Strategic Plan for Addressing Skill Shortages in the Construction Trades

National Joint Labor-Management Committee
on Skill Shortages in the
Construction Industry

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INTRODUCTION

PURPOSE AND ORGANIZATION

This project is intended to develop ideas, information, and encouragement to enable the organized sector of the construction industry to address the critical issue of skill shortages in our industry. The intent of this document is to design an array of strategies that will stimulate and inform joint labor-management efforts to correct shortages and to address underlying issues that have caused the problem.

The strategies were generated in discussion by the National Joint Labor-Management Committee on Skill Shortages in Construction, with input and guidance form the Construction Industry Partnership of the Building Trades. Initially, both groups generated dozens of ideas. Finally, the Committee developed each of the ideas in discussion, considering both the potential for the idea and the actions necessary to allow the strategy to be undertaken.

The Strategic Plan is divided into three (3) sections. First, its goals and objectives are expressed. Next, the facts and issues that have caused and/or contributed to the shortage are briefly described along with a series of strategies that might be used to address each issue. Then, some of the resources of unions, signatory-contractors, and jointly-trusted training funds are noted.

The strategies have been placed with the issue that they most directly address. However, most strategies will help deal with more than one issue. For example, Clarifying Career Paths will more efficiently use an under-used resource; however, equally important, it also will help improve retention in the industry. Exhibit 1: Strategy Alignment, illustrates both the primary association of the strategies with issues for both primary and secondary associations.

MISSION OF STRATEGIC PLAN

The mission of the Strategic Plan is to encourage and enable joint-labor management construction partners to increase the pools of skilled workers and the skills of union craft workers so as to improve the lives of union members, the competitive position of signatory contractors, the long-term sustainability of union organizations and the vigor of the unionized segment of the construction industry.

OBJECTIVES

- Describe the issues and facts associated with skill shortages in clear, understandable, and directly relevant terms to labor, management, and joint-labor management construction groups.

- Create a range with sufficient variety and information that each Affiliate can find at least (1) strategy to implement.

ASSOCIATED BENEFITS

In addition to meeting the proposed objectives, full implementation of this Strategic Plan by CIP members should produce the following important benefits:

1) Help restore a positive public image of the union construction industry
2) Replenish the core of skilled craft workers in construction unions.
3) Improve the retention of the core of skilled craft workers in each union.
4) Identify resources to expand the market share of the organized sector.
5) Improve recruitment of workers into the organized sector of the construction industry.
6) Demonstrate results in beginning to address skill in shortages in the skilled crafts.

Exhibit 1: Strategy Alignment

Primary Association	Secondary Association
Eroding Wages in Construction	**Eroding Wages in Construction**
1 Apprentice Pay Adjustment	1
2 Profit Sharing	2
3 Pay for Skills and Training	3
Poor Public Image of the Construction Industry	**Poor Public Image of the Construction Industry**
4 National Marketing Campaign	4 13 26
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8 Expand Specific Internal Education to Union Members	8 18
9 National Recognition Day	9 19
Changing Demographics	**Changing Demographics**
10 Community-based Organizations (CBO's)	10 13
11 Specialized Programs such as Women in Construction and Job Corps	11 14
12 Set Aside Executive Orders	12
Lack of Targeted Recruitment Strategies	**Lack of Targeted Recruitment Strategies**
13 School-to-Work Projects	10 12 14
14 Develop Targeted Recruitment Campaigns	11 13
Changing Preference of Target Groups	**Changing Preferences and Skills of Target Groups**
15 Establish Distance Learning	15 18 25
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Under-Use of Available Resources	**Under-Use of Available Resources**
18 Move Toward a more Competency-based Apprenticeship Program	18 25
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21 Create Skills and Work Lists	21 12
22 Career Paths	22 19
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THE SITUATION AND THE PROMISE: EVIDENCE, ISSUES AND STRATEGIES

DATA ON SKILL SHORTAGES

The construction is of major importance to the economy of the United States. It is one of the country's largest industries with over 6 million workers and almost 600,000 construction contractors. Equally important, according to published economic research, in 1997 new construction accounted for approximately 7% of the Gross Domestic Product (GDP). If one adds rehabilitation, repair, and construction materials fabrication to this total productivity for the United States. The importance of the industry is reinforced upon realizing that over 10 million people are employed in the U.S. construction industry when design, new construction, renovation, equipment and materials manufacturing, and materials supply are all included in the totals. In the is accounting process, the construction industry becomes the largest manufacturing industry in the United States.

The numbers of individuals, contractors, and value to the GDP is only a partial measure of importance. Actual construction spending in the United States averages close to 650 billion dollars per year. Moreover, of that 650 billion dollars, approximately 70% are spent on nonresidential and public construction. Moreover, the industry has experienced eight successive years of growth and is projected to continue that growth, although at a more moderate pace, for the immediate future.

Given the size and importance of the construction industry to the economy, it is no wonder that there is concern when a series of studies consistently project a growing problem in the industry – the problem of growing shortages of skilled labor. The findings consistently suggest that the shortage will continue throughout the first decade of the 21st century. Moreover, the range of the shortages indicates that the shortfall, unless significant effort is expended to reverse current trends, will measure from 3% to 5% of the total workforce within the industry, and that, by any measure, is a potentially significant problem.

Selected findings from several studies and articles help establish the consistency of concern regarding the skills shortages.

- A 1996 study by the Business Roundtable found that over 60% of responding contractors had encountered a shortage of skilled workers. Moreover, 75% of the respondents indicated that the shortage was a trend that had increased during the previous five years. The crafts that were experiencing the greatest shortages included electricians, pipefitters, and welders. Regionally skills shortages were experienced as strongest in the Southwest and the Southeast. Moreover, the Business Roundtable projected that the shortages were

severe enough that under present economic conditions, 200,000 to 250,000 new craft workers would be needed each year for the next decade.

- The Construction Labor Research Council (CLRC), in an unpublished recent paper, indicated that the crafts were experiencing a shortage of labor throughout the United States and particularly in the Northeast, West, South and Southwest. Their data indicated that the skilled crafts were attracting too few new apprentices to replace the craftsmen who were exiting to retirement or to other work. Moreover, in a second paper entitled "Craft Labor Supply Outlook 2000-2010", the CLRC estimates that, under any economic circumstance, in excess of 100,000 new workers will be needed each year for the next decade. Three out of four of these new entrants will be required to replace current workers who are leaving the industry.

- The Bureau of Labor Statistics' *Construction Employment Outlook* suggests that at least 185,000 to 196,000 new construction workers per year will be needed between 1996 and 2006. Moreover, the findings support the suggestion by the CLRC that 3 out of 4 new entrants –almost 150,000 per year – will be required to replace current workers who are leaving the industry. Moreover, data suggest that between 70% and 80% of total vacancies will be for skilled craft workers.

- The annual Dun and Bradstreet *Construction Survey* in October 1999, revealed that 23 percent of the 200 surveyed construction executives said they were unable to hire enough skilled workers. More than half of respondents reported that they had been hampered by various limits to production, including lack of both numbers of skilled workers and the skill levels of craft workers.

- The recent FMI *1999 U.S. Construction Industry Survey Report* revealed additional data on shortages. Their findings, gathered from a cross section of contractors; union-signatory contractors (37%), open-shop contractors (38%), and "double-breasted" contractors (28%), suggested that a "lack of qualified personnel" was their greatest concern. The lack of skilled craft workers was especially problematic for contractors doing less than $100 million of work annually.

- Recent newspaper and magazine accounts (*New York Times, Crain's Detroit Business, Baltimore Sun, Engineering News Record*) report that shortages among skilled construction workers in their regions are serious-to severe. The shortages have caused many production delays and are forcing contractors and project owners to adjust work schedules to fit labor realities. Additionally, in at least some situations, projects have been redesigned to accommodate skill shortages in specific trades.

- A survey of members of the National Joint Labor Management Committee on Skills Shortages as well as the Construction Industry Partnership (CIP) indicates a unanimous concern that there is a shortage of skilled labor within the construction industry. Moreover, that concern is especially prevalent in the West, South and Southwest parts of the United States and seems to be true for virtually every craft. Both labor and management members reported situations where contractors have decided not to or been unable

to bid work because they recognize that skilled labor is not available to do the work should the bid be successful. In other circumstances, members cited instances where contractors have decided not to accept contractor offers because they have been unable to "man" the job. Still other contractors reported being unwilling to expand their corporations within an available market because they are experiencing shortages of skilled labor, even though they recognize this as an excellent opportunity to expand and regain "market share" for their companies.

Taken together, these studies and articles suggest that the construction industry is experiencing, and will continue to experience, a serious skills shortage over the next decade. The magnitude of the shortage ranges anywhere from 3% to 5% of the installation, repair, and maintenance construction workforce for any given year, and cumulatively over the decade could exceed over 20% of the workforce of the entire industry. Moreover, the shortage has two related but distinct dimensions: (a) there is a shortage of skilled workers in most trades and in many places in the United States; and (b) there is a shortage of specific skills within a portion of the available workforce and among pools of applicants for the workforce.

