The Workforce Boards
OF METROPOLITAN CHICAGO

Regional Solutions for Manufacturing for the Northeast Illinois Economic Development Region

September 2004

This report was commissioned by the Workforce Boards of Metropolitan Chicago and prepared by the Corporation for a Skilled Workforce.

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Executive Summary

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

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

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

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

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

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

1. **A Critical Skill Shortages Report;**
2. **A Root Causes Report; and**
3. **A Solutions Report.**

This report addresses solutions to the root causes of critical skill shortages for the manufacturing industry in the metropolitan Chicago region. Drawing on the data summarized in the Critical Skills Shortage Report and the Root Causes Report, this document reviews the results of the multiple qualitative and

quantitative intelligence gathering activities completed from March through August 2004. It then describes proposed solutions to the key root causes of these shortages and outlines a call to action for the region.

Critical Skills Occupations, Root Causes and Solutions

Over 70 occupations were identified as critical skills shortage occupations early in the CSSI planning process. Since that time, CSSI project stakeholders have whittled the list down to a more manageable size. These shortage occupations are addressed in detail in the Critical Skills Shortage Root Causes Report, submitted in July 2004. They are also listed in the table below; there are about 30 occupations falling into 14 standard industrial classification (SIC) codes across the ten manufacturing sub-sectors on which CSSI efforts focused.

Manufacturing Critical Skill Shortage Occupations
First-Line Supervisors/Managers of Production and Operating Workers
Maintenance and Repair Workers, General
Welders, Cutters, Solderers, and Braziers
First-Line Supervisors/Managers of Mechanics, Installers, and Repairers
Machinists
Computer-Controlled Machine Tool Operators, Metal and Plastic
Electrical and Electronic Engineering Technicians
Metal Workers and Plastic Workers, All Other
Industrial Machinery Mechanics
Printing Machine Operators
Lathe and Turning Machine Tool Setters, Operators, and Tenders, Metal and Plastic
Mixing and Blending Machine Setters, Operators, and Tenders
First-Line Supervisors/Managers of Helpers, Laborers, and Material Movers, Hand
Rolling Machine Setters, Operators, and Tenders, Metal and Plastic

Moving from shortages or needs to causes and then to solutions is neither a straightforward nor quick process. Using a variety of quantitative and qualitative methods to analyze and problem-solve, the CSSI manufacturing stakeholders identified four interrelated causes of these shortages:

1. **Increased demand for advanced skills in manufacturing sectors at all levels.** The combination of new technologies, integrated supply chains,

and new quality tools and frameworks is increasing the skills required for all jobs and creating new jobs that require more sophisticated technical and critical thinking skills than ever before.

2. **An aging manufacturing workforce.** Some firms reported that the average age of their entire workforce was increasing, while others reported a "bifurcated" workforce characterized by large numbers of young workers (who may not view their jobs as leading to careers) and large numbers of tenured workers who have few obvious candidates to succeed them.
3. **The manufacturing industry's poor image.** Although the image problem associated with the industry is not new, media coverage of recessionary job loss and increased levels of off-shoring and out-sourcing have dramatically worsened the industry's image in the eyes of would-be talent.
4. **Specific information gaps** at both individual and organizational levels prevent skill needs from being met and prevent new talent from building manufacturing careers.

Addressing these interrelated root causes requires creative solutions.

In one CSSI meeting, area manufacturers were asked what they thought would happen if they did nothing to address critical skills shortages. The response was clear, "we don't have a choice—we can't *do nothing*." These industry professionals worked with stakeholders to identify three categories of solutions:

1. **Enhancing collaboration across the industry;**
2. **Promoting training that delivers results; and**
3. **Improving the industry's image among key constituent groups.**

This report describes:

- **The methodologies used to develop solutions** that address the occupation and skills shortages, and human resources and training needs of the manufacturing industry in the Chicago metropolitan region.
- **The processes used to engage industry and community partners** in the development of these solutions.
- **The call to action – a proposal to work, in partnership, to achieve these solutions. The Action Plan** focuses on the partnerships required to address manufacturing's critical skills shortages and develop a flexible, diverse workforce that meets the needs of regional companies today and in the future.

During discussions, interviews, surveys, and meetings, a broad range of stakeholders (firms and workers, public and private) provided thoughtful suggestions and insights into their industries. The CSSI project benefited enormously from their contributions and looks forward to increased collaboration in the coming months.

Regional Coalition and Industry Partner Engagement

The Workforce Boards of Metropolitan Chicago engaged a broad range of manufacturing industry professionals in the CSSI project. These industry partners represented firms in one of the 10 key manufacturing sub-sectors listed in the table below.

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

The Workforce Boards also engaged an array of community stakeholders representing the following constituent groups:

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

Partnership Structure

The project's formal partnership structure includes a number of entities whose roles are described as follows:

- **The CSSI Leadership Council.** The Leadership Council membership comprises the private-sector workforce board chairs and the chief local

elected officials (or their designees) associated with the local Workforce Boards who are members of the Metropolitan Chicago (regional) partnership. The Council provides oversight to the CSSI project, and the implementation of CSSI initiatives or programs.

