategies includes components to support the transformation of education to better prepare young people for these careers, for career awareness strategies for middle

and high school students, and for teacher academies. The boards will also develop an internship protocol to provide a standardized, one-point-of-contact approach to help businesses access interns more easily and open doors for individuals and institutions to internship opportunities, and other strategies.

The one-stop centers are being developed to better prepare individuals who have been laid off or otherwise unemployed for possible careers in industries such as manufacturing or healthcare. The one-stop centers provide occupational information and assistance in upgrading skills. The Workforce Boards are also seeking resources through the Department of Labor, foundations, and other sources in order to build the skills of the current workforce in target industries such as healthcare and in technology occupations across industries including manufacturing. The Workforce Boards are also conducting local labor market analysis through review of existing data, focus groups, and other means to develop a profile of the region's workforce and the gaps between the workforce profile and what business needs.[131]

Chicago Jobs Council: The Chicago Jobs Council (CJC) is a leading organization representing community interests in the field of workforce development. The Council plays an active and influential role in national, state, and local policy initiatives. CJC focuses on issues of workforce development, welfare to work, and organizational development for community-based organizations.

Bob Wordlaw, the executive director of the Chicago Jobs Council, is also a co-chair of The Workforce Alliance, a national organization seeking to influence national workforce development policies. CJC also partners with CANDO in the State Agenda for Community Economic Development that focuses on state legislation and policy. CJC meets regularly with the heads of Illinois Department of Commerce and Community Affairs, Illinois Department for Employment Security, the Chicago Mayor's Office of Workforce Development and other workforce-related state bodies to stay in touch with policy and legislative developments. CJC helped pass the Job Training and Economic Development Act that has contributed funds to JARC and other community-based organizations statewide.[132]

Council for Adult and Experiential Learning (CAEL): Since its founding in 1974, under the auspices of the Educational Training Service in Princeton, New Jersey, CAEL has provided individuals and organizations with the tools and strategies needed to create practical, effective lifelong learning solutions for their education and training needs.

CAEL has experience in assessing the workforce education needs of businesses and providing long-term solutions that draw employers, unions, employees, education and training providers, and CAEL together into partnerships. CAEL's work is closely tied to other activities such as research on effective learner-centered programs, consultative services, and policy initiatives.

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[131] For more information: www.chicagoworkforceboard.com (Chicago Workforce Board) or www.theworkforce.com (Northern Cook County Workforce Board)
[132] For more information: www.cjc.net

CAEL has also published several works exploring workforce development, adult education, and prior learning assessment. With a membership of over 700 colleges, corporations, labor unions, associations and individuals, CAEL is headquartered in Chicago and maintains offices in Denver, Philadelphia, and New York City.[133]

Illinois Manufacturing Foundation (IMF) (formerly Chicago Manufacturing Institute (CMI)): The Illinois Manufacturing Foundation was founded in 2001 as an independent spin-off of its predecessor, the Chicago Manufacturing Institute, which was founded in 1992 as a subsidiary of Chicago Commons (CC) — an expansion and outgrowth of CC's Industrial and Business Training Programs, which were launched in 1981 by Ric Gudell, an innovator in workforce development in Chicago. Chicago Commons, founded in 1894, is one of Chicago's oldest major human service organizations. IMF provides training and technical services for the Chicago-area manufacturing workforce in conjunction with Chicago-area manufacturing firms and trade associations.

IMF trains both incumbent workers and individuals seeking technically skilled positions in manufacturing. IMF training programs take 3 to 9 months to complete. Training is provided for skilled positions in the screw machine products and metal-finishing industries, and in the occupational fields of industrial mechanical inspection and industrial maintenance mechanic.

At different times, IMF and its predecessor, CMI, have recruited from work-release programs for ex-offenders, One Stop Centers, community-based organizations, and churches. IMF's predecessor partnered with the City Colleges to provide training. IMF works closely with the Precision Machined Products Association, the Chicago Association of Spring Manufacturers, the American Electroplaters and Surface Finishers Society, and other trade groups. IMF maintains strong relationships with individual firms as well. These firms contract with IMF to find workers, participating in establishing new training programs and providing much of the machines, tooling, material, and equipment used in training. In 20 years of operation, IMF and its predecessor organization have trained and placed more than 3,500 students.

IMF provides a strong model of training designed to meet the needs of both employers seeking skilled personnel and individuals seeking technically skilled manufacturing careers. IMF provides training that is directly liked to the workplace because the IMF training staff is drawn from each of the sectors and fields in which IMF offers training, and because trainees utilize equipment and material that they will be using when they are hired. Because of its close relationship with manufacturing firms, IMF can provide practical, hands-on training and place graduates in jobs.[134]

Instituto del Progreso Latino (IPL): Instituto del Progreso Latino was established in 1976 to provide social and community services to neighborhoods on the south and west

[133] For more information: www.cael.org
[134] For more information: www.cmsusa.org

sides of Chicago. It prepares residents for careers in semi-skilled and skilled positions. It also provides services such as transportation, childcare and counseling.

IPL provides training at every level. It is the provider for the Manufacturing Technology Bridge Program, which was established with the Great Cities Institute of the University of Illinois at Chicago (UIC) (see below). It provides classes in basic literacy, ESL, basic math, computers, blueprint reading, basic computer skills, precision metalworking, welding, and other topics. IPL has ties with the Tool and Manufacturing Association (TMA), West Side Technical Institute, the City Colleges, and companies such as Chicago Rolled Metal Products, and American Precision Casting. In the last year, IPL has graduated 285 people with an 82 percent placement rate as of August 2001.[135]

Great Cities Institute Manufacturing Technology Bridge Programs: These programs prepare educationally disadvantaged adults for skilled, entry-level positions in manufacturing and qualify them for further career path training in post-secondary institutions. To "bridge" the skills gap, Manufacturing Technology Bridge Programs integrate basic math, reading, writing and communication skills with hands-on introductions to technical manufacturing skills. UIC's Great Cities Institute has been involved in the development of two bridge programs: one in Chicago and one in Detroit. In both cities, the Bridge Programs were developed through a partnership between a university, a community college, and community-based organizations.

Chicago's Manufacturing Technology Bridge Program is delivered at Instituto del Progreso Latino (IPL) (see above). IPL offers students an intensive, 16-week program that emphasizes technical fundamentals and communication and employment skills. IPL partners with the West Side Technical Institute of Richard J. Daley College so that Bridge program students taking the Machining and Metrology course can receive hands-on instruction in Daley's machining lab. Daley has also provided technical assistance in curriculum development. The Bridge program has had impressive results, according to a January 2001 evaluation by the Academy for Educational Development, which found that Bridge graduates are 5 times more likely to be "consistently and gainfully employed" than their peers. With a median annual income of $16,555, Bridge graduates also earn more than twice as much as the median income of peers without this training ($7,758).

The Chicago Bridge program successfully integrates and coordinates services from a range of different providers. It has also demonstrated its effectiveness in offering a range of academic enhancements, more specialized training, and support services to see that participants are fully prepared for the employment experience.

UIC Great Cities additionally provides a broad range of technical, research, and consulting services to a number of Chicago workforce development initiatives – working with community-based organizations, city agencies, city colleges, private firms, and others.[136]

[135] For more information: www.idpl.org
[136] For more information: www.uic.edu/cuppa/gci

The Regional Manufacturing Training Collaborative (RMTC): RMTC was founded two years ago by a group of organizations that have been pioneers in skill training and education linked to manufacturing, including the Illinois Manufacturing Foundation, the Jane Addams Resource Corporation, the Greater WestTown Development Project, and the Policy Research Action Group. The collaborative, which was originally formed to administer a $1-million Department of Labor grant to assist dislocated workers, has since expanded its membership and activities. It focuses on:

- Identifying key manufacturing sectors with good job opportunities,
- Developing training programs and curricula geared to the specific needs of the sectors served with active involvement by employers;
- Recruiting low-income residents who have typically been excluded from the "skills track," including people on welfare, ex-prisoners, and older youth, as well as dislocated workers;
- Developing a regional system to meet the needs of members and offer technical careers to the economically disadvantaged;
- Offering intensive training and job placement opportunities;
- Serving as a One Stop Center for employers to find qualified employees; and
- Providing the necessary framework and support to ensure students' success.[137]

The Candy Institute (CI): The Candy Institute is a project of the Center for Labor and Community Research. Inspired by New York's Garment Industry Development Corporation, it was created in 1995 in recognition that Chicago is the "Candy Capital of the World," home to 100-plus companies with over 13,000 employees. CI engages in a variety of approaches to building the industry, including workforce education and development, in partnership with employers, unions, and city government agencies.

Employees at American Licorice, Eli's Cheesecake, Able Electro Polishing, and Schulze Burch Bakery are getting help to upgrade their skills from the Candy Institute. Employees have been able to take advantage of these training programs, mostly on company time, to improve their skills in Workplace English-as-a-Second Language, Food Handling & Sanitation, Computer for the Workplace, Good Manufacturing Procedures, Leadership and Team Building, Baking Science, and Techniques and Production Processes. This training will open the doors for promotion to higher-skilled and better-paying jobs for many employees. The training will also help employers by providing a more flexibly trained, higher-skilled, more productive workforce.

In recent months the Candy Institute has facilitated training programs at these four food manufacturing companies in the Chicago region with the aid of funding from the City of

[137] For more information: www.chicagolandrmtc.com

Chicago, the MWDP, and the Joyce Foundation. The Chicago Workforce Board helped the Institute access the City's Department of Planning and Development's Tax Incremental Financing through the Mayor's Office of Workforce Development. With these funds, the Candy Institute conducted a training needs analysis in each company, assessed and helped select exemplary training providers, ensured that the company and union participated in the development of curriculum, monitored the conduct of training, and analyzed and evaluated the training outcomes.

As an intermediary, the Candy Institute promoted training among stakeholders (companies, unions, workers, government, training institutions, and funders), linked all the parties and resources, and then ensured that high standards were applied in the conduct of the programs. The Institute set standards for measuring the outcome of the training on an individual employee basis as well as for measuring the return on investment for participating companies. Harold Washington College, Wilbur Wright College, South Suburban Community College, and the Illinois Institute of Technology were the training providers.

The first training program facilitated by the Candy Institute was conducted at American Licorice in 2000 and was funded by the Mayor's Office of Workforce Development and the Joyce Foundation. The result of this training was that all 31 workers who started the class completed their training and achieved considerable competency improvements. Four of the employees who went through the training received promotions in shipping. One person went from being a general laborer to a line inspector. Their average increase in pay is over $2,500 per year. A very interesting illustration in the change in company commitment to training has been the building of a training room and the supplying of equipment for future training activities at the plant. The total investment in this facility will be approximately $100,000.[138]

Northwest Suburban Education to Careers Partnership, Arlington Heights: The Career Partnership in Arlington Heights is unusual because it is so well integrated. Sally Griffith, the Executive Director for the program, is the single Education-for-Employment (EFE), Tech Prep, and Education-to-Careers (ETC) coordinator. It is more common for EFE, Tech Prep, and ETC to be organized in separate offices, each with their own director and their own funding. All state funds for the Arlington Heights area come through Ms. Griffith, so she is able to ensure that all the programs and initiatives support one another.

The Careers Partnership has achieved a number of important goals. It conducted a survey of high school students to establish career interests and followed up by sending appropriate information; it makes scholarships available in six different areas; and it has corporate involvement in engineering, drafting and manufacturing. Strongly linked to Harper College, the Partnership has developed a variety of career path curricula linked to Harper course sequences. Teachers from all area high schools and Harper review and coordinate the vocational curricula. The Partnership provides field trips to industry for K-14 teachers willing to write a lesson plan to meet state standards to teach what they

[138] For more information: www.candyinstitute.org

have learned. It has mentors in each high school that try to match students with job-shadowing that fits their career goals. It also has business involvement in course development to ensure that their courses prepare students for the job market.

The Career Partnership has achieved two basic objectives for creating an effective manufacturing workforce development system. First, it has coordinated funding streams and planning for maximum effect. Second, it has centralized, large-scale involvement of employers to help high school students gain access to job shadowing, internships, and job placements.[139]

High Schools

Gage Park: Gage Park High School in Chicago has created the Equipment and Technology Institute, adopting the California Career Academy model from the National Center for Education and the Economy, which relies on building links with industry in order to provide students with a work-based component to their education. The Institute is also linked to Daley College, to provide college-level courses to high-school students.

Ninth-graders apply to the Institute, and are accepted on the basis of their grades and attendance records. These students receive regular high school English, mathematics, science, and social studies instruction in addition to their technical training, and meet basic Chicago Public Schools requirements. Students in this program are also paired with mentors at area companies where they participate in paid internships. They go on field trips, listen to guest speakers, and do job shadowing. Technical teachers in the program receive special training including six weeks at Universal Technical Institute, one week at Hitachi, and one week at Caterpillar; core teachers go through a one-week externship at Caterpillar, which is funded by the Chicago Public Schools. The results of the program have been outstanding. Eighty-four percent of the first group of Institute students graduated from the program in June of 2000, and all of these students advanced to post-secondary education or found employment. The program received numerous local and national awards.

The Institute maintains strong ties to Daley College, which provides access to manufacturing equipment, and UIC, with which they share seminars and speakers. Students are encouraged to enter UIC after graduation to continue their manufacturing training. As of 2002, graduates from the Institute will receive special diplomas.

The Institute is notable for its excellent partnership structure with employers and community colleges, which helps students gain real experience in the skills they are being trained for, and its career academy requirements ensure that students receive both a general education and a more specific technical education that is tied to the job market.

[139] For more information: www.ed2careers.com

Conant High School: Conant High School is the only high school in Northwest Cook County with a machining program. This program is led by George Weisner, a knowledgeable and charismatic teacher with a large student following. The program has obtained equipment from closing shops, recruits students from all of the high schools in the district, and has a working partnership with the Tooling & Manufacturing Association (TMA).

The Conant program offers two formats, one for two hours a day and the other for four hours a day. The four-hour format includes integrated, cross-curricular courses in math and language arts as they pertain to manufacturing, and it has been shown to improve students' math and reading test scores. This program offers students NIMS credentials, and its students are enthusiastic because they graduate with the possibility of getting a good-paying job and a career path in manufacturing.

George Weisner's innovative math and science curriculum is integrated with a NIMS-driven machine shop and is a model for high school machining programs. In the Conant program students feel that they are learning something of real value, and they benefit from its integration of math, reading and science curriculum with vocational education.[140]

Obstacles faced by the High Schools

Schools seeking to help students move into the world of work face severe problems that threaten the few programs in place. They lack:

- Up-to-date equipment;
- Appropriately trained teachers;
- Recruitment of students with appropriate skills and motivation;
- Offers from employers to provide opportunities for job shadowing, internships, and employment opportunities;
- Articulation agreements with community colleges;
- Integrated career path and college preparatory programs; and
- Integrated funding streams and centralized decision making among key decision makers.

[140] For more information: www.conantcougars.com

Community Colleges and Universities

City Colleges of Chicago (CCC): CCC offers a wide range of credit and non-credit manufacturing and production related programs. College credit programs are offered at Richard J. Daley College and four Technical Institutes (Dawson, Truman, Humboldt Park, and West Side). Programs run from six months to two years and focus upon training Aknowledge workers@ — employees armed with both the technical and general skills required to advance in today=s modern manufacturing environments.

Illinois Machining Skills Standards have been integrated into the machining curricula and training sites partner with national and state associations and local companies. The American Gear Manufacturers Association, National Association of Manufactures, Tooling & Manufacturing Association, Illinois Manufacturing Foundation, Chicago Manufacturing Center (CMC), Manufacturing Productivity Center (MPC), and the Printing Association of Indiana and Illinois work with CCC to ensure credit programs meet industry standards.

Boasting a 12,000-square-foot machining laboratory with over 80 pieces of state-of-the-art equipment, Daley is a member of the National Coalition of Advanced Technology Centers. However, CCC=s shorter-term credit machining programs at the Technical Institutes articulate to Daley=s Multiple Spindle Screw program which, in turn, articulates to the Bachelor of Manufacturing Technology program at the Illinois Institute of Technology. Daley also has articulation agreements with eight high schools and an Excell dual credit program for over 80 high schools students. Short-term (12-14 weeks) non-credit programs focus on moving people directly into entry-level positions, transitioning them to appropriately linked credit programs, or providing industry-required refresher training programs.

City Colleges of Chicago also offers customized, contract-training programs for manufacturing and production related companies. The American Gear Manufacturers Association (AGMA) has sent over 400 employees from 175 companies to take the Gear Machining program at Daley College, which is represented on the AGMA Education Council. Through partnerships with CMC and MPC, Daley has provided Technical Information assistance for 24 companies, Modernization Assessments for four companies, and Modernization Technical Support to eight companies.

Daley College's program with the Associated Equipment Distributors Foundation and Gage Park High School earned the Illinois Workforce Development Award and the prestigious Bellwether Award for planning, governance, and finance.[141]

Triton College: Triton's customized training department works with 3,000 companies to create real partnerships. It offers certification programs such as a computer repair

[141] For more information: www.ccc.edu/daley

program that offers national A+ certification to graduates, and has a manufacturing training program at Leyden High School.

Triton College is connected to the Des Plaines Valley Region Education for Employment program (EFE) This group coordinates EFE and Tech Prep efforts in the area; high school representatives, coordinators of technical programs, and Triton College representatives meet monthly. They design, implement and retool curricula to articulate high school vocational programs with Triton College. They also find and train teachers and oversee career service centers. Aided by an employer advisory committee, these career service centers set up visits to businesses for students and teachers. The main strength of this program is its coordination of Triton College and high school programs, as well as the involvement of businesses.[142]

Northern Illinois University Business and Industry Services (NIU-BIS): NIU-BIS offers customized training to businesses. With a professional staff of more than 100 and a wealth of practical business and industry experience, NIU-BIS has served over 84,000 employees in more than 4,100 companies in Illinois. NIU-BIS specializes in company-wide strategic improvement and bottom-line profitability projects such as lean operations, quality system implementation, strategic planning, executive leadership, supervisory skills, organizational development, customer and employee surveys, IT and e-commerce consulting, continuous improvement systems, technical and basic skills training, customized curriculum design and compensation systems.

NIU-BIS has cooperative arrangements with the Illinois Manufacturers' Association and the Illinois State Chamber that access training grants from the Department of Commerce and Community Affairs (DCCA). These grants are available to eligible Illinois companies to reduce the cost of training programs.

Located in Naperville, the NIU-BIS office has a state-of-the-art computer lab, as well as executive meeting space. Many of the NIU-BIS full-time consultants have experience as CEOs, general managers, and top management.[143]

South Suburban College: Through programs administered through its Business and Career Institute, South Suburban College offers a wide range of manufacturing classes including metrology, industrial maintenance, small engine repair, heating and air conditioning, hydraulics, soft skills, basic skills, support training for ISO 9000, and others. It is also a regional center for WorkKeys, providing services for companies ranging from administering tests and grading them to performing job profiles.

The Business and Career Institute manages the WorkKeys program, involving industry partners in the analysis of key jobs, with an emphasis on manufacturing skills. They can test students and counsel them with regard to what education skills will be needed to pursue careers. The students are also counseled as to the coursework they will need to succeed in their chosen work fields. The important element in this process is that the

[142] For more information: www.triton.cc.il.us/index/index/html
[143] For more information: www.niubis.com

education has both a heavy skills-related component as well as academic preparation that complements the skill building. This process is used as a recruiting tool by the college, since so many students are working in companies in the area and can see how they can progress in business through this process.

South Suburban College offers Associate in Applied Science programs in Building Construction Technology, Computer-Aided Design, Electronics Engineering Technology, Machine Tool Process and Materials Production Control.[144]

Illinois Institute of Technology (IIT), Chicago: One of the few examples of a coordinated manufacturing education program for youth is the Bachelor of Manufacturing Technology Program at IIT. This program, commonly called a "2+2+2" program, consists of a seven-year process that tracks students from the junior level at high school through a two-year community college degree program and on to IIT for a Bachelor's of Manufacturing Technology and Management degree.

Currently the program has 117 students, with all but two working full-time. Classes are offered at night and on Saturdays. Twelve high schools including Senn, Tilden, and Lane Tech, are involved in the program. Six community colleges participate and various community-based organizations such as the Mexican Community Center and Instituto del Progreso Latino help provide additional training and internship opportunities. This program is small, but it has helped to encourage over 125 students to take manufacturing positions while they continue their education.[145]

Obstacles faced at the Community Colleges and Universities

Despite some exemplary initiatives, area community colleges face serious problems that impede progress. There is a substantial need for more:

- Uniform and portable certification for students;
- Up-to-date equipment;
- Appropriately trained teachers;
- Students with appropriate skills and motivation;
- Testing mechanisms tied to jobs;
- Case management and job placement mechanisms; and

[144] For more information: www.ssc.cc.il.us
[145] For more information: www.iit.edu

- Offers from employers to provide job shadowing, internships, and job opportunities.

Private Sector Initiatives

Tooling & Manufacturing Association (TMA): The Tooling & Manufacturing Association was founded in 1925 by eight small manufacturing companies. Through the years, members established programs and services that would help their businesses grow and prosper, train their employees, and provide medical benefits. As a result of these efforts, TMA has grown into a 1,600-plus-members not-for-profit organization of precision metalworking, plastic molding, and supplier companies in the Chicago area.

TMA conducts a wide variety of courses and seminars throughout the year. CAD/CAM and other technical courses are available using TMA=s state-of-the-art computer lab, and TMA designs custom training programs to suit the needs of individual employers. The Association currently offers four three-year apprenticeships: Machinist, Mold Maker, Tool & Die Maker, and Precision Sheetmetal/Model Maker. TMA=s Education Foundation addresses the need for outreach in metalworking by financially supporting programs that promote the field with education, image-building and career awareness, and equipment purchases.

TMA is an example of a training provider that works closely with employers and promotes their industries based on the needs of these companies. TMA is most notable for the longevity and breadth of its efforts, and for its emphasis on increasing the pool of qualified candidates for precision metalworking and related careers, improving the image of metalworking careers, and sustaining and expanding metalworking technology education. TMA has also been a persistent and patient partner with many community and education initiatives to improve the region's workforce development system.[146]

Ford Motor Suppliers and the Chicago Manufacturing Campus: In September of 2000, Governor Ryan and Mayor Daley joined the Ford Motor Company to announce plans for an automotive supplier manufacturing campus on Chicago's Southeast Side. The Chicago Manufacturing Campus site, located on an urban brownfield at 127th Street and Torrence Avenue, will be home to 18 small to mid-sized manufacturers supplying parts to the Ford production facility on 130th Street and Torrence Avenue. The site is being developed as a joint-venture by Ford Motor Company and Centerpoint Properties, with a commitment of over $117.4 million dollars in city and state assistance.

At the top of the agenda for this initiative are the recruitment and other workforce development activities needed to fill the anticipated 1,000 to 1,200 new manufacturing jobs. Mayor Daley has committed over $5 million to this effort. In addition, the State of Illinois and the City of Chicago plan to build an on-site training center. The city will work with the suppliers to offer training classes and will also provide space at the center

[146] For more information: www.tmanet.com

for customized training. Joel Simon of the Mayor's Office of Workforce Development explains that "the purpose of the training center is to provide ongoing training opportunities to upgrade the skills of [the suppliers'] workers and potentially serve as a locus for recruitment." The city will be reaching out to community intermediaries to assist in recruitment efforts.

The Chicago Manufacturing Campus provides an excellent opportunity to develop an infrastructure to create a feeder pool of qualified workers on the far South Side in an area of high unemployment with relatively little in the way of manufacturing training resources. The center will not only benefit the Ford suppliers but is also intended to serve the wider community. The center is expected to be operational 24 hours a day to accommodate different work shifts. Childcare services will be available for employees of the Ford Motor suppliers.

The Chicago Manufacturing Campus creates a self-contained unit of manufacturers with a high level of interdependency. Understandably, there are concerns that the suppliers will "raid" each other's workforce. This concern is shared by area manufacturers. The training center can be an effective strategy to minimize "raiding" because it can supply a sufficient pool of qualified workers to meet all of the local manufacturers' needs. At the time of this writing, many of the details are still in discussion, but the potential impact on the local workforce is enormous. If successful, this model could be replicated in other parts of the city by creating more public-private partnerships between larger manufacturers and their suppliers.

Chicago Metal Rolled Products (CMRP): With its roots going back to 1908, Chicago Metal Rolled Products is a job shop that bends structural steel members primarily for construction, original equipment manufacturers (OEMs), mechanical contractors, and steel service centers. It employs approximately 85 employees. Most of the production workers are machine operators. The workforce is primarily Hispanic (60 percent) and Polish (25 percent).

When George Wendt took over the family business in 1984**,** he knew that the company needed to modernize its production processes to remain competitive. The company worked closely with the local Manufacturing Extension Program and the Chicago Manufacturing Center to create a winning strategy for improvement of its production processes. Two main components of the company's workforce strategy are (1) the use of an outside pre-employment training program for the majority of its recruitment and (2) extensive training provided by the company after hire.

CMRP has hired several graduates since 1999 from a pre-employment manufacturing training program offered by the Instituto del Progreso Latino in partnership with West Side Technical Institute (a part of Daley College) and the UIC Great Cities Institute. In the day program, participants at Instituto attend seven hours per day during weekdays. As Mr. Wendt describes the program, the participants learn "the skills that fit well with my company's needs for entry-level employees: blueprint reading, measurement, basic computer skills like Excel and Word." The participants also gain some hands-on

experience with machines at West Side Technical Institute. Upon graduation, Instituto sends CMRP a batch of resumes that it helps prepare for its graduates. Instituto then sets up the interviews based on CMRP's selections. After hire, Instituto follows up with CMRP and the graduates to assist in making a successful transition from the program to employment.

CMRP hired the Council on Adult and Experiential Learning (CAEL) to assist in developing a plan to meet its objectives. As mentioned above, the training program is an integral part of the overall company strategic plan. CMRP offers employees several avenues for learning. The company provides a variety of classes onsite in its designated classroom, including blueprint reading, shop order documentation, shop math, problem solving, and quality and safety. CAEL maintains the individual worker's scores and releases only aggregated scores to CMRP so that the workers are not intimidated about revealing areas that need improvement. Classes are taught by internal management and outside providers recommended by CAEL. Employees are also eligible for $500 per year for tuition reimbursement for outside training. To qualify, employees must develop individual learning plans with the assistance of CAEL.

Informal training is also promoted by CMRP through the use of cross-functional teams. Teams are responsible for their assigned area of machines and work together to solve problems and promote improvements. Each team includes employees from production, shipping, maintenance, and sales. The members of the team train each other as they work together to run their operation. In addition, the outside worker learns a new function while building inter-departmental cooperation. Employees earn bonuses based on production volume, quality, service, and safety.

CMRP demonstrates how manufacturers can benefit from the use of sectorally-based intermediaries for the recruitment and training of their workforce. CMRP continues to grow despite the recent economic slowdown. Investing about $100,000 in training annually, Mr. Wendt considers training to be a worthwhile investment because of the reduction in turnover and increase in the quality of the company's workforce.[147]

Summary

There are a variety of public and private sector initiatives in workforce development throughout Cook County. They include projects and leaders that are known nationally for their innovation and determination and are exploring every possible way to bring those they represent into meaningful careers in the manufacturing economy and to overcome the barriers that confront them. There are teachers and administrators in public high schools, community colleges, and four-year institutions who are dedicated to unraveling the complex mix of history, tradition, red tape, and bureaucratic inertia to do whatever is necessary for their students to get a strong education linked to a career. There are employers and trade associations who are desperate to find a predictable pool

[147] For more information: www.cmrp.com

of skilled employees needed to sustain their businesses and are reaching out to find new partners.

We were impressed with many of these providers. Yet, in the main, they are the exception. They operate on a scale that is very small when compared to the needs and demands of the huge manufacturing sector we have in our region or the needs of their constituencies. Their programs are often at risk because of a lack of capital and capacity. Particularly in the schools, most of the best teachers are near retirement, and there are not many successors in sight. There are few examples of the kind of social partnership we know is necessary for a successful workforce development program.

Despite the weaknesses, we found a determined willingness and desire to address the challenges, to overcome the fragmentation, and test the potential of new approaches. We see this with the attitude of the individual organizations with new efforts to create broader coalitions such as the Regional Manufacturing Training Collaborative and the Chicago Jobs Council, with the determined outreach of the Chicago Workforce Board and the suburban Cook County Workforce Boards, and with the spirit of the new leadership in the City Colleges of Chicago and Chicago Public Schools. All of these bode well for the establishment of a comprehensive workforce development system.

III. Our Proposal

Chapter 10: Summarizing the Gaps in our System

In the previous chapters, we presented our findings regarding the gaps in our workforce development and training system. Following is a summary.

Cook County employers have difficulty finding skilled workers while many ill-educated and untrained Cook County residents sit idle.

It is important to understand that this is not a *vocational* education problem in the traditional sense. Although improvement in basic skills (literacy and numeracy) is clearly vital to obtaining a good job in a manufacturing firm, these skills are needed for most good jobs in *any* sector. In the long run these skills must be successfully taught in the K-12 school system. ***Improving school performance is an essential step to implementing a manufacturing workforce development system.*** This is a long-term undertaking, however, and until it succeeds there will be a continuing need to provide remedial educational programs for all students who have not acquired the basic skills they need.

Several system participants bemoan the decline of vocational education in the public schools. While we advocate greatly improved education to prepare students for work, we want to make it very clear that we have no desire to resuscitate a model that segregated students into college-prep or vocational tracks. In the past several decades, vocational education became a separate track, often the place where schools sent students with behavioral problems or simply those with lower academic skills. Rightly or wrongly, vocational courses came to be seen as primarily a dumping ground for students who had little hope of going to college. Our vision is something different.

We believe that all students who are able must have a solid academic education that prepares them for both college *and* work. Literacy and numeracy along with education in science and social studies are necessary for everyone in a contemporary society. How these are taught may, and should, vary. Some students will learn well in a traditional classroom. Many others will learn well in a laboratory, hands-on setting, such as a machine shop or production kitchen. Specific courses in manufacturing can offer a place for the *contextual* learning of academic skills.[148] Studies reported by the National Alliance for Business found that

> "…Contextual learning, in which students master rigorous academic content in real-world or work-based learning experiences, is emerging as an important strategy for improving student achievement… Contextual learning may result in better course-taking patterns, improved reading and math scores, fewer dropouts,

[148] The concept of contextual learning is not new. The potential of a "techno-liberal" curriculum "in which liberal education is offered through a technical rather than a classical focus" was articulated as early as 1938, according to David R. Scoular, *Developing Technology Schools* (unpublished thesis, London, 1993). Scoular articulates a model of a secondary school based on techno-liberal learning. On another level, the Algebra Project successfully teaches math to inner city students by using math problems drawn from the real-life experiences of students. See: www.algebra.org.

> and more college enrollments… Research shows that only about 40 percent of students remember best what they see or read, and fewer than 30 percent recall best what they hear. Most people are 'tactile' or 'kinesthetic' learners, who learn best by moving, touching and doing — the hands-on activities that form the basis of contextual learning. Contextual learning raises the bar for all students, challenging them to deepen academic learning by putting it in meaningful contexts."[149]

Manufacturing education — understood and delivered as a contextual learning opportunity — enhances academics and college preparation while providing vocational skills.

Manufacturing education in the public schools has, therefore, two fundamental purposes: First, to provide the academic foundation for a lifetime of formal and informal learning necessary for additional education and a career[150], and second, to introduce some manufacturing specific skills that will be useful to the student if he/she subsequently elects a career in manufacturing. Manufacturing education should be enabling, not restricting. These dual purposes also reflect the reality that even among those Chicago students who do go on to college, most do not graduate.

Our research confirmed that job applicants typically lack soft skills. Defined loosely as the capacity to interact and function appropriately in the workplace, soft skills can include everything from dress to language, communication styles, and level of motivation. Soft skills are skills abilities and traits that pertain to personality, attitude and behavior rather than to formal or technical knowledge. The environment is important in the development of soft skills.[151]

These are important real skills that are necessary on the job, and that many applicants lack. Unfortunately, because "soft skills by definition are complex and cannot be easily quantified, the assessment of what could constitute [an acceptable level of] soft skills is therefore inherently open to racial distortions…"[152] Chris Tilly and Philip Moss studied how employers' desires for soft skills have impacted black male employment:

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[149] "Emerging Trends in Contextual Learning Show Positive Results for Students," *Work America*, Vol. 18, No. 2 (Washington DC, National Alliance for Business, February 2001).

[150] A recently released meta-study asserts the value of contextual learning for academic success, college preparation and career. See: Katherine L. Hughes, Thomas R. Bailey and Melinda J. Mechur, *School to Work: Making a Difference in Education* (New York: Columbia University, Institute on Education and the Economy, 2001).

[151] The Annie E. Casey Foundation, *Jobs and Race* (Baltimore, 2001). Also see: Troy Duster, "Post-industrialism and Youth Unemployment: African Americans as Harbingers," in Katherine McFate *et.al.*, eds. *Poverty, Inequality and the Future of Social Policy* (New York, Russell Sage, 1997); William J. Wilson *The Declining Significance of Race* (Chicago, University of Chicago, 1980) and *The Truly Disadvantaged* (Chicago, University of Chicago, 1987); and Barry Bluestone, Mary Huff Stevenson and Chris Tilly, *Public Policy Alternatives for Dealing with the Labor Market Problems of Central City Young Adults* (Boston: University of Massachusetts, 1994).

[152] Philip Moss and Chris Tilly, *Soft Skills and Race*, (Lowell, MA: University of Massachusetts, 1994).

> We argue that soft skills are in part culturally defined, and therefore employers' assessment of soft skills may be confounded by differences in culture and racial stereotyping. Indeed, the word "skills" may be a misnomer, though employers most definitely conceptualize these attributes as skills. We find evidence for both elements of our hypothesis: Employers report an increasing need for soft skills and many of them also rate black men poorly in terms of such skills.
>
> ...[E]mployers may engage in statistical discrimination. That is, given the impossibility of measuring individual productivities in advance, employers may discriminate against whole classes of people based on (correct or incorrect) perceptions of the mean productivity (or variation in productivity) for these classes... Based upon face-to-face interviews with employers in Chicago and its suburbs [Neckerman and Kirschenman] found that employers use race as a primary distinction while making recruiting, screening and hiring decisions. Employers use negative racial stereotypes in conjunction with stereotypes of class and space to discriminate, perhaps statistically, against black applicants. [Neckerman and Kirschenman] also found that the particular combination of the distinctions that matter vary according to the demands of the job. Their work suggested that racial stereotypes could be mixed up with perceived job-related attributes such as communication skills, demeanor and dress, initiative — the types of soft skills we discuss here.
>
> The growing emphasis on soft skills already disadvantages black male job applicants, and will continue to do so. This is because many employers see black men as lacking in precisely the skills that they consider increasingly important. Employers' views of black men in this regard are partly stereotype, partly cultural gap, and partly an accurate perception of the skills that many less-educated black men bring to the labor market. It is important to understand the relative proportions of this mix, since the three causes call for different policy responses. But in one sense it doesn't matter, since as long as employers have these views — regardless of why — they will be reluctant to hire black men.[153]

Once a potential worker has the basic skills (traditionally acquired in school) and the soft skills (traditionally acquired in the family and community, although sometimes at school or via a community-based organization's training program) necessary to obtain a job, attention needs to be turned to acquisition of hard technical skills.[154] The would-be worker comes face to face with the fact that ***there are no standards for defining what quality training is or measuring whether or not training has been effective.*** The worker therefore has difficulty selecting a program that will actually train him/her in skills that employers want and need. The student's concerns are justified, since employers report

[153] *Ibid*

[154] Basic, soft, and hard skills may be acquired in many ways in many institutions, of course. The description of "traditional" loci of these activities should not imply that one place is better than another, although it is hard to conceive of a sound system where basic skills were not taught universally. Community-based organizations have also come to the fore in providing remediation to their constituents.

that ***community colleges and other training providers are not teaching the skills required by employers.***

High schools and community colleges must adhere to separate sets of internal standards, resulting in diplomas and certifications that verify skills learned or correlate these skills with available jobs. While there are many examples of articulation agreements that create some academic linkages between these systems, the relationships between courses, skills, and jobs within actual industry career paths has not been defined, much less tested. Thus, graduates of these systems do not earn verifiable or portable credentials.

With no clear set of verifiable standards that define a career path in manufacturing, *community-based organizations* (CBOs) and others are left to customize programs around the needs of the companies they work with. This approach to training design means that different programs produce workers with different sets of skills that are not readily verifiable and that may or may not be portable but in any case lack certification.

Employers have no way of knowing what a credential presented by a job applicant really means. When employers turn to customized training as the way to increase the skills of their incumbent workers and, by doing so, fill hard-to-fill skilled positions, they create the same problems community-based organizations create when they customize training. With customized training, the wheel is reinvented for each individual employer. In this process, industrywide skill needs go unidentified, and again, training participants are left with certifications that are not verifiable or portable.

There is a lack of connection between key system players to insure positive career outcomes for workers and employers.

Except in the case of customized firm-specific training, *employers* tend not to be involved with providers of training, especially high schools and community colleges. *Unions* also are rarely adequately involved. *Students* therefore have less chance of landing a job, not to mention job shadowing and internship opportunities. This lack of connectedness also makes it difficult for the educational institutions to know what to usefully teach.

There are internal disconnects as well. Technical skills programs in *community colleges* do not recruit adequately from their own basic skills and ESL programs. This disconnect means that unskilled (and often low-income) youth and adult populations from local communities don't have sufficient access to career opportunities.

Chicago high schools do not take adequate advantage of articulated community college courses. *Community colleges and community-based organizations* aren't linked to provide case management and retention services to community residents who are in the process of overcoming employment barriers.

There is no recruitment mechanism that attracts new participants to manufacturing training and its career opportunities.

All system players are concerned that too few students opt for manufacturing training and that there are too few qualified applicants looking for manufacturing jobs. All agree that a large-scale coordinated promotion of career opportunities in manufacturing is necessary to create a more accurate and up-to-date image for manufacturing in Cook County.

Chapter 11: Our Proposal to Build a Manufacturing Career Path System

In the previous chapters, we described the gaps that characterize the present workforce development "system." Our proposal to build a Manufacturing Career Path System seeks to close these gaps in a systematic and comprehensive fashion, based on these findings from our research:

- **Workforce training and education is a requirement for economic and community development in our region.** We live in a new knowledge-based economy. A highly skilled and capable workforce is a prerequisite for retaining and attracting manufacturing companies. High skill and continuous learning are essential for personal advancement and security in a rapidly changing and highly flexible economy. Targeted investment in and development of our training and education system will lead to greater development of our economy and greater security and wealth for our residents. Education and training cannot be an afterthought.

- **We need a well-organized formal system.** We currently do not have a system. A system is a set of parts that work together to perform a particular function or to reach a certain goal. We have a set of very expensive parts that do not work together. Without a shared mission, they relate on the basis of a mishmash of goals and conflicting directions. There are few clearly defined relationships and linkages between companies and the education and training community. There are few articulation agreements between various educational and training centers, colleges, and universities. There is no clear system of career and educational paths that individuals can identify and pursue, that the public sector can support, or that companies can find and connect to. City, state, and federal funding streams are extremely complex and often not connected with those that need the support the most. A formal system is required for efficiency and accountability — and to systematically measure and promote progress.

- **A Workforce Development System has certain requirements:** There are over 8,000 manufacturers with approximately 400,000 workers being served by hundreds of training providers in Cook County. Any genuine manufacturing workforce development *system* must therefore have certain features to deal with this complexity. These system requirements include:

  Standards. Training providers need to know what employers require so that they can train to meet those requirements. Employers need to know that graduates of programs have a given, readily verifiable package of skills and abilities. Workers must be able to have the confidence that if they complete a curriculum successfully they will have the ability to be hired or to advance.

Certification. Certification of training providers is needed to ensure that training providers teach to the standards and can produce graduates who have requisite skills.

Credentialing. Workers or potential workers who can perform to standard must be able to earn a recognized credential. Employers must be confident that they can expect a given performance level from anyone who has earned and received the credential.

Career Paths. Workers and prospective workers need access to jobs that will lead to rewarding careers — jobs that are interesting and provide good compensation — rather than simply being trained in various functions that may or may not lead to employment and advancement.

Standards, certification and credentialing give providers guidance as to what to teach that will be useful to their students, assure workers of gaining real portable skills that have value in the workplace, and offer employers a way to hire and promote competent employees.

In addition, a system must incorporate a new system of *career paths.* Workers and employers expect that at least some workers will advance to more complex occupations. An adequate workforce development system must take into account the need not just to prepare entry-level workers, but also to assist and facilitate this advancement process. In the conventional approach, career ladders refer to the normal progression of individuals from entry-level work into advanced skill-level occupations. Most firms have developed internal labor "queues" for workers to advance.

Preparation for advancement comes from a combination of workplace experience and training and classroom preparation. Workers can be expected to move back and forth between "school" (broadly defined) and work. Over the course of a working lifetime, all workers will face major technological advancement and upheavals and most can be expected to move among employers. Workers also face the constant creation and destruction of occupations, jobs and firms. Given these realities, the old concept of a "ladder" — which implies movement in one direction — may be less meaningful than the concept of a *career path*.[155] Workers may move along the path by leaving their firm and joining another. Or they may move back to school, acquiring more specialized skills and then moving back to the workplace. Career paths will be different for different people.

A career path *system* implies the development and recognition by employers of an external career ladder — i.e., the use of external certifications and credentials to

[155] In any case there are some indications that the present labor market instability is resulting in less of the traditional "climbing up the ladder" among the latest generation of workers. See Annette Bernhardt, Martine Morris, Mark S. Handcock, and Marc A. Scott, *Divergent Paths: Economic Mobility in the New American Labor Market* (New York: Russell Sage Foundation, 2001).

not only help select and place the worker in the first job, but also to place him/her on an advancement track. The credential represents not simply the amount of training (an Associates degree equals two years of classroom time), but the measurement of that training by use of a widely recognized external set of standards (credential XYZ represents the specific set of ABC demonstrated skills). This system also permits the participation of many forms of system participants — for example, community colleges, community-based organizations, and employment service firms — which would be part of the career path in manufacturing. Indeed, through the operation of a uniform set of standards and credentials the integration of diverse training institutions and their constituencies can be achieved more effectively than through the creation of yet another organization or super-coordinating council.

A workforce development system must take the realities of this constant job movement into account and support the worker and his/her employers throughout his/her career. The concept of lifelong learning is crucial.

- **We need a workforce training and education system that focuses on the technical and critical thinking skills required by the demands of manufacturing companies in an increasingly competitive economy.** Over the past quarter-century the formerly broad-based commitment to providing skills training in manufacturing has diminished. During the heyday of the steel and meatpacking industries, we had skills-training schools such as Washburn Vocational School and active vocational and shop programs throughout the high school system. Then the 1970s and 1980s brought real declines in certain industries. At the same time, questions arose regarding the quality and purpose of those programs. As a result, a commitment to what was called "vocational education" dramatically declined, and publicly funded programs for preparing the workforce were allowed to essentially collapse. This coincided with a growing crisis in the Chicago Public School system that resulted in painfully few students learning basic reading and math skills, as well as personal discipline and a strong work ethic.

  As we now know, the needs of companies for skilled employees have continued to increase with the introduction of new technologies and new approaches to the organization of work. In the most competitive companies, employees need not only technical skills but also, and just as importantly, they need critical thinking skills for new forms of work organization and teams.

  As a result of the dramatic decline in education geared to preparation for work, the field of workforce development has, in large part, become focused on basic employability skills, at best making up for what isn't happening in the public schools system. There are some successful programs providing adequate training for skilled workers and technicians, but they have not kept pace with the demand for highly skilled employees. In most cases, employers have come to accept this as a given. In some cases, companies have taken on the responsibility to provide

all training (including remedial) — particularly larger companies that have the resources and sophistication to develop comprehensive programs. But most area manufacturers do not have the resources or sophistication and must focus on the immediate task at hand: trying to remain competitive.

The result is lowered standards and lowered expectations, which are now at a dangerous point. Many employers in our focus groups and interviews suggested that they were at the point where they would settle for "a warm body that can think," and they would do the rest. This is the inevitable result of an unsustainable mélange of schools, curriculum, faculty, agreements, and conflicting goals that cannot meet the needs of a competitive economy.

- **We need a comprehensive system.** A true system ties all the parts together from the education side, the production side, and the publicly supported infrastructure. We need a system that appropriately links elementary, secondary, post-secondary, university, and continuing education together in a continuum for the benefit of individuals, educational institutions, and companies alike, with the needs of companies clearly integrated into the work of this education network.

- **We need clearly defined and appropriate roles for the participants in this educational system.** The current state of affairs has companies using resources to provide workers with an education they should have received in public schools or community colleges. We have public schools and community colleges providing education that students should have received in earlier grades or at home. We have under-resourced community training providers struggling to provide training for relatively high-skilled jobs with old equipment. And we have people looking for training despite not knowing what the training will or will not do for them.

- **We need transparency and accountability at *all* levels of the system.** There is much well-deserved cynicism about the functioning of our current non-system at all levels. Workforce training and education is an industry providing employment and income for many people. In the absence of clear standards and certification, it is very difficult to hold the private sector, agencies, school and college systems, government agencies, community–based providers, private training providers, and consultants truly accountable. In each segment of the system there are excellent, dedicated people, and there are also time-servers shielded by low standards. Too often the emphasis is on the trainer getting paid rather than the student or employee gaining a real skill or level of education, getting a good job that leads to a career, and succeeding in that job. Issues of transparency and accountability must be addressed, and with rigor, to re-establish confidence in all aspects of the workforce development field.

- **We need tripartite (employers, labor, and educational institutions) certification for employees and prospective employees.** Employers need to know that an applicant or employee has the required skills to do a particular job.

Employees or applicants need certification of their skill and educational level that is recognized by all companies and educational institutions so they can secure the job or next level of training that matches their knowledge. Currently the training institution or individual company provides certification (if it is provided at all). This undermines the value of the certificate. There must be a broadly recognized certifying agency that gives all participants in the system an accurate picture of the knowledge and skill that the certificate represents. This is essential for the employer, and provides genuine portability for the employee. This certification process must have the input, participation and support of employers, labor, and educational institutions to be useful and effective.

- **There must be a formal partnership involving business, labor, government, and the education community in building each aspect of the system.** The absence or non-involvement of any one of these partners would severely compromise the quality and impact of any effort to improve on the status quo.

The Proposal

Our efforts to understand the current manufacturing workforce development "system" have led us to consider an alternative model for manufacturing training — one that correlates particular manufacturing job types with necessary skills and arranges the resulting "skill clusters" in an interlocking hierarchy of manufacturing occupations and related skills. To create such a model, we have focused on a particular manufacturing "super sector" — Fabricated Metals, Machinery, and Electrical Machinery (MME) — and within that sector have outlined current career paths, reviewed available skills standards, and used these standards to help construct a proposal for career path training that can prepare participants for entry-level to highly technical manufacturing positions.

We develop, describe and diagram a career path system for MME to provide a clear example of how such a system could be built in a specific manufacturing sector. In Appendices II and III we include similar descriptions of career paths in the printing and food industries. We believe that career-path analyses can and should be conducted for other manufacturing sectors as well as for the service, retail, and other sectors of our economy. Meanwhile, our MME Career Path Diagram provides a prototype flowchart, with its interlocking "skill clusters" providing the foundation or centerpiece for the workforce development system we propose: the Manufacturing Career Path System.