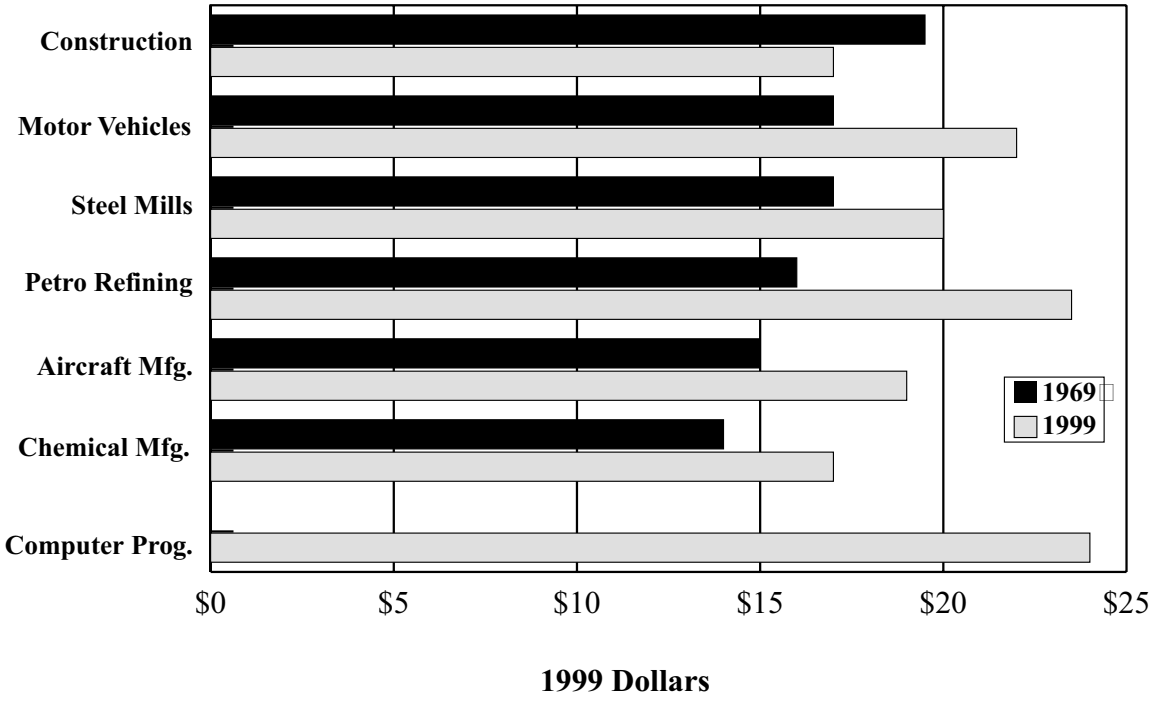
The data consistently indicate that a skills shortage exits for labor, and especially skilled labor, within the construction industry, however, the data are much less clear about the reasons for the shortage. Information from a variety of sources indicate that at least eight factors contribute to the growing skills shortage; eroding wages; poor public image of the construction industry; demographic shifts; lack of targeted recruitment strategies; under-use of existing resources; retention problems; changing preferences of the target groups; and internal barriers. A discussion of each issue follows.

Issue: ERODING WAGES IN CONSTRUCTION

The Situation:

Overall, real wages in the United States for working people have fallen in the last 20 years. However, the effects have been different in various industries as illustrated in Exhibit 2: Average Hourly Earnings for 1969 to 1999.

Exhibit 2: Average Hourly Earnings 1969–1999



Data from this and other corroborating studies illustrate the following points:

1. Construction wages have eroded in absolute terms over the 20-30 years.
2. Wages in manufacturing other than construction activity have advanced while construction wages have decreased, thus erasing the relative wage advantage construction had long enjoyed and used for recruitment and retention.
3. Starting construction wages now rank below the starting wage of some other industries.

Strategies

APPRENTICE PAY ADJUSTMENT

Strategy: Adjust apprentice pay rates upward during all phases of apprenticeship program.

Description: Apprentice wages usually are established as a percentage of journeyworkers' wages. One possible strategy is to increase the percentage of the journey worker wage so that, for example, a beginning apprentice might earn 65 percent of the journeyworker's wage, as opposed to 50 percent. Likewise, the pay range for apprentices throughout the term of apprenticeship could be adjusted upward to narrow the gap between the apprentice pay and that of the journeyworker and thus improve construction's competitive position verses the pay in other industries.

General Approach: Among the activities necessary to undertake this strategy are the following:

1. Examine apprentice pay ranges across all skilled crafts and situations.
2. Adjust pay rates upward and correct language within contracts to accommodate the wage increase.
3. Incorporate the new pay scale into the apprenticeship agreements as registered with the Department of Labor and the state bureaus of apprenticeship and training.
4. Market opportunities for earning and learning to potential workers.

Potential Outcome: The immediate potential outcome of this strategy is to increase the pay overall image of the industry and enhance the recruiting potential of the industry and enhance the recruiting potential of the industry in attracting entry-level job seekers into apprenticeship system. Overall it will make apprentices feel more valued; improve their retention in the training system and the organized sector of the industry; and allow them to become fully integrated into the system.

PROFIT SHARING

Strategy: Improve wages through profit-sharing programs.

Description: Profit-sharing type programs distribute additional resources to those individuals who work/share in the programs. The idea to develop a program that allows skilled crafts workers to benefit from having worked on a project that has been completed ahead of time, comes in under cost, or exceeds suggested value (safety, productivity, attendance).

General Approach: At least the following activities would be part of some profit-share type program:

1. Identify incentives that could be used in the program.
2. Develop a set of program rules that enables projects to accurately measure outcomes/contributions made by individuals/teams.
3. Set aside and track monies to enable the profit to be paid.
4. Keep accurate records.
5. Distribute revenue among those who worked on the job.

Potential Outcome: The potential outcome of profit share type program would be to improve the image of the industry and to generate additional revenue for those skilled craft workers who participated in the profit share program at any given construction site. The strategy will help create “ownership” in a project rather than just another job. Workers will feel more valued and employers will enhance their ability to retain a stable work force through the project.

PAY FOR SKILLS AND TRAINING

Strategy: Improve wages by initiating pay-for-skill programs/compensation.

Description: This program would generate pay increases for members who complete or return to training in any kind of setting. In other words, wages serve as an incentive for acquiring the training, while the acquisition of the skills should cause an increase in some measure of productivity.

General Approach: The general set of activities required to implement this strategy includes the following:

1. Determine the type additional or new skills needed by individual segments of the skilled craft labor force.
2. Initiate a record keeping system to track the skills of individual members who successfully complete training and go back to work.
3. Determine monies that can be set aside for purposes of creating a pay-for-skill program.
4. Create the training support the initiative
5. Create the delivery system to allow the training to be taken and the skills to be mastered as demonstrated through performance testing.
6. Pay people for their skill acquisition.

Potential Outcome: The potential outcome of this strategy is to provide an increase in earnings opportunity for members who complete additional or specialized training; to improve the overall image of the industry; and to increase the value for continuing education. It also should result in creating a long-term incentive to owners to require training into their bid specifications.

Issue: POOR PUBLIC IMAGE OF THE CONSTRUCTION INDUSTRY

The Situation:

As an industry, construction suffers a poor public image. A number of factors seem to contribute to the situation. The following data, as reported from published sources and from project interviews, help to paint the picture of the unfavorable image of the construction industry and the craft worker in the industry. The 1996 *The Wall Street Journal Job Almanac* surveyed young people to determine careers they were interested in pursuing. Data from that study revealed that construction work ranked 248 out of 250 career choices. The findings indicated that the unfavorable image of construction as an industry was based on several factors including the perceived lack of a career path, poor working conditions, physically-demanding work in hot and dirty situations, poor pay, and overall poor public image of the industry. Other image difficulties include the following elements.

- A 1999 study in the Northwest entitled, "Study of Construction's Image" interviewed several hundred high school students about career choices and construction crafts in particular. Eighty-four percent of interviewed students indicated that they would not con-

sider a career in construction largely because of the unfavorable image of the industry. When asked to describe the construction worker in an open-ended question, answers such as “sleeze;” “butt crack;” “dirty;” “grunt.” “fat,” “lazy;” “unshaven;” “cigarette smoker.” “beer belly;” “overweight;” “scruffy” were the typical response. In addition, a number of participants commented about the hard physical labor involved in construction and indicated that they had little interest in pursuing that kind of work. Moreover, one other consistent comment emerged related to student perception about construction; how workers treated women. Specifically, students suggested that tradesmen “hoop and holler at women and harass women.”

- A review of articles in major newspapers over the last year from around the United States reveals relatively few positive articles about the construction trades. Instead, the typical article dealt with cost overruns, delayed or late projects (each a consequence of skill shortages), traffic tie-ups, skill shortages, corruption issues, or structural collapses and ensuing injury.

- Young people receive relatively little encouragement to consider skilled craft careers in school. School guidance personnel and teachers encourage students to pursue college and careers that require college degrees as opposed to careers in the skilled crafts. One recent study found that guidance counselors expressed “limited personal awareness and low incentive to promote skilled construction trades” and, therefore, did not do so.

- Conversations with guidance personnel reinforced these findings. Counselors indicated that their typical experiences with the construction industry have been limited, relatively unpleasant, and consisted of three primary situations: (1) as women, many have been harassed when passing construction sites during some point of their lives; (2) many have experienced unpleasant encounters with home builders and remodelers about personal residences; and (3) many had witnessed workers they believed to have been construction personnel, standing around or leaning on shovels. When asked if they referred students to construction as a career, one counselor summed up the general consensus by expressing, “ I recommend construction only to kids who can’t, period.”

- No longer to athletic coaches of high school and college sports teams demand that student-athletes purse construction activities during off-season and summer vacation. Even the parents of skilled craft workers rarely recommend the skilled crafts as an occupational endeavor for their children. In fact, 70% of workers reported that they did not recommend the skilled crafts; the vast majority instead recommended that their children pursue a college education and opportunities that emerge from that endeavor.

Strategies:

NATIONAL MARKETING CAMPAIGN

Strategy: Conduct a national teleconference.

Description: The national teleconference is a single broadcast or multiple broadcasts to specific target audiences about the construction industry. The targeted broadcasts occur at specifically-announced times, and provide an opportunity for interaction among the participants and include follow up materials (CD, videos, posters, etc.).

General Approach: Among the activities necessary to undertake a teleconference are at least the following:

1. Identify funds to pay for the activity.
2. Identify resources useful in the teleconference, including conference facilities and locations.
3. Develop program and accompanying materials.
4. Promote the activity among the target audience.
5. Hold the activity and provide follow up information.