- **The CSSI Regional Council.** The Regional Council's members include a broad range of industry, labor, and government professionals, including:
  - The state Departments of Human Services, Commerce and Economic Opportunity, and Employment Security
  - The Illinois Community College Board
  - Labor organizations
  - Economic Development and Workforce Professionals
  - The Chair and Vice Chair of the Industry Sector and One-Stop Councils
  - Foundations
  - Workforce Board Chairs
  - Community College Presidents
  - Other private-sector industry experts

  During the planning phase of the CSSI project, they assisted in all aspects of information dissemination, intelligence gathering, etc. And as the project progresses, it is this group that will be expected to lead the effort to redirect resources to better meet the needs of firms and workers in Metropolitan Chicago's manufacturing industry.
- **The CSSI Manufacturing Council.** The Manufacturing Council includes a range of industry and trade association professionals, together with economic development, Chamber of Commerce, and labor leaders. The Council provides intelligence, outreach, and networking assistance in support of CSSI research activities, as well as validates CSSI findings, helps the Workforce Boards interpret these findings, and develops and helps to implement solutions to the critical challenges identified through the CSSI project.
- **The CSSI Manufacturing Council Solutions Team**. The solutions team, a sub-group of the Manufacturing Council, met to develop the preliminary list of solutions that would be presented and discussed at subsequent Manufacturing Council meetings.
- **The CSSI One-Stop Council.** The One-Stop Council includes representatives from One-Stop partners in each local workforce area. The Council is focused on best practices in program design and sector strategies, implements CSSI findings and solutions, and provides feedback and input on regional efforts to the Workforce Boards and other key investors.

- **CSSI Stakeholders and Community Groups.** An array of stakeholder and community groups has participated in all CSSI activities. The Workforce Boards maintain a growing list to help keep interested parties and community stakeholders well informed.

Engagement Activities

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

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

As the project's committees and teams took shape, most of these individuals participated in some form, and other experts and stakeholders joined the effort over time. It is this expanded group of industry and community stakeholders that participated in and guided CSSI research, and helped convene the series of workgroups and discussions out of which the proposed solutions emerged. These solutions build on strategies being utilized both in the region and across the country. Stakeholders proposed building upon current regional efforts already underway, or proposed new ideas. Appendix A includes examples of strategies that were discussed.

Primary Research

A variety of primary research methods were used to generate potential solutions. **Manufacturing firms, professional and trade associations, community and technical colleges, and employment and training professionals participated in a range of activities,** including:

- Phone interviews
- Solutions team meetings and workgroups; and
- Manufacturing Sector Council meetings and workgroups.

The interviews and meetings were conducted following a standard protocol (Appendix B). The protocol asked participants to:

- Identify the relative importance of each root cause as well as the ability to impact the issue;
- Identify the desired state of each of the root causes;
- Identify the impact of doing nothing;
- Suggest solutions and strategies to address the root causes; and
- Determine actions and partners required to take action.

Participants focused on identifying solutions to the root causes of critical skills issues in the following shortage occupations:

Manufacturing Critical Skill Shortage Occupations
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Welders, Cutters, Solderers, and Braziers
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Inventory of Manufacturing Producers

In addition, the Workforce Boards commissioned an Inventory of Producers—providers of training in the critical skills shortage occupations—to inform the solutions process. The inventory identifies providers and programs, and gives some detail about these programs such as cost, frequency of offerings, and capacity.

This producer inventory was developed using a variety of data sources and data collection methods. The first step in creating the inventory was to use a state of Illinois data base (IPEDS) to determine instructional programs related to the

occupations identified in the Critical Skill Shortages Report (CSSR). Since the inventory includes a list of programs broader than those whose "primary purpose is to provide postsecondary education," supplemental information was provided by the following sources:

- Illinois State Board of Education's Private Business and Vocational Schools Directory
- Illinois Community College Board
- Illinois Board of Higher Education
- Illinois Department of Employment Security's Workforce Information Center
- Illinois Department of Employment Security's Career Information Service
- Illinois Workforce Development System Eligible Provider Database
- Expert Review

The inventory identifies 57 producers in the Chicago region offering some 143 programs that address the 20 occupations originally identified during the Critical Skills Shortage analysis.

The Chicago area is fortunate to have a significant network of education and training providers supporting manufacturing. This inventory should be considered a "snapshot" of the producers at a particular point in time, since producers frequently make changes, adding and discontinuing programs with some regularity.

Focus Groups

Focus groups with employers, incumbent workers, high school students, job seekers, and community college students were convened throughout the region in order to learn:

- How employers and the current manufacturing workforce perceived their workforce needs (and introduce potential solutions to them), and
- How youth, students, and job seekers perceive manufacturing and are aware of career opportunities within it.

It was clear from this research that Chicago manufacturers mirror national trends; their businesses are constantly changing as a result of global pressures to compete on quality, cost, and time. In response, they adopt new technologies and develop processes that raise the skills and knowledge requirements of employees at all levels.