The key characteristics of our Manufacturing Career Path System can be summarized as follows:

- It is anchored in a sectoral analysis;

- It groups job and skill clusters in the context of a career path as the foundation for the training and education system;

- Training and education curricula are developed in the context of industry standards and employer requirements;

- Training and education lead to nationally-recognized credentials; and

- It relies on a partnership of business, labor, government, and educators to develop all aspects of the system.

A comprehensive Manufacturing Career Path System accessible to all employers, workers, and would-be workers in Cook County will have many advantages over the present non-system, including:

- Issuing nationally recognized credentials for each skill cluster in the system;

- Facilitating uniform measurement of training quality by outside evaluators;

- Allowing students and incumbent workers to enter and exit the system to upgrade their skills according to their specific employment needs and personal goals;

- Allowing employers to hire graduates at different skill levels within the system;

- Allow training providers of all types — high schools, community colleges, community-based organizations, union, and trade organizations — to participate in a unified, clearly articulated system;

- Accelerating job placement by correlating specific skill clusters with corresponding job openings on a county-wide basis;

- Facilitating county-wide recruitment of new participants; and

- Promoting life-long learning strategies for workers and employers.

The Manufacturing Career Path System meets essential criteria for successful reform of Cook County's workforce development system:

- It provides a meaningful focus for training that will both enhance our current manufacturing sector and set the stage for making the acquisition of education *and* skills the driving force in our education system;

- It establishes a formal structure and methodology that can be expanded to all sectors of our economy;

- It defines clear roles and standards; and

- It provides a framework for meaningful certification and credentials.

In order to understand how the Manufacturing Career Path System can be realized, it is first necessary to understand the rationale for conducting career path training based on standards in the context of one sector. We will present a detailed description of the system's levels and parts in the context of the MME cluster, explaining how it was constructed and how it would work in the context of a larger Manufacturing Career Path System. This full description of the system will also include the roles that different manufacturing standards will play in making the system work and an explanation of how a successful implementation of these practices and approaches could lay the groundwork for other industry sectors developing similar county-wide approaches to career path training.

The Rationale for the Manufacturing Career Path System

The Manufacturing Career Path System is based on the notion that particular sets of skills are required for particular ranges of job types and that there is a hierarchy of these corresponding skills and job types that describe actual career paths in the manufacturing field. Building a hierarchy of job types requires that similar kinds of jobs across major manufacturing industries in Cook County be grouped together and that those sets of job types that both require more skills and command higher wages be placed in a hierarchy "above" those that require less. The task then is to match a verifiable hierarchy of literacy, critical thinking, interpersonal, and technical skills to the grouped job types to form detailed skill clusters that, as a set, result in a plan for career path training that can link graduates of each skill cluster directly to jobs.

This kind of career path approach to training is an essential element of any workforce development system because it offers the largest number of benefits to the broadest range of potential system users. In such a system, participants new to manufacturing can enter the field with a clear plan for gaining experience and moving up. Incumbent workers also can upgrade their skills to obtain better jobs with their current employers or seek better jobs in a wider market. And employers can designate career path training as a means for developing their current employees and gaining the more highly skilled employees they so desperately need without having to rely on ad hoc customized training. Thus, workers and employers alike gain the power they need to make improvements in their lives and companies for the long term.

Another benefit of career path training arranged in skill clusters and tied to particular job types is as an approach to career advancement that does not depend solely on a college or university education. This feature of the plan allows high schools, community colleges, community-based organizations, private providers, unions, and trade associations to be included as equal partners in a manufacturing workforce development system, each delivering only those skill clusters for which they are best suited. While continuation in established manufacturing or other degree programs would always be offered as an option to participants, it would not be a requirement. Thus, curricula developed for these

skill clusters need only concentrate on those job skills needed for specific job types, offering participants direct pathways to higher wage jobs.

By incorporating selected manufacturing skill standards into the Manufacturing Career Path System, it will be possible to make hands-on mastery of technical skills the measurable exit-criteria for each of the skill clusters. The performance standards made available by these manufacturing skill standards will not only allow participants to earn nationally recognized credentials upon graduation from each skill cluster, but will also allow for straightforward evaluation of the quality of the training delivered. Teachers will be required to prove mastery of the performance standards they will be preparing participants for, and training providers will be required to develop and sustain the kinds of programs that will ensure high rates of successful participant graduation. With these kinds of clear, measurable exit-criteria incorporated into the skill clusters, an independent quality-oriented system can be established in which varying types of training providers participate as equal partners held to consistent system-wide standards.

The plan for the Manufacturing Career Path System is that it be detailed enough as an initial outline that it can generate a fully articulated set of curricula complete with discrete exit-criteria and a customized placement system. These curricula, in turn, are to be made available to training providers who are interested in taking on and are capable of delivering specific skill clusters. These processes will help build a complete workforce development system that can support, oversee, and sustain a comprehensive career path approach to meeting Cook County's manufacturing training needs.

Reading and Understanding the MME Career Path Diagram

Reading the Career Path Diagram will be a new — and challenging — experience, and one that requires careful attention to the details.

First, to give an overview, we show and describe the skill clusters boxes for the whole career path in MME. Each box represents a grouping of occupations with similar skill requirements. Each skill cluster box corresponds to a particular set of skill standards for the represented occupations. Each job is part of a career and education path that can be easily understood by the job seeker, the employer, the training and education provider, and by government. These skill cluster boxes are grouped in three general categories — Foundation Skills, Core Skills, and Advanced Skills — with each shaded differently.

Following the chart, we provide more detail for each specific category and a sample of the details of the Skill Cluster Descriptions that correspond to each category. We first provide the description for Foundation Employability and Foundation Manufacturing Skills. We then provide one example of the Skill Cluster Description for a Core job, and a Skill Cluster Description for an Advanced job to give a specific understanding of the relationship between the description of a job, the prerequisites for having the job, the various jobs these skills will prepare the student to hold, and the Skill Areas that the student will have mastered in being credentialed for this position.

The lines between the boxes show career paths for advancement, from foundation skills to core skills, and then to advanced skills. Finally, at the top of the chart we show the most appropriate learning setting — classroom, lab-centered, or employer-centered.

Different participants and employers may use the structure differently. Incumbent workers with the requisite skills may be placed in any of the skill clusters for skill upgrades and go in and out of the training system as they move up in their careers.

The chart shows the hierarchy of jobs in this particular MME System and lists the expected number of jobs that will be available in each skill cluster annually. Following is a brief explanation of each of the skill clusters:

- *Employability Skills* is where the least skilled participants would enter the system. Those who complete the Employability Skills cluster can access the Common Manufacturing Skills cluster.

- *Common Manufacturing Skills* is for all participants who want to enter the manufacturing field. Those who complete the Common Manufacturing Skills cluster can access the Welding; Metal Forming 1&2; Machining 1,2, and 3; and Quality Assurance Level 1 clusters.

- There are two *Metal Forming* clusters: the first is prerequisite to the second. Those who complete the Metal Forming clusters can access the Quality Assurance, Maintenance and Machine Building, and Tool and Die Makers clusters.

- There are two *Quality Assurance* skill clusters based on level of expertise and experience.

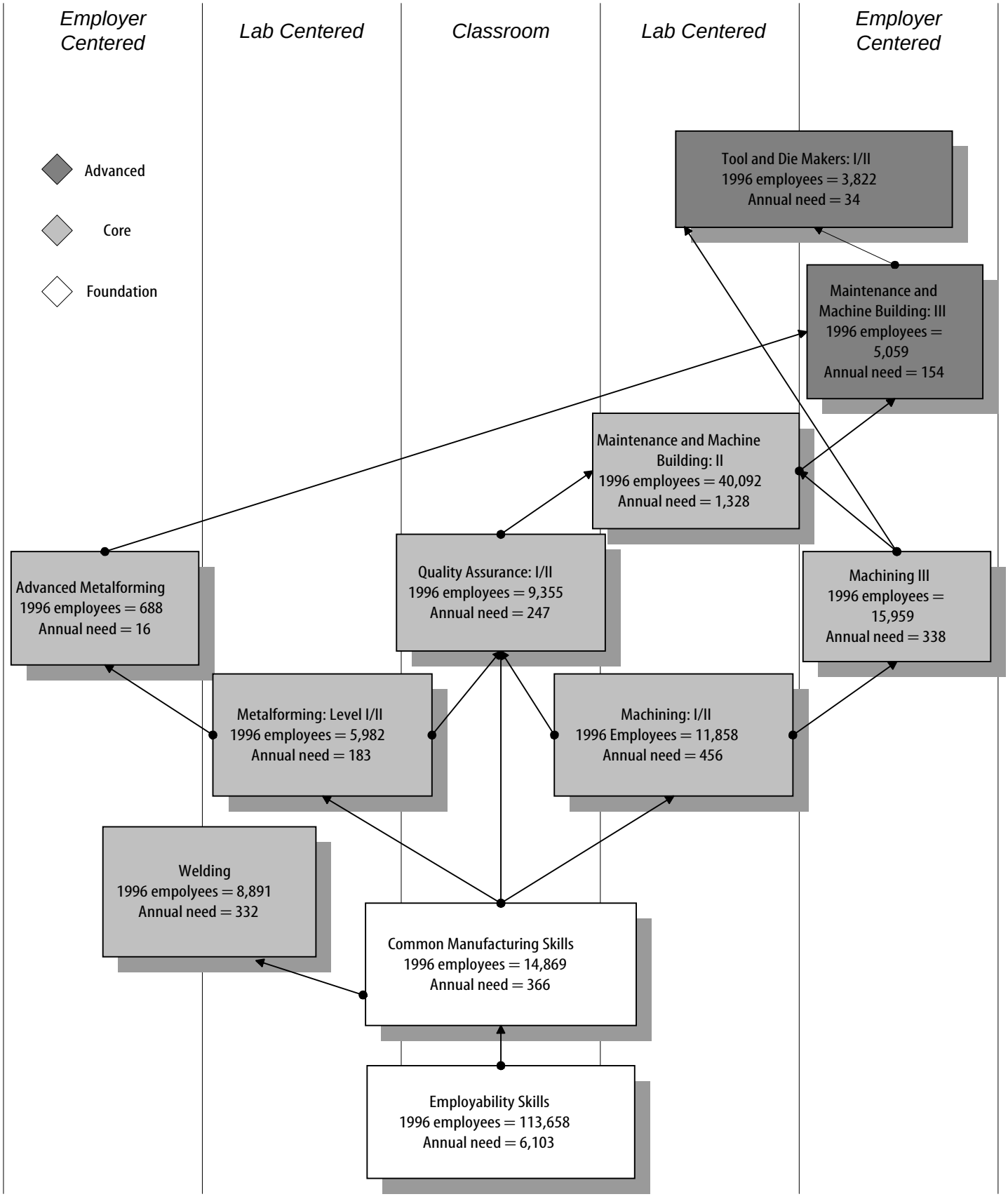
- The *Machining, Maintenance and Machine Building, and Tool and Die Makers* skill clusters each have two skill levels. Those who complete Machining Level 1 and 2 can access Quality Assurance Level I. Those who complete both of the Machining skill clusters can access the Maintenance and Machine Building and Tool and Die Makers clusters.

As you can see, entry-level positions corresponding to the Employability Skills cluster and the Common Manufacturing Skills cluster are primarily taught in the classroom, with some lab instruction for the latter. The first level of Metal Forming is taught in a lab setting. The higher level is taught in an employer-center setting, which could be located either on or off the job site. In this system, there must be a continuous linkage with specific employers that will provide specialized training necessary for their production requirements.

Each section of the diagram also gives the number of employees in the cluster in 1996 (last figures available) as well as the projected number of employees needed annually.

Manufacturing Career Paths

Skills Cluster Diagram - Metals, Machinery, Electrical Manufacturing

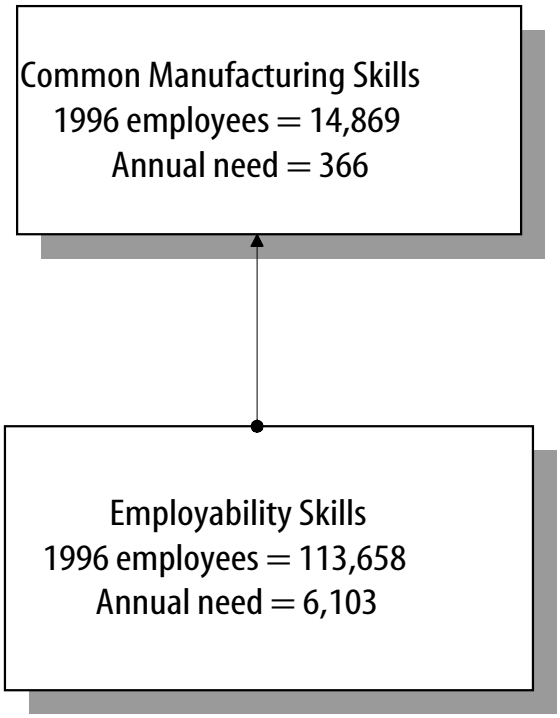


Skill Cluster Descriptions

As mentioned, above, each of the boxes in the chart represents a Skill Cluster that consists of a group of occupations with similar skill requirements. These groups of occupations are called Job Clusters. Each Skill Cluster has a set of skills needed for its occupation. These descriptions were informed by various existing standards, described later in the Chapter. Following are the Skill Cluster Descriptions we have developed for the Foundation Skills, followed by a sample of the Skill Cluster Descriptions for the Core and Advanced skill levels. This provides a detailed sample of the linkage between skills and jobs.

Foundation Skills

These are the foundation skills for all of the Job Clusters in the Manufacturing Career Path System. At the core of these Foundation Skills are the various skills assembled in the Pre-Bridge and Bridge programs developed by Davis Jenkins at the UIC Great Cities Institute and now being taught in various programs.[156]



Employability Skills: These are the basic foundation skills that are required for learning all the skills in the System hierarchy including Common Manufacturing Skills.

I. General Description: This skill cluster will cover basic communication — reading, writing, speaking and listening skills, basic math, and those skills that lead to an understanding of universal business practices and expectations. Participants will be involved in career planning activities and write resumes as well as participate in mock interviews.

[156] The Pre-Bridge and Bridge Programs are summarized in greater detail in "Framework for Development of Bridge Training Programs—A Working Draft 1999," Davis Jenkins, UIC and Gary Saganski, Henry Ford Community College, Detroit. For more information, contact Davis Jenkins at UIC Great Cities Institute, 412 S. Peoria St., Suite 400, Chicago, IL 60607 — (312-996-8059).

II. Prerequisites: TABE (Test for Adult Basic Education) scores of 5.0 in reading and math.

III. Jobs Participants Will Be Prepared For:

Job Clusters	Other Job Types
Metalworking Industry	
• Grinders & Polishers, Hand • All Other Assemblers & Fabricators • All Other Hand Workers	• Material Handler • Cleaners and sweepers • Deliverers • Grinding, abrading, buffing, and polishing machine operators • Machine operators (simple) • Electroplater dippers

IV. Skill Areas

Skill Areas	
Reading: • Comprehension skills.	Math: • Whole numbers, fractions, decimals, percentages.
Writing: • Basic grammar. • Write multi-paragraph pieces.	Communication: • Know employer expectations. • Work well in a team.
Speaking: • Mock interviews/ role-play.	Business Planning: • Understand universal/standard business practices.
Listening: • Follow directions.	Workforce Issues: • Understand rights and responsibilities.
Computer Skills: • Basic keyboarding/data entry.	

Skill Cluster for Common Manufacturing Skills: This is the next required level of training for all the other skilled positions in the Manufacturing Career Path System.

I. General Description: Entrance into manufacturing fields must combine basic math, language, and awareness of all manufacturing processes with theory-related topics of safety, metrology, metallurgy, and tooling. Hands-on experience with hand tools and at least one machine (mill, drill press, grinder, etc.) is necessary to create awareness and reduce fear of equipment for users new to metalworking machines.

II. Prerequisites: Read and write English at 7th grade level. Calculate math problems at 7th grade level. Follow directions and have an established work ethic (on time to class).

III. Jobs Participants Will Be Prepared For:

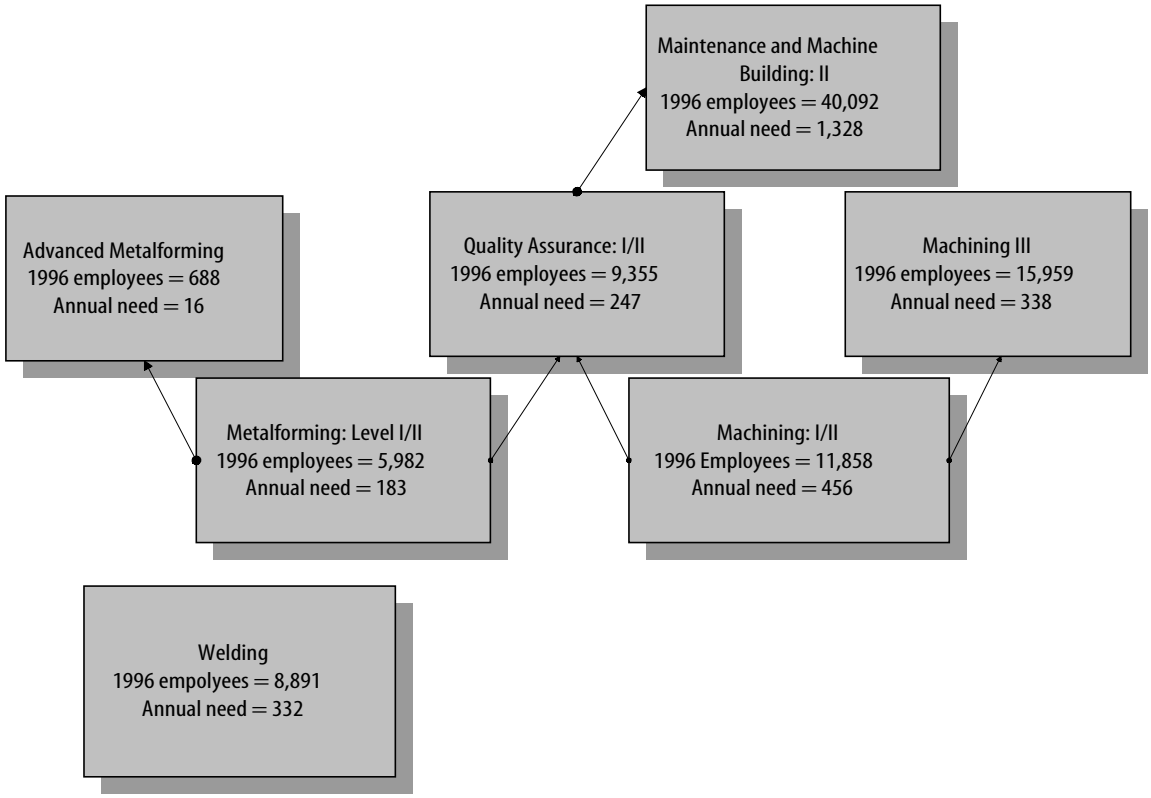
Job Clusters	Other Job Types
Metalworking Industry	
• Machine Tool Cutting Operators Metal • Machine Forming Operators Metal • Punch Machine Operators (simple) • Combination Machine Tool Operators • Coil Winders, Tapers & Finishers • Forging Mach Setters/Operators Metal • Soldering & Brazing Machine Setters • Press Machine Operator (Stamping Only)	• Vertical Band-saw/cut-off-saw operators • Secondary Operations (i.e. debur, file, grind, etc.) • Machine Operator Helper (lathe, mill, press, etc) • Shipping/Receiving & Forklift Driver • Floor Inspector • Miscellaneous Metalworking Machine Operators • Die Casting • Heat Treating Operators
Skill Areas	
Addition, Subtraction, Division, and Multiplication of fractions, decimals, and Whole Numbers	Explain cutting theory for beginning tooling
Layout and bench work	Maintain clean work space
Identify some properties of various metals	Maintain tools
Read Instructions	Part inspection
Write Description of Hands-on Work	Work readiness
Explain Process Activities	Safety and environmental protection
Listen and Interpret Oral Instructions	Job Planning
Work with others to accomplish objective	Problem solving
Read standard and metric measurements	Identify basic tooling and its purpose
Operate machines	Be computer literate w/keyboard
Read measurements on gages	Use hand tools appropriately

IV. Performance Standard Types:

- Measurement, Materials, and Safety
- Job Planning, Bench Work Layout
- Use hand tools for metal
- Operate a lathe, mill, drill and/or grinder

Core Skill Cluster Descriptions

Following is a sample of a Skill Cluster Description for Core Skill positions — Machining Level 1 & II. These positions require greater skill and training, offer higher levels of compensation, and prepare employees or students for career training in the Advanced positions.



Machining Level 1 and II

I. General Description: Machining skills are based on applied metallurgy, metrology, print reading, tooling, machine operation, machine set-up, safety, and shop math used for determining machine speeds. These tradespersons have achieved proficiency in a variety of metalworking skills. Multiple job titles emerge from machining including machine operator, all-around machinist, inspector, and CNC operator.

II. Prerequisites: High School Diploma, Common Manufacturing Skills and Introduction to Machining

III. Jobs Participants Will Be Prepared For:

Job Clusters	Other Job Types
Metalworking Industry	
• Milling Mach Setters/Operators	• Lathe & Turning Machine

• Grinding Machine Setters/Operators • Numerical Control Mach Operator	Setters/Operators • CNC Milling Operators • Drill press setter/operator • Screw machine operator • Tool Crib Attendant • OD/ID Grinder Setter/Operator • EDM Setter/Operator • Materials Clerk

IV. Skill Areas:

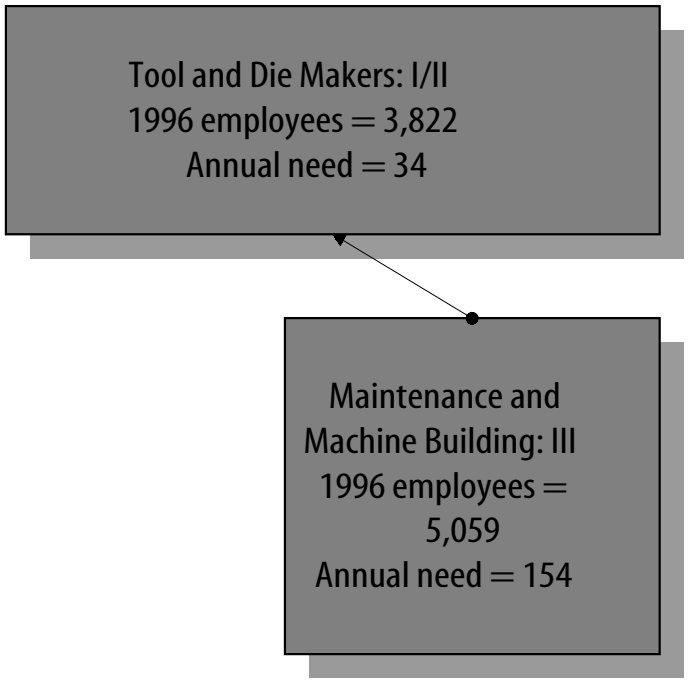
Skill Areas	
Read advanced prints and GD&T	Calculate speeds & feeds
Read and interpret corrective action reports	Compare tolerance with instrument reading
Write shift change instructions	Convert metric to standard (& visa versa)
Calculate mean and standard deviation	Interpret results of an X bar R chart
Coordinate axes, Cartesian and polar	Set-up and operate mills, lathes, inc. CNC
Use formulas required for trade	Measure the degree of surface taper
Cutting theory	Solve for unknown sides of triangles
Identify use of specific tooling	Use various types of micrometers to +/- .0001
Identify material properties	Use various types of calipers
Use machine tools	Use surface plate instruments i.e. indicator
Use cutting fluids and coolants	Interpret geometric dimensioning/tolerance
Use operating system to access software	Trigonometry for CNC Tool paths
Keyboard skills	Metal properties applied to cutting problems

V. Performance Standard Types

- Set-up and operate one or more of the following machines: Mill, Drill Press, or Surface Grinder, EDM (plunge–wire), Cylindrical Grinder (OD/ID), and screw machine (single/multiple spindle)
- Recognize machine vibrations that result in unwelcome chatter caused by tooling or speeds and feeds.
- Calculate speeds and feeds required to produce the expected surface finish.
- Make adjustments to metal cutting machines that will improve tolerance requirements.
- Read prints including GD&T along with use of indicators and other precision instruments.

Advanced Skill Levels:

These positions require even more training and skill and offer greater compensation. Following is a sample Skill Cluster Description for the Machining Level III position.



Advanced Machining Performance – Machining Level III

I. General Description: Advanced machining skills are used by skilled tradespersons who have achieved proficiency in the set-up and operation of mills, lathes, EDMs, and complex grinding machines. Multiple axis, multiple spindle, and programmable machines add to the complexity of their job.

II. Prerequisites: Machining Level I & II

III. Jobs Participants Will Be Prepared For:

Job Clusters	Other Job Types
Metalworking Industry	
• CNC Lathe & Turning Mach Setters • CNC Drilling & Boring Mach Setter • CNC Combination Mach Tool Setters • Combination Mach Tool Setters • Metal Fabricators • Machinists	• Lathe & Mill Turning Center Setters • Experimental Machinist • Fixture Maker • Boring Mill Operator • Multiple Spindle Screw Machine Setter • Single Spindle Screw Machine Setter

IV. Skill Areas

Skill Areas	
Geometry of compound angles	Set-up a CNC turning center
Geometry of profiles of a line	Set-up a horizontal boring mill
Profiles of a surface	Set-up a cylindrical grinding machine
Computer aided manufacturing software	Set-up a ID and OD grinder
Set-up a CNC mill	Set-up an EDM (wire/plunge)
Set-up manual contour turning	Set-up turning center w/secondary milling
Set-up steady rest turning & boring	Set-up single spindle screw machine
Set-up follower rest turning	Troubleshoot equipment problems
Machine difficult materials	Problem solve and find root causes
Set-up multiple spindle screw machine	

Background to Building the Manufacturing Career Path System

We began building the Manufacturing Career Path System in the context of earlier findings that substantiated the need for a comprehensive manufacturing training system in Cook County. In the manufacturing sector in Cook County, we found that a projected 10,500 new and replacement workers will be needed each year between 1996 and 2006. Ninety-two percent of these new positions will be created through the replacement of current workers who retire, are disabled, or leave the workforce. Additionally, the metal-electrical sectors anticipate a productivity growth rate of 3 percent during this time period, while food and printing anticipate a 1.5-percent increase. These significant numbers point to the need for bringing large numbers of skilled workers into the manufacturing field and making it possible for incumbent workers to upgrade their skills as manufacturing occupations become increasingly technology-intensive.

We also built a context for work on the Manufacturing Career Path System by listing the occupations for each industry under study and creating sets of occupational clusters for the metal, machinery and electrical equipment industry, for food, and for printing. (The Career Path Diagrams for printing and food can be found in Appendices II and III..) For each industry grouping, clusters of occupations, as defined by SIC codes, were arranged in a hierarchy: those with similar job tasks and skill requirements were grouped together and groupings that require more complex skills were placed “above” other groups to sketch out the beginnings of a career path (see Table 3 in Chapter 3).

We began our work by reviewing these occupational clusters and refining them based on our understanding of developmental skill learning and on how these industries work. More current job types that are not typically described were added to the occupational clusters, new occupational clusters were created, and a more complex hierarchy was constructed to reflect more tightly defined sets of occupational tasks. Additionally, more flexible relationships between the new occupational clusters in the hierarchy were added to the sketch.

Next, we assembled all available manufacturing/ industry standards for review and determined how they might inform the initial arrangement of occupational clusters as well as contribute to a formal design. We found that there are a number of general sets of manufacturing standards and that the metalworking industry has sets of very detailed standards.

The major sets of standards that have been incorporated into the Manufacturing Career Path System are listed below:

- The National Skill Standards Project for Advanced High Performance Manufacturing - NACFAM (1997)
- Manufacturing Skill Standards Council Standards - MSSC (2000)
- National Institute for Metalworking Skills Standards - NIMS (1997)

To understand how these standards inform the Manufacturing Career Path System, each set listed above will be described and their specific purposes and uses explained in detail.

The Role of NACFAM and MSSC Skill Standards

Early on, we decided that there needed to be skill clusters that addressed basic academic skills and introduced participants to the business world and the world of manufacturing. These skill clusters would prepare participants to take entry-level positions in any manufacturing setting and give them the skills they needed to both progress quickly in current jobs and be well prepared for further technical training. The NACFAM and MSSC standards detail these kinds of introductory skills in different ways and help define the bottom two skill clusters on the Manufacturing Career Path System: Employability Skills and Common Manufacturing Skills.

The NACFAM Standards list specific skill standards in 13 categories. These skill standards read like the competencies educators use to describe the outcomes they want from their specific lesson plans or courses and, thus, the skill standards in each category could easily be used to structure curricula. The thirteen categories included in the NACFAM standards are as follows:

- Communication and Teamwork
- Math and Measurement
- Problem Solving
- Computer Use
- Business Planning and Operation
- Workplace Skills
- Manufacturing Fundamentals
- Workplace Safety and Health
- Quality Assurance
- Blueprint Reading
- Process Control and Improvement
- Workforce Issues
- Learning Skills

We looked at each of the skill standards in each of these categories and sorted them into the Employability and Common Manufacturing Skills clusters to create preliminary outlines that we described in the Skill Cluster Description earlier in this chapter.

The MSSC Standards also play a part in further defining skill clusters, beginning with the Common Manufacturing Skills cluster. The NACFAM standards are more detailed than the MSSC standards with regard to specific tasks. The NACFAM standards present very detailed descriptions of the work required by different aspects of manufacturing processes and then match these sets of work tasks, or "critical work functions," to two sets of knowledge and skills. The first set of knowledge and skills is a list of 17 core academic and employability skills that is presented with each set of critical work functions. Each skill on this list is given a rating to indicate the level of complexity the critical work function requires. The second set of knowledge and skills is a list of those specific occupational and technical skills that are necessary to successfully complete that particular set of critical work functions.

What is important to note is that the MSSC's academic and employability skills have a strong correlation with the NACFAM skills.[157] The first column in the listing of NACFAM categories above directly correlates with a number of the MSSC's 17 core academic and employability skills. The additional overlap between NACFAM and MSSC in the second column occurs when MSSC categories for critical work functions are laid out. These categories in the MSSC standards are:

- Production
- Quality Assurance
- Logistics and Inventory Control
- Health, Safety, and Environmental Assurance
- Maintenance, Installation, and Repair

[157] It should be noted that the National Coalition for Advanced Manufacturing, the creators of the NACFAM standards, were heavily involved in the creation of the MSSC Standards.

- Manufacturing Production Process Development

The strength of the NACFAM standards is that they are articulated as competencies. MSSC standards complement the NACFAM standards by providing enough of a crosswalk between skills and detailed work tasks to suggest ways to bring fuller understandings of work processes and responsibilities to the classroom. By working with NACFAM and MSSC standards in this way, it also appears possible that a set of non-technical performance standards could be developed for the Common Manufacturing Skills cluster. Such an innovation would bring hands-on exit standards to a type of skill cluster that usually relies on paper and pencil exit testing exclusively.

Our aim is to develop and use the MSSC Production Standards to further inform the Common Manufacturing Skills cluster. Other categories of MSSC standards will be integrated into the other appropriate technical skill clusters discussed below.

The Role of NIMS Performance Standards

The technical skills clusters, or the skills clusters arranged "above" Common Manufacturing Skills on the Manufacturing Career Path System, are heavily informed by NIMS Standards for Metalworking. NIMS are a complex system of performance standards that include 24 separate sets of standards that detail up to 3 levels for 13 areas in the metalworking field. Each set of standards comes with written tests and hands-on performance standards that all participants must complete successfully in order to receive national credentials.

The NIMS framework of performance standards divides metalworking into two major areas: metal forming and machining and offers a basic set of Level 1 performance standards for each of these areas. Then, for different categories of occupation within each area, there are associated specializations. Some of these specializations come in Level 2 and Level 3 designations, while some require only one additional set of standards. Each specialization requires completion of the appropriate Level 1 set of performance standards as a prerequisite.

A summary of the NIMS framework of skill standards is charted below:

Level 1	Occupations	Specializations
Metalforming Skills	Metalforming Occupations	Stamping Skills
		Roll Forming Skills
		Spinning Skills
		Slide Forming Skills
		Press Brake Skills
		CNC/ NC Punch Press
		Laser Cutting Skills
Machining Skills	Machining Occupations	Screw Machine Skills
		Machining Skills
	Die Making, Mold Making and Die Casting Die Occupations	Die Making Skills
		Mold making and Die Casting Die Skills
	Machine Building and Maintenance Occupations	Machine Building Skills
		Machine Tool Maintenance/ Machine Tool Service and Repair

We worked to simplify this huge volume of NIMS performance standards to create the outlines of a more streamlined system. To accomplish this, we designated three distinct place types where learning could be centered: the classroom, the lab, and on-site at the employer's plant. This arrangement allows employability and common manufacturing skills to be taught in the classroom, general hands-on technical skills to be taught in a lab, and specialization skills to be taught in coordination with an employer. The following place descriptions point out how the system players would participate in this place-centered system:

- **Classroom:** Those skill clusters require minimal amounts of equipment and could take place at a high school, community college, or community organization.

- **Lab-Centered:** These skill clusters require the basic equipment used by the industry and would most likely take place at a community college or technical center. Skill clusters that take place in the lab would use NIMS-defined performance standards to credential participant skills, while only those more basic to the skill cluster would be included in lab-centered training, and would include those performance standards from the specializations that could be taught in a lab so that participants can be introduced to the separate specializations at this level.

- **Employer-Centered:** These skill clusters allow participants to learn specialized skills on specialized machines on the job. Again, NIMS performance standards would define what is to be learned, tested, and credentialed. Employers would

need to work with outside educational institutions that could help them facilitate the credentialing process.

The rationale for this approach is that most of the specializations only make sense to employers and workers who use the machines and processes associated with them. Typically employers report that they need skilled workers with a general facility for working with machines and with a general understanding of the production process. They are prepared to train workers to use their specialized machines and learn their particular processes. Moreover, by credentialing workers on-site in the processes the employer uses, employers can improve their production systems and workers can gain clear recognition for what they have achieved.

We would need to sort through the NIMS performance standards to determine which belong in lab-centered or employer-centered learning situations for all the technical skill clusters: Metalforming, Machining, Maintenance and Machine Building, and Tool and Die Makers. Additionally, the following standards would be used to inform the final design of the technical skill clusters in the following ways:

- Welding standards from the American Welding Society Standards would inform the welding skill cluster.

- The MSSC Quality Assurance Standards would used to help design the Quality Assurance skill clusters.

- The MSSC Maintenance, Installation, and Repair Skill Standards and the Packaging Machinery Maintenance Institute (PMMI) Packaging Standards would inform the Maintenance and Machine Building skill cluster. Inclusion of the PMMI standards will make this cluster more relevant to the food industry.

Creating a Placement System: The Role of WorkKeys®[158]

By assigning specific performance standards to each skill cluster, the Manufacturing Career Path System lays out a clear system of exit criteria. These exit criteria can create portable credentials for participants and a way to measure whether or not a training provider is able to produce predictable outcomes. However, in order to create a complete, unified system, a placement mechanism must also be in place.

Because the Manufacturing Career Path System's purpose is to devise career path training that prepares participants for jobs and not degrees, we are interested in

[158] WorkKeys® is a product designed and created by ACT, Inc. to determine if a employee or applicant has the necessary skills for a particular job. ACT, Inc. is an independent, not-for-profit organization that provides assessment, research, information, and program management services in education planning and workforce development. Founded as the American College Testing Program, it changed its name in 1996. For more information, contact: www.act.org

incorporating an assessment system that clearly establishes a relationship between participant skills and job types. In the course of our research, we found that a number of community colleges and other organizations in Cook County use WorkKeys in their customized training programs to match job seekers with specific jobs to fill open positions at the places where they work.

WorkKeys assessments makes this matching possible because testing identifies specific job-related literacy skills that correlate, or can be correlated, to any job type. In Cook County, this testing system has been largely confined to customized programs because most academic programs depend on the Test for Adult Basic Education (TABE) to place new participants into courses. As the TABE is a normative test that results in scores that are only relevant on a specific academic scale, we recommend that WorkKeys' framework of developmental literacy skills be incorporated into the skill clusters so that the WorkKeys assessment system can be adopted. With this assessment system, developers of the Manufacturing Career Path System will not only be able to augment the MSSC and NIMS standards, but also will be able to create a comprehensive placement system capable of placing participants into skill clusters as well as into jobs.

There are three significant features of the WorkKeys assessment system that would make it a good placement mechanism for all of the skill clusters in the Manufacturing Career Path System. First, the WorkKeys system produces meaningful test results that indicate an exact set of literacy skills each test-taker has. Each test-taker can be tested on eight foundation skills and each foundation skill category has seven clearly defined levels with descriptions of the skills in that level.[159] The eight foundational skills tested by the WorkKeys assessment system are:

- Reading for information
- Applied mathematics
- Listening
- Writing
- Teamwork
- Applied technology
- Locating information
- Observation

With scores that result in a level description for each of these eight categories, test-takers and the programs that use the assessment can obtain detailed skill profiles that designate the skills a test-taker has and those they need to work on. If these eight foundational skill categories were integrated into the Manufacturing Career Path System, WorkKeys test results could be used to place test-takers into the appropriate skill clusters.

Second, WorkKeys Regional Centers are able to do job profiles that correlate the levels of the eight foundational skills with the skills needed to do particular jobs. Trained job profilers observe the worker in his/her particular job and go through an evaluative process to come up with the particular set of WorkKeys skills that are required for a particular job. These profiles gives employers a way to develop their workforce by hiring

[159] These skill areas align with the nationally recognized workplace foundation skills known as the SCANS Skills (developed by the Secretary of Labor's Commission on Achieving Necessary Skills).

qualified applicants, evaluating current workers, and determining student ability to participate in internships and other employment activities. There are also generic occupational profiles available that establish needed literacy skill levels in the eight skill areas. Thus, once test-takers receive their WorkKeys scores, they can not only find out about the skills they have, but they can find out which occupations and/or actual jobs they are already qualified for and what skills they must achieve to qualify for higher-level / better paying jobs.

A software system, Keys2Work, can be used with the WorkKeys skills indicator to match job seekers with job opportunities. With this software, test-takers, school counselors, and job developers can match results of WorkKeys tests to occupational categories as well as specific jobs openings that have been profiled. Keys2Work could have a real impact on the manufacturing workforce development system by linking the efforts of employers, unions, workers, and training providers to one another to provide skill cluster graduates with just those job opportunities they are qualified for. And should such an assessment and matching system be dispersed widely throughout the Chicago area, more job seekers would have access to proper assessment and appropriate available jobs and training.

We believe that a successful pilot of a manufacturing workforce development system that uses WorkKeys assessments and software should help pave the way for wider use of WorkKeys in Cook County job preparation programs in lieu of the TABE. Not only would the WorkKeys assessments require job preparation programs to gear their courses more closely to a continuum of job-related literacy skills, but also the troublesome aspects of TABE testing would be eliminated. Organizations we interviewed in the course of our research raised concerns about TABE testing:

- The TABE results in a set of grade-level scores that indicate general deficiencies without indicating the specific skills that a test-taker does or does not have. Usually, in a TABE placement system, additional testing must be done to pinpoint skill needs, and even these must be surmised as there are no clear definitions of the skills needed to move from one grade level to the next.

- The TABE can be misused. In order to get accurate grade level scores, test-takers must be given a locator in each test subject and placed into the appropriate test type per test subject. Should the test-taker take TABE tests in regular intervals, they must again be placed into the appropriate test type according to their most recent scores before they take it again. Each test type can only detect a specific range of grade levels, so that if a test-taker is given a test type too high or too low for their ability, the test is incapable of giving an accurate score. Far too often, educational institutions give all students the same test type to cut down on the complexity of giving the test correctly — and teachers are left wondering what their students' actual skills are as students are routinely misplaced in their classes.

- The TABE generally does not provide accurate score to test-takers that speak English as a second language. Learning patterns and needs are very different between native and non-native speakers such that the TABE's grade level scores

do not reflect non-native speakers actual grade level, but some unspecified level of first language and/or cultural interference.[160] Thus, students who have university educations from their own countries or who have difficulty reading and writing in their first language may come up with the same scores, and again may be placed in programs and courses that do not meet their needs.

- The skills the TABE tests for are not correlated to jobs skills or to jobs. Thus, students with "skill deficits" who must concentrate on obtaining better test scores to access job preparation programs often become frustrated because they do not see how the time needed for prerequisite training will improve their job prospects. Many programs that deal with low-skilled job seekers suffer retention problems as a result.

- The TABE generally cannot be effectively used to diagnose an individual's learning needs, a problem common among achievement tests.

- The TABE is based on the way school children think and process knowledge. Children think and process knowledge differently than adults, thus limiting the value of TABE in a principally adult education system.

We believe that a career-path approach to sector-based training is the best context in which to adopt new assessment and placement practices. In this context, uses of more generic instruments like the TABE can be phased out in favor of products and systems that link job seekers, training providers, and employers more closely together for clear, measurable outcomes. We believe that the manufacturing workforce development system can demonstrate that this approach works by integrating WorkKeys' framework of developmental literacy skills into its career path training and adopting its assessment system and software to create clear access between job-seekers, training, and jobs.

Implications for Cook County's Workforce Development System

In summary, the Manufacturing Career Path System approach offers a number of advantages over the present non-system. These include:

- A comprehensive and flexible set of performance-based skill clusters that emphasize hands-on mastery of manufacturing skills. These skill clusters would not rely on the achievement of academic degrees for participant advancement, but instead only require that participants achieve those nationally recognized credentials that pertain to specific occupations. However, these career paths do not preclude academic achievement in a variety of technical fields, and therefore

[160] The WorkKeys testing system recommends the use of CASAS tests for participants with significant first language interference. CASAS is specially designed to test language acquisition for English as Second Language students.

may be attractive to college-bound high-school students and workers as well. Academic or college-prep skills will, in fact, be enhanced in some learners by affording a contextual learning experience.

- Universal access. The proposed system would incorporate WorkKeys literacy objectives, and WorkKeys tests would act as a placement system into the skill cluster and into jobs. The system would be able to determine and address the needs of all applying for entry. High-school students, job seekers, and incumbent workers would all be on an equal par for training and employment options.

- All skill clusters would be defined by nationally recognized standards that would give independent credibility to the training, allowing training providers of all organizational types to participate equally, and providing a uniform standard for evaluation of training provider performance.

- The Keys2Work system would make it possible to deploy a job seeker/ job opening matching systems in manufacturing "One Stops" designated at local high schools and/ or manufacturing training providers' sites. Such a system would be attractive to employers who would see that credentialed graduates from specific skill clusters are excellent candidates for their job openings. A manufacturing matching system like Keys2Work could make its way into local Illinois Employment Training Centers ("one-stop" recruitment and service centers) should appropriate testing procedures be adopted.

- A successful implementation of this manufacturing training system could lay the groundwork for structuring other sectors' workforce development systems. Other sectors such as service, retail, tourism and hospitality, health, biotechnology, information technology and others, should be encouraged to devise an independent training system based on industry performance standards, interface with existing training providers to deliver a unified system, and use testing systems that allowed educators and employers to "speak the same language" when it comes to skills and employment opportunities. The vision would be to have a wide range of clearly articulated career paths with skill clusters that correspond to real sector hiring needs so that training and career advancement would be made available to large numbers of workers over the long term.

- Manufacturing trainers that are not directly included in the system could take advantage of the many benefits the system has to offer. These manufacturing trainers could:

    - Refer their students to NIMS-certified labs within the system to get credentialed;

    - Refer their students to any skill cluster in the system for further training;

- Adopt the WorkKeys assessment system to correlate results to occupational profiles; and

- Eventually use the Manufacturing One Stops systems to gain access to internships, job shadowing, and placement opportunities.

- Cook County's manufacturers would be able to utilize the manufacturing workforce development system to upgrade the skills of their workers and advance their careers. Similarly, employers would be able to hire graduates out of the training system to fill job openings.

Chapter 12: How Do We Get There?

The challenge of building a comprehensive workforce development system for the Chicago area is undeniably daunting. The problems described in this report have accumulated for decades, and in some cases may take decades to address. To ignore that reality is to slip into utopian fantasy. On the other hand, there are problems that can be solved and opportunities that can be seized in the immediate and short term that would begin to build the type of system we envision, demonstrate the power of the approach we advance, and build the momentum and capacity that is essential to addressing the larger and more complex problems.

Key Steps Toward an Effective System

We propose to create a Manufacturing Career Path System in Cook County based on the methodology described in Chapter 11, with priority given to implementing the system in the MME, Food, and Printing sectors. There are numerous key steps that must be taken to ensure successful implementation. That is not to say, however, that there is only one best way to initiate them. Later in this chapter we describe *our* specific approach and priorities, but it should be emphasized that these steps can be initiated by *any* institution, company, or agency with sufficient capacity, interest, and determination.

1) **Create a Consensus.** This is a new approach to workforce development and education in Cook County. For it to succeed, broad support must be developed among policymakers in key institutions of business, labor, and education, in philanthropy, among elected representatives at the city, county, state, and federal levels of government; and among the broader public.

   Employers must be won to this approach and come to see it as worthy of their investment of time and money. They need to be convinced to participate in the design and operations of appropriate education and training programs, and to work with other stakeholders equally important to the success of this approach, particularly labor and the education community.

   As part of this consensus-building effort, a broad and sustained public relations and education campaign should be launched to heighten public awareness of the importance of manufacturing and the opportunities it offers to present and prospective workers, companies, communities, and the educational community. At the very least this initiative should be on the scale of a campaign for a major public health concern.

2) **Develop Curricula.** The Manufacturing Career Path System provides an outline for creating a complete set of curricula that would integrate MSSC, NIMS, WorkKeys, and other appropriate standards to create comprehensive career path training in manufacturing.

3) **Develop Education and Training Capacity.** Once these curricula are developed, appropriate training providers throughout Cook County need the incentives to deliver the skill clusters for which they are willing to take responsibility. Training providers could be high schools, community colleges, community-based organizations, unions, trade associations, and other entities. Prerequisites for taking on a skill cluster would be the ability of the training providers to deliver the training. Required features would include:

   a) Sufficient basic equipment;

   b) Appropriately trained teaching staff able to meet required standards; and

   c) The willingness to create relationships with other training providers so that clear participant referrals could be made and resources shared.

   d) A commitment to working with employers, labor, educators, and other key stakeholders in the design as well as implementation of the training program.

4) **Create Linkages.** It will be essential to create active and effective education and training linkages between schools and employers through internships and work-based learning opportunities; between unions and employers; and between secondary and post-secondary educational institutions.

5) **Provide Specific Education and Incentives for Educators.** The quality and motivation of educators at all levels of the system will be crucial to it success. Adequate material incentives as well as non-material incentives need to be provided to encourage educators currently in the field to fully understand the importance of manufacturing, as well as the specifics of their particular area of teaching. Those who have had careers in all aspects of manufacturing must be encouraged to enter the educational field and to teach what they have learned through years of practice, whether as a machinist, an assembly line worker, a supervisor, a chemist, a marketer, an engineer, a union leader, or an entrepreneur. We must have the ability to bring them into the training and education system, and we must be able to provide support for ongoing professional development once they are in the system.

6) **Increase private sector investment and participation.** The private sector must be persuaded to increase its investment in and commitment to training and education. The objectives of this proposal can be met only if employers work closely and patiently with government, labor, the educational community, and the broader community.