Potential Outcome: Among the potential outcomes in the teleconferences strategy are an improved image for the industry, both through the use of technology and because it is beamed to a specific target audience. Additionally, the strategy should generate additional interest in recruitment for the industry because it engages participants in a dialogue that can be used to explain the opportunities and realities of the industry; dispels myths; and promotes the positives.

PUBLIC TV/CABLE TV

Strategy: Develop Television Programming.

Description: The construction industry is under-represented in terms of favorable media coverage in print and on the television. Rarely are situation comedies or documentaries focused on the industry or on positive aspects of the industry. However, there is an opportunity to generate favorable publicity in this venue.

General Approach: Among the activities necessary for this approach are at least the following:

1. Identify items of interest and "good stories" within the construction industry around which to create programs.
2. Generate the idea and write the script for the program.
3. Identify sponsoring organizations as well as media channels that will air the program.
4. Publicize the program especially among the membership and those associated with the industry.
5. Launch the program on a regular basis.

Potential Outcome: Among the outcomes that this type of strategy should generate should be both more information and more accurate information about the industry, as well as improved interest in recruiting new workers into the industry. We can tell the stories of our industry that are really unknown to the general public and dispel the "fear of the unknown."

PUBLIC WORKS PROJECTS

Strategy: Organize and/or participate in community projects.

Description: Public works projects provide an ideal opportunity for construction contractors and union members/officials to improve their image by working with the general public in developing projects within the community that everyone values. Not only does it generate favorable publicity, but also it allows people to work together, thereby dispelling some of the fear of the industry that is held within the general population.

General Approach: Among the activities necessary to enable to this strategy to succeed are at the least the following:

1. Identify available public works projects, playgrounds, "Christmas in April", housing projects, and so forth.
2. Work with officials to secure permission, permits, and other kinds of issues associated with undertaking the project.
3. Work with all trades to ensure that the work is done in the most professional manner.
4. Generate publicity from the activity, especially among those in the industry.
5. Perform the activity.
6. Work with members of the community as you perform the activity.

Potential Outcome: This strategy has the potential to greatly improve the public image of construction industry. In the places in the United States where public works projects have been undertaken, the publicity far exceeded what could have been purchased as advertising if available through other means.

COUNSELOR EDUCATION

Strategy: Initiate counselor education programs.

Description: Counselor education programs are aimed at correcting the relatively sketchy or inaccurate knowledge of the industry held particularly by high school and vocational counselors at the secondary and middle school levels. Counselor education programs give broad focus to the construction industry an provide specific information that the counselor can use in their day-to-day work with students and parents of students.

General Approach: Among the activities necessary for this approach are at least following:

1. Secure funding.
2. Generate a schedule for the project.
3. Generate the content materials (course content; reference materials; materials for students), as well as secure instructors to provide the sessions.
4. Locate and contract with some facility in which to hold the counselor education program.
5. Promote and recruit the idea among potential candidates for attendance.
6. Hold the counselor education program.
7. Conduct follow-up to adjust program and encourage use of information.

Potential Outcome: The program should allow unions and union contractors to explain and demonstrate the value of unions construction. It will educate counselors who are unaware or unfamiliar with the opportunities within the industry. Additionally, it should generate favorable publicity for the industry and image in the process of doing so. Further, the number of able students who are referred into the industry should increase as a result of the counselor education program.

EXPAND SPECIFIC INTERNAL EDUCATION TO UNION MEMBERS

Strategy: Expand specific internal education to members.

Description: Many members do not recommend construction to their children as a matter of course. It may be time to survey members to find out what they like about the industry and to encourage them to pass along that information to other members of their family who might potentially work within this industry.

General Approach: Among the activities necessary to undertake this approach are at least the following:

1. Interview and survey workers to determine their perceptions of the industry, their needs, and what they appreciate about the industry.
2. Reinforce and enhance the positive aspect; note and work to change negative.
3. Work to change both the impression and the items that are unappreciated by workers.
4. Mount an intentional strategy to encourage workers to refer acquaintances and relatives into the industry as new entry-level workers.
5. Provide ongoing recognition for those members who actually perform this service.

Potential Outcome: The potential outcome of this strategy is to improve recruitment by promoting the positive aspects of the industry. Additionally, this strategy has the potential to improve recruitment by bringing into the industry individuals who already have

knowledge of the industry and/or an ongoing link to a person who is successful within the industry. As a result, retention rates also should improve.

NATIONAL RECOGNITION DAY

Strategy: Design and Implement National Campaign/Recognition Day

Description: Any of several "national" days could bring favorable notoriety and publicity to the construction industry and to the organized sector. It should be a work event and a media activity.

General Approach:

1. Consider possible topics/events (such as safety-SMART MARK) around which to build national days.
2. Designate coordinator and decide on roles/responsibilities budgets of all.
3. Develop program, create publicity, and organize volunteers.
4. Coordinate with local building trade councils.
5. Execute the program.

Potential Outcome: The strategy should help to improve the poor image of construction by generating favorable publicity. It will attract attention to an issue of concern to all workers and the positive effort that is being made working in the industry.

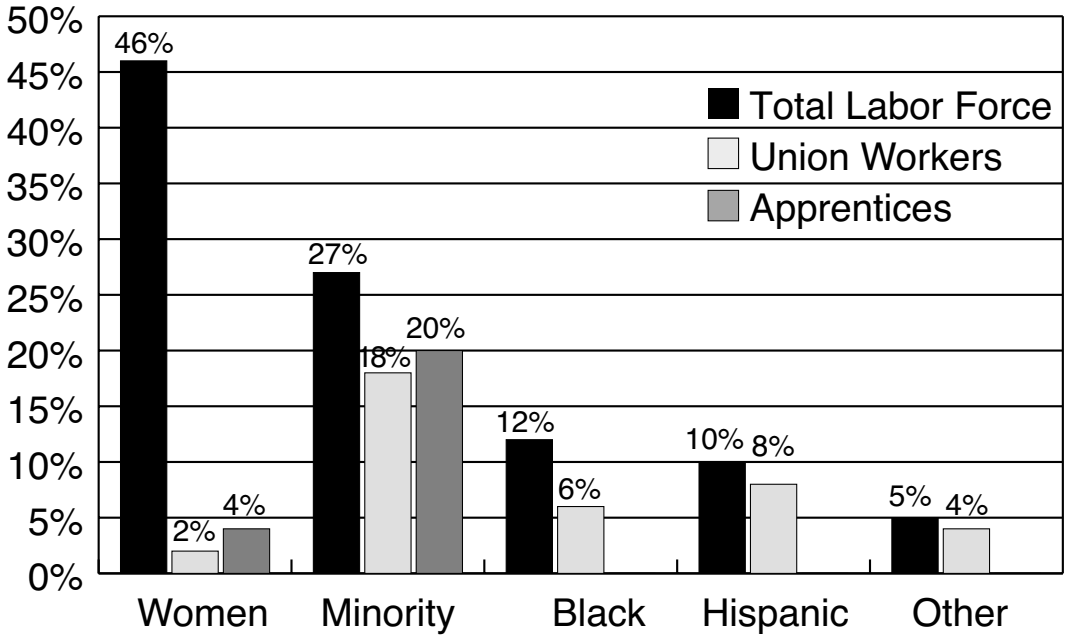
Issue: CHANGING DEMOGRAPHICS

The Situation:

The demographics of the skilled workforce present an interesting and complicated picture that continues to contribute to the skill shortages. Several factors including participation of women and minorities in the trades as well as the age of the skilled work force contribute to the issue.

Given that the pool of available workers has been changing dramatically over the last decade the question becomes "has the composition of the construction workforce changed with the pool?" The Center to Protect Worker's Rights recently analyzed demographic data on the construction industry that suggested that the industry made limited progress in recruiting minorities into working in the industry. Their data, as illustrated in Exhibit 3, illustrate growth in women and minority participation in union programs, but not yet at a rate of equal to that of participation in the entire force or the general population.

Exhibit 3: Female and Minority Participation in Union Programs, 1998



The aging of the skilled workforce compounds the demographic factor. While the entire workforce is aging, it is especially problematic in some crafts. As the Construction Labor Resource Council points out, "the portion of the workforce that is older varies widely by craft." Exhibit 4 depicts the percentage of workers in several age groups by various crafts within the construction industry. It highlights, for example, the impending need to replace millwrights in the coming decade. So too, there will be serious need to replace retiring operating engineers, pipefitters, sheet metal workers, electricians, bricklayers.

Exhibit 4: Percentage of Older Workers

	Age 55-64	Age 50-64
	%	%
Boilermakers	6.2	25.0
Bricklayers	10.4	16.2
Carpenters	6.3	12.9
Electricians	9.0	16.5
Elevator Constructors	2.1	15.6
Ironworkers	8.0	21.2
Millwrights	17.9	28.2
Operating Engineers	9.8	17.7
Painters	7.9	13.4
Pipefitters/Plumbers	10.8	21.0
Sheet Metal workers	9.8	16.3

Strategies:

COMMUNITY-BASED-ORGANIZATIONS (CBO's)

Strategy: Use community-based organizations in recruiting

Descriptions: Community-based organizations provide specific recruitment and training programs to individual populations within the broader community. Most often, community based organizations serve specific target populations, such as the League of LaRosa working within the Hispanic community. Also of note and promise are churches, especially in urban or rural areas.

General Approach: Among the activities necessary to implement community-based activities are at least the following:

1. Identify target populations.
2. Identify community-based organizations through which the project can be run/linked.
3. Identify message and media to use with the target population.
4. Identify training and incentives to use within the program.
5. Promote the program.
6. Initiate outreach.

Potential Outcome: The construction industry image should improve. More importantly, the targeted recruitment should increase the numbers of individuals interested in entering the industry as construction industry apprenticeships are extended to a more ethnic and diverse audience.

SPECIALIZED PROGRAMS SUCH AS WOMEN IN CONSTRUCTION AND JOB CORPS

Strategy: Use specialized programs, such as Women in Construction and Job Corps for specific pools of potential workers.