The constant media coverage of plant closings and declines in manufacturing has had a significant negative impact on the perception of youth, community college students, and job seekers. Participants were aware of local plant closings and workforce reductions, as well those reported in the national media. As a result, they perceived jobs in manufacturing sector to be unstable or of poor quality.

Secondary Research – Review of Industry Reports, Workforce Research

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

- Developing a list of potential solutions for stakeholder review (Appendix A). These included information about both regional and national effort.
- Researching existing regional and national efforts to learn about solutions that could be used across the region.
- Researching evaluation reports about major manufacturing-focused strategies being employed.

In several cases, interviews and meetings with industry experts identified potential solutions for further investigation.

Perhaps the most important outcome resulting from this phase of the CSSI project was pulling together key professional associations and networks, plus industry leaders, experts, and firms of all sizes from manufacturing sectors to address shared workforce issues.

While CSSI's enormous scope and short timeline made it difficult to engage new partners, project stakeholders are confident that the project has resulted in a solid foundation for ongoing collaboration on key workforce and economic issues in the region.

Description of Solutions

The Root Causes Report, submitted to the state of Illinois in July 2004, identified the root causes for the critical skills shortages in manufacturing for the Chicago region. These included:

- More demand for advanced skills;
- The aging of the manufacturing workforce;
- The poor image of manufacturing; and
- Specific information gaps.

It is clear from the research that these root causes are interrelated. As people retire from manufacturing, it is difficult to attract new people because of the industry's poor image. There is a continual need to provide training for incumbent workers to keep up with technological and process changes, but difficulty in finding information about training providers. Thus, as solutions are developed and implemented, it is likely that they will address more than one root cause.

It is also important to note that despite the differences among the 10 industry sub-sectors, the challenges were remarkably common across manufacturing. The differences in challenges between durable and non-durable manufacturing were virtually non-existent. Thus, the proposed solutions are not separated by sub-sector.

There is much that could be done to help the companies meet their needs more effectively and efficiently, while also insuring that existing and potential manufacturing talent can access information about jobs and careers with successful firms in the region.

Real solutions will not occur overnight, but evolve over time.

Proposed Solutions

Three proposed categories of solutions emerged from the solutions process; descriptions of each follow. Each set of solutions is intended to affect at least one of the root causes and multiple skills shortage occupations. A table summarizing each is found in the Action Plan in the next section. In addition, industry stakeholders recognized that addressing vast numbers of occupations might dilute the effectiveness of solutions, proposing instead a clustering of occupations into two groups:

- **Production occupations**—Clerks, Operators, Maintenance and Repair, Assembly, Machinists, etc. These occupations are closer to entry-level positions than to senior level positions. They require few skills or credentials, but have the potential for a career path, and are characterized by skills transferable across many manufacturing sectors and even multiple industries.

- **Production "plus" occupations**—Advanced Machinists, Welders, Supervisors, Engineers, etc. These occupations require advanced skills and specific credentials. They offer a career path, although it can be difficult to navigate, good pay and transferable skills (albeit specialized). These jobs are closer to senior-level positions than to entry-level positions.

Solution 1: Enhancing Regional Collaboration Across the Industry

The Chicago Region is fortunate to have numerous excellent manufacturing workforce programs and organizations. Many of these organizations operate in a specific part of the region, others focus on a specific occupation or sector. These programs and organizations offer the possibility of leveraging resources, the ability to learn from what's been done and expand it to other parts of the regions, and a means of accelerating the implementation of solutions.

CSSI stakeholders propose enhanced collaboration in the region through some formal *organizational structure*, but the *type of structure is less important than its existence.* One model is a regional umbrella organization—a consortium, alliance, collaborative, or partnership;[1] another comprises a network where different partners own responsibility for different program or service elements; another might be a series of inter-organization agreements that detail a course of action for frequent and common requests or needs.

A collaborative approach—regardless of the form it takes—would enhance cooperation and coordination among and across sectors and professional associations and their members. It would bring the key players in the region together to work on shared challenges. Many organizations likely to play important roles in the consortium have worked closely with the Workforce Boards during CSSI project planning activities. Membership and rules of engagement would be determined by the Workforce Boards in collaboration with key stakeholders.

The consortium might focus on both the solutions presented in this report as well as provide a vehicle for identifying and addressing new challenges over time. It could serve as an organizing source of information about and referral to manufacturing workforce programs and initiatives across the region, and as a clearinghouse, seeking to leverage and improve existing efforts and provide information about best practices, referral, and direct help as needed.

A specific area of focus in the short-term might be *strategic workforce planning*—within sectors, within firms, and within supply chains or groups of firms—to address the consequences of the aging manufacturing workforce and its far more

[1] This collaboration will be referred to as "consortium" throughout the remainder of this document for purposes of clarity.

diverse and much younger replacement. Firms participating in the CSSI project expressed a demand for help:

- **Finding ways to enable older workers to remain on the job.** Flex-time, job-sharing, and part-time work arrangements were all suggested as potential approaches;
- **Finding ways to extract, manage, and share the knowledge and expertise of skilled employees before they retire.** Mentoring programs, documentary initiatives, and formal succession planning at all levels were suggested as potential approaches;
- **Finding new and better ways to do existing work** (innovation); and
- **Finding effective and efficient ways to fill open jobs with qualified candidates,** including filling specific skill or language gaps that might prohibit otherwise qualified employees from advancing.