7) **Create a certification entity.** It will be crucial to provide certification for students, employees, educators, and training providers that is recognized by the

key partners as valid. The certification entity should be responsible for conducting evaluations of all the system players to be sure they are meeting specified system standards. Nothing less than system-wide certification can ensure employer confidence in the system while at the same time providing true portability for workers.

8) **Establish centers for recruitment and assistance for entry-level or dislocated as well as incumbent employees.** This could be done from existing "One Stop" centers or other community and school-based programs that would engage local employers and unions to make job shadowing, internships, and placement opportunities available to students or employees in all the manufacturing training programs in the region. The centers could also pilot the Keys2Work software to begin assessing and matching youth and employees with these employment activities and additional manufacturing training. These centers would reach deeply into all of our region's communities, with emphasis on those that have residents in poverty, to orient, recruit and provide comprehensive assistance in preparing people for work.

9) **Conduct research and analysis.** We need ongoing research on all factors related to workforce training and education and the steps needed to reform our system, including analysis of relevant experience locally, nationally, and internationally, coupled with the creation of learning partnerships with appropriate institutions. Among other things, shared research initiatives provide a vital way to contribute to building deep linkages to other efforts in our region to retain our industrial jobs and companies, to modernize the manufacturing sector, and to promote modern work organization and management techniques.

10) **Develop and establish a policy and legislative agenda in support of the Manufacturing Career Path System.** Finally, the creation of such a system requires full policy and legislative support on a local, regional, and national level, both in order to create the funding streams and mandates that are needed for each aspect of the system and to ensure coordination and consistency. Although necessarily complex, this agenda will need to reflect:

    a) Simplicity and transparency: We need a system that can be readily understood by all the participants. A system-wide approach makes this possible in the long run, in contrast to the current situation of trying to make sense of scores of parts that are often contradictory and defy linkage.

    b) Accountability: There must be clear standards for performance for all level of the system that are rigorously enforced. This applies to the private sector, to government, to community-based recruiters and providers, to the educational community, and all those involved in workforce development.

The Stages of Changing the System

We envision a sequence of stages that will lead to the successful establishment of a comprehensive workforce education and development system:

1. **First Stage:** Developing an analysis of the present "system" and a plan for improving it, shaped and supported by the key organizations in Cook County's workforce development system.

   This is the current stage. Aided by an Advisory Committee representing key organizations and institutions, we have completed our initial report and proposal. Additional research and the involvement of a broader range of organizations are the necessary foundation for the next steps.

2. **Second Stage:** We will create organizational capacity and partnerships around specific "start-up" projects that will demonstrate the strength of our vision and the competency of our network over the next two to three years. With this limited capacity, we will seek funding for projects and will work to influence policies and priorities in key institutions and organizations in the public and private sector.

   We will work with existing organizations, companies, agencies, and institutions that are beginning to share the objectives and approach outlined in this report and want to engage in common work building on projects and relationships that they have created. This includes the existing Workforce Investment Boards in the region, the community colleges and universities, the public and private school systems, government agencies, and the numerous non-governmental agencies that are engaged in workforce development and education. Together, we will build a "virtual" network that is committed to and increasingly capable of bringing about the systemic change outlined in this report — a network intended not to replace existing efforts but to strengthen research, communication, ideas-exchange, and momentum among those currently engaged in workforce development. Practices building toward a Career Path system should be supported and gaps that exist in the current field should be identified in order to define and promote new initiatives.

3. **Third Stage:** The third stage will be to build capacity in several sectors in order to advance development of the system we seek and demonstrate competency through successful training programs, creation of partnerships, the leverage of social and economic resources, and the expansion of our research and analytical work. We envision this work being initiated in the next year and developing over the next several years. Through this work, we will build a greater resource base for use in workforce development, and create a much larger leadership pool throughout the system that will serve as a resource for institutions willing to embrace a comprehensive approach to workforce education and development.

   In this third stage we will continue building our network but with relations between participating organizations becoming deeper and greater in scope. This

network will consist of organizations, companies, agencies, and leaders with a shared vision, a common language, and increasing capacity for coordination.

4. **Fourth Stage:** At this stage — reached, we hope, within about the next three years — we envision institutional adoption of our approach by small and large companies, public and private schools, colleges, Workforce Investment Boards, local government and others, leading to a functioning workforce development system consistent with the standards outlined in this report and operating on a large scale. This stage represents the beginning of systemic change, gaining momentum with success in the start-up projects and the intermediaries. A full transformation of our present "system" will probably take 10 to 20 years — if we begin now.

Our Plans to Build the Manufacturing Career Path System

In the remainder of this chapter we elaborate on the specific work plans and aspirations of the Chicago Federation of Labor, the Center for Labor and Community Research, and our partners to establish a Manufacturing Career Path System for Cook County. Our two organizations are deeply committed to the perspective and proposals presented in this report, and will do all that's within our capacity to bring about the Career Path System in manufacturing. Success in the various projects we describe in this last section of the report finally depends on our ability to secure the funding and build the organizational capacity and partnerships required by the projects.

Our First Stage

Over the past 18 months we have conducted our research; established partnerships with a broad range of Cook County organizations, companies, and agencies; developed our proposal for the Manufacturing Career Path System; and initiated projects consistent with our objectives.

Our Second Stage: Start-up Projects — Building the System Now

In coming months, we will be seeking the resources and capacity to launch start-up projects that begin to build the system, while at the same time working with others who are already working on similar projects. These are not "pilot" or "demonstration" projects but simply the modest beginning of a determined effort to rebuild and reform our manufacturing workforce education system. Each of these projects will embody the key principles we believe to be crucial to building an effective system, will link with key organizations and institutions, and will be designed to directly contribute to improving our system. These start-up projects will have three principal objectives:

- To create the strongest and most dynamic linkages possible between various education and training initiatives and specific companies, between unions and the companies they represent, and between OEM companies and the suppliers committed to developing a modern workforce development system. Fundamental to the success of our workforce development system is the direct involvement of the companies in designing, shaping, and implementing training and education programs for their existing and future employees;

- To support, expand, and upgrade public initiatives in training and education to ensure the highest level of competence and sophistication in their programs; and

- To build and demonstrate the strength of the social partnership between labor, business, education, and government in workforce development.

The following list and description of projects reflects our best thinking about what is consistent with what we have learned in the course of this project, what could start us on our way to building a real workforce development system, and what we think is achievable in the short term. It is a place to start, and some of these efforts — including the first item on the list — are already under way. But the list as a whole is intended only as a guide, not a blueprint. A variety of short-term, low-cost steps and combinations of activities and partnerships is likely to develop as network-building proceeds, momentum builds, and opportunities arise. Again, these projects represent our intentions, but, finally, our role will depend on funding, capacity, and partnerships.

1. Work Chicago: Key to the success of this project, and the potential success of our long-term plans, is the creation of the social partnership that is required for a truly modern and effective workforce development system — a partnership involving labor, business, the education community, community-based organizations, and local government. In our view, simply proposing the reforms outlined in this report will not bring about change. There must be an organizational entity that fully understands the perspectives and thrust of the Manufacturing Workforce Development Project and is capable of prompting, guiding, and assisting both start-up and long-term projects in ways that advance the project's strategic vision and core assumptions. CFL and CLCR propose to create such an entity and to name it *Work Chicago*.

Work Chicago will be a not-for-profit corporation with a broadly representative and diverse Board of Directors. It will: serve as a regional resource and facilitator of the objectives of this report; work with our partners on the MWDP Advisory Committee to launch appropriate start-up projects; carry forward the research and analysis initiated for this report; and continue to support the partnerships created in the course of this project; and periodically convene the Advisory Committee to review progress and provide guidance. Work Chicago will be a lean operation with a small staff: our primary objective is to expand the capacity of others in this field, and to help create the competent and diverse partnerships that are essential for success.

2. ***Expand our Research Foundation:*** In the course of this project we have identified a number of issues and questions that require additional research and analysis as a foundation for our work going forward. Three clear priorities need to be addressed in order to provide an analytical foundation for new projects and other activities.

- Manufacturing, Communities, and Race: In Chapter 2 we outlined a number of issues related to manufacturing and race. Though widely recognized, more research and analysis needs to be done to fully document and understand the interrelationships and linkages, and this work needs to be fully integrated into the other education and retention initiatives suggested by this report. Currently, under the auspices of the New Chicago School for Economic Development[161], a network of organizations including Notre Dame University, CLCR, the Egan Center at DePaul University, the Near North Neighborhood Network, the Little Village Development Corporation, Teamsters Local 738, and the Building Organizations for Labor and Development (BOLD) Coalition, a research project is being designed to create a social and economic history of race and manufacturing. The focus will be on the experience of African American, Mexican, and Puerto Rican people in the rise and fall of industrial West Side communities of Chicago over the past 50 years.

- Labor and Workforce Development: We need to survey the Midwest to identify companies and unions that have negotiated education and training programs and to identify best practices in this field as a foundation for increasing the level of engagement by organized labor in our region. This research will inform a start-up project to expand labor-management agreements on training and education.

- International Experience in Workforce Training and Education: This is a field in which considerable research is being conducted on an ongoing basis. Chicago-area stakeholders need to be an active part of this international discussion and exchange. The CFL and CLCR proposed to Global Chicago that it, in partnership with the Chicago Council on Foreign Relations, create a Fellowship on Work, Business and Labor to help facilitate the exchange of research, as one part of this initiative. We are also exploring the possibility of partnerships with workforce development organizations and agencies in Denmark, Germany, and Canada.

3. Establish Education and Retention Intermediaries in Three Sectors: A key recommendation of the project is grounding workforce development in a sector analysis and strategy to gain the benefits of scale, agglomeration, synergy, and focus. We will initiate the start-up of three intermediary projects or support existing projects in the food, printing, and metal, machinery, and electrical manufacturing (MME) sectors. These projects will embody the principles, values, and objectives of our report and

[161] The New Chicago School of Economic Development (NCS) is a new network of organizations and individuals gathered around a set of strategic assumptions on High Road economic development and committed to joint intellectual and practical work. The NCS is a project of the Egan Center of DePaul University, and the Chairman of the NCS is Dr. Michael Bennett, Executive Director of the Egan Center.

recommendations. Their success will prove both the effectiveness of the approach as well as build a larger network of skilled and experienced leaders from the field who can be advocates for and builders of the longer-term objectives of the project.

These projects will:

- Develop the key partnerships in each industry between employers, labor, educators, government, and community at the plant, local, and regional level;
- Develop career and education paths and appropriate curricula, including pre-bridge and bridge programs;
- Develop and promote tripartite (employer, labor, and government) certification of courses, instructors, and institutions in their respective sectors; and
- Guide and facilitate the creation and implementation of education and training programs in companies in the sector.

These projects and the organizations contributing to their development will need the following services to successfully fulfill their mission:

- Research and analysis on trends in the industry, modernization, markets, labor market analysis;
- Assistance in asset mapping and gap analysis for the industry and workforce development in particular;
- Identification of international best practice in the industry and partnership possibilities;
- Development of a funding strategy identifying public and private sources; and
- Creation of a network of educators at all levels for the sector.

Work Chicago will develop a policy agenda and strategy to influence the agendas of philanthropy and local, state, and federal government to support these sector initiatives through:

- Creating adequate funding streams;
- Supporting the development and enforcement of standards of performance at all levels;
- Promoting uniformity of excellence;
- Promoting increased scale and overcoming fragmentation;

- Promoting Workforce Board coordination in support and in partnership with these sector initiatives; and

- Creating learning networks with other sectors in manufacturing and the rest of the economy including information and communications technology, biotechnology, hospitality and tourism, health care, service, and retail.

Work Chicago will develop a program for general industrial retention in these sectors, providing assistance in:

- Developing "early warning" systems that proactively gather data on area economic sectors and companies to identify problems before they become a crisis and to facilitate development of timely and appropriate solutions;

- Promoting modernization with the assistance of the Chicago Manufacturing Center and other organizations positioned to provide assistance in technology, new approaches to management, new marketing initiatives, etc.; and

- Providing assistance in labor/management relations and work organization reform. Our proposal is based on developing new relationships and new responsibilities for both labor and management. Work Chicago will work with both sides in finding creative and effective ways to increase the competitive advantages of area companies and to increase job and income security for workers.

4. Create a Small Schools Manufacturing and Technology Career Academy in Chicago Public High Schools: A critical component of building a modern workforce development system is the continued reform of Chicago Public Schools. Because of the scale of the problems as well as the opportunities, linking secondary education to work and higher education must be one of our greatest priorities. In addition to building on what has been achieved by the current Education-to-Careers program, we need to create a powerful symbol of how a public high school can embrace our objectives.

Work Chicago will work with the Small Schools Workshop, Networking for Democracy, the Chicago Teachers Union, a local community, and Chicago Public Schools in creating a Manufacturing and Technology Career Academy. This "small school" is envisioned as having approximately 400 students and the following objectives:

- Provide an excellent, comprehensive educational experience for every student. The Academy will offer students, including special-education students, the benefits of contextual learning, leading to enhanced academic and manufacturing-specific skills;

- Provide every graduate a link to a job or to post-secondary education including university;

- Meet industry standards and provide certification consistent with the criteria of the Manufacturing Career Path System;

- Provide rigorous, high-quality instruction; and

- Offer internships with industry as an opportunity to experience varied work environments and to help students lay the foundation for a career and education path linked to manufacturing and technology.

5. Establish a Manufacturing and Technology Demonstration Center: A state-of-the-art Manufacturing and Technology Center is needed to serve as an important resource for the entire proposed manufacturing workforce education and development system. As envisioned, this facility would feature the full range of the most up-to-date equipment for either machining or metalforming with sets of attached classrooms and labs in central locations. All students in the manufacturing workforce development training system would have access to this center, gaining hands-on experience on the machines they will most likely be using on the job and earning required NIMS credentials. The center would also function as a showcase, attracting prospective students and their families and generating excitement about high-tech career opportunities in the manufacturing field.

All of the stakeholders in the system would benefit from the creation of this center:

- Training providers — high schools, community-based organizations, community colleges, and unions — could use the classrooms and equipment to augment their own classes and to get students NIMS-credentialed;

- Employers could send their employees for training on new machines and to become NIMS-credentialed;

- Manufacturing teachers could be trained and NIMS-certified;

- Employers or associations could rent or lease labs for short-term training on new equipment;

- Middle schools, high schools, and unions could take students and incumbent workers on field trips to the center to show how high-tech and viable a career in manufacturing could be;

- Major technology groups could work cooperatively to create a higher profile for manufacturing careers in Cook County; and

- Manufacturers could view the latest equipment and technology in operation and have employees trained on the equipment prior to purchasing.

There are a number of current developments in the workforce development field that make this an opportune time to initiate this project:

- The Tooling Manufacturing Association is in the process of setting up two metalforming centers, and collaboration with the TMA in this area could create wider publicity, increased use, and long-term support for such an approach;

- A number of employers have expressed interest in investing in and helping organize state-of-the-art manufacturing centers;

- City Colleges of Chicago has expressed interest in housing such a center at one of its colleges; and

- There is considerable national experience in establishing such centers.

***6. Expand and Increase Negotiated Labor-Management Training Programs*:** Within organized labor there is a tradition of involvement in training in the building trades, but less so in manufacturing. We need to increase the utilization of negotiated, contractual labor-management training programs in manufacturing and the involvement of labor in training and education to promote manufacturing as an important career as well as a way to increase competitiveness and productivity. Many manufacturing unions are not fully aware of the opportunities awaiting them in workforce training and development; many labor agreements contain provisions to fund training programs that have not been fully implemented because of employer and employee inaction.

This project will focus on reaching out to organized labor in our region, providing education and technical assistance to unions interested in becoming more involved in workforce education and development, assisting unions in emphasizing training and education in negotiations with management, and promoting strong labor-management partnerships. In pursuit of these objectives, Work Chicago will:

- Hold annual conferences for organized labor on workforce development and retention of companies, using these conferences to introduce union leaders to the objectives of this project and the ways in which they can become involved;

- Provide training for union leadership on a company level to assist them in working with local management to construct a workforce education program and to develop appropriate contract language for a union-management program; and

- Identify two or three companies with inactive education and training programs and work with management and the union to develop a program consistent with existing contractual agreements and the goals of this project.

We have identified several potential partners for this project, including Chicago's labor unions, the Chicago-based Council for Adult and Experiential Learning (CAEL), the

Association of Joint Labor/Management Education Programs, the Consortium for Worker Education, and the AFL-CIO Working for America Institute.

7. Develop Curricula Incorporating MSSC, NIMS, and WorkKeys: The centerpiece of our proposal — the Manufacturing Career Path System — is informed primarily by MSSC and NIMS standards. We propose to align these skill standards with WorkKeys literacy skill levels and develop a comprehensive curriculum outline and assessment and placement system with these materials. It is critically important to develop a manufacturing training system that gives trainees portable credentials that employers will recognize and trust.

- We will seek to integrate MSSC and NIMS to pioneer a career path curriculum in manufacturing that makes meaningful connections between relevant knowledge and skills needed for general manufacturing practices as outlined in the MSSC standards and the very specific performance standards detailed in the NIMS standards. Together, these two sets of standards can help articulate a comprehensive system that can reach trainees with low literacy skills and no experience in manufacturing as well as skilled incumbent workers who need further training to move up in their careers. This integration also offers a wide range of training providers the opportunity to deliver a part of the manufacturing career path curriculum. With clear standards connected to each skill cluster in the career path, community colleges, trade schools, CBOs, and high schools will be able to participate in a single system that can deliver reliable results. We also want to align the manufacturing career path curriculum with WorkKeys.

Current developments in the workforce development field make this a good time to initiate this project:

- The Manufacturing Skill Standards Council has just released its skill standards and there is an opportunity to correlate them with existing skill standards.

- The NIMS standards curriculum is in the process of being planned in various states.

- South Suburban Community College has a Regional WorkKeys Center that it has been operating for 10 years. Specialists at this Center have extensive experience doing job profiles for local manufacturing clients, administering WorkKeys tests, making placements based on test results, and piloting WorkKeys software. Representatives from the College have expressed interest in linking WorkKeys' literacy skills to skill standards. The City Colleges of Chicago are also becoming a regional WorkKeys Center.

- The South Metropolitan Regional Leadership Center is convening a committee of representatives from five high schools, Prairie State Community College, and Governor State University to research current training programs and to design and

establish a manufacturing training system among the partners. Working cooperatively with this group may prove beneficial for both efforts.

- The Illinois Institute of Technology and the Manufacturing Technology Center now have a "2+2+2" program that links workforce education including two years in high school, two years in community college, and two years in a four-year educational institution.

8. Launch a Public Relations and Education Campaign to Promote Manufacturing: One of the common themes emerging from research, focus groups, and interviews has been the fact that manufacturing is generally viewed in a negative light by most people: manufacturing jobs are seen as dirty, dead-end, and part of a dying sector of the nation's economy. Many parents, guidance counselors, and teachers — particularly in the African American and Hispanic communities — see a career in manufacturing in terms of the historic tendency to track students of color into menial jobs, and as a negative option for their children or students. Often manufacturing suffers from being counterposed to high-tech, with high-tech depicted as absolutely good and manufacturing depicted as absolutely bad. Many people think of manufacturing careers as suitable only for those of lower intelligence.

The reality, of course, is very different. Although there are low-end jobs in the field, the modernization of manufacturing and its increasing reliance on skilled teamwork has created a very different work environment offering important opportunities for those with the skills and ambition to take advantage of them. The image of manufacturing is sorely in need of an overhaul, and indeed there is little likelihood of successfully implementing a comprehensive workforce development system without rallying public opinion behind the idea that careers in manufacturing have much to offer.

A coordinated, multi-year public relations and education campaign is needed. It should be designed to address three distinct audiences: policymakers and opinion-shapers, including elected officials, industry leaders, community leaders, and the media; parents and school and community college officials, principals, teachers, and guidance counselors; and children in grades 6–12.

Activities could include:

- Developing an education campaign including academic studies, articles, and events directed at policymakers and elected officials;.

- Initiating a multi-media campaign and educational materials directed at parents, school officials and teachers, augmented by tours of modern manufacturing facilities, in-school workshops, and manufacturing workers' participation in career fairs and career days;

- Convening public meetings in the region to discuss and debate the issues. Of particular importance are forums on manufacturing and race, involving residents,

community leaders, workers, union leaders, and others in grappling with problems whether real or perceived.

While the campaign should target messages and materials tailored to the needs of the different audiences, it will need to address several broad themes. Manufacturing should be depicted as what it is: essential to the 21st-century economy; technologically advanced and generally clean and healthful; and capable of providing career paths leading to good-paying, interesting jobs grounded in lifelong learning and advancement. At the same time, manufacturing's historic weaknesses — including racial discrimination — must not be papered-over. They need to be creatively and candidly addressed.

This ambitious campaign should call upon the talents of our region's best educators, journalists, advertising agencies, and marketing firms. Potential partners could include the key workforce development institutions represent on our advisory committee, industry associations, and area advertising and marketing firms. The very substantial costs of this campaign (on the order of more than $1 million per year for several years) should be as widely shared as possible. Efforts to mitigate costs by donating services should of course be encouraged, but it should be recognized at the outset that this is a vitally important investment that must be funded accordingly.

9. Launch the Work Illinois Policy Initiative: Several of our partners in the Advisory Committee including the Chicago Jobs Council, Chicago Association of Neighborhood Development Corporations, the Policy Research and Action Group, Council for Adult and Experiential Learning, the Jane Addams Resource Corporation, and the other organizations in the Regional Manufacturing Collaborative have been engaged in a sustained policy initiative to influence state policy on workforce development and industrial retention. This effort needs to be expanded with the new strength of the Advisory Committee and the Illinois State Federation of Labor to ensure that adequate funds and support are extended to the various initiatives recommended in this report.

Our Third and Fourth Stages: Long-Term Objectives

Devising a plan for a comprehensive workforce development system is, above all, a humbling experience. We are acutely aware that an undertaking of this scope can succeed only if all of the stakeholders — Work Chicago and our partners and allies throughout the region — join together to tackle the task of making major changes in the status quo. These include:

1) Training urban educators in the needs and dynamics of manufacturing firms;

2) Promoting ongoing reform and investment in public schools and teachers;

3) Removing the barriers of discrimination in all aspects of the manufacturing economy including discrimination by employers, unions, educational institutions, and others;

4) Creating a broader cultural understanding of the value and character of work for the individual and society;

5) Building competencies and capacity among public organizations in the workforce development system, particularly those in underserved areas;

6) Creating an independent, respected system-wide certification agency that has the support of employers, labor, educators, and government;

7) Coordinating workforce training and education on a regional basis;

8) Designing a comprehensive policy agenda for federal and state government; and

9) Developing a popular consensus on the need for lifelong learning and a variety of complementary education programs available to the public.

This is a daunting list — and it could become nothing more than a wish-list unless it is coupled with a determined and sustained commitment to bring about fundamental change in our current system. What we have learned over the past 18 months, however, is that there is broad frustration with the status quo and widespread agreement on the need to improve on it. We believe that Chicago and Cook County have the resources to develop a world-class workforce development system. The question now is whether we have the will. On that point, too, we are optimistic.

Conclusion

"Make no little plans," said the great Chicago architect Daniel H. Burnham a century ago, warning that they have no magic to stir the blood. "Make big plans, aim high in hope and work," Burnham urged. We need to take his cautionary words to heart.

In the course of our research, interviews, and exchanges with workforce development practitioners in Chicago and around the country, we frequently heard: "You're on the right track, but you really can't change the system." Then, more often than not, the provider — or educator or philanthropist or union leader or employer — would argue, in effect, for the wisdom of settling for a piecemeal approach.

Without detracting from the value of doing what one can with the resources at hand, we have become convinced that nothing less than true systemic change is required if Chicago and Cook County are, first, to maintain — let alone improve — our position in both the domestic and international economy and, second, to meet the employment needs of those who live here.

Given the rapid changes taking place, no undercapitalized or underinspired effort in one or two schools, or one or two communities, or four or five companies, is going to be enough to offset the forces of stagnation and deterioration. Nor will such efforts have the opportunity to gradually expand in the luxury of a stable economic environment. In our view, we have no real choice other than to overcome the fragmented, small-scale efforts that characterize Chicago's workforce development field.

We are also convinced that the time is right. We believe that the major stakeholders — including employers, labor organizations, school and community college systems, local governments, community-based organizations, and certainly the public — are much more ready for systematic change than would have been the case even a few years ago.

There have been changes in leadership in Chicago's public schools and city colleges, and anyone in a position of leadership today — in public office and private corporations, in unions and trade associations, in education or the investment community — knows that something dramatic has to happen if we are to reverse the trends that have brought us to an increasingly vulnerable economic position. We found weariness and cynicism, to be sure, but we also found (often in the same people) a pragmatism and a willingness to consider new options if they are grounded in solid research and reasonably presented.

That is what we have tried to do in this report. We believe, and we hope we have demonstrated, that a comprehensive career path system can be created and that it will open up exciting new opportunities for the people of our region. We look forward to taking the next steps — making no little plans, and aiming high in hope and work.

IV. Appendices

Organization of Appendices:

I. Tables supporting the Identification of Industry Clusters

II. The printing industry reports, nature of career path

III. Food industry skill cluster descriptions

IV. Employer focus groups and interviews, including:
- J.I.I. Manufacturing
- U.S. Gear
- Chicago Metal Rolled Products
- Abbey Metals
- Allied Metal
- Best Metals
- Chicago Turnrite Company
- Midland Metals
- Focus group at Culligan
- Focus group at Calumet Area industrial council
- Focus group at Nabisco
- Focus group at Ampere Automotive

V. Employer survey write-up

VI. Employee focus groups write-up

VII. Training Provider Database summary

VIII. European Observations

IX. Glossary

X. Contact list

Appendix I

TABLES SUPPORTING IDENTIFICATION OF INDUSTRY CLUSTERS

Table I-1
Projected Employment Change Over 10 Years, Cook County and U.S.
Cook County 1996 to 2006, U.S. 1998 to 2008[1]

SIC	Industry	Cook	U.S.	Cook compared toU.S.
201	Meat Products	1.5%	14.9%	-13.4%
203	Preserved Fruits and Vegetables	4.6%	-5.8%	10.4%
205	Bakery Products	3.1%	-4.9%	8.0%
206	Sugar and Confectionery Products	1.8%	-3.9%	5.7%
208	Beverages	2.4%	-9.6%	12.0%
209	Miscellaneous Foods and Kindred Products	9.1%	10.5%	-1.4%
271	Newspapers	-3.4%	-9.6%	6.2%
272	Periodicals	1.5%	8.3%	-6.8%
273	Books	0.4%	9.4%	-9.0%
274	Miscellaneous Publishing	0.4%	7.2%	-6.8%
275	Commercial Printing	0.4%	0.0%	0.4%
278	Blankbooks and Bookbinding	-1.6%	-3.0%	1.3%
344	Fabricated Structural Metal Products	3.4%	8.3%	-4.9%
345	Screw Machine Products, Bolts, Nuts	-0.9%	-2.0%	1.1%
346	Metal Stampings	-0.3%	-3.0%	2.7%
347	Metal Services, Nec	8.9%	13.8%	-4.9%
349	Miscellaneous Fabricated Metal Products	3.8%	3.0%	0.8%
354	Metalworking Machinery	-3.5%	-7.7%	4.2%
355	Special Industry Machinery	-0.0%	4.1%	-4.1%
356	General Industrial Machinery	1.1%	1.0%	0.1%
357	Office, Computing Machinery	3.0%	-3.0%	6.0%
359	Miscellaneous Machinery, Except Electrical	7.3%	3.0%	4.2%
361	Electric Distributing Equipment	0.5%	-15.8%	16.3%
362	Electrical Industrial Apparatus	-0.8%	-20.8%	20.0%
364	Electric Lighting and Wiring Equipment	1.8%	-14.0%	15.9%
366	Communication Equipment	6.6%	7.2%	-0.6%
367	Electronic Components and Accessories	12.3%	24.3%	-12.1%
371	Motor Vehicles and Equipment	-3.6%	-4.9%	1.3%

[1] Derived from U.S. Department of Labor, Bureau of Labor Statistics, "Industry Output and Employment Projections to 2006," *Monthly Labor Review*, November 1997 and Illinois Department of Employment Security, Economic Information and Analysis Division, "Employment Distribution and Employment Change by Occupation 1996-2006," unpublished computer runs.

Table I-2
Relative Importance of Leading Cook County Manufacturing Industries[2]

SIC	Industry	Cook 96 % of Mfg	U.S. % of Mfg	Relative Importance
201	Meat Products	1.6%	2.6%	63.3%
203	Preserved Fruits and Vegetables	1.1%	1.3%	86.2%
205	Bakery Products	2.6%	1.1%	227.3%
206	Sugar and Confectionery Products	2.3%	0.5%	429.0%
208	Beverages	1.1%	1.0%	113.2%
209	Miscellaneous Foods and Kindred Products	0.9%	1.0%	93.9%
271	Newspapers	2.1%	2.4%	87.5%
272	Periodicals	1.6%	0.7%	229.8%
273	Books	1.3%	0.7%	195.0%
274	Miscellaneous Publishing	1.1%	0.5%	225.4%
275	Commercial Printing	4.0%	3.1%	131.2%
278	Blankbooks and Bookbinding	1.2%	0.4%	328.7%
344	Fabricated Structural Metal Products	1.5%	2.4%	62.6%
345	Screw Machine Products, Bolts, Nuts	1.6%	0.5%	290.4%
346	Metal Stampings	3.0%	1.4%	221.4%
347	Metal Services, Nec	1.7%	0.7%	230.5%
349	Miscellaneous Fabricated Metal Products	2.3%	1.4%	169.4%
354	Metalworking Machinery	3.4%	1.9%	181.3%
355	Special Industry Machinery	1.0%	1.0%	108.2%
356	General Industrial Machinery	1.6%	1.4%	111.8%
357	Office, Computing Machinery	1.1%	1.4%	80.6%
359	Miscellaneous Machinery, Except Electrical	2.1%	1.9%	111.8%
361	Electric Distributing Equipment	1.2%	0.4%	277.0%
362	Electrical Industrial Apparatus	1.2%	0.8%	137.8%
364	Electric Lighting and Wiring Equipment	2.5%	1.0%	259.4%
366	Communication Equipment	5.4%	1.5%	368.1%
367	Electronic Components and Accessories	4.2%	3.3%	126.8%
371	Motor Vehicles and Equipment	2.1%	5.2%	39.4%

[2] Derived from U.S. Department of Labor, Bureau of Labor Statistics, "Industry Output and Employment Projections to 2006," *Monthly Labor Review*, November 1997 and Illinois Department of Employment Security, Economic Information and Analysis Division, "Employment Distribution and Employment Change by Occupation 1996-2006," unpublished computer runs.

Table I-3
Projected Change in Productivity for Selected Cook County Industries
1998 to 2008[3]

SIC	Industry	% Change Productivity
201	Meat Products	0.3%
203	Preserved Fruits and Vegetables	1.5%
205	Bakery Products	0.4%
206	Sugar and Confectionery Products	1.0%
208	Beverages	2.5%
209	Miscellaneous Foods and Kindred Products	-0.1%
271	Newspapers	-0.4%
272	Periodicals	-0.1%
273	Books	0.8%
274	Miscellaneous Publishing	1.9%
275	Commercial Printing	1.5%
278	Blankbooks and Bookbinding	-1.6%
344	Fabricated Structural Metal Products	-0.1%
345	Screw Machine Products, Bolts, Nuts	0.8%
346	Metal Stampings	1.7%
347	Metal Services, Nec	3.9%
349	Miscellaneous Fabricated Metal Products	2.8%
354	Metalworking Machinery	2.8%
355	Special Industry Machinery	3.9%
356	General Industrial Machinery	3.3%
357	Office, Computing Machinery	14.8%
359	Miscellaneous Machinery, Except Electrical	3.3%
361	Electric Distributing Equipment	4.5%
362	Electrical Industrial Apparatus	5.6%
364	Electric Lighting and Wiring Equipment	3.1%
366	Communication Equipment	7.3%
367	Electronic Components and Accessories	8.5%
371	Motor Vehicles and Equipment	2.0%

[3] U.S. Department of Labor, Bureau of Labor Statistics, *Monthly Labor Review*, November 1999.

Appendix II

THE PRINTING INDUSTRY

The Nature of the Printing Industry

The printing industry produces many different types of products. These include customized orders for business clients, newspapers, magazines, books, labels, postcards, greeting cards, and many other types of goods.

The industry can be broken up into a number of different sub-industries that each produce substantially different types of products. These include newspapers, books, commercial printing, blankbooks, and miscellaneous printing. The largest sub-industry is commercial printing. These establishments produce catalogs, advertisements, and various printed materials for businesses. The second largest sub-industry is newspapers.

There are three basic stages of the printing process: *pre-press*, which is the preparation of materials for printing, *press***,** which is the actual printing process, and *post-press* or finishing, which is the folding, binding and trimming of printed materials into final form. There are a number of different technologies that can be employed in each of these three stages. During the last two decades, all three of these stages have been affected by rapid changes in the technology of printing. Computers have had the greatest impact on the pre-press stage of production. Computerized production of complete documents, including the layout of graphics and text, has replaced the traditional methods of cutting and pasting.

The printing industry remains one of the mainstays of Cook County's manufacturing sector. Overall, printing industry companies employed 49,028 people in the county as of the year 2000. The observant reader might note that this number is somewhat higher than the sum of the 1996 employment in the printing industry in Table 2 found in Chapter 2. Regrettably, this is not due to industry growth but rather to the fact that this appendix includes *all* sub-industries, whereas the table in Chapter 2 is limited to the *six* sub-industry segments employing over 1000 workers and expecting to need significant numbers of new and replacement workers. The printing industry employs the third most people of any manufacturing industry in the county, behind only Electronic Machinery and Fabricated Metals.[4] 12.4% of the total manufacturing work force in Cook County works in the printing industry.

The total number of people employed in the printing industry has been declining for the last decade. In the middle of the 1990s, the printing industry's share of Cook County manufacturing also declined. However, as the following table illustrates, this decline has been approximately proportional with the overall decline in manufacturing for the last few years.

[4] Illinois Department of Employment Security, *Where Workers Work.*

Printing Industry Share of Manufacturing Employment in Cook County, 1990-2000[5]

Year	Printing Industry Employment	All Manufacturing Employment	Printing Industry % of Manufacturing Employment
1990	63,629	470,616	13.5%
1991	61,330	448,546	13.7%
1992	57,610	423,025	13.6%
1993	58,674	427,185	13.7%
1994	57,163	430,935	13.3%
1995	56,189	432,274	13.0%
1996	55,245	430,472	12.8%
1997	53,682	427,595	12.6%
1998	52,414	423,285	12.4%
1999	50,184	403,154	12.4%
2000	49,028	396,160	12.4%

As the above table illustrates, the printing industry's share of manufacturing employment declined steadily from 1994 to 1997. However, in the late 1990s, the printing industry's share of Cook County manufacturing employment has stabilized. While there has continued to be a decline in the absolute number of workers employed in the industry, this decline has slowed. After a decade of decline, the printing industry continues to be a major source of manufacturing employment in Cook County. We can expect that it will continue to be one into the future.

The last decade was one in which printing industry employment was adversely affected by numerous technology changes. The increase in desktop publishing and various types of in-house publishing by firms that once were clients of the printing industry has reduced demand. At the same time, those same technologies have increased printing industry productivity. These technologies have also replaced many of the traditional skills of the printing industry with newer, computer related skills. All of this has led to a transformation of the industry in the last decade.

The future for the printing industry, however, looks bright. The overall demand for its products remains high and stable. Old skills have been largely replaced with new ones, and this means that new opportunities are opening up for workers seeking to enter the industry. In addition, as current workers leave the workforce or change industries, their positions will open up to new workers. This replacement rate was calculated by the U.S. Department of Labor, Bureau of Labor Statistics to be 2.2 percent a year for precision production, craft and repair occupations, and 2.3 percent a year for operators, fabricators

[5] *Ibid.*

and laborers. Including this replacement rate with the absolute job growth in the industry, there will be considerable employment opportunities for new workers in the industry.

The Illinois Department of Employment Security made projections of employment in the printing industry up to the year 2006. They predict that total employment in the industry in Cook County will grow at a 1.3 percent annual rate in the coming years. If this is accurate, approximately 1100 additional jobs will be created in the printing industry in Cook County for each of the next five years. 630 of these jobs will be production, or blue collar positions. If we balance the fact that the decline in Cook County printing industry employment has been slowing for the last three years with the IDES prediction that it will slowly increase in the future, it is safe to say that the printing industry overall is a stable employer in Cook County.

The same report predicts that manufacturing employment over all will also be stable in Cook County over the same period. The printing industry should therefore continue to employ over twelve percent of the manufacturing workers in Cook County for the foreseeable future.

Why Printing Firms Continue to Locate in Chicago

There are a number of reasons why Chicago remains an important production center for the printing industry. First of all, Chicago has a large number of advertising and other firms that act as the clients of the printing industry. This gives those printing firms located in Chicago the advantage of being able to have face-to-face contact with their customers. According to a survey conducted by the Center for Urban Economic Development at the University of Illinois at Chicago in 1988, most printing industry executives place a premium on face to face contact with their customers. There is no reason to believe that has changed over the last thirteen years.

A second advantage that Chicago brings to the printing industry is access to labor. Chicago has historically been a center for the industry. For this reason, it already has a large pool of skilled and experienced workers in the industry. As this report will illustrate below, there remain many job categories in the printing industry that require a relatively high degree of specialization. Also, while many technological changes have affected the industry in the last few decades, many of these new procedures are based on old skills. In addition, since Chicago already has a large number of printing workers, many of these workers receive training in the new technologies as they are introduced.

A third advantage is that Chicago is home to many suppliers of paper, ink and equipment. This makes it easier for industry representatives to consult with their suppliers when they are implementing new technologies. It also makes it easier for them to get the supplies they need quickly and at a reasonable cost.

Of course, these general factors are different for each branch of the industry. The newspaper industry, for example, is dominated by those firms that produce directly for the Chicago market, such as the Tribune, the Sun-Times and the Herald. These companies have a clear interest in remaining within the county. For other firms, which produce books and periodicals for a national market, the location might be less important.

Nonetheless, Cook County continues to bring certain important advantages to printing firms willing to locate within its borders. These advantages are relatively stable factors, and should continue to attract and retain a high share of the nation's printing production to the city.

Analysis of Job Categories

There are six different major sub-industries within the overall category of printing. These are Newspapers, Periodicals, Books, Miscellaneous Publishing, Commercial Printing and Blankbooks and Bookbinding. We chose to focus our occupational analysis on those occupations that employ at least 100 workers in at least one of these sub-industries. These occupations were defined by the IDES, and are used in their employment projections. The table below shows the thirty different production and technical job categories that have over 100 workers in at least one of the sub-industries.

Occupations in the Printing Industry

Occupation title	Workers	Percent of Total
First Line Supervisors, Production	588	3.7%
Industrial Machinery Mechanic	129	0.8%
Job Printers	273	1.7%
Electronic Pagination System	885	5.5%
Camera Operators	124	0.8%
Strippers, Printing	131	0.8%
Platemakers	279	1.7%
All other Precision Printing	100	0.6%
Offset Lithographic Press Operators	870	5.4%
Letterpress Operators	110	0.7%
All Other Printing Press Setters	192	1.2%
Screen Printing Mach Setters	132	0.8%
Bindery Machine Setters	1,549	9.7%
All other Printing, Setters	103	0.6%
Printing Press Machine Operators	1,777	11.1%
Photoengraving and Lithographic Operators	217	1.4%
Bindery Machine Operators	1,101	6.9%
All other Printing, Binding	544	3.4%
Cutting and Slicing Mach Operators	270	1.7%
Packaging and Filling Mach Operators	148	0.9%
All Other Assemblers and Fabricators	709	4.4%
All Other Hand Workers	113	0.7%
Truck Drivers, Light	586	3.7%
Industrial Truck and Tractor	486	3.0%
Conveyor Operators & Tenders	742	4.6%
All Other Trans Mat Moving	249	1.6%
Machine Feeders and Offbearers	883	5.5%
All Other Freight, Stock Handlers	487	3.0%
Hand Packagers and Packagers	1,420	8.9%
All other Helpers, Laborers	830	5.2%
Totals	**16,027**	**100.0%**

These job categories can be grouped in a number of different useful ways. The first way is by the importance of the printing industry to the given job category. There are some job categories that are relatively specific to the printing industry, such as Bindery Machine Operators, of whom 95.9 percent work in the printing industry. There are others that are less specific to the printing industry, such as Packaging and Filling Machine Operators. Only 1.3 percent of the Packaging and Filling Machine Operators in Cook County work in the printing industry. Obviously, any changes in the printing industry will more seriously affect those job categories in the first group than those in the second. The printing industry employs 12.4% of Cook County's manufacturing workforce. 9,648, out of the total of 16,027 workers in the above categories, work in job categories that have more than 12.4 percent of the their workers employed in the printing industry. The printing industry employs a higher share of these workers than its total share of Cook County manufacturing employment. This is 60.2 percent of the total.

Another useful way these job categories can be grouped is by whether they are expanding or contracting. The introduction of new technologies over the past few decades, including desktop publishing and other computer related technologies, has shifted the industry's labor needs. Older skills, such as Photoengraving and Lithographic operators, are less in demand, while demand for computer related skills like Electronic Pagination System is growing. Overall, twenty-two of the above categories are expected to grow, three are expected to be stagnant, and five are expected to shrink. Of the twenty-two that are predicted to grow, eleven are expected to grow at a rate faster than the 1.3 percent overall rate. A high percentage of the new jobs available in printing in the coming years will be in these eleven job categories. This is demonstrated more fully below in the table titled Jobs Available Annually in Printing Industry Occupations.

Finally, these job categories can be grouped according to the training and education required to perform them. Many printing industry jobs, such as Hand Packagers and Packagers, require little or no training. Others, such as Job Printers, require much more specialized training. The National Occupational Information Network (O*NET) developed a classification system for the amount of training necessary in a given occupation. These classifications range from Job Zone One, or positions that require little or no preparation, to Job Zone Five, or positions that require extensive preparation. The following table shows the O*NET Job Zone classifications of the different printing industry occupations.

Training Requirements for Printing Industry Occupations

Occupation title	O*NET Zone
First Line Supervisors, Production	3
Industrial Machinery Mechanic	3
Job Printers	5
Electronic Pagination System	4[6]
Camera Operators	4
Strippers, Printing	4
Platemakers	3
All other Precision Printing	2
Offset Lithographic Press Operators	1
Letterpress Operators	3
All Other Printing Press Setters	NA[7]
Screen Printing Mach Setters	3
Bindery Machine Setters	2
All other Printing, Setters	NA
Printing Press Machine Operators	1
Photoengraving and Lithographic Operators	2
Bindery Machine Operators	1
All other Printing, Binding	NA
Cutting and Slicing Mach Operators	1
Packaging and Filling Mach Operators	1
All Other Assemblers and Fabricators	NA
All Other Hand Workers	NA
Truck Drivers, Light	1
Industrial Truck and Tractor	1
Conveyor Operators & Tenders	1
All Other Trans Mat Moving	NA
Machine Feeders and Offbearers	1
All Other Freight, Stock Handlers	NA
Hand Packagers and Packagers	1
All other Helpers, Laborers	1

[6]There is no O*NET job category corresponding precisely with Electronic Pagination System. The closest job category description is for Desktop Publishing, which O*NET puts in Zone 4.

[7]Most of the "All Other" job categories contain many different jobs with different skill levels, so it is not possible to classify them in one Job Zone.

If we discount those categories for which one Job Zone classification was impossible, eleven occupations are in Zone One and twelve are in Zone Two or higher. Those jobs in Zone One employ 9,113 workers, while those in Zone Two or higher employ 4,517. 2,397 people work in occupations for which no Job Zone classification was possible. Overall, there are approximately twice as many workers employed in occupations requiring little training as there are in those jobs that require substantial training.

Where the Printing Industry is Going

We compared these same employment categories to data from the Illinois Department of Employment Security that projected employment totals for the year 2006 and calculated the average annual job growth in each job category. We added a 2.3 percent annual replacement rate to those numbers to arrive at a forecast of the total number of jobs available annually in each job category.

Jobs Available Annually in Printing Industry Occupations

Occupation Title	Forecast Annual Growth	Annual Replacements	Jobs Available Annually	Percent of Current Jobs Available Annually
First Line Supervisors, Production	1	14	15	2.6%
Industrial Machinery Mechanics	1	3	4	3.1%
Job Printers	2	4	6	2.2%
Electronic Pagination System	56	13	69	7.8%
Camera Operators	-2	2	0	0.0%
Strippers, Printing	-17	2	-15	-11.5%
Platemakers	-4	4	0	0.0%
All other Precision Printing	0	1	1	1.0%
Offset Lithographic Press Operators	7	13	20	2.3%
Letterpress Operators	-4	2	-2	-1.8%
All Other Printing Press Setters	3	2	5	2.6%
Screen Printing Mach Setters	1	2	3	2.3%
Bindery Machine Setters	0	24	24	1.5%
All other Printing, Setters	3	2	5	4.9%
Printing Press Machine Operators	20	25	45	2.5%
Photoengraving and Lithographic Operators	-2	3	1	0.5%
Bindery Machine Operators	14	15	29	2.6%
All other Printing, Binding	7	7	14	2.6%
Cutting and Slicing Machine Operators	1	6	7	2.6%
Packaging and Filling Machine Operators	3	3	6	4.1%
All Other Assemblers and Fabricators	1	15	16	2.3%
All Other Hand Workers	3	1	4	3.5%
Truck Drivers, Light	11	8	19	3.2%
Industrial Truck and Tractor	9	10	19	3.9%
Conveyor Operators & Tender	6	19	25	3.4%
All Other Trans Mat Moving	6	6	12	4.8%
Machine Feeders and Offbearers	0	19	19	2.2%
All Other Freight, Stock Handlers	9	18	27	5.5%
Hand Packagers and Packagers	55	38	93	6.5%
All other Helpers, Laborers	26	29	55	6.6%
Totals	216	310	526	3.3%

The above table shows that while the printing industry as a whole is projected to show moderate growth, some job categories will grow much more than others, and some will even experience an absolute decline. For obvious reasons, those job categories that already employ a large number of workers will have more openings for replacements than those job categories that employ fewer people.

One trend that can be seen in the above data is that those job categories that are less skilled and usually less specific to the printing industry will have more jobs available than those that are more skilled and more specific. There will be 32 new jobs a year created through growth, excluding needed replacements, in those positions with an O*NET Job Zone classification of 2 or higher. Discounting the 56 new positions added annually for Electronic Pagination System, a relatively new computer related occupation, there will be a net loss of 24 jobs a year. The highly skilled, traditional printing jobs are either in decline or are stagnant. On the other hand, those occupational categories that require the least training will add 152 net jobs a year, excluding replacements.

This is partially the result of technology changes. Many of the older tasks are less relevant, both because they have been directly replaced with computers and because more of the preparation of printed material can be done by clients than was possible in the past. There has been a rise since the 1980s of in-house publishing, whereby client firms of the printing industry can produce their own camera ready materials. This means that fewer jobs are available in preparing materials for camera. Even within the printing industry, platemakers and strippers, for example, are being replaced by workers using computers. Many of the tasks performed by Electronic Pagination System workers would have been performed by a larger number of more specialized workers in the past.