Description: There are a number of specialized programs that deal with the changing face of the work. These specialized programs provide specific training and education for identifiable populations that enable those populations then to perform successfully in the workplace. Among the specialized programs are the Job Corps Program, Women in Construction, and Minority Worker Training Programs such as those run by the Department of Housing and Urban Development.

General Approach: Among the activities necessary for success in using specialized programs are at least the following:

1. Identify the target population and the programs that serve that population.
2. Identify the skill necessary to succeed in the construction industry and compare those to specialized population.

3. Develop and deliver new training materials to specialized populations that meets needs.
4. Provide support services for the specialized population as it moves into the mainstream workforce.

Potential Outcome: Specialized programs have the potential to continue to adjust the composition of the workforce in the skilled trades such that it more accurately reflects the population in general. The programs also could help with overall recruitment by developing a favorable image of concern for the workforce.

SET ASIDE EXECUTIVE ORDERS

Strategy: Use set aside executives orders.

Description: Set aside executive orders specify certain types of workforce mixes on any given job. For example, many Department of Transportation orders require that specific numbers of women incorporated into the workforce that is building roads or bridges in a particular area. While the orders are a mandate, by using the orders, providing expanded training, and making an effort to keep these new workers as apprentices, the orders can become a strategy for helping to address skill shortages.

General Approach: Among the activities necessary to operate a successful program are at the least following:

1. Identify existing executive orders and the requirements of those orders.
2. Develop and use targeted recruitment strategies to build the population sectors indicating the executive order.
3. Provide specific training to these individuals, together with competency and performance testing.
4. Use people with the training to perform work tasks on the job.

Potential Outcome: Among the potential outcomes of set aside executive orders is greater balance in the workforce among all the different groups of individuals. This process should foster diversity and help to counter the myth that union construction discriminates against any group.

Issue: LACK OF TARGETED RECRUITMENT STRATEGIES

The Situation:

Historically, workers have found their way into the building trades through family tradition and/or word-of-mouth assistance from friends and neighbors. However, with changing demographic conditions and the poor image of the industry, construction must recruit against other industries for entry level workers. However, as illustrated by the skill shortages, recruit-

ment to date is only moderately successful. Among the factors that contribute to difficulty in recruiting are the following:

1. There is little history of planning and carrying out targeted recruiting programs.
2. There is no specific budget for recruitment in most construction organizations.
3. While there has been some success with pilot programs like school-to-work, there is no clear evidence of its long-term benefit or sustainability.
4. Until recently, there has been little attention to existing pools of new applicants such as individuals exiting from military, both in terms of identifying the pool of individuals or in terms of identifying and working with the messages valued by the specific pool.
5. There has been reliance on relatively ineffective techniques such as newspapers ads of school job-fairs as advertising techniques. Little attention has been directed to identifying the media and messages that can be effective with various pools of individuals.

Strategies:

SCHOOL-TO-WORK PROJECTS

Strategy: Initiate school-to-work projects in many locations.

Description: School-to-work projects are exploratory and intentional training activities that prepare middle school, high school, and community college students to go to work in the construction industry. The school-to-work curriculum is therefore, tailored around the skills and knowledge necessary to be successful within the industry, and students will acquire knowledge through class as well as on-the-job experiences during this program. Oftentimes, the program ends by extending to participants a job opportunity in the industry. Additionally, many career awareness opportunities need to be provided to elementary and middle school.

General Approach: Among the activities necessary to undertake a successful school-to-work project are at least the following:

1. Identify the skills necessary to succeed within the industry.
2. Identify the activities to build into the school-to-work project.
3. Identify job sites and resources that can be brought to bear in the school-to work program.
4. Generate the curriculum with credit for whichever institution may be sponsoring the program.
5. Develop promotional materials for the project and initiate their use within the school.
6. Develop outreach activities to work with teachers and parents as well as students.
7. Teach the school-to-work projects.
8. Extend invitations to participants to come to work in the industry.
9. Develop and embed early school career awareness activities on construction.

Potential Outcomes: Among the potential outcomes of these projects are both the improved image of the construction industry and increased numbers of new job applicants anxious to enter into the construction industry. Counselors, teachers, and parents will become more supportive of their child's interest in the industry and teachers and counselors will have more complete knowledge of opportunities from which to speak.

DEVELOP TARGETED RECRUITMENT CAMPAIGNS

Strategy: Develop targeted recruitment for identified pools of applicants.

Description: Targeted recruitment strategies identify and concentrate on discrete, smaller pools of the general population. Each strategy is targeted to a specific group that an organization would try to recruit from. For example, a targeted strategy might be directed at women high school seniors, or military retirees, any of which might be appropriate pools for the construction industry to recruit from. The advertisement is highly selective for that individual pool and will not necessarily work for any other pool.

General Approach: The general approach includes at least the following activities:

1. Identify the location and characteristics of the target applicants.
2. Identify the message that they will hear (in other words, what is important to them about the construction industry).
3. Identify the medium that they pay attention to, such as radio.
4. Prepare and distribute the advertising message in a fashion similar to an advertising campaign used by any other organization to recruit members or to sell products.
5. Adjust the effort, as necessary.

Potential Outcome: Targeted advertising by any of the number of organizations has demonstrated that it generates additional interest and response from whichever group is targeted, as long as both the message and the media are matched to the target population.

Issue: CHANGING PREFERENCES OF TARGET GROUPS

The Situation:

Data on the generation emerging from high school and college between 1990 – 2010 suggest that this group of individuals have somewhat different interests, skills and values than previous generations. Among the things that this generation of young people value more centrally than previous generations, according to survey research, are: money; benefits like paid vacation; the internet and technology; visual stimuli; the intellectual challenge of games; and creature comforts. They work well with cause and effect and incremental reinforcement. Further, they have good eye-hand coordination, a shortened attention span, and less tolerance for delayed gratification. Many young people prefer not to work outdoors and have had relatively little experience with physical labor. In fact, public health information illustrates that the new generation is the

least physically fit and most obese in history. Therefore, they seemed somewhat ill-suited to work in the construction industry where tasks often include working in the elements and usually in physically demanding ways.

Further complicating this issue is the lack of basic skills this new generation brings to the industry. Overall standardized test scores as well as the experience of training funds and employers suggests that basic skill levels are poor, making apprenticeship training more expensive and possible longer. As one training trust fund administrator suggested during an interview for the project, "We spend fully 30% of our training budget providing basic skills to new members who should have left school with those skills in the first place." CIP members echoed similar concerns as they indicated that "many apprentice applicants cannot succeed with the entry requirements;" "applicants and too many new apprentices lack even basic math and reading skills;" and, "we have difficulty finding apprentices who can do the work."

Strategies:

ESTABLISH DISTANCE LEARNING

Strategy: Establish distance learning opportunities and programs

Description: New learning technologies offer opportunities to teach in ways never before used – by computer; with multi-media; via satellite; at distance locations; and using multiple topics and audiences.

General Approach: Among the activities necessary to make this strategy a reality are the following:

1. Investigate the different types of distance learning options.
2. Investigate content and audience needs and match them to distance learning options.
3. Design curriculum materials and build technology.
4. Create record keeping system for training.
5. Publicize/promote the programs.
6. Begin incorporating distance learning into the system.

Potential Outcome: This strategy has the potential to improve the image of the industry and to match the preferences of a new generation of learners. It also has the capacity to improve learning efficiency and effectiveness thus helping to correct for deficiencies.

BENEFITS "MENUS" THAT CHANGE OVER TIME

Strategy: Create a menu of benefits program. (Cafeteria Plans)

Description: Cafeteria menu plans allow workers to choose from a range of benefits that are the "most" important to them at any given time of their career. For example, a member might choose paid vacation or sick leave, as opposed to a pension plan; similarly, a member might choose a travel allowance as opposed to some differential level of dis-

ability insurance. The concept calls for menus to be changeable on a regular basis, perhaps as often as the commencement of each new year so members can readjust their benefits packages to changing family needs.

General Approach: Among the activities that must be undertaken to create a menu of benefits program are the following:

1. Review legal considerations (ERISA) or this type of plan.
2. Identify benefits that might fit within the option, and those that would be excluded.
3. Generate rough categories of equity among the different benefits.
4. Develop the plan within legal guidelines and promote it to all the skilled craft workers.
5. Develop, implement, evaluate and pilot program.
6. Initiate the program to pay the benefits as well as allowing for benefit changes at regular intervals.

Potential Outcome: The potential outcome of this program is to improve the image and the retention within the construction industry by allowing individuals to more closely match their particular needs with the opportunities available in the industry. It should improve worker satisfaction and attract new workers to the industry.

ADD NEW BENEFITS SUCH AS SICK LEAVE AND VACATION LEAVE

Strategy: Develop new benefits options such as sick leave and vacation pay within the traditional benefits package.

Description: Historically, construction workers in the organized sector have experienced very good benefits, particularly those associated with health and welfare as well as pension plans. However, the new generation of workers prefers different benefits, especially early in their work life than those who have been historically available in the construction industry. New workers particularly value benefits such as sick leave and vacation pay.

General Approach: Among the activities necessary for a successful program are at least the following:

1. Identify benefits valued by the new generation of workers.
2. Identify existing program that demonstrates how these benefits might be provided to the selected demographics from other industries.
3. Develop and try a pilot program to allow these benefits to be incorporated into the workplace.
4. Make contractual and institutional modifications necessary to allow these new sets of benefits.

Potential Outcome: These benefits should enhance recruitment among the population of young workers now coming into the workforce as their first job experience.