A collaborative approach to addressing these challenges can greatly reduce the costs of these services to individual firms, and improve dissemination of good practices throughout the region.

Solution 2: Promoting Training that Delivers Results

The most common need expressed by the region's manufacturing firms was providing new skills and knowledge to its workforce. As previously discussed, the demands of entry-level jobs are increasing and new technologies and processes are requiring on-going training for life. Three types of training in particular emerged as critical to the health and economic competitiveness of the Chicago region's manufacturing industry. These include:

1. **Training for job-seekers and career changers seeking to work in entry-level high demand occupations.** This training focuses on skills for specific high demand occupations, with the expectation that individuals seek careers in the industry.
2. **Training for incumbent workers whose jobs or job requirements are changing.** This training is tied to the adoption of new technologies, processes, and quality initiatives by firms in competitive sectors.
3. **"Bridge" programs to fill specific gaps that would enable job seekers to fill manufacturing jobs with career potential.** This training helps individuals overcome specific skills gaps, from math to language, and helps identify whether and how transferable skills are applied in the new workplace.

All training initiatives seek to address the critical skills shortage occupations (identified below) in the context of participating firms' business objectives.

Manufacturing Critical Skill Shortage Occupations
First-Line Supervisors/Managers of Production and Operating Workers
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Welders, Cutters, Solderers, and Braziers
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A wide array of vehicles might be used to deliver such training, including training grants awarded to firms, groups of firms, or associations; individual training accounts; procurement of customized training; or tuition reimbursement.

Firms receiving funds may be required to submit training plans identifying the proposed training, training provider, and timeline. Funds would be leveraged by asking firms to pay a portion of the costs, such as the salaries and wages of the employees during the training, as well as a portion of the program cost.

Solution 3: Develop and Implement an Image Campaign for the Region's Manufacturing Industry

The region would benefit from a campaign to improve the image of manufacturing. Such an effort would focus on the positive aspects of

manufacturing and build on current regional, corporate, and national efforts. It would use a strategic approach to reach key target audiences such as high schools, parents, immigrants, different parts of the region, and career changers.

Assistance could be offered to:

- Work with the manufacturing community to identify existing image efforts currently underway within the region.
- Develop a plan that builds upon current efforts to fill gaps and that targets particular audiences and portions of the region.
- Implement the plan throughout the region.

  A cohesive campaign might include outreach programs that redefine manufacturing. Modern manufacturing offers innovative, creative, technologically-advanced professions that attract diverse talent. Unfortunately, the word manufacturing itself conjures up negative images in the minds of the majority of the public.
- Develop a strong, creative series on modern manufacturing.
- Provide key messages on manufacturing's new image to use in speeches, interviews, and internal company communications.
- Ensure the public relations leads for all key stakeholders are engaged in the plan to change manufacturing's image and that they "buy in" to the program.
- Create curricula for K-12, community colleges, and universities that help change the image of manufacturing.

Action Plan

The Workforce Boards of Metropolitan Chicago are actively taking the steps required to implement the proposed solutions. This includes taking the steps to establish the on-going Manufacturing Workforce Collaborative and to implement the identified solutions through grants. A timeline for issuing requests for proposals to implement the proposed solutions is below.

Activities	Completion Date
Leadership and Regional Councils presented with final list of CSS occupations and solutions identified to date; Councils provide input on solutions.	September 23
RFP announced/issued	September 27
Solutions reports submitted to DCEO	September 30
Bidders conferences conducted.	October 5 and 6
Written questions & answers posted on Workforce Boards of Metropolitan Chicago website.	October 12
Proposals due.	November 1
Independent reviews completed/recommendations finalized	November 15
Workforce Boards formulate funding recommendations to be included in training grant application	November 17
Leadership Council Meeting – approval of recommendations/grant application	November 19
Training Grant Application submitted to DCEO	November 30

In addition, action plans for each of the additional solutions were developed. These action plans show the relationship to the root causes, objectives, activities, timeline, expected results, and leveraging of resources. The action plans identify the root cause(s) to which they apply:

Root Cause 1: More demand for advanced skills.

Root Cause 2: The aging of the manufacturing workforce.

Root Cause 3: The poor image of manufacturing.

Root Cause 4: Specific information gaps.