Also, there are many job categories that are directly related to printing but for which the majority of positions exist outside the printing industry. A prime example of this is the category of Camera Operators. According the IDES, Camera Operators "operate process, line, halftone or color separation cameras and related darkroom equipment to photograph and develop negatives of material to be printed." Every worker who is put into the category of Camera Operator is working to prepare materials for printing. However, only 30 percent of Camera Operators in Cook County work directly for the printing industry. The growth of office technology means that more and more firms are able to produce their own small scale printing needs. It has also led to an overall increase in printing products that are produced by the economy as a whole. There are many workers who are not officially part of the printing industry, but whose job classifications are involved in printing. While it is beyond the scope of this study to make a numerical analysis of those workers, if they are taken into account, the weight of printing in the Cook County economy is even greater.

Training Needs for the Printing Industry as a Whole

Almost all occupations in the printing industry require at least a high school diploma. As the industry continues to become more computerized, computer skills will be increasingly

important for industry workers. General courses in electronics and computers are very useful for workers seeking to make a career in printing. In the past, specialized apprenticeship programs were necessary for many different occupations. Today, however, many more workers are trained informally on the job for their specific task.

Training Programs Available in the Printing Industry

There are four colleges in the Chicago area that offer programs in graphic arts. These are Kennedy-King College, Triton College, the College of DuPage and Chicago State University. Triton College and the College of DuPage are not in Cook County, but their graduates compete for jobs in the Chicago area, including within Cook County. There are a number of other schools that offer programs in graphic design, but those are usually four-year programs that prepare students for non-production jobs in a wide variety of industries, so they are not included in this study.

The College of DuPage Graphic Arts Technology program offers two-year Associates Degree programs and one year certification programs in three different printing related fields. These are Desktop Pre-press, Image Assembly and Press Operation. Each of these degrees prepares workers for a number of different job categories. The Desktop Pre-press and Image Assembly programs both prepare graduates for positions as Electronic Pagination System workers. All three programs prepare graduates for the different Printing Press Machine Operator and Setter positions. The Press Operation program would also prepare graduates for work as Bindery Machine Setters or Operators. It could also prepare workers for positions as Job Printers, though that job category includes a wide range of skills. Thus, this program prepares workers for the largest and fastest growing job categories that are specific to printing.

The Graphic Arts Institute of Technology at Triton College offers courses that could prepare a worker for an Electronic Pagination System position, or for any of the production jobs in printing. This program is tied to the Graphic Communications International Union Local 458-3M, which is located in Carol Stream. Workers currently in the union and already working in the field are offered the opportunity to attend the Triton College program for additional training. This training is often paid for by printing industry employers.

Kennedy-King College offers a certification program that is focused on preparing workers for all the different Printing Press Machine Operator positions. Chicago State University offers a Bachelors of Science degree in Industrial Technology that includes courses on photography, stripping, camera work, platemaking and offset press operations.

There are also graphic arts or graphic communications programs at four other schools in Illinois. These are Eastern Illinois University, Western Illinois University, Central Illinois University, and Illinois State University. While these schools are outside the immediate Chicago area, graduates from their programs are likely to look for positions in the Chicago area due to its weight in the printing industry in the state as a whole.

In addition, many workplaces offer on the job training programs for their workers. The length of on the job training varies depending on the position and shop. Many Press Operators, for example, begin as helpers and advance to press operators after training. This training period can vary from a few weeks to a few years, depending on the specific press and on the shop. Training is usually given under the supervision of a more experienced employee. On the job training, however, is often specific to the individual needs of the shop and does not necessarily prepare workers for positions in other establishments.

Also, as new technology is introduced, many current workers in the industry are trained to operate the new technology. When more advanced presses that incorporate more colors are introduced, for example, Press Operators that already know the basics of the job are often trained on the new, more productive machines.

Overall, the Chicago area offers numerous educational opportunities for workers interested in entering the printing industry. There is every reason to believe that these educational opportunities are sufficient to maintain a sufficient supply of skilled printing industry workers for the foreseeable future. However, that does not mean that these educational opportunities are optimal for those workers looking to make a career in the industry. The examination of Career Path Opportunities below will further examine this question.

Career Path Opportunities

The traditional career path in the printing industry has been largely disrupted by technology changes. The old career path would have a worker start as an apprentice helper in a shop. That worker might start as bindery worker moving paper from cutting machines to folding machines, or as a feeder on a press. They would then be trained how to operate more complicated machinery or perform a more specialized task. For instance, a press operator might learn how to do set up work that was more complicated. In smaller shops, workers in the past were often trained to do a variety of tasks. They might be trained in the entire range of pre-press occupations, including camera operating, stripping, typesetting and platemaking. This old career path, however, is largely closed to new workers. Those positions that remain in the old occupational categories are closely guarded, and most of those occupational categories are in decline. There is still the possibility of moving from a position as one type of press or binding operator or setter to another. There is also still the possibly getting promoted to supervisor. However, the old skilled crafts are by and large closed to new workers entering the industry.

However, the new technology introduced into printing has opened up new possible career paths. These paths have been opened in two ways. First, workers can be trained for the new computer related skills. Computer skills are more transferable than the old craft skills in the printing industry. This means that workers with a general training are more likely to find positions available and to advance. In addition, new technologies are

constantly being introduced. This means that the possibility of advancement exists for current printing industry workers able to learn the application of those new technologies.

These career paths could be improved if they were made clearer, and if training within the industry was more general. Most of the advancement possibilities within the industry are open to those workers with computer related skills. These skills need to be offered more widely to printing industry workers if the industry is to remain attractive to the workers it needs.

Career Path Analysis Of The Printing Industry

The importance of career ladders, or career webs, was made clear in the main body of this report. A career path schema was developed for the food and MME sectors that forms the centerpiece of our proposal to enhance manufacturing workforce development. The schema for those industry clusters utilized a particular methodology. In printing we utilized a different methodology to come up with a similar schema. This highlights a key feature of our proposal: it is an open system. While the overall principles remain the same, any industry segment can utilize industry specific data and methodologies to come up with a schema appropriate for their industry.

Printing is different in several key ways. First, in most industries, manufacturing technology has transformed tasks and therefore what people do on the shop floor but not the nature of the responsibilities of the shop as a whole. For example, all machining is still done in machine shops, even if by computer controlled machines from computer assisted designs. In printing, major shop floor functions have moved form being *production* functions to being *creative* functions. At one time the output of an artist or writer was transformed by production workers into plates for the press using a series of steps. Now the computer largely does that. In essence much blue collar work has become white collar work.

Second, in MME and food, production work and white collar work are closely linked. It is not at all unusual for executives to have started on the shop floor. Partly this is because the physical object produced is the real product, be it an automobile, a cracker, a piece of machinery or a cell phone. There is a strong connection between making and using the product and therefore designers, salesmen and managers can easily come from the ranks of production workers. In most printing production, the physical object is not the product in the same sense – typically it is the intellectual content that is the real product. Motorola makes cell phones, not conversations. The Tribune produces content that happens to come as ink on newsprint. There is therefore an unusual disconnect between the production process and the product. Writers and artists produce the real product, and the production process serves an intermediary role. In employment terms this means that a large percentage of workers in the industry have jobs producing content. Writers and editors rarely start in the pressroom.

Methodology

The printing industry career path analysis that follows serves as an example of the general applicability of the manufacturing career path system. This analysis is based on considerably less extensive research and knowledge than the career path system we developed for the MME sector. This analysis is meant to demonstrate that it is possible to develop similar career path systems for different industries, and that our basic format is flexible.

A particular weakness of this system is that it is based on data from O*NET and the Bureau of Labor Statistics. These sources often define job categories differently from the way they are actually defined in the industry. The Bureau of Labor Statistics job categories are very broad. One Bureau of Labor Statistics category often encompass many different jobs that are classified differently, paid differently, and require different amounts of skill. Our system is based on the Bureau of Labor Statistics and O*NET data, and as such, its categories and the skills that it points to are also quite broad.

We first established a system of four skill levels, which correspond to the number and mastery level of skills required for each type of job and its place on the occupational hierarchy. We then established a list of skills required for each level based on O*NET skill categories and data and on other sources on the printing industry, including training programs, the Printing Industry of Illinois and Indiana, and the Graphics Communication International Union. Based on this data, we were able to establish possible career paths through printing industry occupations.

Printing Industry Career Levels

The different occupations in the printing industry can be subdivided into four ranked levels. Skill level one includes those occupations which are not specific to the printing industry, and which require little training, such as Machine Feeders and Offbearers. Many of these occupations do require the same skills as occupations at higher levels, and could prepare workers for promotion to higher level occupations. Skill level two includes those occupations which are more specific to the printing industry, but which require little specialized training. These include basic printing press machine operators. Level three occupations involve more specialized and intricate operation and set-up of printing industry production machines. These include setters and set-up operators for different types of printing presses and bindery machines, and Electronic Pagination System workers. Level Four occupations are either highly specialized and skilled pre-press workers, such as Camera Operators and Job Printers, or more general highly skilled workers that are working in the printing industry, such as Industrial Machinery Mechanics.

These Levels correspond roughly to the Job Zone categories developed by O*Net for the U.S. Department of Labor. However, in many cases, the O*NET Job Zones do not reflect the relationship between different jobs. For instance, according to O*Net, Printing

Press Machine Operators, including Offset Lithographic Press Operators, rank in Job Zone One, the lowest skill level. O*NET ranks Offset Lithographic Press Setters and Set-up Operators in Job Zone Five, the highest skill level. These two occupations are closely related and involve many of the same skills and tasks, yet one is given the lowest Job Zone ranking and the other is given the highest. The difference in their Job Zone rankings reflects the varying degree of complexity and difficulty involved in operating different types of printing press machines and the inexactness of the job categories. Our Levels are also inexact, since there are many different types of printing industry tasks that could be described by the same basic occupational category. However, these Levels do serve to indicate the basic hierarchy of printing industry jobs.

The following lists show which occupational categories belong in each Level. We chose to focus our analysis on those occupations that employ at least 100 workers in Cook County in one of the printing sub-industries (Newspapers, Periodicals, Books, Commercial Printing, Miscellaneous Publishing, and Blankbooks and Bookbinding). Those occupational categories called "All Other" are excluded from this analysis.

Level One:
Packaging and Filling Machine Operators
Conveyor Operators and Tenders
Machine Feeders and Offbearers
Hand Packers and Packagers
Cutting and Slicing Machine Operators
Industrial Truck and Tractor Operators
Truck Drivers, Light

Level Two:
Bindery Machine Operators
Printing Press Machine Operators
Offset Lithographic Press Operators

Level Three:
Photoengraving and Lithographic Machine Operators
Letterpress Operators
Screen Printing Machine Setters
Bindery Machine Setters
Electronic Pagination System

Level Four:
Camera Operators
Strippers
Platemakers
Job Printers
Industrial Machinery Mechanics
First Line Supervisors

There are certain general skills that are required for most of the tasks within a given level. However, at levels three and four there are some fundamental divisions between different job categories that make it necessary to examine those categories specifically, and not just as a level. For example, First Line Supervisors and Industrial Machinery Mechanics are both highly skilled, but the specific skills needed to be a supervisor and a mechanic are very different. The following pages show what jobs fit under different levels, and what skills are required for those jobs.

Skill Level Descriptions

Skill Level One

I. General Description: Skill level one tasks are those that are not specific to the printing industry. Workers at this skill level need to have basic math and language skills, and awareness of the manufacturing process. There are different jobs at this skill level that require different skill levels. Some are closer to the Common Manufacturing Skills level in the MME Career Path analysis, while others might require only Employability Skills. What unites all of these occupations under one skill level is that they are general occupations that exist in many industries, and not exclusively or even primarily in printing.

II. Prerequisites: Basic communications skills and an established work ethic.

III. Job Participants Will Be Prepared For:

Job Categories
• Packaging and Filling Machine Operators • Conveyor Operators and Tenders • Machine Feeders and Offbearers • Hand Packers and Packagers • Cutting and Slicing Machine Operators • Industrial Truck and Tractor Operators • Truck Drivers, Light

IV. Skill Areas

Skill Areas	
Watch gauges, dials, or other indicators to make sure a machine is working properly	Apply safe work procedures
Control operations of equipment	Read instructions
Inspect and evaluate the quality of products	Listen and interpret oral instructions
Use hand tools appropriately	Job planning
Maintain clean work space	Work readiness

V. Performance Standard Types:

- Measurement, Materials, and Safety
- Operation of light trucks, forklifts

Skill Level Two

I. General Description: Skill level two workers operate production machines that are specific to the printing industry. These workers need to be able to monitor their machines, follow instructions, and learn how their machines work to be able to evaluate problems that arise.

II. Prerequisites: Skill level one skills.

III. Jobs Participants Will Be Prepared For:

Job Categories
• Bindery Machine Operators • Printing Press Machine Operators • Offset Lithographic Press Operators

IV. Skill Areas

Skill Areas	
Determine the kind of tools and equipment need to do a job	Determine what is causing an operating error and what to do about it
Perform routine maintenance	Conduct tests to determine whether equipment is operating as expected
Read instructions	Basic computer skills

V. Performance Standard Types

- Operate bindery or simple printing press machines, including offset lithographic presses.
- Adjust speed, temperature, inkflow, position and pressure tolerances of presses.
- Install printing plates, screens, rollers, stencils, type, dye and cylinders in machines.

Skill Level Three: Operators and Setters

I. General Description: Skill level three operators and setters operate more complicated presses and bindery machines than those used by skill level two workers. These workers need advanced equipment operations skills. In many cases, these workers have similar positions to workers in skill level two occupations, but they operate more complicated machinery. For example, they might operate a press that incorporates more colors and is therefore more difficult and complicated. These workers also required more specialized skills to operate their machines.

II. Prerequisites: Skill level two skills.

III. Jobs Participants Will Be Prepared For:

Job Categories
• Photoengraving and Lithographic Machine Operators • Letterpress Operators • Screen Printing Machine Setters • Bindery Machine Setters

IV. Skill Areas

Skill Areas	
Install equipment to meet specifications	Instruct others how to operate machines
Make minor repairs	Basic computer skills

V. Performance Standard Types

- Set-up and operate one or more of the following machines: Photoengraving (including plate graining, pantograph, roll varnishing and routing), Lithographic press, Letterpress (sheet or web), Screen Printing, or Bindery machines.
- Operate presses that incorporate multiple colors
- Understands whole press process, to evaluate and correct operations

Skill Level Three: Electronic Pagination System

I. General Description: Electronic Pagination System workers are increasingly replacing traditional skilled prepress workers. These workers produce and prepare entire publications on a computer before transmitting them to the press stage of production. They require a higher level of reading and writing skills than most other printing workers. These workers share many skills with white collar printing workers, such as desktop publishing.

II. Prerequisites: These positions require a high school diploma. Many also require a bachelor's degree.

III. Jobs Participants Will Be Prepared For:

Job Categories
• Electronic Pagination System

IV. Skill Areas

Skill Areas	
Create art from ideas	Use computer aided design software
Use graphic technology software	Use word processing software
Use desktop publishing software	Use Paper Characteristics In Publishing & Printing Processes
Perceive and apply color/balance/proportion in graphic and related production	Distinguish details in graphic production setting
Reading comprehension	Keyboard skills

V. Performance Standard Types

- Use a computer screen to call up type and art elements from computer memory and position them into a completed page, using knowledge of type styles and size and composition patterns. The completed page is then transmitted for production into film or directly into plates.

Skill Level Four: Prepress Occupations

I. General Description: Skill level four prepress occupations include the traditional skilled printing occupations that are performed prior to the press stage of production. These occupations require a high degree of skill and training. They include camera operators, job printers, strippers, and platemakers. Each of these occupations requires its own, highly specialized skills. All of the traditional prepress occupations are declining rapidly, however, because of the increase of computer based prepress operations (electronic pagination systems).

II. Prerequisites: Many of these positions require an associates or bachelor's degree, or some formal vocational training. Extensive experience, sometimes up to five years, is also required. They also require skill level three operator and setter skills.

III. Jobs Participants Will Be Prepared For:

Job Categories
• Job printers • Camera Operators • Strippers • Platemakers

IV. Skill Areas

Skill Areas	
Analyze needs and product requirements to create a design	Reading comprehension
Use logic and analysis to identify the strengths and weaknesses of different approaches	Read and apply blueprints/art layouts
Mathematics skills to determine proportions and layout of text and graphics	Operate and adjust camera equipment
Photography related chemistry knowledge	

V. Performance Standard Types

- Job printers set type according to copy, operate a press to print a job order, read proof for errors and clarity of impression, and correct imperfections.
- Camera operators operate process camera and related darkroom equipment to photograph and develop negatives of material to be printed.
- Strippers cut and arrange film into flats (layout sheets resembling a film negative of text in its final form) which are used to make plates. They prepare separate flats for each color.
- Platemakers produce printing plates by exposing sensitized metal sheets to special light through a photographic negative.

Skill Level Four: Industrial Machinery Mechanics

I. General Description: Industrial Machinery Mechanics need an extensive knowledge of the production process and knowledge of how to repair the machines used in that process. These workers need a working understanding of electronic circuitry, hydraulic systems, pneumatic systems, mechanical functions, and machine controls, whether manual or computer controlled. They also need a group of specialized skills gained from working on specialized printing machines.

II. Prerequisites: Skill level three operator and setter skills. These positions require apprenticeship training or substantial on the job training.

III. Jobs Participants Will Be Prepared For

Job Categories
• Industrial Machinery Mechanics

IV. Skill Areas

Skill Areas	
Programmable Logic Controls	Problem solving
Automation controls	Schematic drawings and exploded layouts
Power transmissions and mechanical systems	Assembly drawings
Advanced industrial controls	Vibration
Basic electricity	Growth of components
Fundamentals machine design	Motors
Motor controls	Time delays
Mechanical drives	Relays
Couplings	Effect of oxidation on lubricants
Frequency of fluids and filter changes	Catalytic effect of water on metals
Types of liquid filling machines	Metrology
Labeling equipment	Knowledge of Symbology
Uncasing, unscrambling and cleaning machines	Know computer operating systems
Gluing equipment and adhesives	Safe maintenance practices
Machine noise levels	Hazardous materials

V. Performance Standard Types

- Repair, install and adjust printing machines and equipment. This includes different types of machines depending on the shop.

Skill Level Four: First Line Supervisors

I. General Description: First line supervisors need to have an understanding of the entire production process. They also need to be able to communicate effectively with workers and management.

II. Prerequisites: Skill level three operator and setter skills if overseeing operators and setters, including those in skill levels one and two. Skill level three Electronic Pagination System skills if overseeing Electronic Pagination System workers. Skill Level Four Industrial Machinery Mechanic skills if overseeing Industrial Machinery Mechanics.

III. Jobs Participants Will Be Prepared For:

Job Categories
• First Line Supervisors

IV. Skill Areas

Skill Areas	
Reading comprehension	Speaking with others to effectively convey information
Time management of self and others	Communicating effectively with others in writing
Developing approaches for implementing an idea	Motivating and directing people as they work
Identifying the best people for a job	Obtaining and seeing to the proper use of equipment

V. Performance Standard Types

- Supervise and coordinate the activities of production workers.

Career Paths

The above analysis shows what skills are required for each basic occupational level in the industry. Obviously, there are many specific skills required for each higher level occupation that a lower level occupation would not prepare a worker for. Higher levels might also require a more advanced level of application for the same skills. However, the basic skills are consistent from one level to the next.

We used the skill analysis above to indicate possible Career Paths within the industry. There are a number of different possible Career Paths within the printing industry. These conform partially to the division of the industry into pre-press, press, and post-press tasks. There are also slightly different paths for workers in each of the six subdivisions of printing, Newspapers, Periodicals, Books, Miscellaneous Publishing, Commercial Printing and Blankbooks and Bookbinding. We have indicated below which occupations a worker at a given level might aspire to, given the skills they already possess.

Level One to Level Two:

All Level One occupations except Light Truck Drivers and Industrial Truck and Tractor Operators prepare workers for all Level Two occupations. These two levels share most core skills.

Level Two to Level Three:

Bindery Machine Operators are best prepared to become Bindery Machine Setters. Printing Press Machine Operators, including Offset Lithographic Press Operators, are best prepared to become operators of more complicated and/or specialized printing press machines. This includes Photoengraving and Lithographic Press Operators, Letterpress Operators, or Screen Printing Machine Operators. In addition, there are certain types of Offset Lithographic Press Operators that fit more appropriately into Level Three than Level Two, and those workers already familiar with less complicated machines are best prepared to work on more complicated machines of the same basic type. All Level Two occupations train workers for many of the same skills required for Level Three Occupations.

Electronic Pagination System workers require more specific training. However, many of the same skills required for Level Two occupations are also required for Electronic Pagination System. In addition, a basic familiarity with the printing process will be beneficial for new Electronic Pagination System workers.

Level Three to Level Four:

There is a greater gap between the skills required for Level Three occupations and those required for Level Four occupations. All Level Four occupations require specialized training. However, familiarity with a Level Three occupation would be very helpful for many Level Four occupations.

Electronic Pagination System is a method of performing many of the same pre-press tasks that can also be performed by more skilled and specialized workers in Level Four, such as Camera Operators, Strippers, etc. Electronic Pagination System workers are prepared in the basic concepts of pre-press work and are at a considerable advantage when learning Level Four pre-press occupations. While the specific tasks performed by those workers are different from those performed by Electronic Pagination System workers, many of the skills are the same.

Level Three Machine Setters and Operators are best prepared to become First Line Supervisors and Industrial Machinery Mechanics. Many of the skills required for Industrial Machinery Mechanics are the same as those required for Level Three occupations. In addition, workers who have performed Level Three Occupations are familiar with the machines they would need to maintain. In this case, however, the Level rankings are not entirely reliable. There are some Level Three Setters and Operators that are more highly trained, and more highly paid, than some Industrial Machinery Mechanics.

First Line Supervisors require somewhat different skills from those required for Level Three workers. These include a greater ability to coordinate the activities of many workers, and general communication skills. However, knowledge of the production process is also essential. Level Three workers are already highly skilled production workers, and are much better prepared to become supervisors of other production workers than workers from outside the industry.

Impact of Technology Changes on Career Paths

Technology changes in the printing industry have made many of the more highly skilled workers in the printing industry less necessary. However, these same technology changes have created new positions that rely on many of the same skills as the older occupations. In addition, the number of printing press machine operators and setters of various types is stable, and many of those positions still require a high degree of training and skill.

The basic changes that have taken place require that more workers learn basic computer skills. Newer presses incorporate computer technology. These changes do not alter the basic career paths in the industry; they simply change the skills necessary to advance from one level to the next. Current printing industry workers at a lower level are still the best candidates for open positions at a higher level.

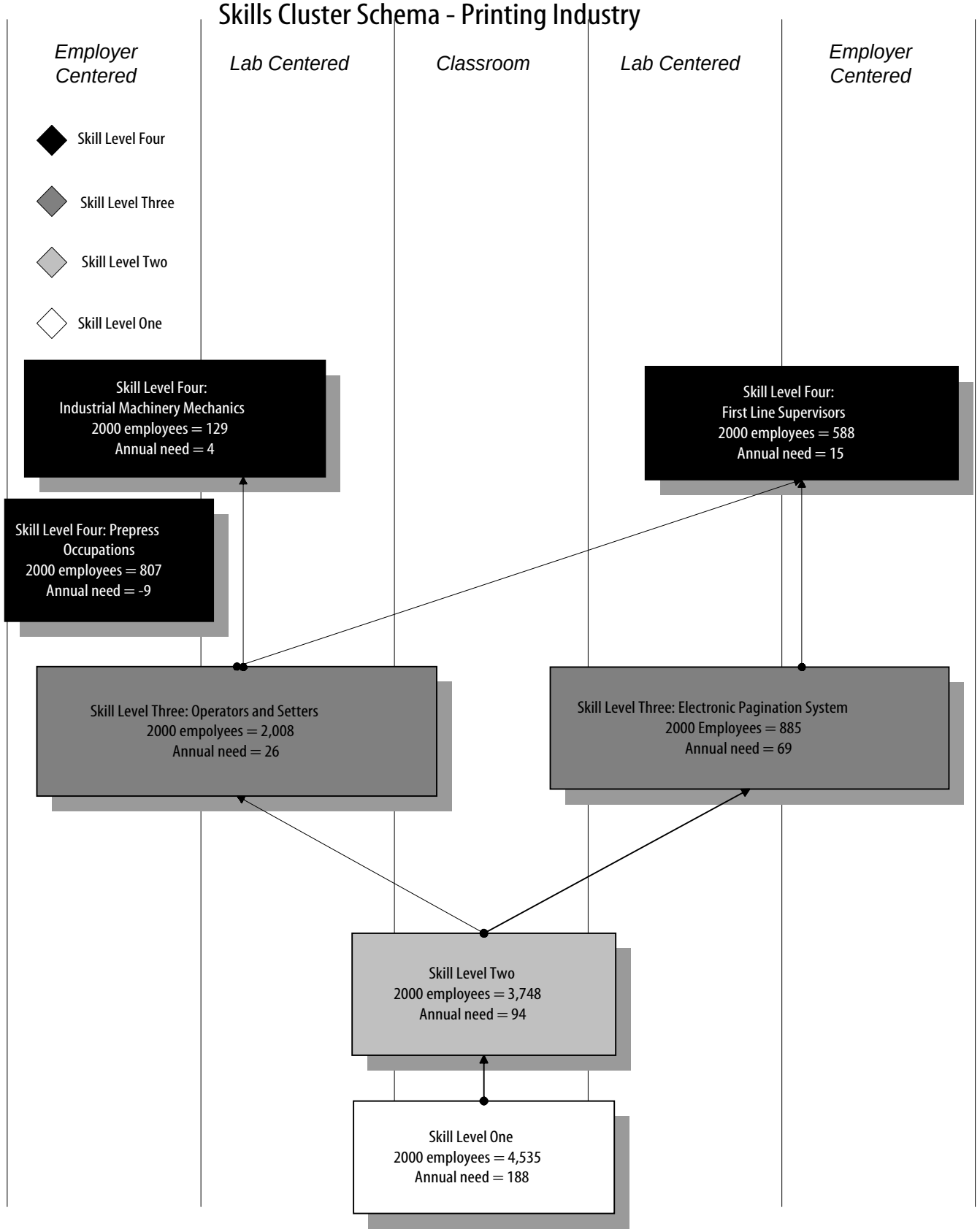
Conclusion

The career paths described above show what skills are transferable from one occupation to another. They show some possible paths that a worker might take to advancement in the printing industry. Three things are necessary in order to make these paths more

accessible to workers looking to enter the industry. First, these paths themselves need to be made clear to workers and to employers. Second, employers need to be encouraged to promote and train workers from within their own ranks to the higher skill level positions. Finally, sufficient training opportunities need to be made available, both to train workers for the specific tasks of the printing industry and for the more general skills that are useful to more than one occupation.

A career path schema follows.

Printing Career Paths
Skills Cluster Schema - Printing Industry



Appendix III

Food Industry Skill Clusters

The following appendix includes descriptions of food industry skill clusters. These skill clusters are arranged in the same way as the MME skill clusters. At the end of this appendix is a career path chart organized along the same lines as the MME and printing career path charts.

The food industry career path includes five different categories subdivided into two rankings. The two foundation level skills are Employability and Common Manufacturing. The three Core/Advanced skills are Quality Assurance One and Two, Machining, and Maintenance Levels One and Two.

Employability Skills

I. General Description

This skill cluster will cover basic communication - reading, writing, speaking and listening skills, basic math, and those skills that lead to an understanding of universal business practices and expectations. Participants will be involved in career planning activities and write resumes as well as participate in mock interviews.

II. Prerequisites

TABE scores of 5.0 in reading and math.

III. Jobs Participants Will Be Prepared For

BLS Job Clusters	Other Job Types
• Assemblers & Fabricators • All Other Hand Workers • Packing and Filling	• Material Handler • Cleaners and sweepers • Deliverers • Grinding, abrading, buffing, and polishing machine operators • Machine operators (simple)

IV. Skill Areas

Skill Areas	
Reading: • Comprehension skills.	Math: • Whole numbers, fractions, decimals, percent.
Writing: • Basic grammar. • Write multi-paragraphs pieces.	Communication: • Know employer expectations. • Work well in a team.
Speaking: • Mock interviews/ role play.	Business Planning: • Understand universal/ standard business practices.
Listening: • Follow directions.	Workforce Issues: • Understand rights and responsibilities.
Computer Skills: • Basic keyboarding/ data entry.	Sanitation/Food Safety • Understand basic sanitation practices

Common Manufacturing Skills: Manufacturing Processes

I. General Description

Entrance into manufacturing fields must combine basic math, language, and awareness of all manufacturing processes with theory related topics of safety, basic sanitation, metrology, and food characteristics and processing. Hands on experience with hand tools and at least one machine are necessary to create awareness and reduce fear of equipment for users new to food production machines. Experienced workers will develop proficiency on several machines, which will provide for advancement within this skill cluster and the basis for advancement to more advanced skill clusters.

II. Prerequisites

Read and write English at 7th grade level. Calculate math problems at 7th grade level. Follow directions and have an established work ethic (on time to class).

III. Jobs Participants Will Be Prepared For:

BLS Job Clusters	Other Job Types
• Cooking machine Operators Food • Roasting machine Operators/ Tenders • Furnace, Kiln, or Kettle Operators • Cutting & Slicing Mach Operators • Cleaning & Pickling Equip Operators • Extruding & Form Machine Operators/ Tenders	• Pouch Filling • Filling by Count • Labeling and Coding Operator • Bag Forming and Filling Operator • Wrapping Machine Operator • Cartoning Machine Operator

IV. Skill Areas

Addition, Subtraction, Division, and Multiplication of fractions, decimals, and Whole Numbers	Understand basic food safety and sanitation practices and implement basic procedures in Hazard Analysis and Critical Control Point (HACCP) plan including Food storage
Identify properties of various ingredients and foods	Maintain clean work space
Operate machines	Maintain tools
Read Instructions	Product inspection
Write Description of Hands-on Work	Work readiness
Explain Process Activities	Basic Baking/Food Science
Listen and Interpret Oral Instructions	Job Planning
Work with others to accomplish objective	Problem solving
Read standard and metric measurements	Identify and use basic tools and purpose
Read measurements on gauges	Be computer literate w/keyboard

V. Performance Standard Types

- Measurement, Materials, and Safety
- Job Planning, Bench Work Layout
- Use hand tools, including basic measuring devices
- Operate a food production machine

Machining: Skilled Food Workers

I. General Description

Machining skills are based on applied food chemistry, baking/cooking technology, print reading, , machine operation, machine set-up, safety, sanitation and food safety, and shop math such as temperature, filling rates, speeds and feeds. These trades persons have achieved proficiency in a variety of skills. Multiple job titles emerge from machining that includes machine operator, all-around machinist and machine setter, inspector and precision food workers such as artisan bakers.

II. Prerequisites

High School Diploma, Common Manufacturing Skills and Introduction to Machining

III. Jobs Participants Will Be Prepared For

BLS Job Clusters	Other Job Types
• Manufacturing Baker • Precision Food Worker • Food Batch maker	• Machine operator in maintenance department • Light maintenance on packaging machinery • Setter for various packaging machines • Setter for multiple food production machines

IV. Skill Areas

Read advanced prints and process diagrams	Calculate speeds & feeds and formulas for different products
Read and interpret corrective action reports	Compare tolerance with instrument reading
Write shift change instructions	Convert metric to standard (& visa versa)
Calculate mean and standard deviation	Interpret results of an X bar R chart
Identify and explain properties of ingredients	Set-up and operate machines
Explain and use Baking/Food Science including material properties and how different ingredients and techniques affect products	Identify use of specific machines and tools
Explain basic food safety and sanitation practices and be responsible for implementing procedures in HACCP plan including Food storage	Understand types & uses of cutting fluids, coolants, and lubricants (especially those used in food manufacturing.)
Troubleshoot equipment problems; Problem solve and find root causes	Use operating system to access software Keyboard skills

V. Performance Standard Types

- Set-up and operate two or more food production machines.
- Troubleshoot machining equipment. Set-up and troubleshoot packaging equipment
- Make adjustments to keep production lines moving and within product specification guidelines.
- Read prints and process specifications.

Machine Maintenance, Building, and Repair (Levels I and II)

I. General Description

The maintenance, building, and repair profession has a working understanding of electronic circuitry, hydraulic systems, pneumatic systems, mechanical functions, and machine controls, whether manual or computer controlled. In the Food Industry, the profession must also integrate basic sanitation and compliance with HACCP plans. The machine maintenance and repair professionals use the foundation of machining with advanced understanding of electricity, electronics, hydraulics, and pneumatics, computer programming and a group of specialized skills gained from working on specialized machines. From an initial foundation of basic machining skills, experience workers gain mastery in machinery maintenance, machine building, or specialized machinery such as found in packaging. These maintenance, building and repair skills stress troubleshooting and assembly skills in the context of food manufacturing.

II. Prerequisites

Machining (advanced) and Quality Assurance I

III. Jobs Participants Will Be Prepared For

BLS Job Clusters	Other Job Types
Food Industry	
• Machine Assemblers • Electromechanical, Electrical and Electronic Equip Assemblers • Industrial Machinery Mechanics • Maintenance Repairers, General • All other Mechanics, Repairers, Installers	• Packaging machinery setter/operator • Packaging machinery troubleshooter • Packaging machinery • Trouble shoot and repair packaging and other machines • Build and repair specialized machines within a company

IV. Skill Areas

Skill Areas – Basic Machine Repair and Maintenance	
Hydraulic systems	Machine noise types and levels
Pneumatic systems	Applications of Geometry
Mechanical systems	Applications of Algebra
Electric/electronic systems	Applications of Trigonometry
Tooling	Problem solving
Knowledge of Symbology	Standard Orthographic Prints
Metrology	Schematic drawings & exploded layouts
Understand types & uses of cutting fluids, coolants, and lubricants (especially those used in food manufacturing.)	Assembly drawings
Frequency of fluids & filter changes	Surface plate instruments

Effect of oxidation on lubricants	Growth of components
Catalytic effect of water on metals	Use computers and computer programs
Safe maintenance practices	Hazardous materials
Explain basic food safety and sanitation practices and participate in development of HACCP plan	Basic Baking/Food Science including material properties and how different ingredients and techniques affect products

Skill Areas – Advanced Machine Repair and Maintenance	
Programmable Logic Controls	Types of liquid filling and packaging machines
Automation controls	Labeling equipment
Power transmissions and mechanical sys.	Uncasing, unscrambling, & cleaning mach.
Advanced industrial controls	Gluing equipment & adhesives
Automated motion control	Vibration
Basic electricity	Motors
Fundamentals machine design	Time delays
Motor controls	Relays
Mechanical drives	Know computer operating systems
Couplings	

V. Performance Standard Types

- Set-up production machinery to operate within tolerances.
- Trouble shoots problems with metalworking, food and packaging machinery.
- Manufacture parts required to repair machinery.
- Trouble shoot production line problems with machinery.
- Set-up packaging machinery.
- Build and/or assemble machines to specification.
- Machine maintenance uses broad experience of skilled machinists and trouble shooting experience of trouble shooting all machines in a company.
- Advanced use of PLCs, motor controls, AC/DC circuitry, switches, gears, slides, cams, and ways on all machinery including turning centers, manual machines, packaging machines, and building new machines.
- Experience with preventative maintenance and use of Cp_k

Quality Assurance Level I

I. General Description

This skill cluster will prepare participants for entry level positions in Quality Assurance such as a floor inspector. Graduates would be skilled with measuring tools and able to follow any control plans used in production. They would also be able to demonstrate inspection techniques to production workers and supervise a group of employees conducting a sort of product.

II. Prerequisites

Machining Level I

III. Jobs Participants Will Be Prepared For

BLS Job Clusters	Other Job Types
Food Industry	
• Inspectors, testers, graders • Production Inspectors, graders	• Floor inspectors • Receiving inspectors

IV. Skill Areas

Skill Areas (cf. ASQ's Cert. Q Improv. Assoc. and CMI)	
Math: - measurement systems and conversions basic algebra, geometry, trig. - statistical math: calculate average, range, standard deviation	Measurement: - Gauges, Optical measurements, temperature and density measurments - Hardness testing, Surface analyzers - Volumetric gages, Weight gages
Inspection planning: - Classification of characteristics (e.g., critical, major, minor), Inspection points (e.g., receiving, first article, in-process, final, source), Product and material traceability, Nonconforming material identification, Product audits (techniques and applications)	Quality Theory: - Language of Measurement, Definitions, and Terminology (e.g., datum, setup point, first article, tolerances) - Calibration, - Plan-Do-Check-Act (PDCA) Cycle - Team Concepts - Control Plans
Engineering drawings: - Standard drawings and Geometric Dimensioning and Tolerancing (GD&T)	Sorting and Sampling rules - Includes understanding of sampling rules per company quality standard, explaining work rules to and supervising sorters
SPC analysis - Charting data on X-bar and R chart - Control limits vs. specification limits - Applying decision rules to jobs in progress	Visual inspection techniques
Food safety and sanitation practices. Participate in design of HACCP and other sanitation plans. Oversee implementation of those plans	Baking/Food Science including material properties and how different ingredients and techniques affect products

V. Performance Standard Types

- Correctly inspect product at different points (in-process, receiving, etc) using the appropriate Inspection Control Plans and sampling techniques.
    - Verify that operators are following the in-process inspection plans.
    - Make corrections to process control plans to maintain conformance to print and customer requirements under changing conditions.
    - Inspections will include use of measuring tools such as scales, micrometers, calipers, protractors, gage blocks, hardness testers, surface roughness gages, volumetric gages, weight gages and dynamometers,

- Devise sorting plans for lots containing non-conforming material.
- Explain sorting plan and demonstrate procedures to other employees who will conduct the sort.
- Supervise sorters to make sure that they follow the sorting plan.
- Make sure that discrepant material is quarantined per company quality procedures.

Quality Assurance Level II

I. General Description

This skill cluster would prepare participants to be Quality Assurance Technicians or "first article" Inspectors. Graduates would be experts with measuring tools and would also understand some important components of quality theory. They could also work in planning teams with engineers, managers, toolmakers, salesmen, and customers.

II. Prerequisites

QA Level I

III. Jobs Participants Will Be Prepared For

BLS Job Clusters	Other Job Types
Food Industry	
• Inspectors, testers, graders • Production Inspectors, graders	• First article inspectors • Entry level QA engineer • Supervisor • Sales associate

IV. Skill Areas

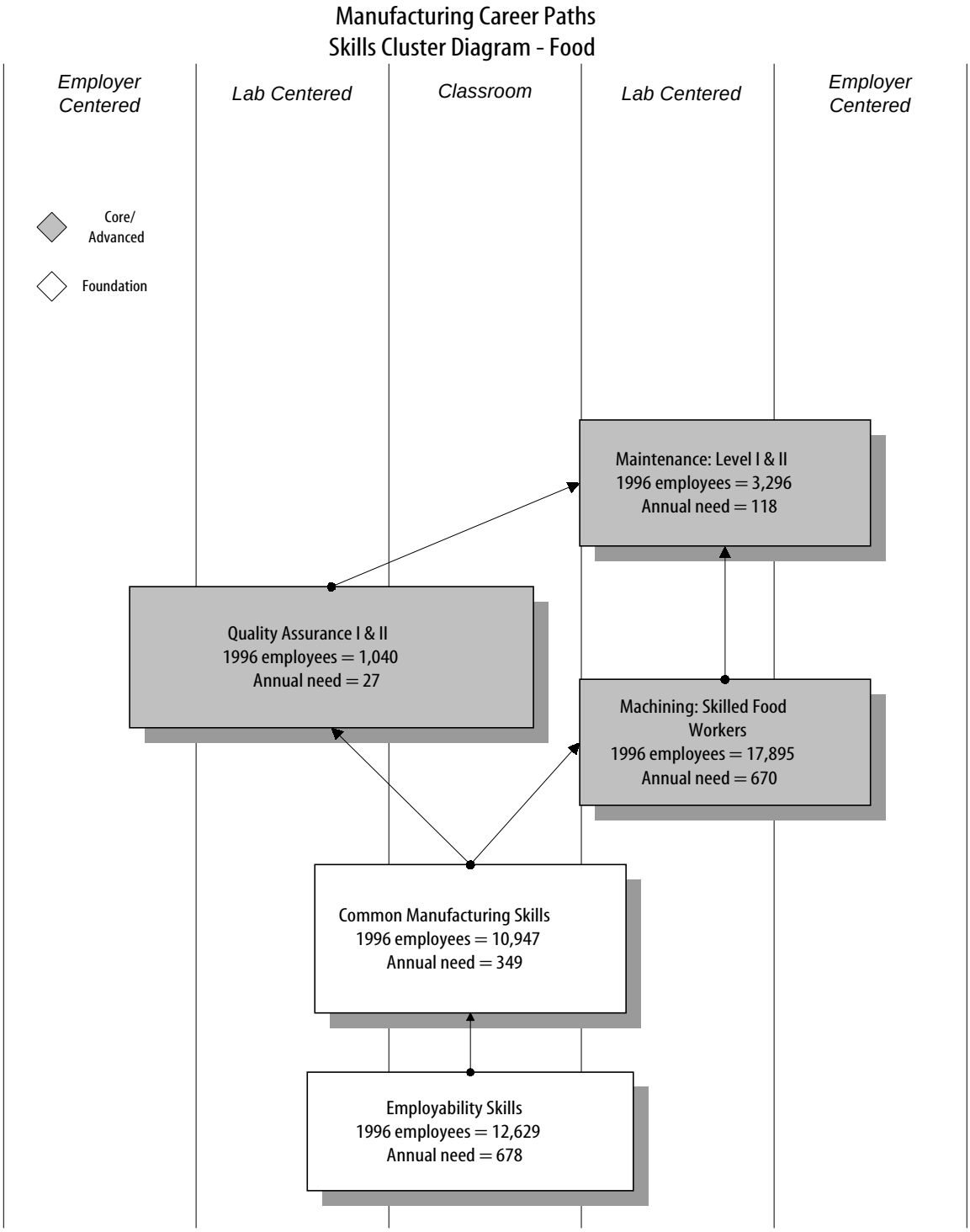
Skill Areas (cf. ASQ's CMI and CQ Tech.)	
Quality Improvement tools: - Use interpret and explain: Flow charts, - Pareto charts, cause and effect diagrams, - Checklists, benchmarking, - Brainstorming, and audits	Gaging - Gage Reproducibility and Reliability - Traceability
Customer-Supplier Relationships - Know how internal and external customers are defined	Improvement Cycles: Plan-Do-Check-Act (PDCA) Cycle
Metrology: - Gage selection - Surface plate methods and equipment - Gear inspection equipment - Transfer tools	SPC: - State of statistical control - Pre-control - Process capability
Failure Mode Effects Analysis (FMEA)	Responsible for preparation of HACCP and other sanitation plans to meet quality and regulatory standards. Direct responsibility for implementation of those plans .

V. Performance Standard Types

- Complete First Article Inspections according to control plans and customer requirements such as may be required by, for example, ISO9000 Advanced Product Quality Planning.

- Participated in product planning teams and help devise in-process control plans and final inspection control plans based on appropriate sampling methods and measurement practices.

- Actively participate on teams that create Failure Mode Effects Analysis or Continuous Improvement plans. Use these plans and analyses to develop inspection control plans and present them to the team.


Manufacturing Career Paths
Skills Cluster Diagram - Food
Employer Centered
Lab Centered
Classroom
Lab Centered
Employer Centered
Core/ Advanced
Foundation
Maintenance: Level I & II
1996 employees = 3,296
Annual need = 118
Quality Assurance I & II
1996 employees = 1,040
Annual need = 27
Machining: Skilled Food Workers
1996 employees = 17,895
Annual need = 670
Common Manufacturing Skills
1996 employees = 10,947
Annual need = 349
Employability Skills
1996 employees = 12,629
Annual need = 678

Appendix IV

Employer Focus Groups and Interviews

The following appendix includes write-ups of focus groups and interviews conducted with various employers in Cook County in the food and MME industry clusters.

These include relevant quotes, and summaries of the employers' responses to the listed questions. The quotes and summaries are anonymous to protect the identities of the interviewees.

MANUFACTURING WORKFORCE DEVELOPMENT PROJECT

FOCUS GROUP AT AMPERE AUTOMOTIVE

March 29, 2001

I. PARTICIPANTS

Participant Name and Job Title	Type of Manufacturer
Jims Electronics - CEO	Electronics components: transformers, power supplies, PC boards.
Parking Metal Products – HR Director	Metal Stamping
Admiral Tool and Manufacturing – HR Director	Machining.
Aetna Bearing Company- HR Director	Agriculture and industrial automotive bearings.
Whitecap – CEO	Vacuum Closures
Ampere Automotive- HR Manager	Remanufacture starters and alternators.

II. SUMMARY OF FINDINGS

Hiring Needs

- These companies are all over the board regarding their qualifications for entry-level positions. Companies expressed different levels of expectation because some are large enough to offer career path opportunities and good pay, while others had lower expectations because they were smaller and did not offer high wages. These differences also align with whether or not the company was unionized. The unionized companies had higher qualifications and were able to pay more.

- Again, non-unionized companies had a harder time filling positions than their union counterparts. However, larger companies have high numbers of older workforces that they are concerned about replacing in the near future.

Recruitment

- Companies use a wide range of recruitment strategies. However, there is general consensus that networking with current workers yields more workers that are retained longer, while newspapers and the like more often yield people with higher skills.

- Companies work with many different community groups and colleges to find acceptable candidates. The groups that work the best for them are the ones they have created relationships with. These relationships make any certification believable. Larger more sophisticated companies have a broader range of more complex relationships that help them fill different types of job openings.

Current Training Needs

- Companies state that lack of English and basic skills interferes with basic production and can cause costly waste of time and materials. They also thought that the extensive OJT needed for new hires was inefficient and costly as it slows systems down. Additionally, managers need training to deal effective with the various stresses in the workplace.

- Companies need workers with more technical skills as new generations of machines become more computerized.

Retention

- Companies offer a wide variety of retention strategies with the more extensive packages of strategies being offered by larger companies who also paid more. Companies with unskilled female workforce stressed the importance of flexibility so that workers could deal with family issues. Otherwise, the effectiveness of each strategy mentioned individually was unclear.
- No company articulated clear career paths in the field to their workers. All offer OJT as the training method used fill job openings. Some companies had a clearer bidding process on available jobs.

Experience Providing Training

- Companies have used some customized training with mixed success. ESL doesn't work in companies where there are bi-lingual managers and their co-workers all speak the same language. Companies feel that the mandatory training they must do, like OSHA training, should be taught at a community college so that they do not have to pay so much individually. Companies do not like Prairie State Funding because of the paperwork and because of their lifetime limits.

Salient Quotes:

"What I see may be a problem in the future. That is that where training comes in is working more with PLCs, CMMs, getting people skilled at more technical skills, like the electrical maintenance issues…Right now I have no problems with recruiting and retention from management on down. What I do see in the future is more of these specialized technical skills being needed."

"In the previous place I worked we paid low and had a hard time finding people with high school math and aptitude skills. Of course I'm one of those firm believers that if you are not going to properly pay your people they will leave. If you pay them acceptable wages they will stay and grow with you."

"Our unions, we have the Steel Workers and the Graphics Union International, they have been more sophisticated in [the training] area recognizing that you need the skills levels to satisfy the jobs otherwise you don't produce the product and loose to our competition. So the union is more accommodating working with you."

"Usually the unskilled people just take the starting level pay without asking [about benefits]. You like to get them to focus not on the starting level, but on how much they can be making after 6 months, 9 month, because if you're willing to stay and grow with us for a year you could be up to 11 dollars an hour. We want the worker to show themselves. I'm sure the benefits are important, because that is paid out of their pockets, but they never ask that. I'm not sure why."