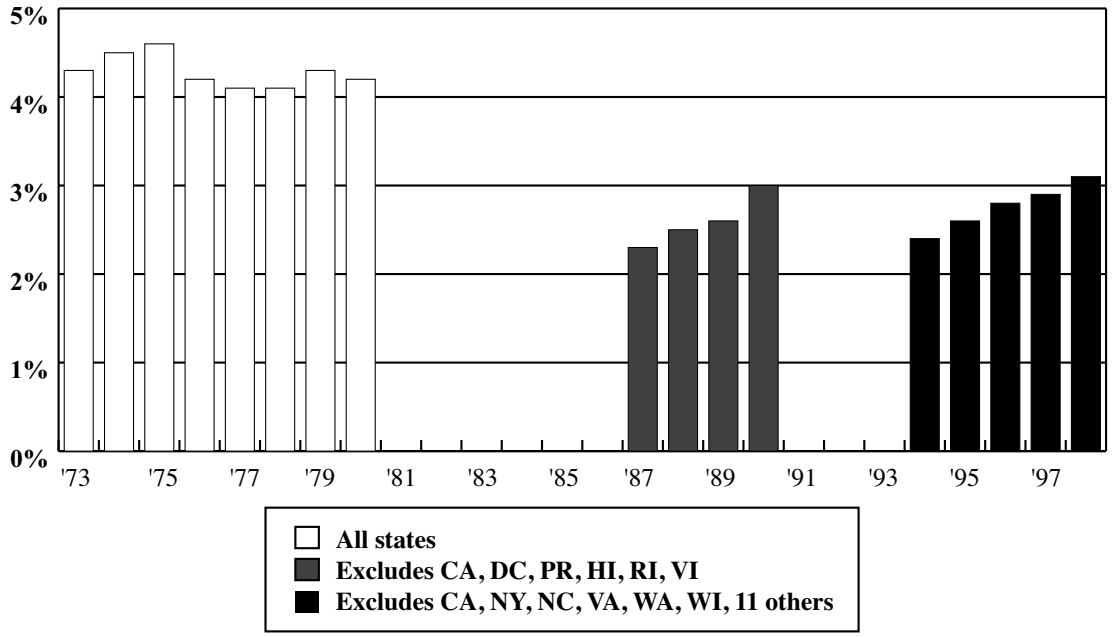
Issue: UNDER-USE OF AVAILABLE RESOURCES

The Situation:

Another factor contributing to the skills shortages in the construction trades is the under-use of available resources. This factor contains two parts: (1) under-use of the apprenticeship system and (2) failure to clarify the career opportunities within the construction industry so as to produce and promote clear career paths.

Apprenticeship has been the method through which workers have learned the skilled crafts for thousands of years. It is a refined, honored, and well-established system through which beginning workers master the practices and theory associated with a chosen craft over time. As illustrated in Exhibit 5: Apprenticeship Percentage of Construction Employment, 1973 – 1998, during the period of the 1960s and 70s, a significant portion of the Union workforce was involved in the apprenticeship program.

Exhibit 5: Apprentice Percentage of Construction



Employment, 1973–1998

However, during the recessions of the 1980s, apprenticeship as a training system receded. Not only were the number of "man-hours" worked in the skilled trades significantly less than they had been in the previous decade, but also, many of the apprentices in the system were unable to maintain continuous employment. Therefore, they lost "standing" in apprenticeship or simply left the skilled trades for other types of work opportunities. Even those who completed training had difficulty finding work. Equally important, the most talented apprentices usually left the system because they had the greatest opportunities elsewhere. As illustrated in Exhibit 5, relatively few apprentices were involved in construction during the height of the recession in the early-1980s; the situation during the late-1980s and early-1990s, while showing some improvement,

still has resulted in only about 3% of the construction workforce actually being those involved in the registered apprenticeship system. Furthermore, most of the growth and improvement has come in the organized sector within registered apprenticeship programs.

An unclear career path also is part of the Under-Used Resources factor. As a recent *Engineering News Record* article points out, "construction employment is thought (by the general population) to be short-term and transitory work that lacks stability and clear career advancement [opportunities]."

As a result, few parents, counselors or new job applicants see construction as a lifetime career with choices and opportunities for growth. However, several relatively simple strategies can correct this problem.

Strategies:

MOVE TOWARD A MORE COMPETENCY-BASED APPRENTICESHIP PROGRAM

Strategy: Move toward a competency-based apprenticeship program.

Description: Historically, registered apprenticeship programs have been time based. That is, the acquisition of skills is more often embedded within expected time frames that allow for hands-on training and experience, rather than specific training and experience, together with performance testing that enable apprentices to demonstrate that they have mastered skills and therefore advance to additional competencies. Moving toward a competency-based program has the capacity to shorten somewhat the period of time associated with completing apprenticeship programs. Competency programs also build self-confidence of participants.

General Approach: Among the activities necessary to implement the competency-based apprenticeship program are at least the following:

1. Identify skills necessary to succeed within an apprenticeship program and as a journey worker.
2. Ensure intentional training as well as experience associated with those skills.
3. Create valid and reliable performance assessments that allow the testing of the skill.
4. Determine levels of mastery as well as rules for testing.
5. Initiate training.
6. Initiate performance testing.
7. Create a record keeping system to track skill acquisition by participants.

Potential Outcome: The potential outcome of the competency-based program is to increase retention within the industry by shortening the period of apprenticeship so that workers achieve full journeyworker status more quickly. In addition, this type of program probably includes increased use of high technology, thereby also improving the image of the industry.

INDUSTRY PROMOTION TRAINING

Strategy: Provide expanded business agent and contractor training.

Description: When the construction industry treats itself like any other business in the community and participates as a community organization, work opportunities in the area are improved.

General Approach: Among the activities necessary to implement this strategy are at least the following:

1. Target business agents and contractor representatives who are candidates for training.
2. Create and deliver program to train participants in the techniques of presenting the positive aspects of the organized construction industry to the community, like every other business. This includes explaining how to join and participate in Chambers of Commerce and local government council meetings.
3. Encourage officers to fully participate as community leaders in whatever community they are part of.
4. Adjust the program, as necessary.

Potential Outcome: This strategy will increase awareness in the business community of the benefits that unionized construction provides to the general public, owners and the community. Among the outcomes that might derive from this program is an increased market share, as well as an improved image for the industry.

DAY SCHOOL OPTION FOR APPRENTICESHIP

Strategy: Operate day school option for apprenticeship.

Description: Often, apprenticeship related classes are taught in the evenings or on the weekends. This kind of schedule makes work and learning difficult for the apprentice as well as for the instructor. Therefore, there is a need to investigate other options for providing apprenticeship, including the day school option.

General Approach: Among the activities necessary to enable this strategy to succeed are at least the following:

1. Find pilot locations for day school training.
2. Investigate and adjust policy to allow for day school training.
3. Execute the pilot and follow up with the apprentices to adjust and expand the program as necessary.

Potential Outcomes: Among the outcomes of better using the resource of apprenticeship through a day school program is increased retention as well as improved recruitment into the program. Day school options also seem to make articulation with formal education somewhat easier.

CREATE SKILLS AND WORK LISTS

Strategy: Create skills and work lists for the skills that workers possess.

Description: Pools of workers in any given area should be identifiable by the particular skill set that they possess at the journeyworker level. Further, there should be a method, perhaps through electronic means, to enable workers and contractors to match specific project skill needs with the specific skill sets of individuals in the immediate area of any project.

General Approach: The activity associated with this approach include at least the following:

1. Create individual worker skill resumes.
2. Collect and verify the skill sets of craft workers within trades regionally and nationally, and to get that list into some manageable and usable database.
3. Create a project tracking information system that allows both contractors and members to search projects for skill needs.
4. Create a skill matching opportunity so that contractors can match skill sets required of the contract with the skill sets possessed by the labor force.
5. Publicize the program and provide access so that all participating individuals have the opportunity to use the program.

Potential Outcome: The potential outcome for this program is to increase the work hours of individuals within any given region of the United States, thereby potentially increasing the income of the skilled craft worker.

CAREER PATHS

Strategy: Define, refine, and articulate career paths within the construction industry.

Description: Career paths lay out the various job options for members within any industry. The career paths include not only changes within the skills, but opportunities to access any job within an entire industry. Usually, career paths tie the occupation with training, work, and necessary skills and knowledge acquired both at work and through formal education.

General Approach: The following activities are part of this strategy:

1. Identify occupations within any larger occupational category.
2. Analyze how those occupations fit together sequentially, chronologically, and in terms of skill sets.
3. Create a logical explanation of the career path, and promote it among those who interact with members in the industry.

Potential Outcome: Career paths will improve recruiting, retention, and the image of construction by allowing entrants to identify clearly defined paths to select. Counselors and parents also will better understand and value the industry based on this strategy.

COLLEGE CREDIT PROGRAM

Strategy: Create college credit program for trade training.

Description: Often, people choose careers because they flow logically from the college experience. Over 80 percent of high school graduates pursue some type of college, though less than 50 percent of those who enter college actually finish it. Nevertheless, creating some sort of college credit program available to those who take formal training in the skilled trades is a way of combining the societal value for education with a way to earn a living and master skills.

General Approach: Among the activities necessary to successfully implement this program are at least the following:

1. Identify colleges that would be amenable to a college credit for life experience program and formal training associated with trade work and training.
2. Work with colleges to create an articulation agreement that provides formal credit for apprenticeship and journeyworker training.
3. Promote the program to the skilled craft arena as well as to high school counselors, vocational teachers, and members of any of the targeted pools for recruitment selection.
4. Incorporate information into emerging career paths of construction work.

Potential Outcome: Among the benefits of this particular strategy are a dramatically-improved image for the industry and more readily-accomplished recruitment for entry-level workers. This strategy also will allow a tool for targeted recruitment.