Solution 1: Enhancing Regional Collaboration Across the Industry				
	Objective: ▪ Provide an on-going umbrella structure for addressing and collaborating on efforts to provide Chicago manufacturing firms with a high quality workforce. ▪ Develop a process for conducting strategic workforce planning to address issues such as retention and recruitment, training requirements, succession planning. Linked to Root Causes: 1, 2, 3, 4			
	Activities, Partners	**Timeline**	**Expected Results**	**Leveraging of Other Resources**
A.	*What*: Formalize the Consortium to continue the efforts of the CSSI Manufacturing Council *Who:* Workforce Boards of Metro Chicago, with assistance from the key manufacturing organizations, firms, labor unions and others	To Be Determined	✓ Improved relationships among industry groups, labor organizations, education and training organizations and the workforce community ✓ Increased collaboration on efforts to address manufacturing workforce needs ✓ Improved information provided to manufacturing firms	Through the Consortium, share best practices and resources rather than re-inventing what exists. Leveraging of organizational resources to avoid duplication and improve communications.

Solution 2: Promote Training that Delivers Results				
	Objective: ▪ Increase training of the current workforce. Priority would be given for training in the identified occupations. ▪ Increase the number of job seekers and career changers to enter high demand occupations ▪ Increase the number of bridge programs focused on manufacturing Linked to Root Cause 1			
	Activities, Partners	**Timeline**	**Expected Results**	**Leveraging of Other Resources**
A.	*What*: Develop and release RFP *Who*: Workforce Boards of Metro Chicago	9/27	✓ Increase training of incumbent workers ✓ Improve the ability of firms to keep pace with technology and process changes ✓ Increase the skills of the people in the critical occupations	RFP will request the identification of leveraged and/or redirected funds to support training initiatives.
B.	*What*: Announce awards and develop contracts *Who:* Workforce Boards develops and monitors contracts, successful bidders develop work plans and collaborate with Boards in fulfillment of contractual obligations.	1/05	✓ Increase skills of people in critical occupations	

Solution 3: Develop and Implement an Image Campaign for the Region's Manufacturing Industry				
	Objective: Improve the public perception of manufacturing. Linked to Root Cause 3			
	Activities, Partners	**Timeline**	**Expected Results**	**Leveraging of Other Resources**
A.	*What*: Communicate intent to potential bidders, including organizations currently working on manufacturing image programs *Who:* Workforce Boards of Metro Chicago.		✓ Cultivation of bidders with creative ideas for RFP ✓ Develop intelligence to help shape RFP	Integrate and expand on current efforts.
B.	*What*: Develop and release RFP *Who*: Workforce Boards of Metro Chicago	9/27	✓ New public-private and cross industry partnerships ✓ Creative proposals with evidence of probable success ✓ Capitalize on current corporate and industry efforts	RFP will request the identification of leveraged and/or redirected funds to support training initiatives.
C.	*What*: Announce awards and develop contracts *Who:* Workforce Boards develops and monitors contracts, successful bidders develop work plans and collaborate with Boards in fulfillment of contractual obligations.	1/05	✓ Innovative and effective targeted campaigns ✓ Increased collaboration within the industry and among firms. ✓ Increased qualified applicants for available manufacturing jobs ✓ Evidence of leveraged resources	
D.	*What*: Assess impact; assess need for sustained effort *Who:* Workforce Boards work with industry to evaluate develop approach to sustainability (if needed)		N/A	N/A

Appendix A – Possible Solutions

Root Causes	Proposed Solution/Rationale	Evidence It Will Work
1. Increased Demand for Advanced Skills in manufacturing sectors, at all levels.		
Education Factors: Changes in technology are requiring continuous training and education for the current workforce . There are manufacturing related programs for all identified occupations in the Chicago region from entry level through advanced degrees. It is difficult and costly for community colleges to keep pace with the changes with manufacturing. There are enrollment limitations in some programs due to program/equipment costs. In some programs there is insufficient faculty understanding of the nature of advanced manufacturing, skilled trades and how to use/teach current technology. ***Supply-Side Factors:*** Training lags behind technological advancement in the industry. ***Demand-Side Factors:*** Increasing technologies. ***Regulation/Policy Factors:*** Need for state support for incumbent worker training. Decreasing federal support for the Manufacturing Extension Partnership.	Develop a local/regional training partnership and attract funding to meet the shared workforce development and training needs of advanced manufacturing in the area. Explore the application of industry-based skill standards, assessments and certifications, such as those developed by the Manufacturing Skill Standards Council (MSSC) for integration into career and technical education programs at high schools and community colleges and into skills-training programs under WIA. Update standards regularly to ensure they remain current, reflect employer needs, and are responsive to workplace requirements. Encourage expansion of the federal government's commitment to career and technical education (not just academic education). Encourage public education and training entities should be more aggressive in integrating life-long learning and advanced learning technologies into normal teaching practices, teacher training curriculum and staff development training. Arrange a long-term partnership between manufacturing organizations and	The Wisconsin Regional Training Partnership is an association of employers and unions that sponsors a variety of programs to expand employment and upgrade the skills of the current workforce. The WRTP brings together the necessary stakeholders and attracts funding for training and related services. Educational institutions are revamping the design and delivery of their instruction, working closely with business to incorporate competency-based skill standards to upgrade and standardize their programs. In Illinois, a few educational institutions have aligned their training programs with the National Institute of Metalworking Standards (NIMS): Danville Area Community College, College of Lake County, Job Corps, and area high schools and technical institutes. (www.nims-skills.org/home/index.htm). The Chicago Manufacturing Center has a proven track record. The Oklahoma Alliance for Manufacturing Excellence received WIB funding to provide Lean Manufacturing classes to