"A lack of skills has a big impact. Well, just look at [OJT] training. Right there you have two people doing the job of one. So if they come in qualified there is a big impact in terms of savings on cost of production. That is an immediate impact, there is cost, and your efficiencies are going to be that good."

"[Retention] is an issue. We get them in and train them and then they leave. It does not happen often because our workforce is small, but losing one person is major to us."

"How many companies need training in OSHA, CMMs, PLCs, electrical maintenance in the new age of training. For example, OSHA training is needed by everyone. Instead of providing funding for training on OSHA standards through rebates or moneys to employers, [we should] fund these programs directly. For example, at a community college, so that I can get the program at a discount rate that I can see. This as opposed to the current system where I pay, for example, $10,000 for OSHA training and eventually get $5,000 back. Why can I not just get the training at $5,000 initially? This kind of a system would be much more conducive to employers using training because of the difference in perception of the cost of training, less paper work, and because it ties up a lot less money. So what we need are basic skills, OSHA requirements, and technology areas."

III. FINDINGS

Hiring Needs

What qualifications are you looking for in applicants for these positions?

- One company requires a high school or GED as well as basic math and a good working attitude for unskilled work. These high requirements are necessary because the company is quality oriented and wants to train them so they can "grow with the company."
- Two companies require some high school education and basic reading and math skills.
- One company gives a manual dexterity test. Unskilled assembly workers need good eyesight, skills with their hands, and speak enough English to understand what is being said to them.
- On company prefers English speakers for non-skilled labor for basic communication.
- One company needs their Hispanic workforce to read basic English to perform their jobs.
- Several companies agree that hiring bi-lingual managers allows for more flexibility in hiring people with low English skills.
- Two companies have tests they give candidates for skilled positions in reading and math.
- Two companies feel they can judge literacy levels for unskilled positions through interviews and written applications. These companies require that candidates fill out these applications in front of them.
- One company does literacy testing.

Do you have difficulty filling job openings? For what positions? What is the problem?

- Two companies have problems with hiring management and skilled personnel from the suburbs because they are reluctant to recruit to the city.
- The non-unionized companies stated that as soon as the unskilled workers are trained they leave. Non- unionized companies have low pay and unskilled workers will leave a job for more money.
- Two companies can't fill electrical maintenance positions because no one has the skills.
- Two union shops stated that they paid unskilled labor well and thus had little problem filling positions.
- Companies that have piecework incentives have more difficulty with hiring. In such jobs workers must work with others and must produce. This makes workers harder to retain.

- Two companies have concerns about hiring in the future as skilled workforce is getting older and will be retiring. In one company the skilled workforce is over 50 years old, have been with the company for 30-35 years and will all retire at the same time. At the other company, 30 people will be retiring. Both will need pool of people to fill those positions.
- One company is concerned about finding engineers and qualified unskilled people that can grow with the organization. This company's entry-level pay is $10-11 and they want these people to become skilled workers over time.

Recruitment

How do you recruit for job openings?

- Three companies advertise in the local neighborhood newspapers; get a very good turn out.
- One company use internal networks, city newspapers, and web sites.
- One company E-mails community colleges about skilled positions. Gets some responses.
- All companies network with their employees for new employees. Several feel this is the best way to get employees who will stay.

From what sources or methods do you have the best luck getting qualified candidates?

- Newspapers bring more people with education. Networking with employees brings family members who are unskilled.

Have you had success recruiting qualified candidates from high schools? Community Colleges? Community training providers? What has been your involvement with these sources? Why have or have not these sources been useful?

- One company uses Jane Adams, Coin Institute, and Wright Community College with some success.
- One company recruits from the Vietnamese Association. This organization teachers enough ESL for unskilled work.
- One company uses Chinese Mutual Aide and Spanish Coalition For Jobs with some success.
- One company has an apprenticeship program through Triton College that provides different technical classes in tool and die, and pressmen for the lithography department at the company.
- One company has hired skilled workers from Triton College and Greater WestTown Development Project.
- One company uses the Illinois Department of Employer Services. Has been very effective.
- One company uses the CFL. Union companies can get a list of available workers, request resumes, and the schedules candidates are looking for.
- Training providers need to screen participants for responsible behavior: showing up on time, completing program assignments, calling in when necessary. Trainees that are motivated and complete programs make good candidates.

Are there certifications or specific qualifications you trust more than others?

- One company is much more interested in high school diplomas than GEDs even though it is hard to trust a high school diploma. However, neither qualification "washes in terms of employment."
- One company only trusts certifications from organizations they have relationships with.

- Two companies don't trust certificates at all and only want use their own tests to qualify candidates.

Do you recruit from the local community? If yes, what has been your experience? If not, why not?

- One company uses Greater North Pulaski Development Corporation for some entry-level positions from the community.

Current Training Needs

What skill deficits currently interfere with optimum production/ quality levels? At the entry-level? In skilled positions? At the supervisory and management levels?

- One company attributes errors and flaws and product quality to lack of English language skills. Also, lack of simple mathematics skills has led to improperly numbered products and, thus, product waste.
- Two companies need training and development for management and supervisors and one is working with Truman College to set this up.
- Workers are going to need more technical skills in the future: in PLCs, CMMS, maintenance, electrical, and industry specific computer skills.
- With turnover comes more on-the-job training that slows down work.
- Two companies state the lack of skills impacts the bottom line considerably because on-the-job training interferes with production efficiencies.

Do you have employees that you would like to move up but can't due to skill deficits? What skills do they lack?

- One company states that employees bid on jobs that are posted. The company is large so there are many opportunities.

Retention

Do you have a turnover problem? For which positions? What are the causes*?*

- Three non-unionized companies had trouble retaining unskilled workers.
- One company stated that unions interfere with retention rates. They require that what is done for one worker must be done for all so it is hard to attend to individual needs.
- Two companies expect older workforces to retire soon and will have big hiring needs soon.

What does your firm do to retain qualified employees? What methods are most effective*?*

- Trains unskilled workers to be CNC operators. This is not effective because people leave.
- One company offers good fringe benefits instead of high wages. This method is effective with immigrant women with families.
- One company offers tuition reimbursement for up to $5,000 a year. Another gives money for tuition upfront so workers use more training opportunities.
- One company has regular communications programs that include shift supervisors meetings to keep people up to date on company information and on production issues.

- One company states that good communication with union stewards helps retention.
- One company says you have to be flexible to allow unskilled workers tend to family issues.
- One company has attendance awards and bonuses for employees that refer new workers that stay a designated length of time. Good communication with new workers was also cited as important.

Would you say your company generally promotes from within? For what positions*?*

- One company uses very experienced workers to do on the job training. New workers find out about career opportunities in the plant in this way.

Experience Providing Training

What training do you currently provide your employees?

- Companies cited the following on-the-job trainings:
    - Assembly line
    - ISO 9000
    - QS 9000
    - Lock out/ Tag out
    - OSHA
- One company does their mandatory training in English and Spanish
- One company pays its OJT trainers when a new person comes on.
- Two companies said they need more diversity training for employees and managers.

Have you hired outside organizations to do customized training? Have you been satisfied? Why or why not?

- Companies cited the following types of customized training:
    - Computer for office work.
    - TMA apprenticeships for tool and die/ pressmen.
    - Truman for management training.
- Three companies found the training they used helpful but often too expensive.

What have been the factors that have made the training successful/ unsuccessful?

- ESL training done in the past did not work because when people live and work with people who speak their native language, very little of what was learned in class sticks. More English was learned in the past when managers spoke only English.

How do you fund training?

- Two companies use Prairie State 2000 yet complain about the funding.
- Two companies use ITP and like because there is no lifetime limit and less paperwork.

MANUFACTURING WORKFORCE DEVELOPMENT PROJECT

FOCUS GROUP AT THE CALUMET AREA INDUSTRIAL COUNCIL

April 6, 2001

I. PARTICIPANTS

Participant Name and Job Title	Type of Manufacturer
Acme Steel	Steel Manufacturers
LTV Copperweld	
Ryerson	Steel Service Center
Evergreen Supply	Distribution of electrical products

II. SUMMARY OF FINDINGS

Hiring Needs and Recruitment

- This focus group was dominated by very large companies that hire a large number of people per year and have a wide range of resources and relationships through which to recruit new hires. One company was having financial problems and was not doing any hiring. The very small and very young company represented in the group is coping with their hiring needs through a new HR employee.

Current Training Needs and Retention

- The large companies do not complain much about retention issues and use tuition reimbursement as their major retention strategy. The smaller company tries to involve their employees in activities that help them learn more about the company and its products.

Experience Providing Training

- The larger companies have a great deal of experience providing internal training options.

Salient Quotes:

"Most of our recruiting from the local level has come through churches and the YMCA. Most of these relationships have been successful, but most of these relationships have not continued because the key people in those organizations have moved on. It was the key individuals that provided the people, not the organizations per se."

"We found out that the OJT system was not working well because at one point they noticed that for the same type of operation we had people that did the operation in five different ways. They could each get the product out, but the problem was that each way necessitated changing the setting on the machines. So each shift would change the settings and that would take a lot of extra time. We are talking about five machines on a line that had to be reset for each new shift. And if part of one crew had to be replaced with another there would be problems, because their methods of production were different. It was really killing production. Finally, an ad hoc analysis was done and that problem was found out. So management said that we needed to institute standardized training and they created a training department."

"For every hour you spend on that training, you gain many hours back production wise."

"If you let people know more about the business then sometimes they are driven by some of the same things that drive management and that is the bottom line. If you could get the buy-in from the production workers on that, then it works fairly successfully. The high performance work team, which has the most business knowledge of our employees, has consistently had the highest production rates."

"When I was writing all of the training manuals, I got asked from one out of three of the people that I interviewed, 'Will this be used for training, because we need training.' It is so desired out there to have formal training on the different machines. Most people want to do the job right. One, it's job security and, two, it's the basic need for respect and knowing internally that you are doing a good job at what you are doing, that you are competent. That is a driving force. Also, because they can see the profitability. It really reduces their workload and simplifies their jobs. So training has been successful."

III. FINDINGS

Hiring Needs

How many new employees have you hired in the past year? For what positions? How many do you expect to hire in the coming year?

- One company hired 40-50 entry level people/ 20-25 production people.
- One company hired 50 people this past year.
- One company is laying off unskilled workers and trying to retain skilled workers.
- One company will be hiring 10 people this year.

What qualifications are you looking for in applicants for these positions? How do you determine what skill levels you want or need for particular positions?

- Two companies do drug screening for all hourly workers.
- One company requires basic math, facility with language, good reading comprehension, and basic ability with logic.
- One company requires new hires pass a basic math and English test, but will do bilingual testing/ Spanish.
- One company requires basic reading, writing, a good driving record, and the ability to read maps.

Do you have difficulty filling job openings? For what positions? What is the problem?

- One company has a harder time finding skilled workers even though they offer good pay.

Recruitment

How do you recruit for job openings?

Recruitment methods include:

- Newspaper ads
- Word of mouth
- Referrals from the alderman's office

- Web-sites: one company said this is not a good tool – too general. One company had great success with white collar jobs on the web.
- Purdue, Prairie State, South Suburban Community Colleges
- State agencies / unemployment agencies.
- Job fairs at colleges.
- Churches/ YMCA – good sources if there are people on each end with good relationships.
- Local high schools – but their dropout rates are so high (70%) that recruitment is difficult.

Do you use temporary employment firms? For what positions? How well has this worked?

- One company uses temp agencies to help screen for entry-level positions. Temps that stay for 90 days and pass a drug-test make good employees.

From what sources or methods do you have the best luck getting qualified candidates?

- One company says 90% of hiring is done from within.
- Companies noted the web and good relationships with community organizations.

Current Training Needs

What are the skills employees need?

- One company representative recommends the following skill levels:
  Read with understanding, know English measurements, be able to write a message to somebody, describe a piece of material they are looking at, use a computer, have good communication skills, have experience being part of a team, have good life skills and work ethic.

What skill deficits currently interfere with optimum production/ quality levels? At the entry-level? In skilled positions? At the supervisory and management levels?

- One company's bottom line suffers if employees don't know their products and complete simple tasks.

Retention

Do you have a turnover problem? For which positions? What are the causes*?*

- One small company, at first, didn't screen, and had big turnover problems. Now there is an employee who handles all HR issues with less of a problem.

What does your firm do to retain qualified employees? What methods are most effective?

- One company has vendors come every Wednesday during lunch so employees can understand the products they sell. The employees enjoy this.
- One company offers substantial tuition reimbursement for any course or series of courses taken.
- One company offers 50% tuition reimbursement.
- One company has tuition reimbursement for salaried employees only.

- One company holds dinners for employees that complete apprenticeship programs and various courses.

Would you say your company generally promotes from within? For what positions?

- All companies said they promoted from within whenever possible.

Experience Providing Training

What training do you currently provide your employees?

- One company has installed computer labs and teaches classes on-site.
- One company does extensive teamwork/ quality / management training to support their total quality systems.
- One company is providing software training for their particular systems.
- One company mentioned their safety, CPR and EPA (mandatory) training.
- Two companies do the various training needed for ISO.
- One company does the training necessary to support high-performance work teams: communication skills, negotiation skills, how to hold a meeting.
- One company does extensive cross training of office and production personnel.
- One company includes their operators in on training design to develop best practices.

Have you hired outside organizations to do customized training? Have you been satisfied? Why or why not?

- South Suburban has done a number of different kinds of customized training for the larger companies present.
- One company uses Olive Harvey Community College for literacy classes. Workers go to class in the mornings and work in the afternoons. They usually pass their classes.

How do you fund training?

- One company doesn't go after grant funding because there is too much paperwork.
- One company has a contact at South Suburban that does all their paperwork for Prairie State 2000 and other funding.

MANUFACTURING WORKFORCE DEVELOPMENT PROJECT

FOCUS GROUP AT CULLIGAN

July 12, 2001

I. PARTICIPANTS

Participant Name and Job Title	Type of Manufacturer
Federal Mogul, HR/ Recruitment Manager	Stamping and rubber molding; auto supplier.
Berke Industries	Stamping; auto supplier.
Culligan International	Culligan water systems
CAMCO	Motion control components.
S&C Electric	High voltage switches and capacitors.
Heidenhain Corp.	Precision measuring instruments.

II. SUMMARY OF FINDINGS

Hiring Needs

These companies have critical hiring needs at every level of their operations. Many have real difficulties finding skilled people internally or externally to fill skilled positions.

Recruitment

These companies use the same types of recruitment strategies as companies from other focus groups. Two companies, however, offer significant recruitment bonuses for their employees who bring them qualified people who stay. They also have relationships with high schools that give them interns and potential employees.

Experience Delivering Training and Retention

This focus group has a number of companies that offer extensive on-site training programs and options in response to their inability to recruit qualified employees at all levels. One of the companies is very large and, thus, able to create and support what amounts to a full set of community college programs that layout and train for a set of career paths within the company. A much smaller company has been able to partner with Harper College to offer training to all levels of employees. Employees get bonus points for their training that turn into cash bonuses by the end of the year. Both systems have dramatically reduced turnover rates. A third system has a fairly large company partnering with Oakton College to provide an array of technical on-site courses. This system has not worked so well because the employees were not required to attend and/or the programs were not tied directly to cash incentives.

Salient Quotes:

"I cannot find any skilled people that can do setup and processing. All our products are getting to be more complex in design, so they require more in-depth skill levels to make them."

"Well, that's how you get trained people now-a-days, you let someone else train them and then you try to steal them."

"We used to build a lot of CAM making systems and ship them around the world. Getting technical people to set them up and repair them was always difficult and getting people who could also train people in another language like Chinese was even worse. We sold that business in 1994 and we are just a metal stamping firm now."

"I think the workforce board will be very good for some companies like retailers and McDonalds. I do not see them helping us yet…"

"We have so many people that are involved in the metal trades that we literally found we had to create our own training program when the well went dry. So we developed some very specific and detailed training programs that we had to put into place to make sure we had people in key positions like machinists, bench press operators, tool and dye makers, and even assemblers because we have specific processes to ourselves. Doing this has worked for us, it has paid dividends, even though we had to pour all kinds of resources, time, and money into doing it. Now we are reaping a benefit because from a retention point of view when people can look and see that there is a career ladder that they can hold in their hands and know it is a tangible thing, that has kept them and minimized our loss in people, but we still lose some."

"It seems to me that the issue at stake is to raise the bar on what it means to be in the trades in society. In Europe it is wonderful to be in the trades, you are considered at par with other respected trades. It is just another path that you have chosen for your career. Here, "oh you work in a factory, gee, I'm sorry to hear that." We need to change that and that is largely a cultural issue that I think a circle of people like this can influence."

"Our profits and sales are up, but we do not expect to hire new people. We have streamlined our business processes with automatic equipment, so we have actually taken people off the assembly line."

"It amazes me how people can get into the trades and not pass [our entrance] tests, especially the electricians. These tests are typically set at the seventh and eighth grade level."

"Someone mentioned that young people are not aware of the potential in the trades and I will give you one of the reasons for that. Out in District 214 they did a study in the high schools asking 2700 students to put down their top three careers – what they would like to do with their lives. They summarized the top 20 careers out of the 2700. How did manufacturing fare? I have engineers, I have accountants, I have sales people, I have the whole gamut, but I could not fulfill one of those positions with the answers given. Doctors, lawyers, judges, pro football player, and TV announcer. That is what they want to be. The high school kids do not have a clue what their parents do, let alone, manufacturing. One of the things that we need to do is to advertise and market the jobs that are there."

"We need a good sitcom starring an engineer."

"Somehow we need to get them to understanding that manufacturing equals wealth. If manufacturing leaves the country, then wealth leaves the country and then the country goes down the tubes. Look at the percent of the economy that we have. So somehow we need to promulgate through society and the institutions that reach the kids at an early age, that manufacturing is not a bad thing."

"Bring back vocational education in high school. Well, you know unfortunately that is not going to happen because the high schools do not want it. They want to send the kids on to college. The

school systems do not want to get involved in the trades. They are going to tell you that that is not their job and that they are there to teach the kids math, science, and reading. Almost every school in Chicago is clamoring for computer systems and labs."

"If there is anything that could come out of something like this project it is some kind of school system or secondary system that is geared simply to this...We need something like the junior college system that is geared only toward the trades. Harper and Triton have courses on electronics, but I tell you that when you walk into those institutions, you do not see the industrial trades. "

III. FINDINGS

Hiring Needs

How many new employees have you hired in the past year? For what positions? How many do you expect to hire in the coming year?

- One company hires 10 people per year.
- One company says it has not created new positions in 30 years; that they only hire to replace retirees.
- One company has hired 90 new employees this year.

What qualifications are you looking for in applicants for these positions? How do you determine what skill levels you want or need for particular positions?

- One company says that skilled positions require that people read blueprints and know how to do SPC, measuring, computer skills and English skills.
- One company says that they require people applying for tech positions to have a 2-year associates degree in electronics or mechanics.
- One company requires that new hires take a math test and then are placed in courses they must take to remediate any skill deficiency.
- Two companies give technical position applicants practical hands on tests.
- One company requires 3-4 years of experience in machine set up and CNC operation.
- One company gives a very simple math test and needs people who can write numbers and speak English.
- One company requires people with high levels of math and a good work ethic.
- One company gives a math test, English test, and aptitude test to applicants.
- One company requires that applicants take a drug test.

Do you have difficulty filling job openings? For what positions? What is the problem*?*

- One company can't find people to do setup and processing. All products are now more complex in design and require more skills.
- One company has a hard time finding engineers. All companies find work ethic issues when hiring people at all levels.
- One company can't find trades people to empty positions.
- One company has difficult hiring people for positions that require manufacturing experience: tool and dye, welding.
- One company says that many applicants can't do addition or subtraction.

- One company has many employees who are nearing retirement or are retiring and can't find skilled young people to fill their positions.
- One HR employee has spent seven months trying to hire qualified electricians, building mechanics, injection molding mechanics, HVAC.
- One company has difficulty hiring for good-paying night-shift jobs.

Recruitment

How do you recruit for job openings?

- Two companies offer summer internships to high school students that they then can hire. Both companies expect 50% attrition with this kind of program.
- Companies use the following resources to recruit new hires:
  - Newspapers
  - Hire schools
  - Community colleges
  - Community centers
  - CBO: Instituto del Progresso, Chicago Women in Trades
  - Temporary agencies
  - Internet (although noted by two companies as not useful for filling manufacturing positions)
- One company offers $500 if an employee refers someone that works out: $250 after the new person stays 3 months and $250 after 9 months.
- One company has a similar referral bonus system but different amounts designated for skilled and unskilled positions.

Do you use temporary employment firms? For what positions? How well has this worked?

- Two companies use temporary agencies for office work, entry-level, and more skilled production positions.
- Once company uses temporary agencies for unskilled jobs and trains internally for skilled positions.
- All companies who have used temporary agencies say this is a good strategy for hiring new people.

From what sources or methods do you have the best luck getting qualified candidates?

- One company hires graduates from TMA and PMA.
- One company gives scholarships to workers so they can take courses at Harper College.
- One company sends workers to TMA's apprenticeship program.

Retention

Do you have a turnover problem? For which positions? What are the causes?

- One company has a turnover problem because jobs and qualified individuals don't match.

What does your firm do to retain qualified employees? What methods are most effective?

***** All companies in this focus group used training as one of their retention strategies. Information on these methods and how effective they are is under "Experience Providing Training".**

Would you say your company generally promotes from within? For what positions?

- All companies indicated they preferred promoting from within and used every opportunity to do so.

Experience Providing Training

What training do you currently provide your employees?

- One company offers a maintenance apprenticeship program but can't get people to become involved because people don't have the 7.0-8.0 prerequisite skill levels.
- One company offers on-site welding and ASME certification programs. The welding apprenticeship program has proved too difficult and demanding for many participants.
- One company created a competency-based set of career path training programs to train machine operators, punch press operators, and sheet metal workers. Workers are required to take 2 courses a year to improve their skills and prepare for their next career move. 32 instructors are recruited from the shop floor and are trained to deliver specific courses. This company is looking to articulate their courses with city colleges, so that workers can earn credits while being trained for the company.
- Two companies say that they have offered training to increase workers' skills but they don't stick with the training programs offered.
- One company has 12 TMA tapes followed by tests they train people with. They also do forklift training.

Have you hired outside organizations to do customized training? Have you been satisfied? Why or why not?

- One company has Harper College come in to teach ESL to workers twice a week. Workers give one hour of time and the company the other. This company is very satisfied.
- One company works with Harper College to develop a series of courses that met workers needs. Workers are evaluated to determine their specific skill needs and recommended for Harper courses. For each course workers take, they get a credit which turns into cash bonuses at the end of the year. In 8 years the program was gone from 3% usage to 73% usage. In addition the turnover rate is now at 3%.
- One company created a competency-based training program to train machine operators, punch press operators, and sheet metal workers. This has resulted in 4% turnover. This has also resulted in increased quality and lower scrap rates.
- One company hired Oakton College to deliver print reading, shop math, and auto-cad. The courses were 50% on company and 50% on worker time. The courses had a real impact.
- One company offers a technical skills certification program in partnership with Oakton College. Five courses – blueprint reading, GD&T, Processes and Materials, Hyraulics and Pneumatics, a PLC course can be taken for credit. There is also a business writing component to the program. The program has graduated only 50 people to date, but graduates tend to stay with the company. The company is moving to a training system that is more based on individual need. They have a career development program that offers individual

consultation and workshops and they also have an on-site tool and dye apprenticeship program run by TMA.

How do you fund training?

Companies use the following funding:

- PS 2000 funding for ESL through Harper College.
- Insurance carrier does an audit and then provides safety training.
- QA manager does training for ISO-9000/ QS-9000.
- JARC helps with getting ITAP funds.
- DECCA has a variety of grants; NORBIC will oversee DECCA funding.
- Secretary of State for ESL: Center for Adult Learning will help write that grant.
- One (large) company hires a person ½ time to work on writing funds for training.

MANUFACTURING WORKFORCE DEVELOPMENT PROJECT

FOCUS GROUP AT NABISCO

April 5, 2001

I. PARTICIPANTS

Participant Name and Job Title
Keebler – Manager
Glernsey – HR Manager
Heinemann's- Community Service Manager
La Marka Foods
Quality Croutons
Sweetheart Corporation – HR Manager
William Wrigley Junior Co. – Learning & Development Specialist (HR)
Best Kosher Foods Corporation
Chocolate Potpourri Ltd.
La Guadalupara Bakery
Quality Snack Foods
Nabisco

II. SUMMARY OF FINDINGS

Hiring Needs

- The food manufacturers in this focus group need a large number of unskilled workers and a smaller number of skilled workers in machine packaging and maintenance. Many companies find themselves with an older skilled workforce that have worked for the company for many decades and are about to retire and a younger low-skill non-English speaking workforce that is very hard to retain. Thus, hiring needs are extreme in all areas. As with the first focus group, larger unionized companies have more strategies for attracting, keeping, and developing their employees than smaller non-unionized companies.

Recruitment

- Hiring needs are so extreme for most companies in this focus group, that the list of recruitment strategies is very long. Companies with HR departments use a wide range of strategies to fill unskilled positions including developing relationships with state offices that help match job seekers with job openings. Temporary agencies are also widely used as a screening mechanism for new hires. Some larger companies with needs for more skilled positions have more developed relationships with training providers throughout Cook County.

Current Training Needs

- Companies need unskilled employees to have basic English communication, reading comprehension, and math and measurement skills. In addition, unskilled workers must have an understanding of the rules of sanitation and why they are important. Without these skills and knowledge, food companies face large amounts of wasted product, and must pay for overtime to make up for the lost product. This impacts their slim profit margins. Lack of

skilled labor, particularly in the maintenance area, has kept some companies from opening up second shifts.

Retention

- Companies are experiencing chronic turnover rates as high as 80% at the unskilled levels. To add to this stress, managers in companies that have been restructured due to buy-outs are overworked and don't have the time to make sure people are properly trained for their jobs. Some companies are experimenting with retention strategies that include mentoring and tuition reimbursement. A few companies emphasize the need to take a stronger role in working with unskilled workers so they develop a stronger work ethic.

Experience Providing Training

- On the whole, companies were pretty vague about the training they do for unskilled workers. Efforts to solve the ESL communication problems were largely unsuccessful because they were too small in scale and/ or because workers would not sign up for the classes. Again, some of the larger companies have programs for skilled workers that allow them to progress and move up in the field.

Salient Quotes:

"We know we have three hundred people who are going to be retiring in the near future. How are we going to replace these people, especially that loyalty and understanding of our processes? We have automated a lot of things over the past few years. We automated weight control, metal detection, we use POG systems that measure virtually every parameter of our product known to man and it is constantly analyzing that forces changes upstream so that we get the quality parameters at the back of the line. How do we train people, predominantly with a 5^{th}- 6th grade education, to manage that kind of stuff?"

"I also recruit for the entry level positions more often than the upper level skilled positions. What I look for in the applicant is basic math and reading. I look for the ability to follow directions and comprehend instruction. Part of our recruiting process is also a drug test and that also is a big challenge. What I get is applicants who speak little or no English, who are illiterate, who don't pass a drug test, and who have difficulties with transportation or home issues, and huge attendance problems because of various things."

"The biggest thing is if they come in and apply and they call us over and over again saying 'Please, let me come in for the orientation.' So we hire them and three days later they are gone. They just do not show up for work again. It is almost a universal thing because we have ten plants across the country and the non-organized firms have gone to contracting labor firms to supply them with entry level workers and packers. We have not done that yet, but we are seriously considering it. I don't think the problem is the pay scale because ours is not that bad."

"We start our people at $18 an hour with full benefits paid. Last year we hired 126 people in May and June and by the end of October we had ninety of them left. They come in and then a few days later they never show up again…This time around we have seen a higher caliber of workers come in partly because of the downturn in the economy. Half the people we talked to were unclean and unkempt, and its like how are we supposed to bring them in to make food for the general public?"

"We've had to find maintenance people who came out of the military that, say, worked on an aircraft carrier, that were very skilled and knew a lot of disciplines like electricity, ammonium, or how packaging equipment works. I think that if students were made aware through career days and skills training that a lot of people could make a lot of money doing these types of jobs there would not be this shortage of skilled workers that we have now."

"It is a big deal that we are having such a hard time finding people to work on packaging lines, because we are having to look at further automating the lines. But the more automation that we have and are forced to do, because of the laws or a shortage of labor supply, that means we are going to need more skilled people to run computerized packaging equipment or the electronic skill and they are not around. There is definitely a void between what we need or are going to need and what we have or are going to have."

"I just think the lack of reading and understanding costs everybody a lot of money. We have shipped out a truckload of product and had to bring it back because someone does not know the difference between a 3120W and a 3220. So it gets out there and it is not the right product and it has to come back. The customer is mad because they are scheduled for a certain time. It happens in shipping. It happens in production in regards to putting the right numbers down, finishing products, calibrating weights, or what not."

III. FINDINGS

Hiring Needs

How many new employees have you hired in the past year? For what positions? How many do you expect to hire in the coming year?

- All companies have significant hiring needs at the entry-level.
- Three companies have substantial numbers of older workers that need to be replaced in the near future.
- One company has 300 people that have more than 30 years of service and will need a pool to hire from soon.
- One company says ½ their workers have been there for more that 25 years and the other ½ for less than six months.
- One company has 30-40 year employees but has problems with finding qualified entry-level employees.
- One company states the need for skilled craftsmen, mechanics, trades people.
- One company needs skilled craftsmen to deal with packaging equipment.
- One company needs maintenance and entry-level workers.
- One company needs more skilled people to use the packaging machines.
- One company has problems getting people at the entry-level who have basic skills: reading and writing skills in English.

What qualifications are you looking for in applicants for these positions? How do you determine what skill levels you want or need for particular positions?

- Two companies do background checks, criminal and employment before hiring.
- One company looks for basic math and reading and the ability to follow directions and comprehend instruction.
- One company does a drug test.

- One company is looking for people who can be on time every day, work safely, be able to follow GNPs, and exhibit basic skills.
- One company states, "If they are breathing, then we will hire them."

Do you have difficulty filling job openings? For what positions? What is the problem?

- One company states that attendance is a very large problem. 40% do not make it past their probation periods because of attendance problems.
- One company says even the skilled people have significant attendance problems.
- Several companies have difficulty recruiting people for the midnight shift.
- Public transportation is cited as a real problem for women getting to some plants.

Recruitment

How do you recruit for job openings?

- Companies use the following types of recruitment techniques:
    - Sun-times, Tribune, community or ethnic papers.
    - Back of the Yards
    - Welfare to work programs; Options for People – minimal success
    - Internet
    - City Colleges
    - Job fairs
    - Military career fairs
    - Employer referrals- very successful for two companies.
    - Word of mouth
    - Temp agencies.
    - Walk-ins: but the problem with walk-in is the lack of green cards.
    - Radio ads
    - Good Will Industries – good in training for sanitation.
    - Instituto del Progresso Latino
- One company ran their own job fairs to get skilled workers as well as
    - Partnered with high schools, Joliet Junior College, Moraine Valley, Triton, College of DuPage
    - Gone to speak to mechanics classes and high school classes
    - Helped develop curriculum at Reavis High School in Burbank
- One company has a contact at the Illinois Department of Employment and training who screens, tests, and makes referrals that fit job openings.
- One company pays $1,000 for referrals of skilled labor that stay over 6 months.

Do you use temporary employment firms? For what positions? How well has this worked?

- One company states that they are considering using temporary firms because turnover is so extreme.
- Several companies already use temporary agencies as a way of filling positions and screening candidates for new hires.

From what sources or methods do you have the best luck getting qualified candidates?

- One company has good luck networking with current workers for new employees.
- Several companies say referrals from other employers work out very well.

Do you recruit from the local community? If yes, what has been your experience? If not, why not?

- One company is working with a local church that works with "gangbangers". The church screens and gives job readiness training to prospective employees and then the church program assigns a case manager to do long-term follow up. The company offers new employees a mentor from their workforce as well.

Current Training Needs

What kinds of skills do you need people at the entry-level to have? What new skills are necessary?

- One company needs incumbent workers to have skill upgrades in English and math so they can qualify for apprenticeship and internal training programs.
- One company states that it needs people to work with PLCs at the skilled level.
- One company states that they need people reading at the 11th grade reading and comprehension level so that they can work on an automated line. In addition they need to be able to use a touch screen, enter data, do measurements, have general computer skills.
- Several companies need basic math, measurement, and English for communication and reading comprehension.
- Several companies stated they needed employees to understand the basics of sanitation and cleanliness as well as how these issues impact a company's bottom line.
- Companies need good communication skills so their workers can communicate well with each other and their supervisors and communicate problems and ideas as well.
- Workers will need more computer skills as more plants get automated.

What skill deficits currently interfere with optimum production/ quality levels? At the entry-level? In skilled positions? At the supervisory and management levels?

- Many people from other countries have difficulty getting accustomed to the idea of sanitation.
- One company states that deficiencies in English mean that workers cannot read labels and package boxes properly.
- One company states that one error in a batch means the whole batch needs to be thrown away. This means there is more waste and more overtime which costs the company. Companies have slim profit margins so errors due to poor communication, the wrong count, or labeling can be devastating.
- One company equates work ethic with safety. Cut fingers can interfere with production and impact the bottom line.
- Auditors go on to the shop floor to talk to employees. If they cannot understand questions asked of them, the audit doesn't go well.
- One company could not open a second shift because they could not find enough qualified mechanics to cover the shift.

Retention

Do you have a turnover problem? For which positions? What are the causes?

- One company has high turnover at the entry-level and machine operator positions.
- Companies have high turn over rates at the unskilled levels: 70%, 50%, 80%. One company reported having to go through 600 applicants to get 120 hires.
- One company reports that too many managers are overworked because of restructuring and buy-outs and don't have enough time to see that all new hires get the full training they need.

What does your firm do to retain qualified employees? What methods are most effective?

- Two companies believes that all companies should
    - Have a long-term training system
    - Create personal relationships with their employees
    - Commit to the personal development of each employee
    - Identify important human values and develop the work ethic in this context.

  These companies believe that a company needs strong middle management to make this work. These managers will be more flexible and help their companies grow by strengthening employee commitment.
- One company has instituted a mentoring system to develop team work between its older and newer workers.
- Several companies offer tuition reimbursement as long as employees commit to stay.
- One company has an agreement employees have to sign and if they leave the company has the right to take that money out of their last pay check.
- One company will send maintenance employees to get training in high-pressure boilers, ammonium refrigeration, or electronics if the supervisors, CFO and others in charge see that it is necessary.
- One company offers employees $100 to go toward any class they want to take – work related or not.
- One company offers bonuses for good attendance.

Experience Providing Training

What training have you provided for your employees? How successful have these programs been?

- Several companies offer computer training skills to their office workers.
- One company hired a consultant to offer language skills, which worked pretty well for 7% of the Spanish-speaking employees who went through the class.
- One company works with Malcolm X College to deliver ESL classes. They are not customized classes because the company believes English for all life skills is necessary.
- One company offers extensive management training.
- One company has an in-house training manager and an internal set of courses. When a technical employee is hired, they have to select a major and minor in the department. When employees complete core classes they get a wage increase. There is also a team training program where employees learn how to lead groups and solve problems.
- One company is offering ESL training. Last time it was offered, 12 years ago, it failed because all language levels were lumped together in one class.

- One company provides a baker apprenticeship program on-site.
- One company tried to offer ESL classes, got 55 people interested, and only 5 people to sign up.
- One company has discussion groups with different shifts so employees can air their complaints and solve problems. This approach has been very successful.

The Ideal Training System

One company would love to see high school students have the opportunity to intern or temp in their facilities as a way of recruiting them into manufacturing.

MANUFACTURING WORKFORCE DEVELOPMENT PROJECT
EMPLOYER INTERVIEWS

I. INTERVIEWEES

Name of Company and Title of Interviewee	**Type of Manufacturer**
Allied Metal- President	Produces Aluminum and zinc alloys for casting industries
Best Metals Owner	Metal fabricator -repetitive small part manufacturer
Chicago Turnrite Company- Secretary/Treasurer	High end job shop- Provides machining services to hydraulic cylinder, hospital, agricultural, railroad, and boat industries
Midland Metals- Plant Manager	Manufactures metal point of purchase displays for advertising agencies

Please note that these companies were interviewed individually. Their information is reported collectively.

II. SUMMARY OF FINDINGS

Hiring

- The majority of the companies hire primarily entry-level workers and promote from within. The first quality these employers seek is a strong work ethic, which they report is lacking in most applicants. During the recent economic boom, most of these companies found it difficult to find people with strong work ethics. Other preferred qualifications are basic reading, communication, analytical, and math skills.

- Half of the companies hired Eastern European immigrants as a major portion of their workforce and reported greater satisfaction with their prior vocational training and work ethic than non-foreign workers.

- Three companies expanded in the last few years but are now stable due to the recent economic slowdown. One company shut down one of its Chicago plants and it is not clear whether it will re-open. The other companies do not anticipate expansion at this time.

Recruitment

- Companies use a wide range of recruitment strategies, although the most favored technique is employee referral. Most of the companies have tried temp agencies with very mixed results. One company considers it to be the best strategy for hiring entry level workers.

- One company had worked extensively with high schools, community colleges, and/or community organizations for recruitment. The company reported mixed results with past placements from a local job program at Prosser High School and Operation ABLE but was pleased with the two graduates it hired from Chicago Manufacturing Institute.

Current Training Needs

- Companies differ in the level of reading and math skills required at the entry level but most want an ability to read instructions.

- For higher skilled workers, companies look at work history and one requires that the applicant make and measure a part during the interview process.

- Companies see a great need for workers to keep up with technological advances.

- Companies would like workers to understand English but make accommodations for a lack of English skills in their workforce. One company uses a bilingual computer program to translate written communications. One company used an outside trainer to teach ESL onsite but found that the workers were resistant to learning English.

- One company stated that basic skill deficits cost between $30 - 50 thousand dollars in lost productivity and quality in the last year.

- All of the companies engage in extensive OJT. The companies reported that it was most appropriate for them to be responsible for specialized training but expressed frustration with the lack of "employability" and basic skills in applicants.

Retention

- Companies that offered lower wages reported higher turnover rates. Turnover rates were most prevalent with newer hires. All of the companies offer benefits packages.

- All of the companies preferred to promote from within the company. One company had an articulated career path and encouraged OJT and outside training for its workers. That company had a very low turnover rate.

Experience Providing Training

- All of the companies relied on OJT as their primary source of training. Only one company offered onsite ESL but found little worker interest. That company also sends workers for more technical skill training to various city and community colleges under a

tuition reimbursement plan. Half of the companies were unaware of public funding sources and hesitant to explore it because of the paperwork requirements. One company had a positive experience with public funding because the training provider served as an intermediary and handled the paperwork.

Salient Quotes:

"We are a modern day blacksmith...if we can get people to understand that you have to come to work on time and put out 105% when the work is available, we can work with it."

"To be quite honest, math [and reading] would be a great bonus but that can be handled after we understand if that person has the ability to understand what you have to do in a working environment. Some of the smartest people we have seen realize after a week of work in the shop, 'I don't want to work in a shop, I want to sit behind a desk and make it look like I am working'."

"Fifteen years ago we had an influx of Eastern European immigrants who ultimately worked up to the top positions. Now we can't find anyone who wants to work hard and learn something and then get paid for it. They want to be paid for it and then you can try to teach them . No one wants to learn anything anymore - [they say] 'you need to pay me more and then I might try to learn.'"

"We have paid for people to take classes in things that would be useful for us but our experience is that people who are motivated to do that don't stick around very long."

"Our employees cannot keep up with the technology - we have to send them to school or have people come in and do in house training on the newer machines."

"[It is] very hard when you are at the bottom of the [pay] scale to get people who actually want to work at all."

"There's [going to be] a big problem when our foremen and supervisors start retiring and leaving . . . they've all got about 10, 12 years left and we can't find people to train. The people who work for us now are not trainable to do those jobs."

"My feeling is that the schools are not preparing the children well enough - especially the Chicago schools. When we went to school, we had to learn. Look at the test scores. Look at the drop out rate. The schools are in worse shape now than they were six years ago. So those are the same people who are knocking at the door and looking for jobs -they can't read, they can't write, they are at minimum levels."

"As long as the government continues to let American businesses purchase foreign manufactured products, the manufacturing business in the United States will continue to deteriorate. We need something that puts [these foreign countries] at the same level. We have minimum wages and other standards for workers and we will never be able to compete with them because of that."

"We don't have the money to start our operators at 10 dollars an hours...We cannot compete with overseas. With the bottom dropping out of the economy, every price has to be bottom line so it is not easy to compete."

III. FINDINGS

Hiring Needs

How many new employees have you hired in the past year? For what positions? How many do you expect to hire in the coming year?

- One company had hired about a dozen employees in the past two years, primarily in general laborer positions. That company is now laying off workers due to the economic slowdown.
- One company had hired about five new workers in the past year, from shipping to entry level machine operators.
- One company hired about 20 new employees to fill 10 positions due to high turnover rate for newer employees. The positions included spot welding, brake operator, and press operators.
- None of the companies see any expansion for the coming year other than replacing for attrition.

What qualifications are you looking for in applicants for these positions? How do you determine what skill levels you want or need for particular positions?

- One company hires entry level workers with no skills, requiring only a good work ethic and a negative drug test. The company reported that it finds people with good skills do not stay so they prefer to hire unskilled workers.
- One company looks for a good work ethic for entry level shipping. In entry machinist jobs, the company also looks for the ability to understand English and do measurements and shop math.
- One company looks for mechanically inclined people for entry level operators but reports there are none. The company also states basic math is helpful.
- One company prefers a high school diploma and basic reading and math for entry levels. At that company, management reads the blueprints and sets up the job orders.
- One company looked for the ability to read blueprints and knowledge of basic welding processes for more skilled positions.
- All of the companies rely on the interview for the hiring of entry level positions. In one company, a machine operator applicant is required to make a part and determine the measurements during the interview process.

Do you have difficulty filling job openings? For what positions? What is the problem?

- One company reported difficulty in filling maintenance positions. Another company had difficulty hiring entry level machine operators. That company attributed the difficulty to their relatively lower wage scale and the 90-day wait for additional piece work pay.

Recruitment

How do you recruit for job openings?

- All of the companies primarily use employee referrals and word of mouth to recruit for workers.
- One company placed newspaper ads for operators and sometimes received no responses.

- One company hired a manager of quality control through a newspaper ad.
- One company gives employee bonuses for good referrals.

Do you use temporary employment firms? For what positions? How well has that worked?

- One company used temporary agencies for temp to perm hiring when the employee performs well.
- Two companies do not work with temp agencies and one uses temps only to cover vacation for office staff.

From what sources do you have the best luck getting qualified candidates?

- Three companies report that the best method is employee referrals. One company prefers the temp to perm workers from temp agencies.

Have you had success recruiting qualified candidates from High Schools? Community Colleges? Community training providers? What had been your involvement with these sources? Why have or have not these sources been useful?

- One company reported that it hired two graduates of the Chicago Manufacturing Institute as mid-level machine operators with positive results. The company also hired years ago from the Prosser High School job program with mixed results.
- One company hired a worker from a city program but does not remember the name of the program.
- One company has hired two interns from the owner's church.
- One company has not worked with outside organizations.

Are there certifications or qualifications you trust more than others?

- None of the companies reported certifications that they trust more than others.

Do you recruit from the local community? If yes, what has been your experience? If not, why not?

- All of the companies stated that they draw mostly from the local community. One company reported that their workers tell others in the neighborhood not to break into the company because "that's my business, that's my future."

Current Training Needs

What skill deficits currently interfere with optimum production/quality levels? At the entry level? In skilled positions? At the supervisory and management levels?

- One company reported that skill deficits in their workforce cost the company between 30-50 thousand dollars in lost productivity/quality.
- All companies spoke about challenges with workers with limited English skills. One company offers ESL classes on site but found that the older workers were resistant to learning a new language. Companies state the inability to speak English interferes with quality because workers need to be able to read the details in a job order.

- Two companies rely on supervisory staff to set up job orders because their workers can not do it.
- Two companies expressed concern that their supervisory staff is older and they do not see how they will fill those positions in the future.

Retention

- One company experiences high turnover rates, primarily with new hires. The company reports that a major reason for the turnover rate is its relatively lower pay scale.
- One company with a lower turnover rate stated that the reason is its non-invasive management style. The company stated that it was not on the high end of the pay scale. The company provided extensive OJT training and had an articulated career path.
- A unionized company stated it had a low turnover rate because it treated its employees fairly.
- All of the companies offer benefits packages.
- One company with a low retention rate offers tuition reimbursement for a grade of "B" or better for company-related courses.
- One company that hires primarily unskilled workers offers tuition reimbursement on an informal basis but finds that these workers tend to leave after getting more training. The company reported that people with good skills do not stay so it prefers to hire unskilled workers.

Would you say your company generally promotes from within? For what positions?

- All of the companies state that they primarily promote from within for all levels. One company filled a manager of quality control position from the outside.
- One company could not promote a person who was otherwise qualified for quality control because of a lack of customer relations and communication skills.

Experience Providing Training

What training do you currently provide your employees?

- All of the companies (two exclusively) rely on OJT conducted by their supervisors or veteran employees.
- Two companies pay limited tuition reimbursement. One company has reimbursed workers to attend company-related classes (e.g. CNC training) offered at Daley, West Side Technical Institute, Wright and Harper Colleges.
- One company did not have to train its higher skilled workers because they came from Poland where they had received a strong vocational education.

What have been factors that have made the training successful/unsuccessful?

- One company used to offered ESL onsite but found that the older workers were resistant to learning English.
- One company stated it depended on the individual employee's motivation.

Have you hired outside organizations to do customized training? Have you been satisfied? Why or why not?

- All of the companies generally have no onsite technical training from outside providers because they are satisfied with OJT.
- One company offers training by the manufacturer when it purchases new equipment.
- One company sent set up operators for management training through a trade association.

How do you fund training?

- All of the companies primarily fund their own training.

Have you used Prairie State 2000 or other city, state, or federal programs for employee training? How did you find out about them? What were the problems associated with using them?

- Two companies had used Prairie State 2000 funds: one for ISO training and one for an ESL class. One company would not have done it unless the outside trainer handled the paperwork.
- Two companies use private funds only for training and are not interested in learning about public funds because they are concerned with paperwork requirements.

The Ideal Training System

What manufacturing positions do you think will be in most demand by Cook County companies in the next two-three years? How will the qualifications for these jobs differ from those of jobs currently in demand?

- One company stated that it believed the demand for sales and purchasing will disappear in the future as these jobs get absorbed by technology and other positions.
- One company sees a demand for entry machine operators despite the trend toward more technology because there will always be a need for support.
- One company said that there will be a big demand for tool and die makers because there are so few left.
- One company said that the demand will be for set up operators of specialized machines, from screw machine operators to high four axis machine centers.

What kind of graduates would an ideal workforce development system be able to produce? What positions should they be trained for? What key skills would they have?

- All of the companies would like graduates to have strong work ethics and basic math and reading skills. One companies desired strong analytical skills. One company would like graduates to be trained to read blueprints.
- One company said that the system would improve if high schools produced graduates with better reading and math skills who knew how to behave in a professional manner.

What role(s) should employers play in an ideal manufacturing system? What would the system have to have in place to support this role(s)

- Two companies stated that smaller companies do not have the capacity to be leaders in the workforce development system outside of providing OJT.
- One company noted that big companies should get involved at the high school level and help students learn the value of work.