Issue: RETENTION PROBLEMS

The Situation:

The Construction Labor Council compared the age of workers in construction to that of workers in other occupations. Their findings, as illustrated in Exhibit 6, revealed that, when compared to other occupations, construction workers find their prime working years between 25 and 44 years old. The data further illustrates that there is little difference in the portion of construction workers under 25 relative to other industries, suggesting that historically, construction has attracted its share of new entrants; rather, the difference occurs in that skilled craft workers are less likely to remain in the construction industry through what is generally considered their full working life. They leave the construction trades during their 40's to pursue other opportunities. The reasons they leave include factors such as the difficult physical labor involved in construction and the toll that it takes on bodies as they age; the opportunities to pursue occupations in industries with clear career paths, given that most adults now work three distinctly different occupations during the course of their work lives; and the fact that many workers choose/exercise their pension option after having worked 20-25 years in the industry. As a result, the construction industry loses many of its most skilled workers at a time when their skills are at maximum levels of efficiency.

Exhibit 6: Work Force Age Distribution for Construction and All Industries

However, with some crafts, age is not the only retention issue. There also is a retention issue in terms of maintaining skilled craft workers through the term of their apprenticeship. The cyclical nature of the construction industry – given that work is subject to both "boom and bust" economic cycles as well as inclement weather – results in a large number of craft workers finding alternative employment during "bad" times and continuing with that alternative employment. And while the alternative employment may offer lower dollar-per-hour returns than does construction, it offers many more hours of work per year and/or work at a single location and/or usually work located where environmental elements are not an issue.

Strategies:

SCHOLARSHIP LOAN AGREEMENTS

Strategy: Develop scholarship loan agreements

Description: Scholarship loan agreements are opportunities through which workers earn money toward formal education by completing prescribed numbers of years or hours within the construction industry. The scholarship loan agreement works much like the GI Bill in the military and provides an opportunity to advance along the career path within the broader industry.

General Approach: Among the activities necessary to implement this strategy:

1. Identify the elements of scholarship loan agreements.
2. Identify the types of institutions and arrangements for which that scholarship agreement might be applicable.
3. Set policy to implement agreement.
4. Promote the opportunity.

Potential Outcome: Among the potential outcomes of this activity are improved retention of workers within the system as they view the scholarship as a benefit that can be achieved over time. Moreover, the strategy creates vested interest within the worker to continue and to succeed in the industry.

MENTORING PROGRAMS THAT INVOLVE OLDER WORKERS

Strategy: Create mentoring programs for new members.

Description: Mentoring programs match experienced and veteran member workers with new workers in any setting. Typically, it has been very successful with projects such as Big Brothers/Big Sisters, but more recently has been applied to broader corporate situations. The mentor helps the new worker understand the rules, norm. skills, and knowledge associated with working in any particular role or industry.

General Approach: Among the potential outcome of mentoring programs is improved job retention both of the new member and of the mentor.

1. Create a program for selecting and training mentors.
2. Create a policy that allows new members to be matched with mentors.
3. Develop, implement and study a pilot program.
4. Match member and mentor for a given period of time, checking to ensure that the program is working.
5. Adopt a wide-scale effort.

Potential Outcome: The potential outcome of mentoring programs is improved job retention both of the new member and of the mentor.

Issue: INTERNAL BARRIERS

The Situation:

Several Internal Barriers to construction and to the organized sector also seem to be potential contributing factors to the skill shortage. Among the issues pointed out by the CIP and Committee members are the following:

- **Location of training sites/facilities.** Many training facilities are located away from population centers. Many sites cannot easily be accessed by public transportation, or easily reached by urban populations who own cars. Therefore, the sites are not accessible either to new pools of workers or to potential inner city project owners.

- **Entry/selection requirements.** Apprenticeship entry and selection requirements may be a barrier. While high standards are critical, the requirements must accurately reflect the skill needs of successful participants and skill levels of successful journeyworkers in the craft. Some crafts have not reconsidered apprenticeship standards in years while other crafts may be using requirements as substitutes for skills because "nothing better is available." The real issues are to ensure that the requirements are valid.

- **Involvement in programs.** Few contractors seem to work closely with apprenticeship and training programs, either in specifying content or in ensuring that adequate numbers of apprentices actually work. It appears that few programs actually achieve their maximum specified ratio of apprentices to journeyworkers. Additionally, "sometimes it seems like contractors simply concede to or assume that unions will take care of training issues." In other situations, it seems that the training staffs fail to pursue information consistently from contractors.

- **Inadequate projections.** There appears to be little systematic effort or easily used method that accurately project future workforce needs in a specific region. Moreover, the question of how to factor economic cycles into manpower training needs remains an issue that has not been successfully resolved.

- **Program quality.** While most jointly-trusted training programs are excellent, some appear to have difficulty monitoring on-the-job training, rotating apprentices through all phases of work activity, updating standards and related instruction curriculum, and coordinating the issues of competency acquisition and time requirements in apprenticeship. Moreover, some crafts do not focus on training beyond apprenticeship, although that need continues to grow.

- **Valuing unions and joint labor-management cooperation.** It appears that some crafts pay little attention during related instruction to critical ideas including the value and necessity of labor-management cooperation, or the value of unions. Still others have not fully capitalized either on the potential relationship between providing member services and retaining workers or on developing a social and community bond with apprentices during training.

Strategies:

EXAMINE TEMPORARY AGENCY STANDARDS

Strategy:: Adopt temporary agency standards and benefits when they benefit members, unions, and signatory contractor.

Description: Temporary agencies are having success in providing manpower needs to some contractors. Many of the workers in temporary agencies are individuals who wanted to be union members, and for any of a variety of reasons, never became union journeyworkers. Moreover, they remain loyal to the temporary agencies because of some of the benefits and practices in use by the temporary agency.

General Approach: Among the activities necessary to undertake this strategy are the following:

1. Study the practices of temporary agencies to determine which benefits and practices are valued by participants and would be members.

2. Adjust the benefits and practices of the organized sector to more closely reflect those issues within the temporary agency sector that are valued by its members.
3. Promote the differences among the membership.

Potential Outcome: The result of this activity should be an improvement of the image of the construction industry and an increased skill/interest level of job applicants who want to become entry-level workers.

TEACHING VALUE OF UNIONS AND JOINT PROGRAM EFFORTS

Strategy: Incorporate teaching the value of unions and joint labor-management program efforts:

Description: The joint labor-management programming effort provides a structure under which a number of training and other activities can and do occur within the construction industry. The structure provides for benefits, workers' rights, and production/quality/safety expectations "guarantees" for the employing signatory contractor.

General Approach: Among the activities necessary to implement this strategy are the following:

1. Analyze the joint labor-management practices, as well as unions and signatory contractors, to identify the particular benefits of this initiative.
2. Develop materials and training opportunities to convey that information to workers.
3. Follow up with interviews to workers to ensure that they receive the information and understand the value.

Potential Outcome: Among the potential outcomes of this strategy are improved retention as workers understand many of the systematic benefits that accrue to the entire industry from the joint labor-management structure, as opposed to specific benefits that accrue to single individuals.

RESOURCES

JOINT LABOR-MANAGEMENT TRAINING FUNDS

Many CIP participants and/or joint labor management training trust funds provide formal Instructor Training Program. Although the Instructor Training Programs differ in arrangements, age, location, and specific course content, the programs share several key elements. Each training program is an annual event of a week or more duration; each involves trade instructors in formal coursework of two types – professional teaching or training skills and technical and advanced/emerging trade knowledge; each uses experts (often university-based) to teach the courses; each program introduces emerging training trade-craft information through technical courses and seminars during the training sessions; each has an opportunity for participants to earn college, graduate, or continuing education credits through successful completion of the training;

and each teaches basic and more advanced teaching skills as part of a required curriculum. Taken together, the jointly-trusted Instructor Development Programs offer a major resource for addressing skill shortages if used to capacity.

Trade training of members also is a critical resource. Data indicates that each year over 350,000 trade workers are trained at about 2,000 training sites, about 10% of which offer residential opportunities for more extensive courses. Additionally, the training has the option of bearing college or continuing education credit; involving manufacturers and other experts in its design and delivery; and reaching contractors as well as instructors and members. Moreover, some of the jointly trusted programs also offer staff resources to develop print, video, and computer-based training materials; performance and paper-and-pencil assessment routines; and records of skill acquisition for participating members.

Contractor Association Resources

In addition to contributing to craft training, the contractor associations also provide education and training experiences to their members on specialized topics ranging from safety to new materials to cost analysis. These courses and seminars also offer an opportunity to help improve the image of the broad construction industry and to help alleviate the skills shortages issues.

For example, many of the organizations have an educational program(s) for its members, with many that provide and qualify for college and/or graduate credit; each has information programs including web-pages and journals to serve members and to educate project owners and the public; each has a public relations office to help the public understand issues about construction; and each monitors and/or contributes to research and dissemination of information about advancing technology. Taken together, the training opportunities and information sharing vehicles reach over 250,000 employers and more than a million individuals.

Union Based Resources

The unions bring a number of resources to bear on the skill shortage issue, including the National Labor College, the Building and Construction Trades Department and resources of individual unions.

The National Labor College of the George Meany Center for Labor Studies, Inc. has developed a unique program in an attempt to satisfy the educational needs of trade union officers and staff members who cannot be served by traditional educational institutions and conventional educational mechanisms. The program is a flexible, largely external program that enables students to pursue a Bachelor of Arts degree while continuing their trade union work. It recognizes the educational value of the union experience that active officers and staff gain over the years; credit is awarded for the learning that this experience has generated.

The curriculum revolves around seven fields of study which enable students to relate their day-to-day activities in the trade union movement to general developments in the American economic, social, and political arenas. The program also requires a large component of liberal arts courses, providing students with a broader perspective that reaches beyond the areas of labor concentration into the social sciences, humanities, and sciences. Demonstrated competency in some

essential skill areas is also required for graduation. This combination of core curriculum, general education and basic skills enables graduates to function as educated members of an increasingly complex society, as well as to serve more effectively as leaders in the American labor movement.

The George Meany Center for Labor Studies was founded in 1969 to fill the need for a specialized leadership development institute designed for AFL-CIO affiliates. The Center provides the opportunity for labor's leaders to combine new ideas with their practical experience in an atmosphere that encourages learning, growth and solidarity. The Center offers more than 80 noncredit labor studies institutes and workshops in addition to the college degree programs every year. The George Meany Center and its facilities are also available to all AFL-CIO national and international unions for their own leadership programs, staff training, and education conferences.