Root Causes	Proposed Solution/Rationale	Evidence It Will Work
	administrators and faculty from area schools (K-12, community colleges, universities) to allow businesses to communicate education and training needs and enable educators to meet these needs. Apply for funding from the local WIB or obtain other relevant grant money to develop/provide necessary incumbent worker training.	selected manufacturers in Oklahoma. All company participants reported significant impact on retained sales, sales increases, cost savings, and/or investment savings as well as improved working conditions and increased employee involvement. The Workforce Partnership of Greater Rhode Island received USDOL-ETA funding to implement a Workplace Learning Project designed to promote worker retention, improve basic skills and upgrade occupational skills. The model also developed leadership and team building skills for management.

Root Causes	Proposed Solution/Rationale	Evidence It Will Work
2. An aging manufacturing workforce.		
Education Factors: See above. ***Supply-Side Factors:*** There are educational programs available for the demand occupations, but they do not have high enrollments. See Root Cause #3. ***Demand-Side Factors:*** The state of Illinois predicts that Illinois manufacturers will need over 15,000 new employees annually; about 75% of them will be replacing workers who retire, fall ill, or seek other employment. Manufacturing firms participating in the CSSI project expressed concern about their aging employees, but they were more likely to describe the problem of bifurcation; they had older workers as well as younger ones, but few in between. Many reported employing large numbers of younger workers (18–30), few people in their 30s or 40s, while their master craftspeople, plant managers, operations officers or senior executives were all nearing retirement. Physical demands.	Workforce planning to prepare for retirements in key positions. Retention programs for workers nearing retirement. Increase participation by immigrants	Experience of high performing firms. Instituto del Progresso provides educational and vocational programs for the Latino community.

Root Causes	Proposed Solution/Rationale	Evidence It Will Work
3. The manufacturing industry's poor image		
Education Factors: Lack of enrollment due to low student awareness. ***Supply-Side Factors:*** Few parents, teachers, or students are interested in manufacturing or see it as a viable career path, and more feel that the direct route to college or university is, increasingly, a necessity. As a result, fewer students are exposed to manufacturing jobs, careers, or even firms, tools, and technologies. And fewer seek jobs or careers in the industry. Lack of respect for manufacturing. ♦ Perception of manufacturing as low tech. ♦ Lack of respect for professions. ♦ Perception of industry as unstable and vulnerable to overseas competition. ***Demand-Side Factors:*** Industry seen as unstable due to history of lay-offs. Lack of career paths. Non-competitive pay. Non-competitive benefits. Work hours/shift work. Lack of on-the-job support for non-traditional workers. Workplace issues affecting retention, such as poor communication, teamwork, etc.	Launch a major regional marketing campaign emphasizing the new world of manufacturing focusing on new technologies and occupational opportunities; foster the cooperation of business, government, labor and education in improving public perceptions of manufacturing and advanced manufacturing careers. Explore use of the National Association of Manufacturers outreach program for schools and the community to increase interest in manufacturing careers. Employers should: ♦ Build effective internal career paths. ♦ Make commitments to life-long learning models. ♦ Empower their workforce to continuously improve and manage their work. ♦ Make investments in training. ♦ Share productivity gains with workers. ♦ Lobby for federal tax incentives for human capital investment	State of Minnesota's "Make it Happen" Campaign. (www.tip.mnscu.edu/manufacturing_facts.htm) Educational institutions, trade associations, and government entities have created web portals that offer easy-to-access information on manufacturing careers. State and regional web sites often list area educational providers and provide job placement assistance. ♦ Precision Metalworking Association Foundation (www.pmaef.org/student/training.htm). ♦ Illinois Career Resource Network (Illinois Dept. of Employment Security) has a web site that targets youth in middle and high schools (www.ilworkinfo.com/ icrn.htm). ♦ GetTech and GetSmarter web sites are sponsored by the Department of Labor, Center for Workforce Success (NAM) and Dept. of Commerce. GetTech (www.gettech.org) helps students, teachers and parents plan for careers in technology, engineering, manufacturing and the sciences. GetSmarter (www.getsmarter.org) lets students test math and science skills against students around the world. ♦ Sloan Career Cornerstone Center is a resource center for those pursuing careers in engineering, mathematics, information technology, and the physical sciences. Its comprehensive