MANUFACTURING WORKFORCE DEVELOPMENT PROJECT

EMPLOYER INTERVIEWS

I. INTERVIEWEES

Name of Company and Title of Interviewee	Type of Manufacturer
J.I.I. Manufacturing- Plant Manager	Forged steel components for autos (e.g. drive trains)
U.S Gear- President	Power transmissions for all sizes of trucks
Chicago Metal Rolled Products- President	Job shop that bends structural steel members primarily for construction, mechanical contractors, trucks, and steel service centers
Abbey Metals- Co-owner	Job shop

Please note that these companies were interviewed individually during the week of June 9, 2001. Their information is reported collectively.

II. SUMMARY OF FINDINGS

Hiring

- The majority of the companies hire primarily entry-level workers. The most sought after qualifications are reading, communication and basic math skills, and a strong work ethic. Most of the companies made allowances for limited English ability for immigrant workers and viewed immigrant workers as generally hard workers.

- Prior to the recent economic slowdown, two of the companies significantly expanded. One company found it could not find qualified entry-level workers and invested in technology to compensate for the skills shortage.

Recruitment

- Companies use a wide range of recruitment strategies, although the two most favored techniques are “word of mouth” and walk-ins. Two companies offer employees bonuses for successful referrals. One company hires graduates from the Bridge Program at Instituto Del Latino Progresso and West Side Technical Institute.

Current Training Needs

- Most of the companies state that a lack of English and basic reading and math skills

requires extensive accommodations (e.g., training, "de-skilling" processes) and can interfere with productivity and increase costs. All companies offer extensive OJT and consider it a part of doing business because their operations are highly specialized. One company offers extensive onsite training that is delivered primarily by outside providers. At least half of the companies stress cross-training to increase worker skills.

- In addition to basic reading and math skills, companies need workers with the ability to identify and solve problems, work in teams, and properly handle record keeping. Companies see a great need for workers with better technical skills to keep up with advanced manufacturing processes.

Retention

- Companies that offered higher wages had lower turn-over rates. All of the companies offer benefits packages and many offer tuition reimbursement for job-related courses. Some companies offer bonuses for factors such as productivity, quality and safety. It is unclear whether there is a difference in retention between companies based on these factors.

- Most companies did not have an articulated career path for their workers, although they generally promoted from within the company. One company has an outside organization advise workers on individual learning plans to assist them in devising a strategy for career advancement and increasing their value to the company. That company also said that hiring graduates from a manufacturing training program had made a positive impact on its retention rates because of the graduates' demonstrated level of commitment, although it could not quantify the impact.

Experience Providing Training

- Most of the companies relied on OJT as the primary source of training. Companies that used customized training for the most part thought it had been successful, with the exception of general ESL classes on workers' time. Companies value public funding of training programs as long as there is an intermediary that handles the extensive paperwork.

- Companies have found that training is most effective when it is held onsite and on company time but that approach is costly.

Salient Quotes:

"One of [our] principles is to continually train everybody for their expanded roles. One of the things that is happening in manufacturing is there is more and more expected by our customers and we expect more from our workers so that they are not just machines operators. Pretty soon they are gathering data on production and quality, getting more involved in maintenance, and in effect figuring out ways that they can add more value. If they can add more value, then they can make more money and it works well for everybody."

"The way the machines are going, and the way the industry is going, and the way the technology is going, people are going to have to be more fluent in the language of machinery than they have ever been before. They are going to have to be comfortable with computer input, they are going

to have to be knowledgeable with basic math and even beyond that, they are going have to be able to write and communicate clearly."

"I think the skill knowledge base in our country is nearly depleted. The introduction of computerized numerical machines will fill that gap to some extent but that requires a skilled person not only to program but a person with knowledge with respect to cutting tools, tolerances and measuring and there just doesn't appear to be any interest generated in our labor force in this type of work. There are some groups of people that completely avoid factories. 99% of our applicants are Latinos and Blacks - we don't get any Asians or Whites."

"You do see a neat thing when immigrants come here and all of the sudden they save some money, then they have a car, and then they have a two flat, and then their kids go to college."

"[Our company] created processes and a job description in which a person with minimal skills can do what formerly was a higher skills job...We try to use computer-enhanced manufacturing practices that make the decisions for the operators so all the intricacies to make a precision part are not required anymore."

"The job shop atmosphere is totally different...Every job you do is once in a lifetime...So you have to have individuals who are flexible enough to make those adjustments on a daily basis."

"We have had great luck with the [industrial engineering] interns. They have added a lot of value and they had a lot of great experiences. I am able to give them a wide range of experiences and a lot of autonomy and a lot of responsibility...The interns were able to look at repeat jobs and [suggest] ways to improve processes."

"I went to college for a year, went to work for a factory...it was a good income. [I] started to look around and there was opportunity, I don't think kids these day do. Sure you can go work at MacDonald's but you can't rent an apartment on the pay at MacDonald's. So I was able to get married and support a family. I had the opportunity to work on a job. Today's kids do not want to work on an assembly - they want start in my job today."

"Usually if you go [for public training funds], you have to spill your guts...They want you to put down everything including your last grandchild."

"I am a great believer [in pursuing public training grants]- we pay a ton of taxes and we should get something back in return."

III. FINDINGS

Hiring Needs

How many new employees have you hired in the past year? For what positions? How many do you expect to hire in the coming year?

- One company hired 30 new employees in past year, 7-10 of which were new positions. The positions were primarily machine operators.
- One company has not hired in the past year due to economic slowdown. Another company has not hired for the last five years.
- One company hired 50 employees for mostly entry level positions in the last year and a half due to increased volume from a new job. The company does not see any expansion

for the coming year other than replacing for attrition

What qualifications are you looking for in applicants for these positions? How do you determine what skill levels you want or need for particular positions?

- One company hires primarily entry-level workers with basic math and reading skills, and ability to learn and work in teams. Other skills include blueprint reading, measurement, basic computer skills and some hands-on machining experience.
- Two companies state that they base hiring on the application and interview. One company asked about favorite classes in high school to see if there was an interest in math or science.
- One company considers qualifications for a machine operator to be the ability to read instructions, arithmetic skills to read a micrometer, blueprint reading and record keeping skills to comply with QS 9000. A set up operator must have more blueprint reading, ability to code a machine, operate the inspection equipment and recognize the output of the equipment and adjust accordingly. Group leaders are set up operators with supervisory responsibility.
- One company wants skills in welding, reading blueprints, understanding job orders, reading and basic math. The company requires welders to have American Welding Society certification.
- One company would like people with manufacturing experience, mechanical skills, logic, ability to solve problems, with strong work ethic and good attendance. The company said it could not find anyone with the level of skills. The company now requires people who can read and write. The company spent 50% more in capital investment for the computers to compensate for the workers' lack of skills.

Do you have difficulty filling job openings? For what positions? What is the problem?

- One company found when the economy is good, there is a shortage of welders.

Recruitment

How do you recruit for job openings?

- One company hires shop workers primarily through Instituto Del Progresso Latino.
- Two companies' hires come from word of mouth and walk-ins.
- One company gives employee bonuses for good referrals.

Do you use temporary employment firms? For what positions? How well has that worked?

- One company said its one attempt at using temp agencies was unsatisfactory.
- One company said temp employees did not want to work and often had alcohol/drug problems.
- One company stated it uses Manpower to screen candidates and then hires them as temp to permanent if satisfactory after 30 days. This reduces cost for physical and test.

From what sources do you have the best luck getting qualified candidates?

- One company stated its best source is Instituto del Progresso Latino.

Have you had success recruiting qualified candidates from High Schools? Community Colleges? Community training providers? What has been your involvement with these source?. Why have or have not these sources been useful?

- One company is very satisfied with hiring graduates from Insituto del Progresso's Bridge Program with West Side Technical Institute. It saves time because Instituto conducts initial screening, schedules interviews, and follows up after placement. In addition, the graduates have shown persistence by completing the program and meeting the attendance requirements. In the Bridge Program, graduates complete a 14-16 week training session covering blueprint reading, measurement, basic computer skills, and some hands-on machining experience.
- Two companies report having been approached by the local city colleges regarding their services and placement of their graduates but there was no follow up by city colleges.
- One company has had interns from IIT, UIC and France in industrial engineering and states the interns have added value. "We had great luck with the interns. They have added a lot of value and they had a lot of great experiences. I am able to give them a wide range of experiences and a lot of autonomy and a lot of responsibility...The interns were able to look at repeat jobs and [suggest] ways to improve processes."
- One company serves on the advisory board of Daley College and has hired a couple of graduates from there. The company has not hired enough workers to evaluate their quality. The company observes that Daley College looks like it has a good maintenance mechanics curriculum.
- One company works with IIT and its Bachelors in Manufacturing Program and hired one graduate from it.
- One company has worked with Score, a program for ex-offenders, and Prairie State community college. The company also hired interns from Washington High School. The most helpful was a relocation program by Prairie State for dislocated workers from Allis Chambers.
- One company said it hired from referrals from the Illinois Department of Human Services but found most of the employees did not work for long.

Are there certifications or qualifications you trust more than others?

- One company does not have experience with certifications but said it sounds like it would be a great idea. The company is trying to develop internal certification specific to its company.
- One company said that it does not currently consider certifications but would like a system which offers reliable certifications.
- One company is not familiar with skills standards or certifications.
- One company said it values American Welding Society DS-1, ASME Section 8 and API 650 certification, and CDL licenses.
- One company said that its wage scale precludes them from attracting certified worker.

Do you recruit from the local community? If yes, what has been your experience? If not, why not?

- Two companies stated they draw mostly from the local community.
- One company states that most of its employees who used to live near the company have moved away due to change in neighborhood.

Current Training Needs

What skill deficits currently interfere with optimum production/quality levels? At the entry level? In skilled positions? At the supervisory and management levels?

- All companies spoke about challenges with workers with limited English skills. Companies make accommodations through bi-lingual supervisors and use of teams. One company offers ESL classes on site. Companies state the inability to speak English interferes with quality because workers need to be able to read the details in a job order.
- Math skills are also a deficit. Workers need to do calculations correctly or quality suffers.

How do these skill deficits interfere with standard plant practices/good communications?

- One company states the lack of English skills interferes with workers' ability to work on teams that are designed to promote continuous improvement.

Retention

- Three companies have experienced high turnover rates for a variety of reasons. Two companies noted poaching of trained employees from high-paying suburban employers as one factor. One company responded by identifying the all-stars and moving them up quickly to be more competitive. One company has an average of 18 years of service.
- All of the companies offer benefits packages. One company promotes recognition, including rewards and holds bi-annual celebrations of workers' learning.
- Two companies offer bonuses based on factors such as quality, cost savings, and productivity.

Would you say your company generally promotes from within? For what positions?

- All of the companies state that they primarily promote from within for all levels, except, in one case, shipping and, another, quality assurance.
- One company looks at the level of cross training, satisfaction of the outside customer, and performance in terms of soft skills (e.g. communication, learning, teamwork, flexibility, etc.). Soft skills are described behaviorally in a matrix and there is a numerical rating of a worker's performance in this area.
- One company generally promotes from within because its equipment is highly specialized and it wants to retain people after training.

Experience Providing Training

What training do you currently provide your employees?

- One company starts with orientation and then assigns employees to be helpers in mentoring situations. Working with CAEL, the company also offers onsite training on company time, sometimes provided by outside providers, including classes on shop math, blueprints, substance abuse, reading shop orders, problem solving, VESL. They offer reimbursement for off site courses.
- One company estimates that it spends $100,000 on training annually. Another spent close to $100,000 to implement QS 9000.

- Two companies offer mostly OJT because their machines are highly customized. Some older workers have been reluctant to train younger workers.
- Two companies emphasize OJT cross-training.
- Two companies pay limited tuition reimbursement, one only for job-related courses. The other company requires the employee to first develop a learning plan with CAEL's assistance.
- One company offered a self study maintenance training program with assistance from the foreman, with a money incentive for completion. No employees completed the program.

What have been factors that have made the training successful/unsuccessful?

- One company used to offer general classes on Saturday mornings but found the classes were insufficient to teach the language.
- One company stated that although it is costly, offering classes on company time promotes participation and workers are engaged in the training.
- One company found it helpful to only receive aggregated results on training so individual workers are not intimidated about training.
- One company gives internal certifications upon completion of training.
- One company found training timing and applicability to current work to be important factors.
- No hourly person has taken advantage of one company's tuition reimbursement benefit.
- One company documents OJT with a checklist that the employee signs to verify he or she understands the skills.

Have you hired outside organizations to do customized training? Have you been satisfied? Why or why not?

- One company works with the Council for Adult Experiential Learning (CAEL) to help design and arrange its training activities as an integrated part of its overall strategic planning. Outside providers have included DePaul University, Daley College, West Side Technical Institute, and Jane Adams Resource Corporation. The company is very satisfied with the quality of CAEL's services. The company was referred to CAEL by the Chicago Manufacturing Center, the local Manufacturing Extension Partnership.
- One company sends employees to gear school (Gleason and Illinois Tool Works) for which employees receive certification.
- One company contracted with the manufacturer for training on new machinery.
- One company sends employees to training at the steel mills for certification on specialized jobs.

How do you fund training?

- Two companies use a combination of private and public funding.
- The co-owner of one company conducts most of its training onsite.
- One company uses private funds for training and is not aware of public funding sources.

Have you used Prairie State 2000 or other city, state, or federal programs for employee training? How did you find out about them? What were the problems associated with using them?

- One company has received funding from the Secretary of State Literacy Program, Prairie

State 2000, and ITAP. The company found it helpful to use an outside intermediary to handle the paperwork and other requirements.

- One company used Prairie State 2000 funds and it worked out well. The company is now applying for a grant to conduct training on blueprint reading, statistical process control, and geometric tolerancing. The company also was funded to re-train the dislocated workers from Allis Chambers from a state grant about eight years ago.
- One company will not go after public funding because of the amount of information that it would need to supply to the funder.

The Ideal Training System

What manufacturing positions do you think will be in most demand by Cook County companies in the next two-three years? How will the qualifications for these jobs differ from those of jobs currently in demand?

- One company hears from other manufacturers that they are looking for qualified entry workers with basic skills and good work ethic. The other demand is for maintenance mechanics.
- One company sees the demand for machinists with math, communication and computer skills.
- One company said that there will be future demand in welding.

What kind of graduates would an ideal workforce development system be able to produce? What positions should they be trained for? What key skills would they have?

- All of the companies would like to see workers with basic reading, communication and math skills. One company also mentioned a good work ethic, drug free status, and the ability to work on teams.
- One company would like to see technical high school or colleges graduates who can do welding, "fit up" the job, blueprint, and math.

What role(s) should employers play in an ideal manufacturing system? What would the system have to have in place to support this role(s)

- One company stated that employers should be fully integrated, helping to develop the curriculum at schools. At a minimum, employers should serve on advisory boards.
- One company has observed high competition by developers of different skill standards and cannot imagine why the developers cannot work together to integrate the standards.
- Two companies noted a small entrepreneurial employer is not going to put in the time and will be suspicious, but the big companies with large human resources will drive the process. Another company observed that manufacturers generally play "a fairly apathetic role" in the workforce development system.

Appendix V

Employer Survey

In April 2001, the Manufacturing Workforce Development Project in partnership with the Illinois Manufacturing Association undertook a mail survey of local manufacturers in the Metal, Machinery and Electrical Equipment sector, a copy of which is included in this appendix. The goal of this survey was to determine the training needs of Chicago area manufacturers and how they currently meet those needs.

We received 41 replies to this survey. 26 of these replies came from firms that employed fewer than 100 workers. Only two of our replies came from firms employing over 300 workers. We did not receive a large enough sample for these survey results to be considered representative. Nonetheless, the responses of these employers indicate some general trends.

For every type of job category, employers indicated that they needed workers with technical skills. Computer skills were also highly regarded. In general, employers cared the least about finding workers with basic literacy. Employers also indicated that they will need future training and skills upgrading for production workers more than for any other category of worker. This indicates that there is a high demand for technical training of production workers.

However, most employers reported that they did not take advantage of outside training providers, either to find new workers or to train current ones. The majority of employers indicated that they train most of their workers themselves, either on the shop floor, by job rotation, or by a class offered at the company. A number of companies did take advantage of outside sources for training. In general, though, employers expressed less satisfaction with these types of training, and preferred to control the training process themselves. Employers also indicated that they do not find many of their workers through either government programs or outside training providers. Instead, they rely on word of mouth, newspapers, and other traditional means of finding workers.

There are two possible reasons that more employers don't take advantage of outside training providers: either they don't know about them or they don't find them useful. In order to improve the overall workforce development system in Cook County, both of these reasons need to be addressed. Employers need to be made aware of what is possible and how it might be useful to them. Training providers also need to ensure that the training they provide is useful to employers and prepares workers for the jobs that exist.

Manufacturing Workforce Development Project, Manager Survey –
Metal, Machinery, and Electrical Equipment (2000-2001)

Name:_____**Company:**_____

Address:_____ **Phone:**_____

1. **For each job title listed please indicate whether you expect to have more workers in the job (circle the +) or fewer workers (circle the -) by 2005. Leave the box blank if you do not expect a change or indicate if the job title does not apply to your workforce. Please think of the job titles as broadly as possible to better fit your workforce.**

+ = increase
- = decrease
NA = Not present in your workforce

Mechanics and Maintenance Repairers:	+ - NA	Tool & Die Makers:	+ - NA	Machinists:	+ - NA
Welding and Metal Fabricating Setters	+ - NA	Precision Assemblers:	+ - NA	Machine Builders	+ - NA
Inspectors, Graders, Testers:	+ - NA	CNC Operators	+ - NA	Combo. Machine Tool Setters:	+ - NA
Multiple Machine Setters;	+ - NA	Welding & Metal Machine Operators:	+ - NA	Hand & Machine Assemblers:	+ - NA
Material handlers:	+ - NA	Fork Lift &Industrial Light Truck Operators:	+ - NA	Other : _____	+ - NA

Please circle the two job titles which you expect to increase the most in the next 5 years.

2. **Please indicate the effectiveness of each method that you have used to recruit new workers in the last 3 years.**

	How effective (1=very; 3=not useful):				
Newspaper	1	2	3	Don't know	Not used
Word-of-mouth	1	2	3	Don't know	Not used
Referral from current employee	1	2	3	Don't know	Not used
Temporary Agency	1	2	3	Don't know	Not used
Listing with training providers (e.g. schools)	1	2	3	Don't know	Not used
Listing with government agency	1	2	3	Don't know	Not used
Other(_____):	1	2	3	Don't know	Not used

Please circle the above method you most prefer.

3. Please indicate (with a ✔) for each production department listed which skill need or deficit is an important problem.

Plant area ➔ Skill Deficit	Shipping and Receiving	Material Handling	Set-up	Production Operations	Packaging	Quality Inspectors	Maintenance and Repair	Tool Room	Information Technology
Following Basic Rules/ Maintaining Records									
Reading English and/or basic literacy									
Basic Math Skills									
Computer Skills									
Oral Communication									
Consistent Work Quality									
Problem solving									
Interpersonal skills									
Organization/ Planning									
Specific Technical training (please indicate: _____ _____ _____)									

4. Please indicate which types of training you offer for production workers:

	If offered, how effective was it: (1=very; 2=moderate; 3=not useful):				
Classroom company-based training:	1	2	3	Don't know	Not Offered
Shop floor company-based training:	1	2	3	Don't know	Not Offered
Job rotation:	1	2	3	Don't know	Not Offered
On-site training by technical schools, colleges, etc.:	1	2	3	Don't know	Not Offered
Off-site training by technical schools, colleges, etc.:	1	2	3	Don't know	Not Offered
Paid Release time for training	1	2	3	Don't know	Not Offered
Tuition reimbursement:	1	2	3	Don't know	Not Offered
Apprenticeships:	1	2	3	Don't know	Not Offered
Peer to peer training:	1	2	3	Don't know	Not Offered
Other (_____):	1	2	3	Don't know	Not Offered

5. Please list which training providers you have used in the last 3 years:

_____
_____
_____
_____

6. Please circle each funding method used if <u>on-site training</u> **was offered:**

company funded **government funded**
worker funded **Not offered**

7. Please circle each funding method used if off-site training **was offered:**

company funded **government funded**
worker funded **Not offered**

8. For each of the production areas listed, please mark those where you believe your current workforce will need future training and skills upgrading to improve production in the next few years.

Plant area ➔	Shipping and Receiving	Material Handling	Set-up	Production Operations	Packaging	Quality Inspectors	Maintenance and Repair	Tool Room	Information Technology
Will need future training and skills upgrade									

9. We need input from employers as we develop a plan to prepare workers for manufacturing. Would you be willing to participate in a 3 or 4 hour focus group with other companies to discuss workforce development issues such as worker recruitment, worker retention and employee training? If yes, please check the box and we will contact you.

10. What are the biggest problem(s) you face in getting and keeping a good workforce?_____
_____
_____
_____

I. WORKPLACE DATA A. What type of product is manufactured at your workplace: _____ _____ B. What are the major production departments in your plant _____ _____	C. Number of employees at your location: 1 - 49 : _____ 50 - 99 : _____ 100 - 299: _____ 300+ : _____ D. Geographical Location (Please write zip code for your production site(s): _____
II. PERSONAL DATA A. Your Job Title: _____	B. Your Primary Work Responsibilities: _____ _____ _____

We want to thank you for completing this survey. We are asking manufacturers throughout Cook County in targeted sectors - Metalworking, Machinery, Electronic Equipment and Food - to provide input regarding current and future skill and production needs. Our goal is to design an effective system to provide you and other Cook County manufacturers with a regular supply of workers who have the skills and knowledge to meet those needs. We will share the results of the survey with you and your company when they are available.

Appendix VI

Summary of Employee Focus Groups
Amy Sherman
September 11, 2001

Methodology

The list of questions contained in Exhibit 1 of this Appendix was used as a guide for the focus group sessions. Six sessions were held. Participants volunteered to attend a focus session by invitation of either the employer or, when applicable, the union. One session was hosted by Chicago Women in Trades. In three sessions, the hosts restricted the type of questions to be asked and/or the time allowed for the session.

The Participants

The majority of the 24 participants have either low or mid-level skills[8]. At least five participants are in highly skilled positions. Nine participants work in the MME sector, two in the printing sector, and 13 in the food sector, representing a combined total of six companies. These companies include two large candy manufacturers, one in the city and one in the suburbs, a large Chicago electrical manufacturing company, a small Chicago metal spinning company, a medium sized Chicago print shop and a suburban engineering company. Three of the companies are unionized, including one that is in the process of negotiating its first contract. Of the 24 total participants, 12 are African-American, nine are Hispanic, one is Asian, and one is Caucasian. 14 are male and ten are female. The average age is 42, with a range from 25 to 60 years of age. The average annual income is approximately $30,719[9]. Exhibit 2 of the Appendix is a table that shows race, gender, job title, and income of participants.

Educational Background of Participants

The participants reported the following educational levels: one with a bachelor of science degree, two with associate degrees, three with some junior college, nine with a high school degree, one with a GED, and two working on completing their GEDs. One was initially trained through Dunbar High School and Washburne Trade School and later completed a sheet metal apprenticeship at Local 73. Four of the participants have earned certificates in non-manufacturing related courses. Three have earned certificates in manufacturing-related subjects. Seven participants received specialized manufacturing training before their current positions: two at private institutions, one at a community college, two at the Chicago Women in Trades Manufacturing Opportunities Program, and two at the Bridge Program at Instituto del Progreso Latino and West Side Technical Institute.

[8] The data in this summary is based on available information reported by the participants.
[9] With the exception of the product designer, the employees in a union shop with a contract made the highest salary.

How the Participants Learn Their Jobs

The vast majority of participants reported that they learned how to do their work on the job. Most were taught job tasks by either their supervisor or their more experienced co-workers. Several workers reported the importance of having a mentor, typically a senior employee, to show them the ropes. For example, one participant spoke about how his brother taught him how to spin metal, a process that requires skill and judgment.

Participants reported that the quality of on-the-job training can be inconsistent, and that this causes problems. For example, at a large candy company, workers said that they are allotted a 15-day "break in" period to learn their new job from a more senior co-worker. Workers complain that issues with the machinery often do not come up until after the "break in" period and supervisors expect them to know how to address the issues without the proper training. In addition, supervisors often adjust the machinery on the line without explaining why or how, and the workers do not learn. Finally, participants note that when a worker is bumped by a more senior person, the bumped worker is reluctant to show the senior person how to do their former job.

In contrast, another company instituted a team approach to production. The participants reported a high degree of satisfaction with this arrangement. One participant noted:

> Working in a team is always like cooperating with each other, communicating with each other and if you can help each other out, you're helping each other. Where I used to work, I was working by myself, if you say to somebody, can you help me out, they don't want to help. Over here it is real different. If you ask somebody for help, they will help you. Every month they have a meeting to explain what is going on in our teams, to see what we need. I think it is great because when you try to do it by yourself, it is frustrating - you don't learn.

The four participants with pre-employment manufacturing training reported benefits from the training, especially with reading blueprints, measurements and tolerances. Three of the four said that the classes also refreshed their understanding of basic math. One participant commented that the training not only improved his math and computer skills, but it also exposed him to the world of manufacturing and helped to improve his work ethic and attitude. He said:

> I had a great math teacher and computer teacher [at Instituto del Progreso Latino]. They motivated you. They used to take us to factories to see what you were getting into. They always told you to "be on time" is one of the main things you have to get in your head. . . . They always talked about being friendly with everybody. There was a lady there who said, "When you get up in the morning and are in a bad mood, a simple good morning to everyone can change your day."

Participants in higher-skilled positions also report benefits from training. One participant talked about going to DeVry to keep current in his field: "By going back to [school] it

helped in other areas. I could expand my horizons, and in electronics, you have to keep up; you have to be able to know the new equipment and tests."

What Workers Want to Learn

Computers and technology training top the list of the training desired by the participants. Participants want more exposure so they can keep up with the latest technology and understand the whole production process. As one participant observed:

> A lot of what I see is that there is no job satisfaction among the untrained and unskilled. But I know for myself I would like to have learned a little bit more about running my machine. Just getting a basic understanding of how my machine operates, why I am doing the certain things that I am doing. Because a lot of times it helps to see a completed product. How this product fits. So if someone is explaining to you this is how I want you to do something, you want to know why you are doing it that way. You want to see the big picture and you want to be more involved in your job. Not just I'm making a part, I'm making a part, I'm making a part. The only reason that I know more about my job is because when they needed more people in other departments on other machines, then I go there and see where the product I make goes.

Two participants talked about the safety implications connected to a lack of training on new machinery. One reported, "You have to know how to read the instruction and directions to get the job done. You have a lot more safety rules . . . because the [lines are running faster]." She speaks of a doubling or tripling in productivity on her line. Another participant stated: "You have to have more education to learn about these machines. They just throw you in there and give you a half a week of training and it is causing a lot of accidents. People are not properly trained." The participants reported that they asked the mechanics for assistance and found that they had not received any training on the machines either.

Five participants spoke of the need for more basic math and measurement training. Most of the Spanish-speaking participants would like to take ESL. One participant stated that she wanted management training because she believed that the trend is for fewer workers with greater technical and management skills to oversee large numbers of machines.

Three of the participants in maintenance positions reported a need for an associate degree level of skill in math, at least through trigonometry. They indicated that reading comprehension and technical knowledge at the associate's degree level is also needed to successfully perform their jobs because of the complexity of technical manuals. Two of the three participants reported a wish for training in heating and air conditioning. A mechanic at another company reported a need for more training in industrial electronics and in the area of controls such as PLC (program logic control). He stated that "there is so much technology coming in that we are just being left behind."

At least six participants reported that they view computer training as a way to protect themselves in the event of inevitable job reductions in manufacturing. As one participant reported, "I would like to take computer classes because manufacturing jobs are playing out and they are making all the other lines automatic. That means we are going to be out without any type of skills. If they had [computer training], we could look forward to it like a back up. We wouldn't be handicapped."

Obstacles to Training

Participants reported that the following are the major obstacles to pursuing additional training:

- Lack of time
- Location of the training
- The timing of the training
- Lack of English skills
- Lack of transportation
- Lack of child care
- Cost of the training

Participants did not rank factors, but a "lack of time" was by far the most frequently reported barrier to additional training. Almost 40% of the participants, both male and female, reported that they are already juggling between work and family responsibilities. For some participants, a long work commute adds a great strain on time. For example, two participants reported that they commute a total of about four hours each day for their jobs as machine operators at a far North Side Chicago electrical manufacturing company. Both of these women are the heads of households with children at home. Another participant, also with child care responsibilities, reported that she commutes every day from Indiana to a plant in Franklin Park, a northwest suburb of Chicago.

Related to the issue of time is the location and timing of the training. Most participants preferred to train at the company. Participants stated that it would be best if classes were held on company time or at least close to their shift end. As one participant complained, she worked three shifts but most classes are offered during the day or early evening. In addition, the need to work overtime sometimes interfered with the participants' ability to commit to any long-term training class.

Most Hispanic participants reported (over half through interpreters) that their most pressing need is to learn English because most training classes are conducted in English. Even a participant in the Bridge Program at Instituto del Progresso reported some frustration with the classes because they were conducted in English.[10] At least two of the six companies have offered employees ESL with generally poor results or unrealistic expectations. Participants reported their co-workers find it hard to learn English unless it directly applies to the job because their community speaks Spanish. In addition, participants reported in one company that the workers felt like they were being rushed in

[10] Instituto Del Progresso now offers its manufacturing classes in both English and Spanish.

class. For example, according to one participant, an ESL class started out in English so no one understood what was being said.

Placement

The majority of the participants learned about their job either through a relative or friend who works or once worked at the company. Notable exceptions are four participants who are graduates of either the Chicago Women in Trades Manufacturing Opportunities Program or the Bridge Program at Instituto del Progresso Latino and West Side Technical Institute. These programs place their graduates. In addition, a product designer works for a contract agency that placed her into a long-term arrangement with a company, where she might be hired for a permanent position. One participant went door to door in areas with a high number of manufacturers for his entry-level position with a metal spinning company. One participant found his job through newspaper advertisements. One participant was referred to his company through an unemployment office.

Retention

Over half of the participants reported that training – as tied to advancement – is a major factor in remaining in their job. At least three of the participants stated that the lack of opportunity for training was a major factor in a decision to leave a prior employer.

Training Programs

Four of the six companies offer or have offered some form of formal employee training programs. However, the quality and availability of these programs is inconsistent. For example, a participant who had worked for a North Side manufacturer with an extensive training program complained about not receiving the necessary supervisory recommendation to take company classes. She stated that she left the company to start an apprenticeship with Local 73 Sheet Metal Workers because she believed that she would not move up in the company without the training. A participant at another company talked about "not being one of the chosen few" sent to training classes. When he asked about the reason, he was told that he was needed at the plant.

In another company, participants reported that a program was offered through Roosevelt University that let workers earn their associate's degrees by taking classes at the company after work. One participant reported how she completed English and a required seminar only to be notified by the company that from now on, she would have to take the classes downtown at the Roosevelt University campus. The participant stated that she could not continue the program due to time and cost constraints related to the commute. According to the participant, the program was terminated shortly thereafter due to a drop in attendance.

Participants reported that when the training is of poor quality it can lead to a lack of interest from workers. For example, two participants described a computer class taught by a co-worker with a strong computer background. The co-worker lacked the skills of a

trainer and he became frustrated when workers asked him to explain terms such as "megabytes." According to one participant, the trainer asked the class, "Don't you know anything?" The participant responded, "That's why we are here." According to the participants, the company did not ask the employees for feedback about these classes so it did not know the level of effectiveness.

Issues of quality are not limited to classes taught by co-workers. A participant spoke of a short-lived training center offered at her company. The training center only had three computers for a workforce of over 700 workers, and two teachers from Triton College. One teacher was described as passive and not engaging. The other teacher at the center spent time finding out about the employees' work, and designed the training to help upgrade employees' skills. According to the participant, "That made all the difference."

Three participants in higher-skilled positions at one company reported that they have to go outside of the company for additional training because their company offers mostly basic skill training. The company's learning center offer tapes on maintenance topics but the participants reported that the courses are refresher courses and do not teach new skills. The participants noted that the center could be beneficial to workers without basic skills. Participants from another company reported that their company paid for an outside training program in maintenance but discontinued the program without explanation.

Participants from two companies reported that their companies had used training in connection with tactics to screen out senior employees. For example, in one company, participants described how management tried to implement a cross-training initiative about four years ago. The participants reported that they successfully opposed this initiative with the support of their union. The participants indicated that the initiative was unfair to senior people who were hired for a particular skill and later were expected to pass a test for a different job after receiving insufficient training. One participant who is an electrician pointed to his welder colleague as an example. The welder had taken a high school program and an apprenticeship. The participant reported, "[The company] wanted to give me three weeks of training, take a test, and call me a welder."

Factors for Success in Training

Convenience, applicability to their work and advancement, and quality are the factors for successful training most mentioned by the participants. As noted above, time, location, scheduling, transportation, and childcare – all convenience factors – can present major barriers to training. The skill of the trainer is also a key to the success of the training.

The applicability of the training to the job and a sense that it leads to advancement also impact the success of the training. As one participant noted:

> [Co-workers] do not mind giving their time but they want to see what reward they [will] get for doing all of this. So the training has to be tied to some kind of monetary reward. The money does not have to be immediate. They and I are just

> going to take classes that are specified for the type of job that [we] are doing, because if I am going to get all the training and I am going to be at a standstill then what is the point? There has to be a career path. I noticed that when I got hired that in some areas people cannot move up so they leave the company. I would say that 75% would be interested in training if they had some sense of advancement linked to that training and [if it were] on company time. If it were not on company time then only 35% would do it.

One participant reported that there could be an economic reward by advancement or training on paid company time.

Discrimination Issues

Language issues sometimes translate to a perception of discrimination in favor of English-speaking workers. Two African-American workers at a large candy company on the South Side of Chicago stated that their Spanish-speaking co-workers complain that blacks were favored for promotions. The workers directly tied the issue to access to training because the classes and instruction for upgraded skills are taught in English. At their unionized company, the most senior person on the job trains co-workers. The problem develops when the trainer cannot speak Spanish. As one participant observed, "If you have a Spanish speaking person, why let her be trained by someone where she will not understand a word of it!"

In some situations, perceived racial issues may vary depending on which race is in the power position. Two African-American participants reported about a Hispanic supervisor who tended to favor Hispanic workers. One participant stated he left a company in part because he believed that Hispanic workers would be asked to train new white employees and then those new employees would be promoted over the Hispanic workers. As one African-American participant noted, "I had to learn everything on my own. Once in a while they would send someone in to train on the machines for a few hours but that was not the training you needed. There were a few people who had most of the training." When asked if he thought that there was discrimination involved, he responded that it depended on whom the supervisors like and added, "I was black and all of the bosses were white." He said most of the time whites had greater access to training.

In addition, women in manufacturing can face difficulties gaining acceptance and hands-on experience in male-dominated workplaces. For example, a product designer related how she spent the bulk of her time doing secretarial tasks at a company while her male counterparts were getting hands-on experience using solid modeling software (Pro Engineering) to design tools and the manufacturing process. She reported that she finally left the company for a job where she is now doing almost 100% design work. This experience is critical to her professional development where employers typically require 4,000 hours of experience using the program. However, the product designer noted an increasing acceptance of women in this high-paying, high-demand area, where women currently occupy only 3% of the workforce.

Another woman related how she became the first woman in the warehouse of a company where she used to work. She described how her supervisor told her that he "did not want no 'B—' in his warehouse . . . When I went to the warehouse, I was the only woman. [My supervisor would] do things. He said "What are you doing here, you should be at home . . . As usual there was no witness and this boss was a man."

Some participants pointed to a need for women to be trained to feel comfortable working in a male-dominated environment. "All women do not have the proper attitude to go into a situation that is male-dominated and be able to deal with that. I have seen some of that, where the women do not know how to handle a situation. They need to be mentored as to how to approach these kinds of situations."

Why Manufacturing

Almost one-third of the participants spoke about how they enjoyed using their hands and being able to move at their jobs. At least four participants representing two different companies talked about the lack of stress in their jobs and the ability to work independently. Participants also spoke of the pride they feel in creating a product. A production assistant talked about how she works at the company that makes her favorite candy bar. Another participant stated, "It's fun; we get to make things that people all around America are using."

A welder spoke of the creativity and challenge involved in his work: "You have to fabricate it, lay it out right, figure out the angles of it." A metal spinner reported that "there is an art to what I am doing." An electrician indicated that the constant changes in technology keep his interest level high: "You go to an electronic show and no matter what they invented, when you get there the next year, it's something different." Another participant talked about how his work as a mechanic was different every day and that made the time pass quickly because it kept him challenged.

One participant noted how she expected her workplace to be dirty but was surprised when she took a company tour and saw how clean most of the departments were in the plant. However, she reported that her department is not as clean as other areas in the company. Another participant talked about how he liked "to get his hands dirty."

Several participants commented that the money was good for a low-skilled worker. As one participant in a union shop noted, "I do it for the money. It was an increase in pay when I started with [the company]. Each year the salary went up, I would not give up my job now. I make good money." She stated that she earns approximately $34,000 with a high school diploma. Another woman reported that she had come to Chicago after chopping cotton in the South and manufacturing was a field where she could get a decent job without a high school diploma. She reported that she has been employed with the same company for 31 years and has moved from the production line to a cook position, making approximately $30,000 per year.

Manufacturing for Youth

Most participants want better opportunities for youth than low-skilled positions in manufacturing. Several talked of the need for skills and education to have career choices. They stressed the need for education and skills to advance and keep a job in manufacturing and other fields in today's economy. As one participant noted:

> I would recommend manufacturing, but there are certain things about it that need to be improved. For one, the opportunity for advancement. That is going to happen, but if you don't have the training and skills for that, then you will not see it happening. A lot of the people at [my company] do not have the training or skills for the changes that are about to take place there. So a lot of them will be out of work because they do not have the skills or the training, or probably not the opportunity, notification, or time to get the training for the changes about to take place. I do not think the younger people will be faced with the same problem, because they realize that no matter what area you will be going into you need to have computer, math, and internet skills. So I would recommend manufacturing for young people, especially as a stepping-stone in society. I still think that that is going to be OK for a while.

One participant reported that he "see[s] a lot of young people who go into production and never go to school." He recommended going to school for higher-skilled positions in manufacturing. "If they don't want to go to school for a doctor or lawyer, they can start in a factory for work experience and then [go to school for a trade]." He talked about the value of gaining work experience in a factory and the opportunity to make a good living in a trade.

One participant in a mid-skilled production job at a company that is involved in mass layoffs stated:

> I tell all my nieces and nephews don't work in the factory. I want them to be counselors. In the factory I tell them they don't appreciate you. Don't appreciate our hard work, they just get richer and richer they don't care about the sweat we pour into the product or how we mind our two breaks.

Similarly, a participant who is an electrician, reported that he would not recommend manufacturing because he reported that the skill level required is higher than the pay: "You put a lot more into it than you get out of it." He indicates the medical field, such as an x-ray technician, is preferable to manufacturing.

One participant on a production line reported: "If you have low skills, come on out here. But I advised people to get a higher education." This participant continued to say that if a young person has an advanced degree, manufacturing "is a lovely place to work because it is challenging [to work with the new technology]."

More than one participant talked about the pleasure in making things. As one participant stated:

> **I would recommend a manufacturing career for young people or just exposure to it because if you look at the world itself you need to learn how to make some of the things that makes the world go round. Just to turn a doorknob is part of manufacturing. I also think that it is a good life and there is always going to be a need for manufactured products. I like manufacturing because I like doing things with my hands and it gives me satisfaction to see a product that I made and to see it being used by another person knowing that I had a part in making it.**

One participant summed it up by stating,

> I think it all has to do with what a person likes. If they can acquire a trade and land themselves in manufacturing, it's fine. If you get into a good manufacturing place, it is pretty good. You gotta earn a living so why not do something you like if a craft calls.

Changes in Manufacturing

The majority of the participants spoke of greater use of advanced technology leading to a reduction in the number of workers and an increased need for skill. As one participant commented:

> I think that [my company] and manufacturers are going through the process of making changes. And I think that less people and more machines is one of [those changes]. But you are going to find that the people that are going to be left are going to have to be a lot more skilled than what they are. You are going to have to be multi-talented. You might be one person running an entire department, and you got to know how to do everything in there and run that place.

In contrast to the majority of the participants, two participants reported that there is less need for skills now when they entered manufacturing in the 1970's because technology "has simplified everything."

Six participants talked about an increased sense of stress in their work because of the demand for greater productivity (faster runs of the lines). One participant reported "you can go to a higher labor grade but then there are three more jobs hooked up to that one job. In my area, they eliminated one person and we had to take on two more extra jobs besides the jobs we had." Several participants reported that technology is advancing, training is not keeping up, and workers are working harder for less money and job security. As one participant stated:

> Manufacturing is moving ahead in technology and the workforce is lagging behind. [The companies] have to spend money on training, whether they like to or not – that's the labor force nationally. That is the key to the whole thing. The countries

with a skilled labor force are the ones that are going to move forward . . . [My company] will invest in equipment but not in personnel. On the production level in the last twelve years, it has at least doubled, tripled or quadrupled. On the labor side, it is fractionally now half of the people who were here. Part of it is the technology and automation but the other part of it is the efficiency of the people working. If people are compensated, people are more than willing to go the mile but now it is going to roll back the other way. They are expecting more and people are making less.

Exhibit 1

Question Guide

Introduction

(1) What is your job? How many years have you been in manufacturing? Have you held other jobs in manufacturing (please describe)?

Recruitment

(1) How did you learn about your current job?

(2) Why did you choose to work in manufacturing?

(3) When you first started in manufacturing what work experience and education/training did you have? Was a lack of education/training a barrier? Was a lack of experience a barrier?

(4) Did you have any training and/or education that was manufacturing specific? Where did you get this training/education? How extensive was it? Who paid for it? What worked and what did not?

(5) Were there skill requirements that hindered your job search? Did you have transferable skills (like working with tools).

Training

(1) How did you learn how to do your job?

(2) Did you have a mentor on the job when you started? Who was that person?

(3) Have you had any training since you started working in manufacturing, both at work and outside of work?

- What was it?
- Did you get a degree or certificate?
- Why did you seek this additional training? Who made you aware of this training?
- Where did you receive this additional training?
- Was it on the job training, employer developed training programs, outside training provides, manufacturing associations, school, college, government training program, etc.?
- If more than one, which have been the most beneficial, why?
- What worked and what did not in the training?
- Who paid for this training?

(4) Are you planning to seek additional training in the future? What? Why?

(5) Have you benefited as a result of training? In what ways are you better off? [e.g. raise, promotion, better work, etc]

(6) Is there room for advancement at your company? Do you have an option for additional training to move up?

(7) Is there any training in specific skills that you wish you could get? What?

(8) What are the main barriers or obstacles that prevent you from getting additional training?

(9) Have you experienced any discrimination in getting training needed for your work?

(10) What factors would be most important to you in deciding to participate in training? Please site examples from your personal experience. (Examples of factors include things like when, where, cost, etc.)

(11) Do you think your co-workers would be interested in upgrading their skills through training? What percentage of your co-workers do you think would be interested? What kind of training would they want (content, site, times, etc.)?

Retention

(1) Does the presence or absence of training opportunities at a company (training programs, tuition reimbursement programs, etc.) have any impact on your decision to work for that company or leave it?

(2) What are the main reasons why you stayed in manufacturing?

(3) Does the presence or absence of clearly defined opportunities for advancement have any impact on your decision to work for a company or leave it?

(4) Have you experienced discrimination in connection with your work in manufacturing? How?

(5) Are you linked to any support services (child care, transportation, support groups, etc.)

Changes in Manufacturing

(1) How has your job changed in the last five years? Have you seen changes in general in how manufacturing is done in the last five years?

(2) Looking into the future, what do you predict will be the changes in manufacturing in the next five years? How about with your job?

(3) Would you recommend manufacturing as a field for young people? Why or why not?

Exhibit 2

AGE	RACE	GENDER	JOB TITLE	APPROX. ANNUAL INCOME
49	African-American	Female	Chocolate Enrober Operator	$26,000
48	African-American	Female	Chocolate Enrober Operator	$34,000
53	African-American	Female	Cook	$30,000
43	African-American	Female	Machine Operator	$38,000
40	African-American	Female	Machine Operator(former)	N/A
25	Hispanic	Female	Machine Operator	$15,000
60	African-American	Female	Plant Cleaner	$23,000
41	African-American	Female	Polymer Machine Operator	$19,700
38	Caucasian	Female	Product Designer	$62,400
54	African-American	Female	Production Assistant	$34,000
55	Hispanic	Male	Electrician	$42,000
58	African-American	Male	Electrician	$40,000
38	Caucasian	Male	Electronic Technician	$55,000
48	Hispanic	Male	Machine Operator	$40,000
37	Hispanic	Male	Machine Operator	$30,000
N/A	Hispanic	Male	Machine Operator	N/A
N/A	African-American	Male	Machine Operator	N/A
57	African-American	Male	Maintenance- Sheet Metal	$38,000
30	Hispanic	Male	Mechanic	$21,000
28	Hispanic	Male	Metal Shearer	$13,000
26	Hispanic	Male	Metal Spinner	$21,000
28	Hispanic	Male	Metal Spinner	$21,000
36	Asian	Male	Quality Inspector	$25,000
34	African-American	Male	Secondary worker	$17,000

Appendix VII

Training Provider Database

The Center for Labor and Community Research developed a database of education and training providers, programs, and courses related to manufacturing workforce development.

This database includes information on 229 organizations that provide training, and on each program provided by those organizations. We included a list of courses, enrollment and graduation figures, and general information about each organization and program.

Six types of organizations are included: High School Organizations and Programs (Chicago), High School Organizations and Programs (Not in Chicago), Non High School Institutional Organizations and Programs (Chicago), Non High School Institutional Organizations and Programs (Not in Chicago), Organizations and Programs, Apprentice-Journeyman Listing, and Organizations: Customized Programs.

This database is available at cost from CLCR.

Appendix VIII

Chicago Workforce Development Delegation Trip Summary

From May 8 through May 17, 2001, a group of nine leaders from Chicago visited Germany, the Netherlands, and Denmark to study their workforce education systems. The trip was made possible by a grant from the German Marshall Fund of the United States to the Center for Labor and Community Research. The itinerary and logistics were developed by the Sozial Forschung Stelle-Dortmund with the assistance of the Danish/US Program on Education and Cirius Danmark. The group included:

Don Turner, President of the Chicago Federation of Labor
Dan Swinney, Executive Director of the Center for Labor and Community Research
Linda Kaiser, Executive Director of the Workforce Board for Chicago
Diedra Lewis, Vice Chancellor of Academic Affairs, City Colleges of Chicago
Peggy Luce, Vice President, Chicago Chamber of Commerce
Ric Gudell, President, Chicago Manufacturing Institute and the Regional Manufacturing Training Collaborative
Amy Sherman, Executive Director, Manufacturing Workforce Development Project
Friederika Kaider, Director, Candy Institute
Brian Banks, Policy Action Research Group

The trip was incredibly productive for at least three reasons:

- We got an excellent introduction to best international practice training and education systems, and the key concepts that are the foundation for those systems: the dual system of education; the social partnership of labor, business and government; the shared recognition of the necessity of using workforce training and education to drive modernization of the firm and economy, and community development; and the capacity of these partnerships to engage in active and regular critical thinking and reform of their own systems.

- We met leaders and organizations who are deeply committed to international partnerships and exchange. Their generosity gave richness to the trip, and opened the door for ongoing partnerships in the years to come.

- The trip provided a context for the Chicago delegation to increase its own unity, sense of purpose in rebuilding and reforming the workforce development system in Chicago, and a level of knowledge that gave strength to our common purpose.