The Building and Construction Trades Department, AFL-CIO, also is a special resource. It pursues special projects on behalf of all the building trades and provides mechanical and program assistance to them. Among its current initiatives are:

- linkages with the military to facilitate the transitioning of those leaving the services into the unionized sector of the construction industry;
- development of a recruitment and retention model for addressing diversity issues within the unionized sector;
- work with the National Labor College of the George Meany Center to formalize the process by which college credit is awarded for apprenticeship;
- development of the Construct the Future! construction industry awareness program for middle school students; and
- research on Temporary Agencies in the construction industry.

Each union also brings resources to the issue. Each has its own information programs for members, benefits programs, officer and steward training, and individual staff development. In addition each sees its members as its most valuable resource. Among the activities of particular note are local union officer education, steward training, and member education and benefits. Each union also has its own internal information programs such as magazines and web page.

Skill Shortages in the Construction Industry

National Joint Labor-Management Committee
on Skill Shortages in the
Construction Industry

Federal Mediation and Conciliation Services
FMCS Grant #97-DC/I-014 [NC]

The White Paper on
The Construction Skill Shortage:
Issues and Activities

Introduction and Purpose

This White Paper is one of several products developed under a Federal Mediation and Conciliation Services (FMCS) funded project on skill shortages in the construction industry. IN this product, we investigate and explain the evidence about and reasons for skill shortages in the construction industry. Additionally, we explore existing programs and "best practices" that are in use for meeting skill needs in the construction industry.

The project was conducted by the National Joint Labor-Management Committee on Skill Shortages in the Construction Industry. The committee was composed of ten members: five from major construction unions and five from signatory contractor organizations. The committee on skill shortages worked with the Construction Industry Partnership (CIP), committee comprised of the 15 building and construction trade unions and 7 national signatory contractor associations. The CIP works to address issues of mutual concern to labor and management in the construction industry.

The White Paper is organized in three sections. First, evidence about skill shortages from published studies and our own investigation with CIP organizations in presented. Next, in a section entitled, "Reasons for Skill Shortages," eight barriers and issues that have caused or contributed to the shortages are explored, using research data to illustrate the problems. Finally, a series of possible solutions, both "best practices" and existing programs are described, including their broad costs and benefits as revealed during their use to date.

This paper describes the background research used as a basis for a companion document – *A Strategic Plan for Addressing Skill Shortages in the Construction Trades.*

Evidence of Skill Shortages

The construction industry is of major importance to the economy of the United States. It is one of the country's largest industries with over 6.25 million installation, maintenance, and repair craft workers, and over 650,000 construction contractors. (*Census of Construction Industries,* **1997 Census,** U.S. Census Bureau). Equally important, in 1997 new construction accounted for approximately 7% of the Gross Domestic Product (GDP). If one adds rehabilita-

tion, repair, construction work, and construction materials fabrication to this total, then the GDP contribution of the construction industry in 1997 was 10% of the total productivity for the United States. (C.S. Berry [editor] *US Industry and Trade Outlook,* 1998. DRI/McGraw-Hill, New York, NY. 1998). The importance of the industry is reinforced upon realizing that over 10 million people are employed in the U.S. construction industry when design, new construction, maintenance, renovation, management, equipment and materials manufacturing, and materials supply are all included in the totals. In this accounting process, the construction industry becomes the largest "manufacturing" industry in the United States (Bernstein and Lemer, 1996).

The numbers of individuals, contractors, and value to the GDP is only a partial measure of importance. Actual construction spending in the United States averages about 650 billion dollars per year. Of that 650 billion dollars, approximately 70% is spent on nonresidential and public construction (*Value of Construction Put in Place,* July 1998, U.S. Census Bureau). Additionally, the industry has been experiencing eight successive years of growth and is projected to continue that growth, although at a more moderate pace, for the immediate future (*Engineering News Record,* November 1999).

Given the size and importance of the construction industry to the economy, it is no wonder that there is concern when a series of studies consistently project a growing problem in the industry – the problem of shortages of skilled labor. While each study and article takes a different perspective and each has a different sponsor, the findings consistently suggest that the shortages will continue throughout the first decade of the 21st century. Regardless of the study, data indicate that the shortfall, unless significant effort is expended to reverse current trends, will measure from 3% to 5% of this workforce within the industry. That, by any measure, is a potentially significant problem. Among the likely consequences of failing to address skill shortage issues would be project cost increases, time delays, infrastructure deterioration, and public discontent.

Selected findings from published studies and articles as well as research from CIP member organizations help establish the consistency of concern regarding the skills shortages. The following studies and sources have helped establish the baseline:

- A 1996 study by the Business Roundtable found that over 60% of responding contractors had encountered a shortage of skilled workers. Almost 75% of the respondents indicated that the shortage was a trend that had increased during the previous five years. The crafts that were experiencing the greatest shortages included electricians, pipefitters, and welders. Regionally, skills shortages were experienced as strongest in the Southwest and the Southeast. Moreover, the Business Roundtable projected that the shortages were severe enough that under present economic conditions, 200,000 to 250,000 new craft workers would be needed each year for the next decade.

- The National Association of Home Builders, in a 1998 paper on skills, reported survey data and anecdotal evidence that strongly suggested the home building industry has been facing shortages of qualified craft workers for at least two years. Their information indicated that the greatest shortages were being experienced in the South and the Midwest and particularly among the crafts of carpentry and earth work trades.

- The Construction Labor Research Council, in an unpublished paper, indicated that the skilled crafts were experiencing a shortage of labor throughout the United States and particularly in the Northeast, West, South, and Southwest. Their data indicated that the skilled crafts were attracting too few new apprentices to replace the numbers of craftsmen that were exiting to retirement or to work in other industries. Moreover, in a second paper entitled "Craft Labor Supply Outlook 2000 – 2010" (1998), the Construction Labor Research Council estimates that, under any economic circumstance, in excess of 100,000 new workers will be needed each year for the next decade. Three out of four of these new entrants will be required to replace current workers who are leaving the industry.

- The National Association of Home Builders in a 1997 survey found that over 70% of builders reported shortages of skilled craft workers in the range of moderate to serious within some crafts. They found the greatest shortages to be among craft workers who perform the carpentry trade.

- The Bureau of Labor Statistics (BLS) Construction Employment Outlook suggests that at least 185,000 to 196,000 new construction workers per year will be needed between 1996 and 2006. BLS findings support the suggestion by the Construction Labor Research Council that 3 out of 4 new entrants—almost 150,000 per year—will be required to replace current workers who are leaving the industry. Moreover, data suggest that between 70% and 80% of the vacancies will be for skilled craft workers.

- The annual Dun and Bradstreet *Construction Survey* in October 1999, revealed that 23 percent of the 200 surveyed construction executives said they were able to hire enough skilled workers. More than half of respondents reported that they had been hampered by various limits to production, including lack of sufficient amounts and skills of craft workers.

- The recent FMI *1999 U.S. Construction Industry Survey Report* revealed additional data on shortages. Their findings were gathered from a cross section of contractors: union-signatory contractors (37%), open-shop contractors (38%), and "double-breasted" contractors (28%). The survey suggested that a "lack of qualified personnel" was their greatest concern. The lack of skilled craft workers was especially problematic for contractors doing less than $100 million of work annually.

- A number of recent newspaper and magazine accounts (*New York Times, Crain's Detroit Business, Baltimore Sun, Engineering News Record*) report that skill shortages among skilled construction crafts in their regions are serious to severe. The shortages have caused many production delays and are forcing contractors and project owners to adjust work schedules to fit labor realities. Other consequences have also emerged due to skill shortages; in at least some situations, projects have been redesigned to accommodate skill shortages in specific trades.

- A survey of member of the National Joint Labor-Management Committee of Skills Shortages as well as the Construction Industry Partnership (CIP) indicates a unanimous concern that there is a shortage of skilled labor within the construction industry. That concern is especially prevalent for the West, South, and Southwest parts of the United States and seems to be true for virtually every craft. Both labor and management members reported instances where contractors have decided not to bid work because they recognize that skilled labor is unavailable should they be the successful bidder. In other circumstances, members cited instances where contractors have decided not to accept contract offers because they have been unable to "man" the job. Still other contractors reported an unwillingness to expand their business within an available market because they are experiencing shortages of skilled labor, even though they recognize this as an excellent opportunity to expand and regain "market share" for their companies.