Root Causes	Proposed Solution/Rationale	Evidence It Will Work
		education, networking, job hunting, and career planning resources revolve around personal interviews with over 400 individuals who offer candid insight into their career paths (www.careercornerstone.org). A number of manufacturers received grants from the NAM under the Manufacturing Industries Careers Alliance which is designed to help companies make a difference in local K-12 schools. Two examples of companies building internal career paths include S&C Electric (Chicago) and Camcraft (Hanover Park). While their internal employee development systems vary in practice, both are made up of essential components: a mix of onsite customized training and off-site certificate and degree programs; clear performance standards, employee reviews and career path opportunities; and mentoring and incentives programs. Most importantly, their Human Resource staff are savvy in building productive external partnerships with educational vendors, accessing outside training resources, and maintaining their leadership's support for employee development. The Bridge to Advanced Technological Education is an outgrowth of a program in Chicago called the Chicago Manufacturing Technology Bridge. The Chicago program was launched in 1997. Their stated goals are to: ♦ Prepare residents of disadvantaged

Root Causes	Proposed Solution/Rationale	Evidence It Will Work
		Chicago communities for career-path employment in manufacturing ♦ Provide foundation for career-long learning on-the-job and in formal technical education and training ♦ Help alleviate the skilled worker shortage facing Chicago-area manufacturers The end product is a qualified entry-level skilled operator.

Root Causes	Proposed Solution/Rationale	Evidence It Will Work
4. Specific Information Gaps that prevent skill needs from being met and prevent new talent from building manufacturing careers.		
A majority of firms reported feeling uncertain about the kinds of skills they should be investing in to prepare current workers for the future. These firms are having trouble making decisions about how to develop their employees—particularly high performers whose jobs were vulnerable. Firms that were concerned about specific technical skill sets were often uncertain about how or whether to train them. While they needed these skills today, they couldn't be certain that they would need them in the future, or that an investment in training today would pay off for their firms or their employees. These firms are having trouble making decisions about specific training investments, both short and long term. Many larger firms reported having downsized their outreach and community relations departments, compromising their relationships with schools, colleges and universities, training programs, and community organizations which they used to both recruit and combat the "image	Regional skill alliances that bring together groups of firms within a sector to work on areas of common need and concern.	There are examples of this approach across the country. Examples of the efforts include: The Jane Addams Resource Corporation (JARC) promotes strong communities, businesses and households to ensure that people who work do not live in poverty. JARC provides high quality skills training and support services to help lower-income and unemployed workers achieve self-sufficiency. JARC provides economic and workforce development services to businesses to improve their competitiveness. The Working for America is coordinating a union-sponsored work with employers and community stakeholders to retain and expand the number of good manufacturing jobs in the tri-state (Pennsylvania, Ohio and West Virginia) upper Ohio River Valley. The intent of this project is to build a sustainable joint union and management high wage manufacturing consortium that will diagnose the needs of the industry in the region and work together to get those needs met.

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

Root Causes	Proposed Solution/Rationale	Evidence It Will Work
problem." Many of these firms are no longer connected to school- or college-based programs and do not know, except in general terms, whether schools are teaching the skills in demand in their industry. Many smaller firms reported having trouble recruiting or difficulty with specific skill shortages, but also have fundamental business issues from which those shortages arise. They lacked information about firms in their areas that might be engaged in similar quality processes or initiatives (even if in other sectors) with whom coordination would be mutually beneficial,[2] and few maintained regular contact with trade associations, schools, or training institutions. Smaller firms reported a greater need for assistance in interfacing with intermediaries, public and private, workforce, business, and education. They lacked information about what kind of assistance was available and from whom, and they lacked knowledge of (or patience with) grant application processes or reporting requirements. Most firms reported difficulty screening for the skills they knew they would need most in the new economy—creativity, problem-solving, and workplace-basics. Nearly all firms reported difficulty in advancing diverse workers		

Appendix B- CSSI- Regional Solutions Survey

Name:		Title	
Org/Comp.		Phone:	( )
E-Mail		Fax:	( )
Contact Notes			
Confirmation Sent			
Interview Date: Time: Interviewer:			

Background Information

Thank you for agreeing to participate in this interview for the Critical Skills Shortages Initiative in Manufacturing. This initiative is being headed by the Workforce Boards of Metropolitan Chicago.

Regional manufacturing and workforce leaders have been meeting over the past several months to identify the root causes of the critical skills shortages in manufacturing they identified and documented. These causes are:

- An increased demand for advanced skills in manufacturing sectors, at all levels;
- An aging manufacturing workforce;
- The manufacturing industry's poor image; and
- Specific information gaps that prevent skill needs from being met and prevent new talent from building manufacturing careers.

The purpose of the interview is to get your input on potential solutions to these challenges that can be employed within the Chicago region. We will be asking you for examples of existing approaches, initiatives, or programs that address these four challenges. We will also be seeking your own ideas and suggestions for innovative approaches to these issues

During the Critical Skills Shortages Initiative efforts focused on manufacturing, four root-causes were identified as leading to the workforce shortages. They are:

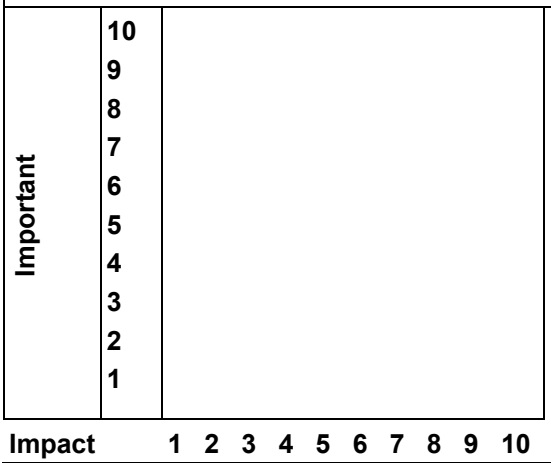
- Increased demand for advanced skills in manufacturing sectors, at all levels;

- An aging manufacturing workforce;
- The manufacturing industry's poor image; and
- Specific information gaps that prevent skill needs from being met and prevent new talent from building manufacturing careers.