A concise report, summarizing the whole experience isn't possible in light of the variety of experiences we had. Attached is a list and log of the meetings held over the 10 days as well as observations from two of the participants–Peggy Luce and Amy Sherman. Also attached is the Power Point presentation we have made to several audiences since our return. The substance of the report is gleaned from meeting notes and literature. Our notes and recollections clearly are imperfect, so there inevitably are inaccuracies.

A. List of Organizations on European Trip

1. Sozial Forschung Stelle-Dortmund–Social Research Place
    a. Dr. Wilfried Kruse
    b. Detlef Ullenboom
    c. Ralf Kopp
    d. Dr. Monika Goldman
    e. Dr. Hans-Werner Franz
    f. Others...
2. Dorre Galvantechnik–small metal-coatings company near Dortmund
3. Handwerkskammer Dortmund–Chamber for Skilled Crafts, Tanja Bevc
4. Department for Development, City of Dortmund, Dr. Utz Ingo Kupper and Joachim Beyer
5. PEAG–an employment center for dislocated workers from steel and other industries
6. IG Metall (metal worker's union)–Peter Schnittfeld
7. Opel Apprenticeship Center in Bochum–the auto company, owned by General Motors
8. Bildungswerk Witten/Hattingen–a training center for apprentices and dislocated workers, Wolfgang Kobernik and Dr. Rainer Lichte
9. University Business Center, Nijmegan, Netherlands, Dr. T. Reubsaet
10. Centrum Voor Innovatie Van Opleidingen (Center for Business Innovation-CINOP) Dr. Tom Visser
11. GBIO, Utrecht, Netherlands–GBIO provides training programs for works councils
12. Cirius Danmark–promotes international exchange on education: Jens Mejer Pedersen and Henrik Neiiendam Andersen
13. Danish Ministry of Education, Mr. Svend Povelsen and Roland Osterlund
14. Danish Technological Institute, Taastrup, Mr. Palle Banke
15. Danish Ministry of Labor–Labor Market Authority, Mr. Villy Hovard Pedersen and Kaj Westergard
16. Confederation of Danish Industries, Ms. Christine Henriksen
17. Landsorganisationen i Danmark (LO-Danish Federation of Trade Unions), Astrid Dahl

B. Meeting Log for European Trip, May 8 through May 17, 2001

1. Sozial Forschung Stelle-Dortmund–Social Research Place (SFS). SFS was our hosting organization and organized our tour.

The History of SFS, Dr. Wilfried Kruse: SFS was originally founded as a passive research group by the state of Westphalia. In 1972, it was re-established by a core of people including Wilfried Kruse. It originally had 13 people and has now grown to over 100 on staff. They are supported by the state, the federal government, the EU, unions, companies, and cities–the key actors in the economy. They typically work under contract. SFS doesn't propose solutions but helps actors find solutions. They are structured as a network with 12 working groups on various topics. They have a broader advisory board and broad contact in Europe, but little contact in the U.S.

Wilfried offered to help us solve the "puzzle" of the German system. It is quite complex and takes a process of getting to understand it. We would work on various parts of the puzzle over the course of the trip.

The Labor Market in Dortmund: The region has about 500,000 people with an unemployment rate of 13% that is almost as high as East Germany. Historically, the area was dominated by steel, mining and breweries. They have almost completely closed and are now being replaced by biotech, leisure, e commerce, etc. SFS studies the labor market in Westphalia to understand mismatches between the needs of firms and the skills of workers. They have learned from the experiences in Denmark, the Netherlands, and Spain. SFS develops a portfolio on the region through phone surveys and visits to company. Their main obstacles are overcoming business resistance and balancing the tension between modernization and social protectionism.

Organizational Dynamics and History at SFS: SFS has been an academic breeder. Every major social scientist came through SFS from the 1940s though the 1970s. In the 1970s, it mostly did empirical research with vague references to social problems. In the 1980s, it focused on applied research and action. It started a pilot project on vocational education, started work with trade unions, expanded its contact in Europe, assisted worker councils, and actively promoted social democracy. In the 1990s, it continued to do applied research, consulting, and transfer of knowledge. By 1996, it changed its structure from a traditional top-down approach to a network of projects with a coordinating center.

There has been a lot of emphasis on changing the organizational structure and dynamics at SFS. It now focuses on quality-based projects, serves as a vanguard in some areas, is open to new requirements, is market and customer-oriented, and is a learning organization.

Discussion on Gender issues: The German discussion was influenced by the US debate in the 1970s. There is a tradition of classic female roles of raising the family. Only 30%

of women participate in the workforce. Women are significantly under represented in all aspects of the work and training system–probably more so than other European countries. There has been a substantial debate to convince society that this is an important issue.

Policy by the European Union (EU) has encouraged "gender main streaming" to bring women into full representation in all aspects of work. Initially, the government didn't support this initiative, but later did. There are now a series of penalties and fines for non-compliance, but it is still unclear how this or if this is aggressively enforced. If there is poor performance regarding gender representation in a firm or training program, the question of whether or not there are discriminatory practices has to be examined. There is some use of quotas and specific goals in various sectors. The state is increasingly aggressive in rewarding performance.

2. Dorre Galvantechnik–small metal-coatings company near Dortmund

This is a small manufacturing company that has won several awards for management, environmental performance, and innovative practices. It is privately-owned with about 40 workers. 38 is the median age for the workers. Now the owner–the son of the founder-- only hires workers under 35. The company coat metals. Its environmental standards are very high. It uses 4 million liters of water a year in production and only releases 250 grams of metal contaminate in the water as a result of the production process. The company has promoted automation that has resulted in increased market share and expanded employment.

The company has several approaches to training and education of their workers.

a. The Teach if Possible program: During workers' down-time, they can spend time on a computer-based learning program that provides self-tests that aren't monitored by the company.

b. The nearest training center is 80 km away. The company has typically attracted workers who have experience in the large metal working companies. If they work for the company for 6 years, the owner pays to send them to public technical school for training and qualification for 6 weeks for each of the two years. At the end of this training they are tested, and if they pass, are certified as a journeyman certification.

c. Twice a week, they have quality circle meetings to discuss performance.

There is very low turnover in the firm because the job is very specialized and there are few other firms like this in the area, they pay well, and there is a lot of pride by workers at the company in the company. For the first 6 years, the get 22-26 DM an hour. With journeyman certification, they get 32 DM an hour.

They have three Masters/Meisters in the factory. Meisters pay for their own education. Their certification also demonstrates their motivation.

The company has a Workers Council of three people–one Meister, and two assistants. If there is going to be an expansion or contraction of the company, or disciplinary action, it must be discussed with the Workers Council as mandated by law.

The company is a member of the Chamber of Trade as mandated by law and is also a member of the Association of Galvanizers and Surface Coatings. They do network with other companies and work together on larger projects.

3. Handwerkskammer Dortmund–Chamber for Skilled Crafts, Tanja Bevc

This Chamber is an extension of the Chamber of Commerce–an organization that must be joined by all businesses. The company we visited paid $38,000 a year to the Chamber in exchange for training and other programs and services. There are 55 chambers in Germany involving 18,000 companies. They are public agencies. There is the general Chamber of Industry and Commerce and the Chamber for Skilled Crafts. As the Chamber for Skilled Crafts, they evaluate schools and companies. They qualify the lecturers in the system, they offer classes, and they work with the dual system. The dual system consists typically of 3 days in class and 2 days in a company for the apprentice trainee.

The Chamber uses special sector training sites to complement small companies that can't provide the breadth of experience necessary to meet the requirements of the training program. They provide classes for the journeyman level–both practical and theoretical. And they establish the Masters curriculum that also includes business training. Having a Masters certification is required to open a business. Once you have a Masters, it is easier to get loans. You must be older than 21 and have been a journeyman for 3 years.

4. NO POACHING OR SCALPING OF TRAINED EMPLOYEES

A Visit with the Chamber of Skilled Craft Trades, Essen, Germany
By Peggy Luce, Chicagoland Chamber of Commerce, June 2001

The Dorre Electroplating Company in Essen, Germany has about 40 employees working on five automated production lines. The same family has owned the company for two generations. The company has extended over the years. It does not depend upon bank loans or other outside financing. The company builds with its own money. The company has very close relationships with suppliers. Dorre suppliers give Dorre new products to test. The company has a laboratory where technicians test and develop new plating processes. The company also takes research and development requests to the university.

The company has extremely high employee retention. No one has left the company for five years. Poaching or scalping of trained employees by competitors is not an issue. There is a long distance between similar companies. Dorre offers could pay. The image of the company throughout the area is quite visible and very positive because of many awards that the company has received.

There are three levels of workers: entry level, apprentice/journeyman and master. Dorre has three masters. A master must educate himself. This is salaried position. The second-generation owner had to complete master training in order to be the owner even though he had a university degree and had been a high ranking military officer.

With expanding, the company has been hiring what we might refer to its dislocated workers. After six years, that worker is eligible to be sent by the employer for apprenticeship training. English, as a second language is extremely important to in both business and manufacturing. Speaking in one common language is so important that Germany's primary immigrant group, the Turks, are not represented in electroplating.

There is a Worker Council at Dorre plating even though councils are required only at companies with 50 or more employees. The owner, one master and two workers participate. If the company is going to start a new production line or is considering firing a worker, the Worker Council discusses such issues.

Dorre is a member of the Chamber of Skilled Craft Trades industry association for surface finishers. Within 50 kilometers, there are 80 electroplating companies with an average number of employees from 15 to 25. There are 800 similar companies in all of Germany.

All companies are required to be of a member of their chamber. Dorre pays the equivalent of about $38,000 to a member of the chamber of craftsmen. The company pays additionally training fees for individual workers sent to vocational classes.

The obligations of the chamber to its members include:

Qualify lecturers for classes

Operate technical classes for journeymen and provide certification

Operate classes for master's training

Provide counselors for all aspects of business

The chamber will be offering interactive cable training programs. Twenty companies are testing these programs now.

There is a separate chamber for industry and commerce. Some companies pay annual dues to be members of both types of chambers.

COMMENTARY: The process of several years of employment before the employer offers and pays for apprenticeship training is similar to what we among voluntary members of such industry associations as the Tooling & Manufacturing Association have. Because some Cook County manufacturers offer tuition reimbursements for university degree programs, the requirement that a "master" pays for his own training is different.

The extraordinarily high retention rate is quite different. Beside the good pay and extremely positive reputation of the company, German workforce rewards and sanctions contribute to retention. Employee longevity with an employer is encouraged by government mandates of employers paying wages in the event of lay-off or plant closure for a number of months that increases with longevity. For example, 15 years of service would entitle the worker to seven months of full wages and benefits prior to tapping into his unemployment benefits. These wage guarantees assured by the company's required reserve fund, are disincentives to lay-offs and shutdowns.

5. City of Dortmund: We had presentations from the head of Economic Development, Dr. Kupper, and Joachim Beyer on the Dortmund Project–an ambitious development strategy for the post steel, mining, and brewery economy in Dortmund.

Their approach is based on developing a new local economy that is focused on growth clusters described as the "new economy" – E-Commerce, Information and Communications Technology, microsystems, leisure, and biotechnology. Their objective is to use all aspects of the region–the social partnership, a highly trained workforce, and government support to promote innovation. They are aggressively investing in these sectors rather than offering subsidies to attract companies. They are determined to add "speed" as one of their characteristics–streamlining the process to get project supported and in motion.

They have identified core competencies:

a. Dortmund is the #1 location for IT training in Germany with 4,500 students in technology training at their local universities.

b. They are promoting innovation in the software industry having 850 IT companies with 12,000 workers. These are mostly Small and Medium-sized Enterprises (SMEs) and often spin-offs from the universities.

c. Dortmund has become the top location in Europe for the development of microsystems.

d. Dortmund is a leader in research and development for logistics (transportation).

e. The growth engine for the area is seen in SMEs rather than attracting headquarters for larger firms.

f. They are marketing the old steel mills for their real estate potential both for commercial and residential as well as new industrial parks. They will flood one steel making area, turning it into a lake that will be surrounded with high-end housing.

g. They see incubators as a key tool–recruiting and assisting entrepreneurs in the start-ups of new companies.

h. They see their trained workforce as a key competitive advantage.

i. They are shifting from being a bureaucratic state to being an actor or a partner in the

market place.

Currently students in IT have a training program that is a public/private program requiring companies to sponsor the student for $DM 2,000 and a commitment by the student to work in the firm as well as pass an examination.

Labor is key player in this modernization process. The head of the union is now the Minister of Technology.

The Social Wage System and Labor Market Development: Dortmund lost about 80,000 workers due to lay offs in steel, mining, and the breweries. They have a strong social wage system and commitment to get people back into meaningful employment. Citizens have a right to these programs and are supported when out of work though the Insurance system, the City of Dortmund, and the European Union as well as the Chamber of Commerce, churches, PEAG, and other organizations. Labor market development–training and education–is recognized as key to all aspects of business retention and development. The city of Dortmund spends $20 million annually on various aspects of workforce development and training.

The city has created a New Enterprises Project over the last two years for people who are unemployed to assist them in starting up companies in all sectors including health and wellness, senior care, culture and media, disabled care, etc. Typically the participants are not laid off production workers but those who came from the higher skill levels in the companies such as engineers. The city has several steps of support. The start with an interview to review the concept. Typically, they have proceeded with 150 of the 500 applicants. If they approve the concept, the city provides funding for development consultants for 3-5 days to help develop the business plan, the market analysis, the financial plan, etc. For the next 3-4 years the new business can receive various forms of assistance. They have had a 70% success rate in the first 2 years of the project.

6. PEAG at Krupp Steel: This was a presentation on the key program for assisting dislocated steelworkers and other industrial workers in Dortmund. The meeting was at Krupp Steel that had closed its last blast furnace three weeks before.

History of Manufacturing in the region: The city of Dortmund is 1,000 years old with industrialization starting in 1832. After WW I, Germany built its steel industry with 35,000 people working in steel in Dortmund. 60% of this capacity was destroyed in WWII. In 1946, steel production began again. During the 1960s, there were a number of mergers in the industry.

In 1951, the Co-Determination Act was signed requiring shared (50%/50%) responsibilities by labor and management in making decisions to develop companies and the industry. This was basically imposed on Germany by the Allies as a way to prevent the kind of concentration in industrial and political power that made fascism possible. The concept was carried by German Social Democratic labor leaders who had gone into exile in England, and influenced the English labor movement and labor party on this

concept. In 1945, Churchill lost the election and Atlee of the Labor Party won. The English were responsible for occupying this section of Germany and imposed Co-determination on the country and region.

PEAG–the Personal Development and Labor Market Agency: It was formed in 1997 with the loss of 6,000 jobs in the steel industry. Its mission is to re-qualify and retrain dislocated industrial workers and to get them placed in new jobs. Many of the workers have had difficulty transitioning from big mills to small companies.

PEAG is a limited liability company–a private/public agency, that started out on a temporary basis. They:

a. Help companies lay off workers in a responsible way.

b. Help workers make a fast transition into new jobs and new work.

c. Some workers that anticipate lay off are sent into companies on a trial basis.

PEAG has 32 staff members – 16 in placement projects and 16 in administration and contract management. They have a Works Council of 4 members. Their success requires a great deal of personalized services. They have 7 centers in the Dortmund area and are beginning to operate nationally.

They have worked with 2,300 people. 72% have been placed in permanent employment. 45-55 year-olds are the most difficult to place in new positions in companies because they have years of experience in a very specialized skill. Many are placed in the service sector mowing lawns, buying groceries for elders, and other service jobs. They are paid about 80% of their previous salary–beyond the market rate for their skill.

In Germany, workers are given substantial advance time for layoffs. If they have 2 years of seniority, they are given 4 months notice of layoffs, and if they have 15 years of seniority, they are given 7 months notice.

They have the option of training for new jobs, such as a 1½ year training program in high tech. This training program is financed by the government, the EU, and businesses and costs about $DM 35-40,000. Applicants have to take an aptitude test that 50% of them fail. They are trained for specific vacant positions and/or to jobs where there is a verifiable demand in the labor market. PEAG is a broker for training and doesn't provide direct training.

In the cutbacks in industry, the Works Councils were deeply involved in developing specific plans for the 20,000 workers that were affected. A large number were given early retirement with the rest getting training and new jobs. There is direct contact and work with employers to help them anticipate job openings. PEAG tracks the newspapers and the web in a constant search for job openings. 50% of vacant jobs in small companies aren't listed anywhere, so PEAG is very aggressive in reaching out to companies through telephone calls, meeting, etc. and has found that this aggressive

engagement helps create a labor market. A lot of small companies don't want to deal with the hassle of employing, but when they get assistance, they are willing to consider new job openings. They have also worked with the city and provided assistance in start-ups often initiated by younger or highly skilled employees from the companies such as engineers. So far they have started 18 companies and none have failed.

Their process includes:

a. Interviewing the worker to assess skill and determine level of motivation;

b. Provide resume writing and interview training;

c. When there is a failure in an interview, the do an evaluation of the worker's performance to identify weaknesses that can be corrected;

d. They provide whatever personal attention and assistance is necessary. There is a strong sense of total commitment by PEAG staff to get each individual into work of some kind.

They also work with companies to estimate the cost of their social plan that is required when a company will close, to help the companies secure funding, and to report back to employees on the results of the efforts.

Usually workers receive 85% of their former pay. The state pays 60 to 67%. Former employers pay for vacations and holidays, as well as insurance. They also get support from the EU. Normally, employers pay salary, a year-end bonus, vacation pay, a savings contribution, insurance, and pension. Under PEAG, workers get high compensation, opportunities for employment, and are relieved of a lot of the emotional burden that typically goes with job loss. For employers, PEAG is an intermediary that takes over all aspects of the social and unemployment contract.

7. IG Metal: This is the largest metalworking union in Europe with 2.8 million members.

With the dramatic declines in industry, labor had to change its tactics and work closely with management. Article 9 of the German constitution deals with labor relations and provides for the right to organize and strike for all workers, the right to bargain collectively, the right for co-determination, and the right for social planning. There is a rigid dual structure for labor that includes the trade union and the works Council.

The trade union is organized on an industrial basis, in various sector structures and in each individual company. The works councils here the companies' plans. The members of the council are elected every 4 years, and the members are frequently released from all work, particularly in the larger companies. They play a full role. Whenever changes take place, it is a law that workers have to be notified. Work Councils are not permitted to strike. Work Councils were defined in the Work Constitution of 1952 and then again in the Co-determination Act of 1972. There was a special act developed for the steel and mining industries. Co-determination functions at the company and plant level.

$1.8 billion in EU funds are used to support this activity. The US criticizes this as a state subsidy. There are the beginnings of European works councils and plans to create world works councils.

8. Opel Apprenticeship Center in Bochum:

Opel has a major assembly factory in Bochum that turns out 1,350 cars in three shifts every day. The factory was built in 1962, and is a subsidiary of General Motors. The company is 100 years old and started with the production of bicycles. It was taken over by GM in the 1920s and provides cars for the European, South American and Australian markets. They have 10% market share in Germany. They view quality as the key market variable.

In 1988, they first started working with the team concept in production. Now it is the way work is done. 5-8 people on are on a team with one leader. The business plan for the company goes to the team level. The team is responsible for individual and group evaluations. Performance evaluation is not tied to wages which creates solidarity and honesty.

We visited the Apprenticeship Center where they have 360 young people learning 5 general areas including Energy Electronics, Mechanics, Metatronics (a mix of mechanics and electronics), and CNC operations. The center has 30 people on staff. The apprenticeship program takes 3.5 years. This is a classic example of the German dual system. The students spend 1.5 days at a public technical school and the rest learning in the apprenticeship center and factory. At the end of it, each student has to take a test given by the Chamber of Commerce to receive certification. They can also go to the University at the same time, get a degree and study industrial theory.

Students are 16 to 21 years old and most come from the gymnasium level of the German schools system. The basic level in the German system is 10 years, the next level is 10 years plus, and students in the gymnasium level have 13 years or more. The minimum requirement is the basic level. Each year about 700 apply and only 100 are accepted. They have to take a test that includes math, general knowledge, and basic intelligence. No special technical skill is required. If the applicant fails the test, they can take it again another year. If accepted, they sign a contract with their parents and the company that is time specific. There are similar programs at Chrysler and Volkswagen. In these large companies there is a richer program than the smaller companies and these programs are recognized as of the best. In recent years, the curriculum has shifted from being only technical to 50% of it including social aspects of team work, analysis of problems, critical thinking, etc. Senior students are often given real problems in production to solve– sometime requiring new inventions.

The first year, they are paid $DM 1,204 and provided with the necessary clothing and tools. In comparison, the average production worker makes $DM 5,000 per month while the average service worker apprentice makes $DM 600 per month. Typically, students

stay with Opel because of the high wages and reputation of the company. Very few students fail to make it through the program–perhaps 5 out of 1,000 fail. There is a commitment on the part of the center to provide as much personal assistance as needed to help students succeed. Only 12% of the students are female. They are trying to increase the proportion but have difficulty. They see it as a by-product of the traditional socialization of women that encourages them to stay in the home or to be in the service industry.[11] 17% come from immigrant populations, particularly Turkish, and mostly from 2nd and 3rd generation. The cost of the program is about $DM 45,000 a year that is paid by Opel.

9. Bildungswerk Witten/Hattingen–a training center for apprentices and dislocated workers, Wolfgang Kobernik and Dr. Rainer Lichte, Hattingen, Germany:

Steel production began in Hattingen in 1811. At its height, the industry employed 30,000 people. Now the mills are closed. For 20 years, there was relatively intense struggle waged by the unions against the decision to close but now the focus is moving on to creating a new economic foundation in the region based in satellite technology, computing, welding, etc.

They are building an incredibly modern center for training in the shadow of a closed steel mill. They currently have 800 students (1/3 are Muslim) who are in some kind of training program. 300 are in formal apprenticeship programs and the rest are in various short term programs that upgrade the skills of those who are already apprentices or are customized programs for local companies. The apprenticeship program is a 3.5 year program and customized to meet the needs of local companies. The salary for apprentices is paid for by the companies and ranges from $DM 600 to 1,400 a month.

10. Nijmegen, Netherlands–the Polder Model. University Business Center, Nijmegen, Netherlands, Dr. T. Reubsaet; and Centrum Voor Innovatie Van Opleidingen (Center for Business Innovation-CINOP) Dr. Tom Visser

The Netherlands is currently in a state of educational vocational reform. The Polder Model is a system of continuous, integrative consultation by the social partners to address all aspects of labor, from wage and hours to the adult training system. The word "polder" refers to the land recovered from the sea–a process that generates a lot of Dutch pride. It was established over 20 years in response to high unemployment and declining industry in the 1980's–a time when the country was known for the "Dutch Disease." Key to the model is the recognition of the value of lifelong learning as the Dutch economy moved to a knowledge based economy. Conditions have changed since the institution of the Polder Model as the economy turned around, and the labor market became tight. Current unemployment is at 2.8% with high demand in heath care and IT sectors. (However, Tom Visser observed that a lot of unemployment is hidden by social safety net). Thus,

[11] See Chapter 5 on Gender and Skills by Helga Kruger, *The German Skills Machine,* Culpepper and Finegold, Berghahn Books, 1999.

there is concern about how to improve the skills of older workers, immigrants, and low qualified as a pathway to entry to the labor market.

Much of the job creation is the result of part-time work. The largest employers are the temp agencies. Difference from U.S. is that there is access to national health insurance. Employees in temp agencies also have collective bargaining agreement and pension plan. Policy is led by the Social Economic Council (SER). This national council has equal representation from employers organizations, labor, and the broader community. In 1982, SER began a number of structural reforms in the economy including:

- lowering wages. Cost of Living was ended in contracts, so wage negotiations now start at "0";
- the working week was reduced from 40 to 38 hours;
- corporate tax was reduced from 42% in 1982 to 35%;
- The generous social wage system was significantly reduced by reducing compensation levels and increasing the company portion of the pay-out;
- there was tax reform that reduced taxes for all individuals.

During this time, there were also major reforms made in the vocational training system.

- Schools were consolidated. In 1992, there were over 500 training institutions that were consolidated into 60.
- there was substantial changes made in the content and style of teaching, and more efforts were made to have training on-site in companies.

In our discussions, the presenters were asked to distinguish this from a typical neo-liberal approach. They answered that the decisions were made by the social partners including labor, and that the measures have stabilized the economy.

Unemployed are screened and given an employability score from "1"- "4," with the level of support and training directed at levels "2" and "3." People with a "1" score should be able find their own job and those with a "4" are "unemployable." Employers must employ a quota of partially disabled or pay fee.

Employer and Unions engage in central, branch and local collective bargaining. Work councils at the company level advise on major issues including worker training, career planning, and technology upgrades. 1/3rd of Dutch workers are organized. Work council members of are elected and are not representative of workforce in terms of age, race, and gender. The work council members are 60-75% organized. There is training system for the work council members, designed by the social partners. A pool funded by the employers was established to pay for 5 days of training for each work council member. GBIO oversees this system and accredits the 27 training institutes that provide the

training. What makes this system interesting is that employers recognize the importance of the work done by council members and the value of informed partners.

The educational system is multi-layered. Compulsory primary education begins at the age of 4 or 5. At 12 years of age, youth attend pre-university or 3 levels of vocational school. At 16 years of age, youth have three tracks. Those who opted for secondary level (pre-university) can pursue a university degree and then post-graduate school. Students in general vocational school can move to higher vocational school (bachelor's degree level) and then post-graduate vocational school. Students in the pre-vocational or junior vocational school can progress to senior secondary vocational programs and then (indecipherable on handout).

About 38% of the workforce stops at the primary school level (2,648,000). Another 1,852,000 finish secondary level. 1,262,000 have middle vocational training and 626,000 have higher vocational training. 556,000 obtain university master's degrees. There is a 10% functional illiteracy rate.

In the system, there is a determined effort to keep kids in schools and there are a variety of levels of aggressive intervention. A kid who is having difficulties can be assisted by up to 4 different adults.

Although the number of educational options allows for full participation, it is the antithesis of an integrated curriculum. At 12 years, you are either university bound or not. Although the systems were merged to 16 in 1990, I still find the number of options a bit confusing and think it might be a difficult choice to make at 12 years of age. What about late bloomers? Like in the US, there is an acknowledgment that parents and students prefer the university track whether it is the best fit or not. Another challenge is the lack of interest in the teaching profession. It is interesting to note that the drop out rate for secondary vocational school is relatively high (per the written CINOP materials) - between 30-40%.

Per the CINOP written material, a 1996 law established the national system of vocational qualifications with the four levels of competencies. The Minster of Education oversees adult vocational education, which is governed by 20 sectoral-based governing bodies comprised of employers and labor called LOB's. The LOB's design the qualification structures for each sector and schools develop curriculum based on the rules of these national bodies. Each of the four levels of qualification is tied to a level of vocational education. A person can participate as a apprentice (about a fifth) or full-time student (almost half). If under the age of 23 and not working, you are required to participate in adult vocational education.

Mr. Vitter commented that there are more resources targeted at the adult general education than the adult vocational education. (Per CINOP written materials, it is the government's position that its fiscal responsibility ends when a person is age 27 if s/he possesses a starting qualification.)

There is a proposed shift from qualifications to competencies. This issue reminds me of the move from TAB testing (which scores people at levels) to Work Keys (which identifies what a person knows). Thus, although skill standards are appealing, not all skill standard systems are created equal.

Under that law, the government recognized dual trajectories. Under the BOL trajectory, the student attends secondary vocational education full-time with a combination of 20-60% practical training. Under the BBL trajectory, the student works with 20-40% day-release study. ROCS (Regional Education Centres) are responsible for this system. In response to the high number of dropouts in secondary vocational school, the government is proposing a entirely work-based trajectory where there is a "qualification" contract between the youth and employer.

Mr. Vitter raised the concern that there is no formal system for continuous vocational training. It is interesting to note that the private providers and sector-based training organization dominate in the adult learner arena. In the area of higher education, over half of the part-time students attended private institutions.

Sixty-six sector training funds exist as a result of training agreements between employers and unions in different sectors. Employers pay on average .5% of the wage bill into the funds. This approach has reduced the poaching problem since all employers participate in the training fund. Employers who participate in initial education and training and apprenticeship program can apply for cost reimbursement and partial reimbursement for wages and travel when appropriate. As in Germany, companies are required to be part of the management associates and participate in the various programs.

Currently, workers are guaranteed leave time by law to pursue training to improve employability. There is a proposed experimental initiative to provide paid leave time through individual learning accounts for employees without basic qualifications. The fund would be built by the government, employers, and employees. A voucher system is also under consideration. There are many other innovations that the Dutch are considering, including accreditation of prior learning.

In my view, it is not so much that the Dutch have met their all of their objectives but that they have an adult vocational system in which the stakeholders are active and vigilant. Industry-wide skill standards are tied to education. Work-based learning is valued and workers have at least unpaid time to pursue training. The Dutch can create a system because the social partners (employers and labor), along with the government, are the drivers in vocational education. As the Dutch work to improve this system, there is a *system*, and that foundation allows for innovation.

11. Utrecht–GBIO and Works Councils.

In 1951, Dutch law mandated Works Councils (WCs) in all companies to defend the interests of labor as the company develops. Gradually laws have been passed to strengthen works councils. Initially, WCs were chaired by management, but reform in

1970 gave labor the chair position, and also gave labor the right to advise and veto certain decisions such as a merger, or some other impact that will have a big social or economic impact.

Works Councils are mandated for firms with 50 or more employees. They represent both white and blue collar workers. They give feedback to management, represent the social interests of the firm, and recognize management rights and boundaries. They resist becoming an extension of management. There are now European-wide WCs. A WC must have at least 3 members. Larger companies have up to 13. Whereas 33% of the Dutch workforce is in unions, 65% of WC members are union. WCs aren't the same as unions and are distinct. Unions play and informal role within the WC and provide separate training for their members in some circumstances. WCs are elected every three years.

In 1975, a reform act provided 5 days of training fro works council members a year with support from the state, and implementation left to the social partners. The social partners created STAR, and $60 million was allocated annually for training of works councils so they could be effective. STAR created GBIO to:

- distribute the funds. GBIO will pay up to 50% of training costs with the rest provided by the company;
- serve as an intermediary to arrange the training;
- and to insure the quality of the training.

The works councils get training on a variety of issues such as how to function as a council; their legal rights and how to use legal articles; and how to develop the dialogue with employers.

12. Copenhagen, May 16, 2001, Ministry of Education, Mr. Svend Povelsen and Roland Osterlund

Background: The history of vocational education goes back 400 years when the guilds regulated training and skills in relation to the trades. Training in the company is the core of the system and is a major priority in Danish society.

Up until World War II, Denmark was principally an agricultural society. After the war, industry emerged as the dominant sector. In 1956, they first of many laws were passed setting up a formal educational system. Up until that point, apprenticeship training took place at night school. In 1956, the turned the 350 existing night schools into day schools and consolidated all of them into 50 schools. In the 1970s, they began to introduce general academic subjects into the system. In the 1990s, they began to decentralize the system and to give greater authority to the institutional level. In 2001, there has been a major reform of the approach to pedagogy in the educational system–giving very specific direction to how teachers teach with a greater focus on meeting the needs of the individual. This is a response to the increasing diversity in background and level of knowledge that exists in the Danish school system. Each student is now to have an individual plan for education and can be awarded school credit for practical experience.

Denmark has received the German Carl Bertelsmann Prize in 1999 (equivalent of a Nobel Prize) for the best vocational education system in the world. It is recognized for its flexibility and the high levels of cooperation it secures from the social partners. The OECD studied the Danish system and also recognized it as the best international vocational education system in regards to the transition from school to work. As they said, "In Denmark, the transition is like walking through a door, while in Southern Europe, it is like jumping off a cliff." The unemployment rate for youth and older youth is only around 1%.

The System: Vocational education is a school-based system combined with workplace training based on a contract between the student, the school, and the company. The student receives:

- a certificate that allows you to compete with adult workers;
- experience in the workplace and experience with the wage system.

A big challenge in Denmark is creating high esteem associated with vocational education. In the 1960s, only 4% of the student population went to the University, and 50% had an essentially vocational education background. Today 50% enter the vocational education system and 50% are entering secondary education (gymnasium). There is a growing focus on academics and academic study has higher prestige. Currently 9 years of education is compulsory.

The Ministry of Education has set the following targets:

- 50% of young people should have higher education including but not limited to a university degree.
- 95% of young people should complete education at the secondary level, which is the equivalent of completing high school and two years of college in the U.S. Currently the completion rate is 83%.

Their objective is building a "creative knowledge-based society" as a foundation for competition in the global economy. Ray Marshall, past US Secretary of Labor described the symbol of the industrial system with the production of the auto. The auto had 60% hardware and 40% knowledge. Today's symbol is the microchip that has 1% hardware (sand) and 99% knowledge. There is more computer power in today's car than was in the first space ships. The key for today's economy is knowledge. Society can't afford to have a group of people who can't think, work, and contribute.

In the Danish system, there is certification for skill and qualification for the university. Education is free to all for all levels. In 1995, a government census revealed that only 75% of 21 year-olds had secondary education in a society where education is free. In today's global economy, knowledge and education is critical. They have set the goal to have all workers with credentials by the year 2010.

To achieve parity of esteem between vocational education and the university, they are continually reforming their system. Vocational education schools are now called "colleges." Like the gymnasium, there is a mix of programs in the same institution that allows a student to change their mind and shift from one program to another. These colleges have programs that last from 20 weeks to 1½ years. Work and training in a company must be based on a contract. A salary is paid by the company.

This system is financed by a standard fee of $200, paid by every company for each employee. This goes into a training fund called AER. This fund will then reimburse companies for the time trainees are in classes. This is in contrast to the German system where companies aren't reimbursed. Companies have no obligation to hire the people they train.

There are very specialized programs for troubled youth that have serious problems. This is called the Open Youth Education Program that is a completely customized system that is completely flexible. Students go to a Production School and design and carry out a project that has meaning to them–a positive educational and productive experience that will provide a foundation for the student to re-enter the standard educational process. A student is matched with an adult who works closely with them and serves as a mentor and friend. There is a very high level of social and cultural intervention.

The Labor Market Education System

Employees		**Employers**
National Trade Unions	Council for Vocational Ed. Ministry of Education	National Association of Employers
Trade Unions	Sector Trade Committees	Sector Employers Associations
Local Unions	Local Education Committees Trade/Sector	Local Business Associations
	Technical and Business Colleges	

All the Boards in this system have equal representation by labor and employers and they together constitute a majority of the board.

Students have to pass a final test designed by the trade committee in the sector they are studying.

Comparisons: The Danish system is similar to that in Germany, Austria, and parts of the Netherlands, with the greatest similarity to Germany and Austria. In Denmark, there is a longer time spent in school than in Germany. The Danish also have a pedagogical tradition that links technique and broader education. In the 18th Century, there was a Danish priest, Grundtvig, who created folk schools for the peasants convinced that they couldn't live on bread alone. This tradition was the beginning of a commitment to life-

long learning that is deeply imbedded in Danish culture. Labor with employers play the strong role in the system in contrast to Germany and Austria where the system is mostly dominated by the state and the employers.

The Danish system is also more flexible than the German, allowing students to shift careers and schools easily. In Germany, if you shift you have to start over. Denmark also allows for testing to determine competency.

13. Danish Technology Institute, Tasstrup; Palle Banke

The Institute is an independent, not-for-profit. It has 1,000 employees in 5 divisions around Denmark, and each division has 5-9 centers. They assist companies in business management, IT, inventions, industrial analysis, human resource development, technology and innovation, etc. Palle's specialty is work organization. They have developed a variety of learning techniques to improve quality and transform work organization. They recognize a constant dynamic between training and the design of work organization.

14. Danish Ministry of Labor–Labor Market Authority, Mr. Villy Hovard Pedersen and Kaj Westergard

Denmark has a population of 5 million with an unemployment rate of about 5% and about 2.7 million in the workforce. 80-85% of the workforce is organized. Under the Labour Ministry, there is an AMS system that has two branches: AF and AMU. AF governs the public employment services (PES), which is broken into 14 regions. AMU oversees adult vocational training that involves 24 schools.

The PES integrates unemployment benefits with work experience opportunities through a system of "activation." In response to perceived disincentives to work due to a very generous unemployment program, the government now limits recipients to one year of benefits, during which time the recipient must prove measures to obtain job and follow official advice. After one year, the recipient must work with PES to develop an action plan that includes work experience with employers approved by the Works Councils. Employers and unions work on councils to develop activation measures. Unions help control quality standards so job placement has a developmental element. Job openings are voluntarily reported to PES. 95% of those openings are filled within 5 days - which reflect the short term nature of many of the jobs. Employers are partially subsidized for employing the recipients. Recipients are expected to be treated like a regular employee. The activation program has greatly reduced the number of youth on unemployment rolls as youth find alternatives.

The AMU began in the 1960's in recognition of a public responsibility to train unskilled, semi-skilled and skilled workers. Between 1/3rd and 1/4th of the workforce is unskilled or semi-skilled (did not go beyond compulsory education). Majority of participants in AMU system are employed. Training for unemployed funded mostly by AF (PES). AMU offers 2,300 courses. To keep the courses current, the curriculum is reviewed at

least every 3 years and each course is dropped after 5 years. Standards are set in each curriculum with multiple levels of courses, which ultimately results in a recognized vocational level.

There is equal representation of employers and labor on the national councils that defined the 12 sectors for education and training. The same goes for the committees that develop courses and curriculum. The National Labor Authority has to approve the course so there is a national certification for completion of the course. According to the chamber representative, there are 90 different occupational programs. AMU finances the work - 2.8 billion kroners for AMU.

The Danish link the employer and unions to the educational providers by establishing a social partner board for each of the AMU centers. The Boards hire the teachers, set up local committees to look at the fit of the courses to the local needs. The entire system is designed to respond to market demands quickly. Courses can be customized and delivered to a company within 14 days. Courses are typically shorter (1-2 weeks) and can be taught on a full or part time basis. Companies call the chamber with demand for new course, the chamber checks demand in other companies. If common needs, creates course with union and government.

AMU is new and participation is falling. AMU is in the process of creating an evaluation system. Youth and unemployed are tracked but no tracking system through ID numbers for employed adults to date. 2.5% of workforce is renewed by youth so have to invest in current workforce.

About 75% of the collective bargaining agreement give workers the right to train with pay for 2 weeks per year. Many employees do not take advantage of this right. Over 40% of the workers are unskilled. Goal by government is 95% to have education.

Teachers are recruited from the skilled workforce. They receive extensive training. They are hard to recruit because of tight labor market.

The AMU Centers get their equipment through government and gifts from manufacturers.

Education for youth is administered by the Minister of Education, with the regulations prepared by the social partners. A nice feature in the Danish educational system is the integration of the youth vocational educational system with adult vocational training. First, there is 9 years of compulsory primary and lower secondary education. (The chamber representative complained that primary education is deficient - sound familiar?) Youth can choose after primary and lower secondary education to go to gymnasium or middle term or short term vocational training. Over 95% choose gymnasium with a 50% completion rate. There is 25% drop out rate in vocational track.

There is a bridge after vocational training to a diploma (bachelors) and master's degree in the adult vocational track. The educational track for adults can begin at a low level (literacy, numeracy - like the pre-bridge program), then moves to basic education. After

that, there is basic vocational training. Upon completion, a student can move to the diploma level, same as the youth. There is a place for everyone, no matter what level of skills.

Youth in the vocational track are educated in a dual system, where they work at companies (approx. 20% of all companies) approved by the National Trade Committees, which have equal employer and labor representation. There are 77 national apprenticeship programs or youth can go to work for a year. Students can spend 30% in production, with alternating periods of school and work. There is a challenge is getting enough work contracts for youth. General education makes up 33% of the training period.

During training, youth get paid by employers who are reimbursed through an employer pool. Per chamber representative, private sector is disgruntled about paying 2/3rds of cost for youth training program. Also, worker wages are only partially paid by government while attending AMU. Employers make up the rest. Like in the U.S., employers are willing to pay for specialized training but complain about paying for DSL and basic education. Vocational training set up for youth not being used by unskilled adults.

Many youth stop at gymnasium. There is the same distaste for manufacturing by youth and Danish parents. There is a youth ambassador campaign set for radio and TV. Also renamed occupations like machine operator to "industrial technician."

The Danes are in the middle of a reform process to reduce the drop out rate and increase the attractiveness of the vocational track. The reform increases work-based learning opportunities. It also creates a double qualification to integrate general education with vocational education and a partial qualification for those who are not able to complete the full vocational program. Finally, students can design individual programs, which must be approved by the relevant Trade Committee.

15. INDUSTRIAL TECHNICIANS: RECRUIT, SELECT, THEN TRAIN A VISIT WITH DANSK INDUSTRI

By Peggy Luce, V. P. Education & Workforce, Chicagoland Chamber of Commerce

In Copenhagen, the representative of the National Labor Market Authority, also referred to as AMS, said that, "It is dangerous to try to merge the training of adults and youth." The Department of Labor handles the training of adults. The Department of Education handles the training youth. Persons ages 18 to 25 are defined as youth and treated quite differently than adults. Unemployed youth are eligible for only student support allowances, not unemployment insurance. To receive their student support, they are required to be in public service employment or in training.

At the Dansk Industri, which is the Danish Chamber of Commerce, my counterpart in workforce and education, Christine Bernt Hendriksen, gave a presentation that included

bullet points similar to what I would say to Cook County visitors from another state or country. In describing the problems Dansk Industri (DI) member companies saw within the training of youth, she referred to:

- the very high dropout rate;
- completers of compulsory education (about age 16) lacking satisfactory reading, writing and math;
- too many gymnasium (high school) graduates without useful workforce skills;
- too many adults as full-time students in the youth vocational programs;
- the need to speed up the offering of new courses.

With regard to manufacturing specifically, she said there were not enough young people taking modern courses such as CNC programming and operations.

The above is what DI members have seen in the past. Denmark is looking forward to a new era in vocational training. The new Vocational Education Training Act (VET) became effective on January 1, 2001. These reforms address many of the problems the DI members want corrected.

Access to the VET courses is open to all those who completed compulsory education. These courses consist of two parts -- the initial basic program and the main program of vocational specializations. The initial basic program is college based and completed with a certificate documenting the subjects and levels which the student achieves. Students in this basic program phase may obtain support through the Danish State Education Grant Scheme.

The main program of vocational specialization starts with a job training placement that will require 60 to 75 percent of the time over 3.5 years. The student alternates between education and training in colleges and the company. It is required that the student has signed an apprenticeship contract with a company before starting to the main program. After signing the training contract, the employer pays wages to the apprentice. The wages a company pays during the attendance at college are reimbursed from the Employer Reimbursement Fund (A E R).

The new system offers a structure of seven access routes to the main specialization courses; six into the technical vocational courses and one into the commercial vocational courses. Each of the access channels paves the way to a foundation course covering interrelated vocational programs. The following access channels have been created:

Technology and communication
Building and construction

Crafts and engineering trades
Food production and catering
Mechanical engineering, transport and logistics
Service industries
The commercial field – trade, office and finance.

The Danes changed the names of machinist courses. These programs are now under the heading of Industrial Technician. The Chamber and trade union are encouraging young workers to go into the primary schools as ambassadors. Vocational classrooms and companies are inviting students and parents to open houses.

The basic phase gives students a high-level of flexibility with duration from 10 to 60 weeks. Those who have made a clear choice can progress directly and swiftly through the initial basic phase. Students who have not made up their minds are given time and challenges to assist their program selection, to develop themselves as individuals and to expand their competencies. All students are offered the opportunity to select supplementary vocational or further study.

The VET reform supports individual learning pathways, flexibility and the links between initial and continuing training. Two essential instruments are the student's personal education plan and the student's portfolio (log book). The VET college catalogs illustrate matrices of modules. The students have the option to design their study menu from a matrix enabling students to change track. For students without a signed apprenticeship contract, the personal education plan includes the actions to be taken toward getting a contract. The personal education plan is accessible to the school and the contracting company.

The particular requirements needed to start the main program are defined in the regulations of each individual VET specialization program. Restricted admission to some programs may be established in accordance with employment prospects in that sector.

The main VET programs start with a practical training period in a company followed by periods at college and the company. Students have the responsibility of finding a company and negotiating an apprenticeship contract, however with guidance from the college.

An important innovation of the VET reform in 2001 is that the student with the company may choose courses/modules from a catalog that includes listings from both the vocational education and training (youth) and adult labor market training systems. The apprentice completes the main program by passing a journeyman's test or similar exam that is monitored by a third party that has representatives of both companies and workers. Passing the journeyman test is no longer accepted as the end of training. Life long learning is expected.

National vocational councils and national trade committees composed of employer and employee organizations are responsible for recommending new or modified training

programs and documenting the need. A new course requires an executive order at the ministerial level. The system allows the local college to decide to what extent a particular course will be offered. These decisions are usually made in consultation with a local employment and training committee.

Vocational school teachers play key roles in this radical transformation of curriculum delivery. Teachers are already working in teams in planning, organizing, teaching and evaluating together. The teachers' new roles include being tutors and career counselors. They must have overall knowledge of the total educational offerings to guide students in designing their individual programs. The Danes describe this as, 'teachers also have to become learners." It is of paramount importance for the teachers to have extensive job experience to insure optimum interaction between classroom-based education and other job training in companies. Teachers in the adult system are required to work in a company for at least two weeks every year.

The vocational systems of the Netherlands and Germany appear to be in contrast to the Danes emphasis on flexibility and life long learning. In the Dutch education system, every student at age 12 takes a test. The score on the test limits their choices for secondary education. Interestingly in the Netherlands, "higher vocational education" includes such careers as accountant, nurse, teacher, IT technician. The Dutch education system has well-defined qualification levels. Assistant vocational training is about half year to year. Basic vocational training is two to four years. Specialist vocational training is usually one to two years. Middle management vocational training is about three to four years. Professional training is also about to four years.

A visit to Germany's General Motors Opel plant illustrates that outstanding students have many wonderful opportunities. The Opel plant offers three and a half years of paid vocational and on-the-job training. The vocational training is conducted at "hands on" work-stations in bright, clean, spacious and well equipped buildings. Students rotate among several integrated mechanical, electronic and technical courses so they are cross-trained for many functions. This training costs about $25,000 per year but the company receives a tax credit. About 700 students compete each year for Opel's 100 trainee openings. Opel experience is that the students choose to remain with Opel because Opel offers the best wages, benefits and stable employment in the area.

COMMENTS:

Small and mid-sized manufacturers would benefit from a diminished appearance that a manufacturing career requires moving from one company to another to gain new experiences and higher earnings and from correcting the images of sporadic, unforeseen lay-offs and long-term unemployment.

There are time and cost efficiencies when the employer selects the student as an employee before substantial training investments are made.

High school students need access to broad based manufacturing courses that open doors to multiple avenues of later specialization, advanced degrees and mid-career changes.

Teachers of basic and specialization courses should be able to assist students in considering the complete array of training options across all "colleges" and must stay close to the "best practices" employers within their "channel."

16. John Christensen, Manager, Business Development in Food Processing and Technology with the William Angliss Institute (WAI) of TAFE, Melbourne, Australia:

John flew from Brussels to Copenhagen to meet with the delegation. WAI is the equivalent level of Chicago's city and community colleges. WAI is a college specifically devoted to training prospective and incumbent workers in the food processing industry. It has thirteen curricula for food processing, of which confectionery manufacturing is one. WAI is currently providing training at the food processing level (AQF 1-3) at one of Mars' subsidiaries in Australia. Often as many as 50% of the employees in larger multinational companies who undertake this training are from overseas.

WAI has been serving the training needs of the confectionery industry in Australia for the past fifteen years. John has been involved during the past two years and has worked specifically on developing a new Diploma of Confectionery Manufacturing. This course was developed through consultation with a group of Australia's major confectionery companies, (and others) to ensure that the training specifically serves their needs and has now been accredited by WAI.

WAI is offering this training on a global basis. John is negotiating with several multinational candy companies to establish a continuous learning program for their employees using WAI curriculum. He is also meeting with European branches of local and global companies, and training providers with a view of developing an international training benchmark with resources available from WAI to any participating training entity.

An international confectionery research network is also in the making. Support has already been received from a number of Australian and European Universities and some industry specific research establishments (Confectionery and Biscuit Organization - CAOBISCO and the International Organization for Chocolate and Confectionery - IOCC). This industry-specific, collaborative research is seen as assisting the industry in the future and aiding the acquisition of research dollars.

This information about the expanded and improved training and credentialing being developed in Australian (and Europe) for the confectionery and broader food industry could have serious implications for American companies. It could mean that American companies with subsidiaries abroad might have economic imperatives to move more and more of their production overseas because of: 1) competitive prices and wages in South

America and/or 2) a highly skilled, flexibly training, highly productive workforce in Europe and Australia.

17. Amy Sherman, Executive Director of Manufacturing Workforce Development Project; Impressions from Germany, Holland and Denmark

I returned from our trip with the following impressions:

Workforce development drives economic development: The Europeans we encountered—from the small employer in Dortmund to the government officials in the Netherlands, to the business chamber and union representative in Denmark— understand that workforce development is an essential driver of economic development. For example, consider the response of the town of Hattingen, Germany to the closing of a steel plant that had operated since 1811 and supplied 30,000 local jobs at its peak. The region made a large capital investment to replace the plant with a high-tech training center focusing on satellite technology, computing, welding, and cooking. Although the center is fairly new, its initiative is already attracting businesses to the region. It is one of several examples I encountered of Europeans applying the principle, "If you supply the skilled workers, the business will come."

These countries determine systematically which skills will be in demand. Thus, supply is in sync with demand. Management and labor actively participate in the overall planning of the adult vocational training system. Specifically, management and labor**,** referred to as "social partners**,"** (1) define the target sectors and occupations, and (2) determine the qualifications needed for each occupation. In **Denmark**, the social partners also shape and approve the curricula offered at the 24 adult vocational training centers (AMU centers) located throughout the country. Curricula are reviewed every three years and courses must be replaced every five years. This approach helps keep technical education fresh and responsive to marketplace demands.

Each of the three countries make the necessary investment in technical training because they realize that they cannot compete in the international marketplace through natural resources or low labor costs. Therefore, they have designed systems to train workers in skills that will command a premium wage in the marketplace. Thus, as observed by Christine Bernt Hendrikson of the Danski Industri (Danish Chamber of Commerce), the country's strategy is to create a "knowledge" economy in target sectors. One of the target sectors in Denmark is biotech and, in this area, the strategy seems to be succeeding. The town of Hilleroed just attracted a major U.S. pharmaceutical company, Biogen Inc. Biogen plans to spend 357 million dollars to build manufacturing plan there, creating at least 400 new jobs. James C. Mullen, Biogen's President and Chief Executive Officer, states that "Denmark is extremely competitive because of its pro-business attitude and the quality of its workforce. The region of Copenhagen and the Southern part of Sweden – often referred to as "Medicon Valley" – is world class in biotechnology and pharmaceuticals. We are very enthusiastic about being there." This statement is especially remarkable when one considers that Denmark is known for higher labor costs.

In all three countries, Labor and Business make the requisite commitment to create an effective workforce development system through partnership.

a. The employers we talked with view themselves as a part of a larger industry and recognize that it is in their individual and collective interests to work together to set standards and oversee education to ensure a steady supply of workers. Because all employers have to pay into the various systems, the threat of poaching employees by other companies is reduced, and accordingly, there is more incentive to train incumbent workers. The mantra sounds more like "what's in it for us?" than "what's in it for my company?"

b. Labor operates as a partner with Business. The role of Labor expanded greatly after WWII in large part as a check against the return of fascism. In each of the three countries, labor and management are mandated by law to work together on economic and workforce policy and programs. The business people we met genuinely seemed to value the role of Labor and did not perceive Labor as the enemy. I asked the owner of an award-winning metal-coatings company near Dortmund about his view of Labor. He told me that because they worked in partnership, labor disputes were rare and joint support for policy and initiatives made things happen. Moreover, in these countries, labor unions go much farther than negotiating on traditional bread and butter issues. Labor plays a meaningful role in the creation of wealth. For example, the Netherlands created a system of work councils for companies with over 50 employees. Chaired by a labor representative, these councils play give input to management on a variety of issues from training to new technology to potential mergers. While 33% of the general workforce is unionized (compare to Denmark – 80-85% are unionized), over 65% of the elected council members belong to a union. The contribution of these council members is valued and the companies help pay for council member training (regulated by the State) so members will have the knowledge and skills needed to be effective advisors.

These countries' systems of vocational education and training contain a strong work-based learning component and also integrate academics with technical classes (at varying degrees). Students are exposed at an early age to real work through the dual learning system. With reforms, there is even greater integration of general academics with technical training, especially in the Netherlands and Denmark. This approach potentially allows students to earn dual degrees and is likely to improve vocational students' communication, analytical, and problem-solving skills. (I will leave the detailed analysis about the content of these programs to our experts on the team).

Appendix IX

Glossary

The following appendix is a glossary of terms that are used in the body of the report and in the other appendices.

GLOSSARY

Academic Skills are skills and related knowledge contained in the subject areas and disciplines addressed in most national and state educational standards, including English, math, science, etc.

Accreditation is notation by a recognized authority regarding the quality of training offered by educational institutions and programs. Institutional accreditation normally applies to an entire institution, indicating that each of its parts is contributing to the achievement of a n institution's objectives, although not necessarily all on the same level of quality. Accrediting agencies and associations are nationally recognized by the Secretary, U. S. Department of Education. For Illinois, the regional accrediting association is the North Central Association. Specialized accreditation normally applies to evaluation of programs, departments, or schools that usually are part of a total collegiate or other post secondary institution

Adult Education Programs serve individuals 16 years and older who have less than a high school education and are no longer enrolled in school. Programs include adult basic education, English as a Second Language, and basic vocational skills. Adult Education Program governance was transferred from ISBE to ICCB July 2001.

Assessment is a process of measuring performance against a set of standards through examinations, practical tests, performance observations and/or the completion of work portfolios.

Business and Industry Centers, located at all community colleges, provide a comprehensive range of services based on local needs that include customized job training and testing; development leaders charged with generating a blueprint for the future of Career and Technical Education that includes supporting high educational achievement for all CTE students.

Career and Technical Education Challenge Task Force was a statewide joint effort between ICCB and ISBE with an appointed committee of more than 40 educational and workforce development professionals.

Career Development Work based learning experiences are planned activities which allow high school learners to explore various career pathways in order to make informed career choices. Examples include classroom field trips to worksites, job shadowing involving one student or a small group of students at worksites with employees and employee representative speakers visiting scholastics to explain some aspect of the worksite.

Certificate is an award that requires completion of an organized program of study at the post secondary level. Certificates are classified by the amount of time required to complete the program of study.

Chicago Workforce Board (CWB) is the WIA area 9 (City of Chicago) designated entity whose mission is to ensure the creation of a workforce development system that supports economic growth and competitiveness by meeting the needs of employers for qualified workers and expanding employment opportunities for Chicagoland and the general public can work together to create policy for the workforce development system. It strives to create a cohesive system of programs and services.

Chicago Workforce Development Center (CWDC) is the new name, proposed by the CWB, for the Illinois Employment Training Center (IETC) One-Stop facilities located in the City of Chicago heretofore known as Chicago One-Stop Career Centers.

Classification of Instructional Programs (CIP) is the U. S. Department of Education's taxonomic standard for federal surveys and state reporting of institutional data.

Consumer Reporting, intended to facilitate customer's decision-making process in training provider selection, is required by WIA in order to empower customer choice and provide opportunities for providers certified under WIA to effectively provide program performance and cost information to the public. The Act requires that the state develop a method to make this consumer reporting information available. This performance and cost information that training providers submit with their applications is also used to o make up the consumer reporting system upon certification. Illinois' consumer reporting system can be found at www.ilworkforce.org/icrs.htm and is intended to provide understandable, accurate and unbiased information about the performance of various WIA-certified training providers.

Content Standard is a specification of what someone should know or be able to do to successfully perform a work activity or demonstrate a skill.

Core Performance Indicators for the Career and Technical Education Act (Perkins III) include: 1) attainment of academic and vocational skill proficiencies; 2) acquisition of secondary or post secondary education and employment; 3) placement in and retention in postsecondary education and employment; and 4) participation in and completion of vocational and technical education programs that lead to nontraditional training and employment.

Credentialing is the provision of a certificate or award to an individual indicating the attainment of a designated set of knowledge and skills and/or the demonstration of a set of critical work functions for an industry/occupational area.

Critical Work Functions are distinct and economically meaningful sets of work activities critical to a work process or business unit which are performed to achieve a given work objective with work outputs that have definable performance criteria. A critical work function has three (3) major components: 1) conditions of performance: the information,

tools, equipment and other resources provided to a person for a work performance; 2) work to be performed: a description performed; of the work to be and 3) performance criteria: the criteria used to determine the required level of performance. These criteria could include product characteristics Accuracy and appearance levels), process or procedure requirements (safety, standard professional procedures) and time and resource requirements. The IOSSC requires that these performance criteria be further specified by more detailed individual performance elements and assessment criteria.

Early School Leaver Program, administered by ISBE in the Chicago area through grants to 3 City Colleges of Chicago, 3 City College Technical Institutes and 3 Chicago Public High Schools, is designed for high school non-completers ages 16 to 21 who want to complete the secondary level of education and obtain work-site learning experiences.

Education-to-Careers is an initiative to promote the overall career preparation opportunities that schools can provide students for success in education, in work and in life. ICCB and ISBE are partners in administering and implementing ETC as an education reform initiative through joint administration with the interagency state-level team, the Education-to-Careers Steering Committee.

Education-to-Careers Steering Committee (ETCSC) is a subcommittee of the Illinois Workforce Board comprised of educators.

Eligible Training Provider is an organization, entity or institution, such as a public or private college, university, community-based organization or proprietary school whose program has been approved by the local workforce board and submitted to the state for inclusion on the statewide list of eligible providers.

Exiters of post secondary institutions are participants who complete a program or who do not enroll for two consecutive semesters or three consecutive quarters excluding summer.

Exiters of short-term vocational programs are participants who have completed the program or who have not received program services for 90 days and are not scheduled for future services other than follow-up services (excluding participants who did not receive services due to health/medical conditions and delays before training begins) for private institutions.

Illinois Board of Higher Education (IBHE) is the planning and coordinating agency for all sectors of Illinois higher education. It is responsible for planning and policy development, budget development, and program approval and review. It is also the operating and degree-granting authority.

Illinois Business Roundtable (IBRT) is part of the Illinois Business Education Coalition (IBEC), (which also includes The Illinois Manufacturer's Association) a collaboration of the major business organizations within Illinois whose agenda is to improve the quality of public schools.

Illinois Common Performance Management (ICPMS) is a data system shared by 8 state

agencies that contains information about certain outcomes of selected groups receiving basic skills, occupational/vocational training and other employment assistance in publicly funded programs. Decisions regarding information to be included and its uses and distribution are made by a team representing the participating agencies and the Governor's Office. The HRIC/IWIB provides policy guidance and oversight of the ICPMS. ICPMS is used as the performance data collection tool for provider certification. Using ICPMS relieves providers from having to collect and submit all performance data to the state. Instead providers submit a few key pieces of information, which are used to extract the full compliment of performance outcomes. (See www.ilworkforce.org/provider).

Illinois Community College Board (ICCB) is the state coordinating board for the community colleges. Its mission is to administer the Public Community College Act in a manner that maximizes the ability of community college districts to serve their communities. Administers Adult Education program

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Illinois Department of Commerce and Community Affairs (DCCA) is in charge of economic development for Illinois. It administers the Industrial Training Program (ITP) for incumbent worker retraining.

Illinois Department of Employment Security (IDES) administers the state's unemployment insurance program, provides job match assistance for employers and specialized assessment and referral services for job seekers. It collects and analyzes local labor market information for the state. Administers the Illinois Common Performance Management Program for workforce programs. Staffs the State's Human Resource Investment Council/Illinois Workforce Investment Board (HRIC/IWIB).

Illinois Department of Human Services (IDHS) assists Illinois residents to achieve and maintain self-sufficiency and good health by providing integrated family- oriented services and establishing measurable outcomes in partnership with communities.

Illinois Employer Council (IEC) (formerly Job Service Employer Council (JSEC), a statewide employer based advisory group comprised of groups of employers advising local IDES sponsored IETCs. The council enables employers to have input in determining employment and training related law and policy. IEC is affiliated with the National Employer Council, which convenes annually in Washington, D.C. with congressional legislators and the U. S. DOL to discuss federal and state legislation.

Illinois Occupational Coordinating Committee (IOCC) was formed in 1977 by interagency agreement. It is a group of state agencies mandated by law to coordinate the collection, organization and dissemination of labor market and career information so that it is conveniently available and useful for educational, economic development and career planning throughout the state. Governance is scheduled to transfer to the IDES January 2002.

Illinois Occupational Skill Standards Committee (IOSSC) is a legislated body representing business and industry, which establishes skill standards criteria, endorses final products approved by the industry sub-council and standards development committee and

assists in marketing and disseminating occupational skill standards. To date the following numerous manufacturing products are endorsed and/or in development by IOSSC for Illinois. The list can be viewed at www.standards.siu.edu/products/Manufacturing.html.

Illinois Resource Information System (IRIS) Programs wishing to be WIA certified must be registered with the Illinois Resource Information System, a statewide database of employment-related services and other human services, available at www.iocc.state.il.us/IRIS. IRIS is designed to assist Illinois residents to identify evaluate and access services, particularly those that promote employability, such as training programs, job search assistance and related supportive services like child care and transportation.

Illinois State Board of Education (ISBE) Sets state educational policies and guidelines for public and private schools, preschool through grade 12, as well as for vocational education. Administers federal and state career and technical education programs including education-to-careers, school-to-work, tech-prep, etc. It analyzes the aims, needs and requirements of education and recommends legislation to the General Assembly.

Illinois Student Information System (ISIS) is a performance information software package created by ISBE in 1998 to replace the Vocational Information. Management System. Regional school and course information data are maintained in local school databases. Additional data elements include Education-to-Careers individual career plans, career pathways and work-based learning experiences have been incorporated. All students, not only those enrolled in CTE courses, can be entered into the student record database, allowing a broad range of reporting capabilities.

Illinois Workforce Board (IWB) assists the Governor to 1) develop a State WIA Plan; 2) develop and continuously improve statewide system of activities under Subtitle B-1 or carried out through a one-stop delivery system; 3) review local (LWIB) Plans; 4) comment on the State's Career and Technical Ed Plan; 5) designate local service delivery areas (in Cook County those areas are WIA 7, 8 and 9); 6) develop allocation formulas for funds distribution for youth and adult training and employment activities; 7) develop and continuously improve state performance measures to assess the effectiveness of the WIA; 8) prepare annual report to U.S. DOL; 9) develop statewide employment statistics system and 10) develop application for incentive grants.

Illinois Employment Training Center (IETC) is the name for Illinois' One-Stop Centers designated in WIA Section 121.

Individual Training Account (ITA) is a financial subsidy to enable customers that qualify for training to access the program of their choice on the statewide list of eligible providers. An ITA is most often in the form of a voucher, which is a document that can be redeemed for training.

Industry is a type of economic activity or product or service produced or provided in a physical location (employer establishment). Industries are usually defined in terms of the

Standard Industrial Classification (SIC) system or North American Industrial Classification (NAIC) system.

Industry Subcouncil of the IOSSC is comprised of representatives from business/industry and education responsible for identifying and prioritizing occupations for which occupational performance skill standards are adapted, adopted or developed. They establish standards development committees and submit developed skill standards to the IOSSC for endorsement. They design marketing plans and promote endorsed skill standards across the industry.

Joint Education Committee (JEC) is a statutory entity [105 ILCS 5/1A-4(D)] consisting of 2 members each from the ISBE, IBHE, ICCB and IHRIC. Members serve on the Preschool through grade 16 council (P-16) along with CEOs of each entity. JEC develops policy recommendations to their respective boards "on matters of mutual concern to elementary, secondary and higher education" such as articulation between elementary, secondary and higher ed and general research and. planning.

Knowledge for industry standards development and skills testing means understanding the facts, principles, processes, methods and techniques related to a particular subject area, occupation or industry.

Local Workforce Board (LWIB) means a Local Workforce Investment Board established under WIA Section 117 to set policy for the local workforce system area. Its members must be individuals with optimum policymaking authority within the organizations, agencies or entities they represent. Duties of the LWIB include 1) develop**,** with the chief elected official(s) and submit a local plan to the Governor; 2) identify eligible youth activity providers and award grants or contracts basis on a competitive based on recommendations of the local youth council; 3) identify eligible providers of services for dislocated workers; 4) designate or certify and terminate for cause one-stop operator(s) eligibility; 5) develop a budget subject to approval of chief elected official(s) who serve as grant recipient and are liable for any misuse of grant funds; {The chief elected official(s) may designate an entity to serve as a local grant subrecipient for such funds or as a local fiscal agent}; 6) disburse funds for workforce investment activities; 7) conduct oversight, in conjunction with chief elected official(s), of adult, youth and one-stop operations in the local area; 8) negotiate and reach agreement on performance measures with the chief elected official(s) and the Governor; 9) coordinate activities with economic development strategies and develop other employer linkages with such activities; and 10) promote participation of private sector employers in the workforce system and ensure effective provision of connecting, brokering and coaching activities through intermediaries such as the one-stop or through other organizations to assist employers in meeting hiring needs.

Local Workforce Investment Area (LWIA) is a geographical designation made by the Governor, of substate areas designed to receive and administer WIA funding at the local level according to Section 116 of the Workforce Investment Act. Automatic designation may be any unit of general local government with a population of 500,000 or more taking into consideration the geographical area served by educational agencies and institutions. In

Illinois 26 local areas were designated, which correspond to the former "service delivery areas" under the Job Training Partnership Act. Cook County contains three (3) LWIAs. They are WIA 9, Chicago; WIA 8, and WIA 7 areas of Southern Cook County.

Machining Skills Cluster Recognition Proposal includes the Machining Skill Standards Levels I-III as developed by the NIMS, which meet all IOSSC's content requirements and have been translated into IOSSC formats.

Manufacturing Subcouncil is a subset of the IOSSC's council that identified machining skills as a major occupational cluster in manufacturing. The subcouncil endorsed Institute for Metalworking Skills standards and refers to them as the Illinois Machining Skill Standards. These Skill standards are used predominately in the following occupations recognized by the Tooling and Manufacturing Association in their analysis of labor market needs in Illinois: Machinist, Machine Tool Setters and Set-up Operators, Metal Processing Machine Setters and Setup Operators, Combination Machine Setters and Setup Operators, Numerical Control Machine Setters and Setup Operators and Tool and Die/Mold Maker.

National Institute for Metalworking Skills (NIMS) developed both written and performance examinations for Matching Skills Levels I-III. These examinations have been pilot-tested and will be available for use in Illinois. NIMS is committed to maintaining, updating and promoting the national machining skill standards for use in Illinois. NIMS board is composed of representatives of leading industry and trade associations and unions in the industry.

Occupation is a group or cluster of jobs, sharing a common set of work functions and tasks, work products/services and/or worker characteristics. Occupations are generally defined in terms of a national classification system including the Standard Occupational Classification (SOC). Occupational Employment Statistics (OES) and the Dictionary of Occupational Titles (DOT).

Occupational Cluster is a grouping of occupations from one or more industry that share common skill requirements.

Occupational Skill Standards are specifications of content and performance standards for critical work functions or activities and the underlying academic, workplace knowledge and skills needed for an occupation or an industry/occupational area.

Occupational Skills are technical skills and related knowledge required to perform the work functions and activities within an occupation.

Office of Rehabilitation Services (ORS) a division of IDHS, ORS provides professional vocational counseling, job placement and rehabilitation technology services to help persons with significant disabilities obtain employment.

One-Stop Illinois Employment Training Centers (IETCs) are listed by the U. S. Department of Labor as the cornerstone of the new workforce (WIA) investment system.

The underlying notion of One-Stop service delivery is the coordination of programs, services and governance structures so that the customer has access to a seamless system of workforce investment services. It was envisioned (in the Federal Rules for WIA) that a variety of programs could use common intake, case management and job development systems to take full advantage of the One-Stops potential for efficiency and effectiveness. The challenge in making One-Stop live up to its potential is to make sure that the State and Local WIBs can effectively coordinate and collaborate within the network of other service agencies (transportation providers, metro planning entities, child care agencies, nonprofit and community partners and the broad range of partners who work with youth). Only one (1) comprehensive One-Stop is required per WIA service delivery area.

Participants in post secondary credit hour programs are individuals who accumulated at least twelve credit hours or more in the program during a single year and have declared an intent to complete a certificate or degree.

Participants in shot-term vocational training are defined as individuals who attended programs regardless of the length of attendance.

Performance Standard is a specification of the criteria used to judge the successful performance of a work activity, demonstration or a skill or outcome of a program.

Populations with Multiple Barriers to Employment as defined by WIA includes low-income individuals with one or more of the following barriers: 1) substantial language or cultural barriers; 2) offenders, 3) homeless; and 4) hard-to-serve populations as the Governor defines.

Post Secondary Education is a formal instructional program whose curriculum is designed primarily for students who have completed high school or a GED. This includes programs whose purpose is academic, vocational, continuing professional education and excludes a-vocational and adult basic education programs.

Product Developer is an individual contracted to work with the standard development committee, state liaison, industry subcouncil and IOSSC for the adaptation, adoption or development of skill standards content.

Program Completion for vocational programs that award formal credentials includes individuals who earn the credential (either a basic or advanced certificate or degree).

Program Completion for vocational programs that do not award formal credentials includes individuals who satisfy criteria that are approved by the Local Workforce Investment Board certifying the program.

Program is training services consisting of one or more courses or classes, that, upon successful completion, lead to a certificate, an associate degree, baccalaureate degree, competency or skill recognized by employers; or a set of skills or competencies generally required for a job or a set of jobs.

Secondary Career and Technical Education Completer includes any student enrolled in an approved CTE 11th or 12th grade course that has been flagged in ISIS as a Key course. The term is not currently (2001) used for state data collection purposes.

Secondary Career and Technical Education Orientation Level Course are ISBE approved CTE 9th and 10th grade courses in program sequences that provide instruction in specific technical skill standards or tasks.

Secondary Career and Technical Education Preparation Level Course is an ISBE approved CTE 11th and 12th grade course.

Short-Term Vocational Training, ranging from one day to nine months, includes on-credit and short-term vocational programs of six credit hours or less at post- secondary institutions.

Skill is a combination of perceptual, motor, manual, intellectual and social abilities used to perform a work activity.

Skill Development Work-based Learning Experiences (WBL) are planned activities for high school students (such as a paid or unpaid experience related to student's chosen career major and occurs during regular school year or during summer school break OR a community service learning experience that is related to the student's chosen career major). that allow learners to develop skills for a specific career in technical programs. Skill Development WBL is comprised of 9 essential elements: 1) instruction in all aspects of an occupation/industry; 2) written agreement defining the roles/responsibilities for all parties; 3) instructional plan closely coordinated with the school site curriculum and based on state or national skill standards; 4) technical skills are acquired through supervised experience with qualified workplace mentor; 5) employability skills, including self-employment skills, are developed through planned experiences; 6) academic and vocational knowledge and skills are acquired through hands-on experiences; 7) skill development is assessed and clearly documented; 8) training programs are articulated with options; post secondary 9) all learning experiences comply with Federal and State laws.

Skill Standard specifies the knowledge and competencies required to perform successfully in the workplace.

Special Population Students is federally defined (Perkins Vocational and Technical Education Act of 1998) to include: 1) individuals with disabilities; 2) individuals from economically disadvantaged families, including foster children; 3) individuals preparing for nontraditional training and employment; 4) single parents, including single pregnant women; 5) displaced homemakers; and 6) individuals with other barriers to educational achievement, including individuals with limited-English proficiency.

State Liaison for IOSSC is an individual responsible for communicating information among all parties (IOSSC, subcouncil, standard development committee, product developer, project director, etc.) in skill standard development.

Statewide List of Eligible Providers is a compilation of all programs, listed by provider, that have been approved by a local board. The statewide list of eligible providers, according to WIA Section 122(e)(4)(A), must be widely disseminated and available.

Statewide List of Eligible Providers is a compilation of all programs, listed by provider, that have been approved by a local board. The statewide list of eligible providers, according to WIA Section 122(e)(4)(A), must be widely disseminated and available through the state's One-Stop system to be available to participants in employment and training activities. In Illinois the statewide list of eligible providers is on the internet at www.ilworkforce.org/slep/htm.

Tech Prep College Completer must have followed a written career plan indicating a Tech Prep occupation as a career goal; taken a sequence of program-specific core academic and technical courses to prepare during the two years of high school preceding graduation; articulated to a non-duplicative academic and technical course of study for a Tech Prep occupation leading to an associate of applied science degree, two-year certificate or two-year apprenticeship following high school; and completed two years of postsecondary education which led to an associate of applied science degree, two-year certificate, two years of an articulated apprenticeship or from a community college to a four-year baccalaureate degree in a Tech Prep occupation.

Tech Prep is a program of study which begins in high school, continues at the community college, and culminates in an associate of applied science degree in a high-demand, high-wage occupational program. Program efforts concentrate on the transitioning of students, pathway development, and preparatory services. In fiscal year 2000 the ICCB and ISBE worked on state-level coordination of Tech Prep. (NOTE: In FY01 Chicago Public Schools had an *articulation agreement waiver for Tech Prep*.)

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Third-Party Assessment is a system in which an industry-designated organization (other than the training provider) administers and controls the assessment process to ensure objectivity and consistency. The training provider could be directly involved in the assessment process under the direction and control of a third-party organization. The third-party assessment is part of the IOSSC process.

Training Services is a category of services that Local Workforce Investment Boards are responsible for providing to adults and dislocated workers under WIA. The broad array of training services may include occupational skills training, on-the-job training, job-readiness training, adult education and literacy activities, cooperative education programs, training programs operated by the private sector, skill upgrading and retraining, entrepreneurial training, and customized training conducted by an employer. However, the occupational training services that mayb e obtained through the use of an ITA may not be so extensive. For example, local Boards may structure job-readiness and adult education and literacy as short term vocational training and include them as a component of WIA intensive **s**ervices. Additionally, on-the-job training and customized training may be an exception to using an ITA and local areas may develop contracts with the private sector to deliver these types of

training programs.

Validity is the degree of correspondence between performance in the assessment system and job performance.

Vocational Education Teacher Requirements for Cooperative Teacher Coordinator include 24 semester hours in the specialty areas plus six semester hours in the organization and administration of coop education; 2,000 hours of employment experience in the occupational specialty to be taught OR completion of a directed occupational experience in the area equal to 2,000 hour employment requirement OR completion of a combination of employment experience and directed occupational experience equal to the 2,000 hour employment experience requirement within four (4) years from the date of initial employment as a coordinator. Options chosen shall be detailed in the district's Regional Education for Employment Plan and are approved if the work experience is a paid one and outside the education or teaching profession.

Vocational Education Teacher Requirements for Interrelated Cooperative Occupational Teacher Coordinator and Cooperative Work Training Teacher Coordinator must meet standards in at least one of the specialty areas plus the requirements for a Cooperative Teacher Coordinator.

Vocational Education Teacher Requirements for Provisional Vocational Certificate may be issued to individuals who have work experience in specific skill areas for which school districts have state-approved reimbursable vocational programs. The applicant must provide letters of experience from employers or notarized statements if self-employed, outlining the work experience relating to the skill area.

Vocational Education Teacher Requirements for Special Vocational Teacher Coordinator include the same requirements as for Cooperative Teacher Coordinators except that the 24 hours in occupational specialty is waived.

Vocational Education Teacher Requirements for Temporary Provisional Vocational Certificate is the same as for Provisional Vocational Certificate except the certificate may be issued only when the employing board certifies to the satisfaction and approval of the Regional Superintendent of Schools (in the case of Chicago Public Schools that means itself) that no qualified teacher holding a regular certificate or a Provisional Vocational Certificate is available and that actual circumstances and need require such issuance. Applicants must document evidence for 8,000 hours of work experience in the specific skill area to be taught. Such a certificate is only valid for one year and may be renewed, which requires proof that the holder has completed three semester hours of credit during the previous year.

Work Experience and Career Exploration Program is a one or two year school-to-work transition program designed for students ages fourteen and fifteen who have had difficulties with their previous school experiences. Students are released from school to work for a maximum of three hours daily up to twenty- three hours per week at a job site. The program aims to help at-risk students to become reoriented and motivated toward education and to

provide direction through career planning to enter into a vocational program, college prep program or a combination of the two.

Work-based Learning (WBL) consists of planned career and skill development activities for high school students, developed cooperatively by education, business, industry, parents and labor representatives to provide learners with education-to-careers transition experiences.

Workforce Investment Act (WIA) is the comprehensive reform legislation that supersedes the Job Training Partnership Act and amends the Wagner-Peyser Act. It contains Adult Education and Family Literacy Act and other education and training related initiatives. WIA represents reform that is intended to be customer- focused to help Americans access the tools they need to manage their careers through information and high quality services and to help U.S. companies find skilled workers. WIA's goal is to increase employment retention, and earnings of participants, and in doing so, improve the quality of the workforce to sustain economic growth, enhance productivity and competitiveness and reduce welfare dependency. The cornerstone of the new workforce investment delivery system is One-Stop service intended to unify numerous training education and employment programs into a single customer-friendly system in each community.

Workplace Skills are the generic skills essential to seeking, obtaining, keeping and advancing in any job. These skills are related to the performance of critical work functions across a wide variety of industries and occupations including problem solving, leadership, teamwork, etc.

INDIVIDUALS THAT ASSISTED THE MWDP		
Name	**Title**	**Organization**
Clarence Davidson		
Michael Biscan	President, CEO	Abbey Metal Corp.
David Flores	Vice President	Ace Industries
Paul Spanopoulos	Supervisor – Employment and Training	Acme Steel
Laura Frost	Manager, Human resources	Admiral Tool & Manufacturing Co.
David Fink	President	Allied Metals
Sal Marsiglia	Vice President, Operations	Ampere Automotive Corporation
Glenn Davis		Association of Joint Labor/Management Education Programs
Bob Brueck	Manager, Human Resources	ATF, Inc.
Jon Baker	Business Representative; Safety Committee Chair	Automobile Mechanics' Local #701 (Machinists)
Tom Wetzel	Director Industrial Development	Back of the Yards Neighborhood Council
Mark Schmidt		Best Foods
John Engler		Best Foods
Fadil Bushati	Human Resources Manager	Best Kosher Foods
Samuel Johnson	President	Best Metals Fabricators
Rick Buhrke	Executive Vice President; Vice President of Finance	Buhrke Industries
Ken Yahiro	President/Owner	Bycap, Inc.
Jorge Perez	Executive Director	Calumet Area Industrial Commission
Robert Dunn	Human Resources	CamCo Inc.
Jerry Benish	Director of Human Resources	Camcraft, Inc.
Bertel J. Smith	Senior Account Executive	CareerWorks, Inc.
Howard Isenberg		CCL Custom Manufacturing
Nik Theodore	Professor	Center for Urban Economic Development at the University of Illinois Chicago

Ric Gudell	Executive Director	Chicago Manufacturing Institute
Mark Allen Brown	Manager, Education to Careers	Chicago Public Schools
Mitch Braun	Education-to-Careers Data Control Coordinator	Chicago Public Schools
Dennis Ptak	Education-to-Careers Coordinator and Grants Management	Chicago Public Schools
Julius Penn	Construction and Manufacturing Cluster Coordinator	Chicago Public Schools
Harry Tobin	Past-Coordinator for Vocational Training Program	Chicago Public Schools
George Wendt	President	Chicago Rolled Metal Products
Steven Alexander	Director of Center for Urban Politics and Policy	Chicago State University
Raymond Carlson		Chicago Turnrite Co., Inc.
Donna Pitz	MOW Manager	Chicago Women in Trades
Melissa Barbier	Girls' Program Manager	Chicago Women in Trades
Ruby Dorsey	Employment Manger	Chicago Women in Trades
Arlene Cruz	Director of Youth Policy	Chicago Workforce Board
Pedro Gonzales	Education-to-Careers (ETC) Coordinator	Chicago Workforce Board
Rev. Henry A. Barlow	Executive Director	Chicagoland Youth and Adult Training Center
Richard Gordon		Chocolate Potpourri Ltd.
Dennis Sienko	Past Director Business and Industry Services	City Colleges of Chicago
Patricia Pikes	Coordinator of Academic and Occupational Programs	City Colleges of Chicago
Dr. Bill McMillan	Associate Vice Chancellor, Occupational Programs	City Colleges of Chicago
Dr. Antonio Gutierrez	Associate Vice Chancellor, Research and Evaluation	City Colleges of Chicago
Nancy Bellew	Coordinator of Special Projects Academic Affairs	City Colleges of Chicago
Dr. William McMillan	Associate Vice Chancellor, Workforce Development	City Colleges of Chicago
Marilyn Engwall	Project Manager	City of Chicago Dept. of Planning and Development
Edward Lewis	Coordinator of Economic Development	City of Chicago Dept. of Planning and Development

John Malloy	Project Coordinator	City of Chicago Dept. of Planning and Development
Susanne Schnell	Senior Manager, Economic Development	Civic Committee
George Weisner	Teacher – Machining Program	Conant High School
Raymond O'Kane	Special Assistant to Executive Director	Consortium for Worker Education
Joe McDermott	President	Consortium for Worker Education, NYC
Bev Ainsworth	Production Manager	Culligan International
Earl Gardner	Production Manager	Culligan International
Prem Sud	Executive Director, Manufacturing Technology Institute	Daley College
Eugene Wagner	Career Dean	DuPage College
Sally Griffith	Executive Director	Education to Careers Partnership(IETC) in Arlington Heights
Dan Heinz	Des Plaines Valley Region-West Cook	EFE Regional Systems Director
Dr. Romayne Baker	Moraine Area Career System-Southwest Cook	EFE Regional Systems Director
Pat Duggan	North Suburban Education Region- North Cook	EFE Regional Systems Director
Craig Williams	Chicago Public Schools	EFE Regional Systems Director
Linda McKinney	Morton Regional Delivery System-West Cook	EFE Regional Systems Director
Tom Hysell	Career Preparation Network-South Cook	EFE Regional Systems Director
Debra Canna	Career Development System-South Cook	EFE Regional Systems Director
Sally Griffith	Northwest Cook	EFE Regional Systems Director
Bruce Anderson	DuPage Area Occupational Education System-Cook & DuPage	EFE Regional Systems Director
Emily Russell	Three Rivers Education for Employment System-Cook, Grundy and Will	EFE Regional Systems Director
Sue Smithson	Instruction Vice President	Elgin College
Mr. Don Petkus		Enterpriz
Patty Cunningham	Human Resources	Evergreen Supply Co.

Arlene Crandall	Director, Equipment and Technology Institute	Gage Park High School
Linda Dworak	Executive Director	Garment Industry Development Corporation
Michael Diamond	Executive Director	Global Chicago
James Lemonides	CEO	Greater North Pulaski Development Corp.
Lowell Rice	Director Industrial Development	Greater North Pulaski Development Corp.
Liv Nilssen	Director	Greater Southwest Development Corporation
Martha Ortega	Human Resources Manger	Guernsey
Kathy Faircloth	Human Resources Director	Hanna Cylinders, Inc.
Marty Bufsart	Vice President, Finance & Administration	Heidenhain Corp.
Steve Holt		Holt & Associates Solutions
Jose Caez	Business Manager/Financial Secretary	IBEW Local 1031
Joe Smyder	Business Representative	IBEW Local 134
Geri Hairston	Student Services Coordinator	IBEW/NECA Technical Institute
Scott Parke	Research and Planning Director	ICCB
Lynn Roberson	Associate Director for Business and Industry Services	ICCB
Preston Morgan	Director for Business and Industry Services	ICCB
Mak Loffredo		Ikadega, Inc.
Tom Hott	EFE Systems Director, Governor's Challenge Task Force Member and IACTE	Illinois Association of Career and Technical Educators
Scott Richardson	Assistant Director for System Finances/Adult Education	Illinois Board of Higher Education
Soyon Bueno	Project Associate	Illinois Center for Specialized Professional Support
Donella Hess-Grabill	Director	Illinois Center for Specialized Professional Support
Leroy Whiting	Executive Director	Illinois Commission on Intergovernmental Cooperation
Hazel Loucks	Deputy Governor for Education and Workforce Development	Illinois Community College Board
Jennifer Foster	Director, Adult Education and Literacy	Illinois Community College Board

Diane Lund	Adult Education Associate Director	Illinois Community College Board
Sarah H. Hawker	Vice President of Workforce Development and Adult Education	Illinois Community College Board
Preston D. Morgan	Senior Director for Workforce Development	Illinois Community College Board
Lavon D. Nelson	Director for Employment and Training Services	Illinois Community College Board
Mitch Daniels	Manager, Workforce Analysis and Dissemination, Economic Information & Analysis Division	Illinois Department of Employment Security
Larry Christison	Manger, Website/Applications, Economic Information & Analysis Division	Illinois Department of Employment Security
Gloria Dooley	Program Services Administrator/Illinois Employer Councils	Illinois Department of Employment Security
William Delgado	State Representative	Illinois House of Representatives
Keith McGee	Director, Manufacturing Programs	Illinois Institute of Technology
Lola Lucas	Client Services Coordinator	Illinois Occupational Information Coordinating Committee
Dave Egan	Assistant to Director for Information Technology	Illinois Occupational Information Coordinating Committee
Brad Welker	Staff Director	Illinois Skill Standards Coordinating Council
Emile Schepers	Social Scientist	Independent Consultant
Harmon Lisnow	Executive Director	Institute for Career Development
Jerry Evans	Assistant Director, Programs	Institute for Career Development, Inc.
Helena Worthen	Chicago Labor Education Program	Institute of Labor and Industrial Relations, University of Illinois at Urbana
Julia Garibay	Former Director of Business Relations	Instituto del Progeso Latino
Tom Dubois	Executive Director	Instituto del Progreso Latino
Robert Stander	Director, Manufacturing Department	Int'l Brotherhood of Electrical Workers (IBEW)
Carl Gallman	Assistant to General Vice President	International Association of Machinists
Steve Martucci		International Brotherhood of Teamsters Local 714
Mary Ann Anthony	Principal Business and Community Consultant, Education-to-Careers	ISBE

Mary Ann Morano	Principal Business and Community Consultant, Workforce Preparation	ISBE
John Kopatz	Industrial/Technical Education Principal Consultant, Secondary Education	ISBE
Linda Lafferty	Consultant, Workforce Preparation Partnerships	ISBE
Fran Beaumann	Division Administrator, Workforce Preparation Partnerships	ISBE
Breanda Warren	Program Specialist, Workforce Preparation Partnerships	ISBE
Cindy Nolting	Program Specialist, Secondary Education	ISBE
Janice Thornhill	Research and Testing Principal Consultant, Workforce Preparation Partnerships	ISBE
John Klit	Community and Family Partnerships Division Administrator	ISBE
Shelia Radford-Hill	Alternative Learning Partnerships Division Administrator	ISBE
Diana Robinson	Deputy Superintendent	ISBE
Jerry O'Hare	Education-to-Careers Principal Consultant	ISBE
Linda Morrow	Private Secretary	ISBE
Dr. Carol Chaska	Research and Policy Development Principal Consultant	ISBE
Lou Berkman	Education-to-Careers Principal Consultant	ISBE
Marty Scribner	Proprietary School Consultant, Alternative Learning Partnerships	ISBE
Gary Osga	Proprietary School Consultant	ISBE
Clebber Gonzales	Proprietary School Consultant	ISBE
Ronald Glover	Proprietary School Consultant	ISBE
Maria Gottschalk	Program Specialist, Secondary Education	ISBE
Dora Welker	Program Consultant, Workforce Preparation Partnerships+D34+D102+D68	ISBE
Ron Engstrom	Manufacturing Secondary Occupational Program Consultant	ISBE
James Topolewski	Plant Manager	J.I.I. Machining

Don Barakat	Vice President of Operations	James Electronics, Inc.
Hal Baron	President	Jane Addams Resource Development Corp.
Margaret Haywood	Director of Training	Janes Addams Resource Development Corp.
Jack McDonnell	(ret.) Project Manager	Job Corps, U.S. Dept. of Labor
Dasve Schmitt	Corporate Recruiter	John B. Sanfilippo & Sons
Mike Bilyk	Machining Group Manager	John Crane Co.
Chuck Cebula	Senior Training Specialist	John Crane Co.
Ray Wolniakowski	Manager	Keebler
Juan Antonio	Plant Manager	La Guadalupara Foods
Yolanda Avitia	Human Resources	La Guadalupara Foods
Tim Poisson		La Marca Foods
Nancy Isaac	Director of Employment	Lakefront SRO
Susan Kidder	Executive Director	Literacy Chicago
Clement Lessner	Training Specialist	LTV Copperweld
Richard Wrobel		Machinery Systems, Inc.
Jerry Field	Senior Staff	Manufacturing Technology & Manufacturing Productivity Center, Illinois Institute of Technology
Caroline Sexton	Executive Director	Marquette Development Center
Joel Simon	Assistant Director of Workforce Solutions	Mayor's Office of Workforce Development
Rita Zambon	Assistant Commissioner	Mayor's Office of Workforce Development
Mike Zyer		Midland Metals
Lauren Baker	Director	Milwaukee Graphic Arts Institute
Beth Reis	Research Director	Moraine College
Doug Brauer	Dean, Workforce Development and Community Services	Moraine Valley Community College
Gary Krupa	Director, Professional Development and Community Ed.	Moraine Valley Community College
Judy Jozaitis	Director, Business and Industry Training	Moraine Valley Community College
Rebecca Lake	Career Dean	Morton College

David Lamy	Bakery Manager	Nabisco, Inc.
Patty Dixon	Human Resources	Nabisco, Inc.
Barbara Homolka	Human resources/Training	Nabisco, Inc.
Cheryl Rauh	Deputy Director, Manufacturing Systems and Technology	National Institute of Standards and Technology (NIST)
Eliud Medina	Executive Director	Near North Neighborhood Network
Mary Jo Hennessey	Executive Director	NIU Business and Industrial Services
Brian O'Malley	Industrial Development Director	North Business & Industrial Council (NORBIC)
Mary Pepperl	Director	Northwest Cook County Workforce Board
Brent Afman	Plant Manager	Otto and Sons, Inc.
Sandra Gil	Manager, Human Resources	Otto and Sons, Inc.
Diana Broeckel	Human Resources Generalist	Parkview Metal Products, Inc.
Brian Banks	Research Action Coordinator	Policy Research Action Group
Cesar Lopez	Operations Manager (requested copy of final report)	Prairie State 2000 Authority
Stephen Nunes	VP, Community and Economic Development	Prairie State College
Patrick Miller	Dean, Workforce Development and Career Education	Prairie State College
Sheila Lewis	Associate Dean, Workforce Development and Career Education	Prairie State College
Lee Helbert-Gordon	Research Director	Prairie State College
Sheila Perkins	Executive Director	Project Jobs
John Baptista	Teacher – Machining Program	Prosser High School
David Moore	President	Quality Croutons, Inc.
Gary Trepina	Vice President	Quality Snack Foods
Frank Fama	Executive Director	Regional Manufacturing Training Collaborative
Stuart Rosenfield	President	Regional Technology Strategies, Inc.
Paula Dent	Human Resources	Ryerson Coil
Gene Cottini	Manger, Human Resources	S & C Electric, Inc.
Janet Kaiser		Sentry Spinning Co.

Elisabeth Solomon	Principal	Solomon & Associates
Rich Jacino	Research Director	Solomon & Associates
Rachel Samuels	Data Checker	Solomon & Associates
Gloria Freeney	Research Associate	Solomon & Associates
Reginald Petty	Research Methodologist	Solomon & Associates
Valentin Mitov	Database Developer	Solomon & Associates
Jai Bowman	Database Consultant	Solomon & Associates
Dan Segebarth	Dean	South Suburban College
Tom Chokley	Tech-Prep Coordinator	South Suburban College
Karen Johnson	Executive Director, Business and Career Institute	South Suburban College
Gloria Taylor	Director of Adult Education Programs	South Suburban College
Debra Canna	Education for Employment Coordinator	South Suburban College
Hank Holevinski	Professor of Aviation Technology	South Suburban College
Tom Edwards	Research Director	South Suburban College
Tom Chockley	Tech Prep Coordinator	South Suburban College
Dan Segebarth	Career Dean	South Suburban College
Ted Stainos	Director, Workforce Development	Southeast Chicago Development Commission
Duane Rankin	Director	Southern Illinois C68Professional Development Center
Dave Ault	Economist	Southern Illinois University
Lucinda Bishop	Director of Development	Southwest Women Working Together
Bob Fittin	Director of Employment Services	Southwest Women Working Together
Shelley Crump Hughley	Executive Director	Southwest Women Working Together
Sylvia Benson	Chief Operating Officer	STRIVE
Erika Dudley	Career Path Director	STRIVE
Steven Redfield	Executive Director	STRIVE
Rebecca Hanscom	Business Representative	Teamsters Local 738
Bethany Paul	Public Information Officer	Tooling and Manufacturing Association

Jerry Baginsky	Vice President and Director of Education	Tooling and Manufacturing Association (TMA)
Dan Kiraly	Manager of Applied Technology	Tooling and Manufacturing Association (TMA)
Kathleen Dowling	Manager of Training	Tooling and Manufacturing Association (TMA)
Steve Everett	Consultant on NIMS implementation	Tooling and Manufacturing Association (TMA)
Dan Heinz	Education for Employment Director	Triton College
Mary Ann Olsen	Education to Careers Coordinator	Triton College
James Smith	Research Director	Triton College
Joe Costigan		UNITE, Chicago and Central States Region
Javier Ramirez	Director of Organizing	United Food and Commercial Workers, Local 100-A
Chris Hurst	Executive Vice-President and Assistant to President on Community Affairs	United Food and Commercial Workers, Local 546
Donald Garfield	President	United States Gear Corporation
Terry Benewich	Region V Director	US DOL/BAT
Jim Haggerty	Human resources	White Cap, Inc.
Eric Parker	Executive Director	Wisconsin Regional Training Partnership
Ami McReynolds	Training Specialist	Wm. Wrigley Co.
Ellen Scully	Skills Strategy Coordinator and MSSC Labor co-leader	Working for America Institute
Tom Gannon	Special Assistant for Manufacturing Skill Standards	Working for America Institute
Ellen Skully	Manager for Special Projects	Working for America Institute
Liz Waller	Senior Fiscal Coordinator	Working for America Institute
Weezy Wahlstein	Director, Labor Market Participation	Working for America Institute
Virginia Carlson	Research Director	World Business Chicago
Rod Hayworth	International Represetnative	United Auto Workers, St. Paul MN
Paul Korman	Regional Director	United Auto Workers
Ron Tonn	Vice President – Public Fund Development	Safer Foundation