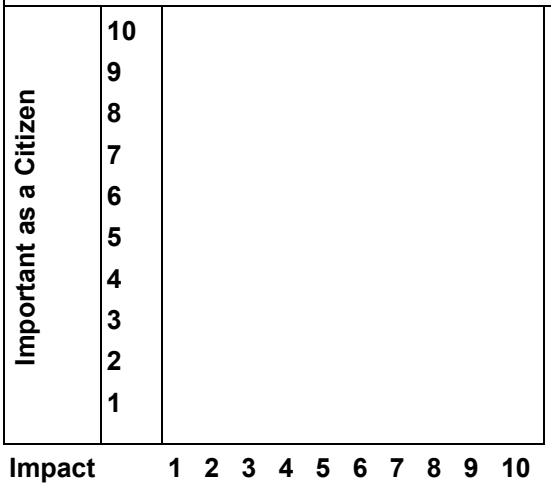
STEP 1: Importance of Root Cause vs. Ability to Impact

For each of the Root Causes: What is your opinion of the importance of this issue, and the ability to impact the issue. "10" represents the highest impact and the highest feasibility.

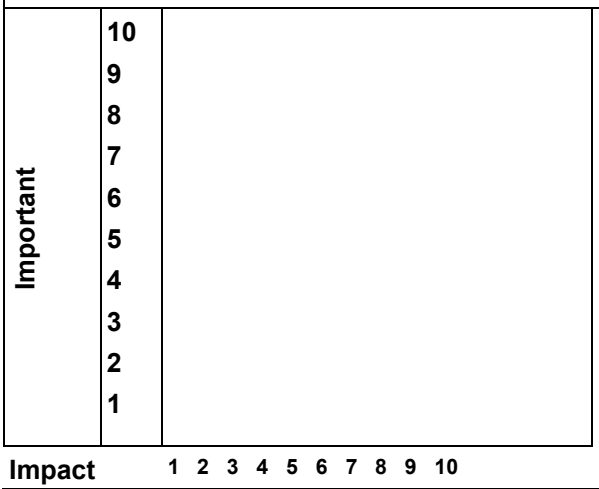
Root Cause #1: Increased demand for advanced skills in manufacturing sectors, at all levels



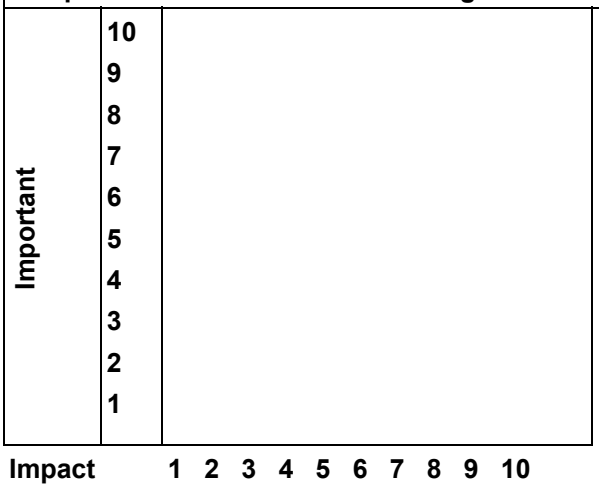
Root Cause #2: An aging manufacturing workforce



Root Cause #3: **The manufacturing industry's poor image**



Root Cause #4: **Specific information gaps that prevent skill needs from being met and prevent new talent from building manufacturing careers**



STEP 2: What is the Desired State for these Root Causes?

Increased demand for advanced skills in manufacturing sectors, at all levels.
An aging manufacturing workforce.
The manufacturing industry's poor image.
Specific information gaps that prevent skill needs from being met and prevent new talent from building manufacturing careers.

STEP 3: The "Do Nothing" Scenario

If no action is taken, what is the impact?

Increased demand for advanced skills in manufacturing sectors, at all levels.
An aging manufacturing workforce.
The manufacturing industry's poor image.
Specific information gaps that prevent skill needs from being met and prevent new talent from building manufacturing careers.

STEP 4: Regional Solutions to Address Root Causes

Strategy	Resources (that you have or need)

STEP 5: Determine Regional Solution to Take and How to Measure the Effect of Those Solutions.

Actions	Measurements

Please send additional information and thoughts that you have for Regional Solutions to Martha Reesman at mreesman@skilledwork.org.