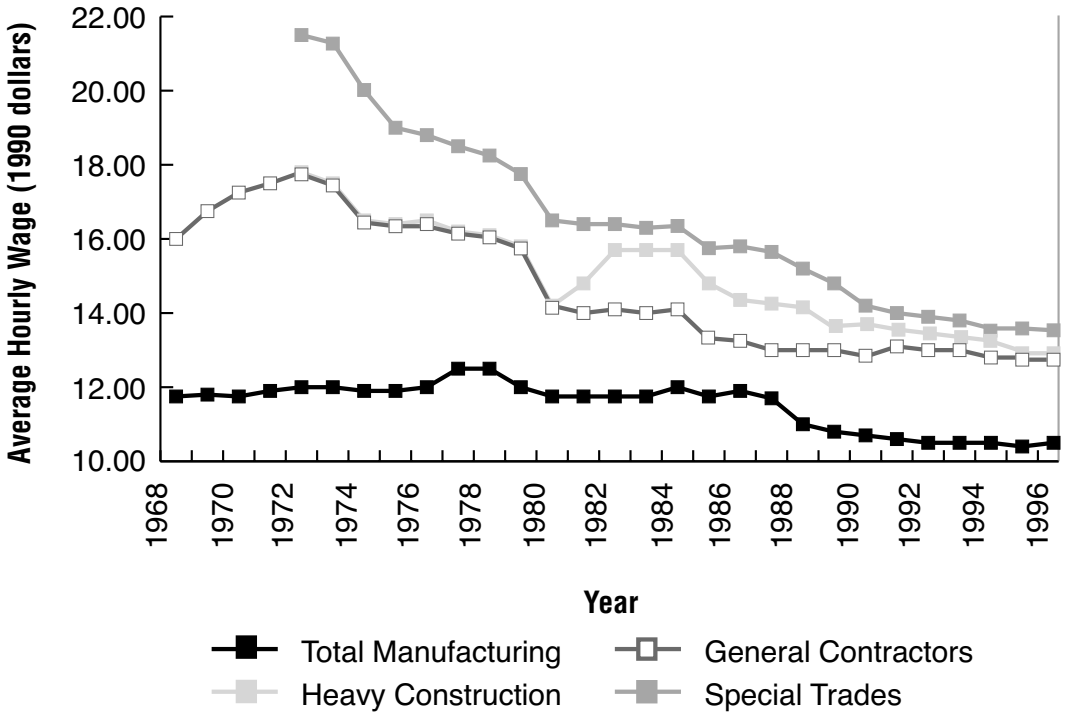
Taken together, these studies and articles suggest that the construction industry is experiencing, and will continue to experience, a serious skills shortage over the next decade. The magnitude of the shortage ranges anywhere from 3% to 5% of the installation, repair, and maintenance construction workforce for any given year, and cumulatively over the decade could distinct dimensions: (a) there is a shortage of skilled workers in most trades and in many places in the United States; and (b) there is a shortage of specific skills within a portion of the available workforce and among pools of applicants for the workforce.

Reasons for Skills Shortages

The data consistently indicate that a skills shortage exists for labor, and especially skilled labor, within the construction industry; however, the data are muck less clear about the reasons for that shortage. Analysis of information from a variety of sources indicate that at least eight factors contribute to the growing skills shortage: eroding wages in construction; poor image of the construction industry; demographic shifts; lack of targeted recruitment strategies; under-use of existing resources; retention problems; changing preferences and skill level of the target group of new workers; and internal industry barriers. A discussion of each issue follows.

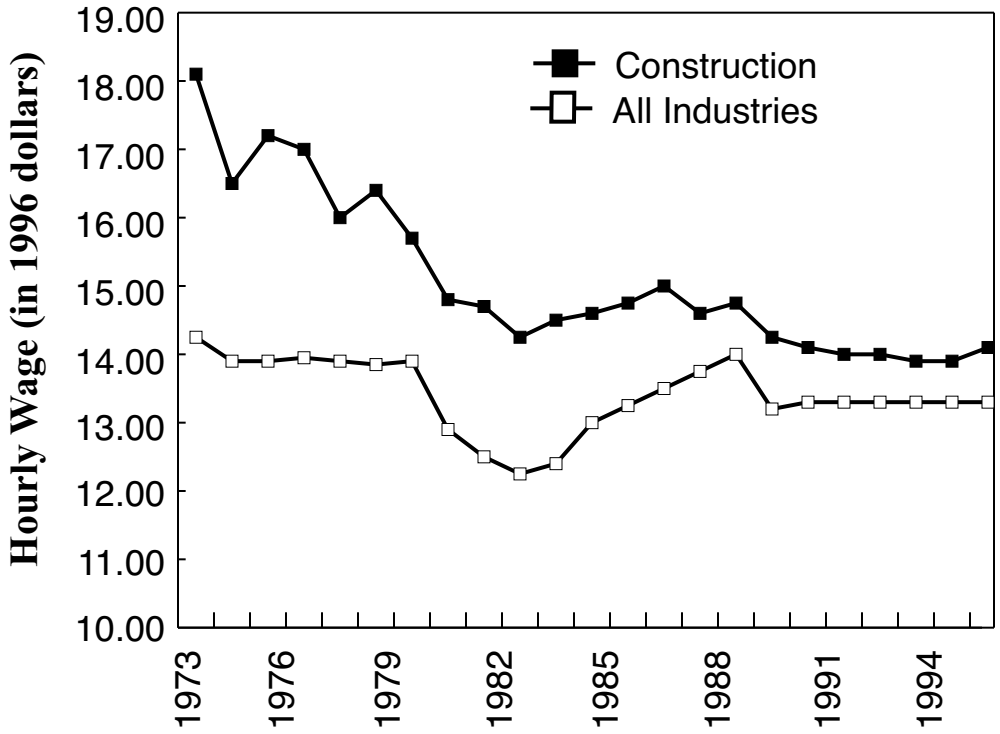
Eroding Wages in Construction. In general, real wages in the United States for working people have fallen in the last several decades. However, real wages in the construction industry have fallen at a more rapid pace over the past 30 years than have wages for most American workers. As illustrated in Figure 1, Real Wage Trends Over 30 Years (Slatter, 1997), wages in each of three broad areas of construction activity: heavy construction, general contractors and specialty trades, have witnessed serious erosion when compared to wages in the total manufacturing sector in the United States. More specifically, for example, wages (in 1990 dollars) for workers in the specialty trades in 1974 were just above $20 per hour while real wages in overall manufacturing at that time were approximately $12 per hour. Sixteen years later, real wages (in 1990 dollars) in specialty crafts workers average $14 per hour while real wages in manufacturing averaged at between $10 and $11 per hour. Wages within the construction sectors have eroded and have been more pronounced than that of manufacturing.

Figure 1: Real Wage Trends Over 30 Years



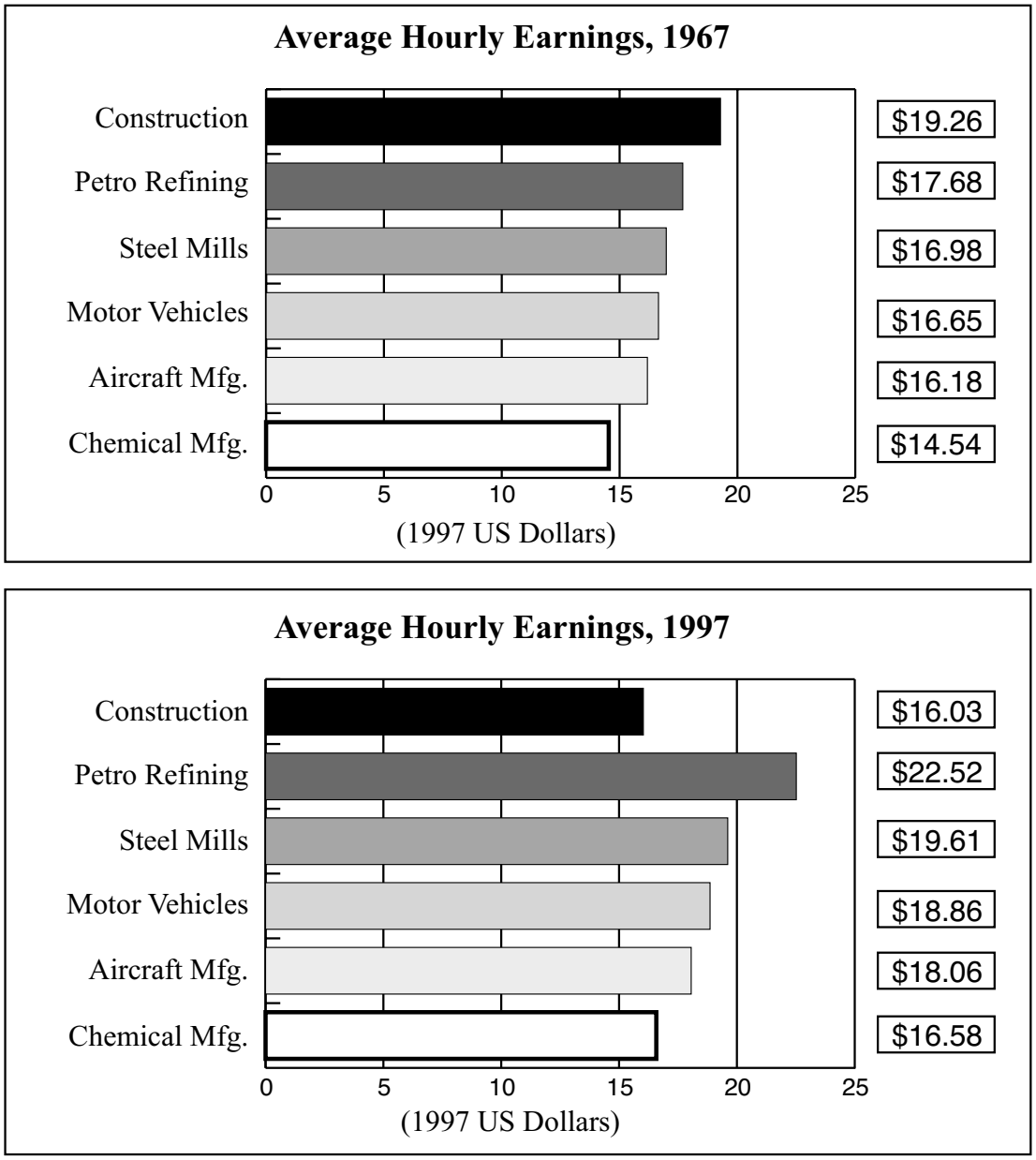
This evidence is corroborated by data from the Bureau of Labor Statistics as cited by Hirsch and McPerson (1995) where they compare wages for all construction versus wages for all other industries in the United States. In their data, as illustrated in Figure 2: Inflation Adjusted Wages, taking into account the cost of money and using 1996 dollars, the average annual wage of construction workers decreased sharply in the late-70's and early 80's. Moreover, while in the last several years' construction wages have begun to increase, they have increased only 3.8% as compared with an average rise of 4.5% in other industries for the same time period.

Figure 2: Inflation Adjusted Wages



Data recently compiled by the Building Trades Department of the AFL-CIO (1998) illustrates the differences by type of manufacturing and corroborates the other evidence. As Figure 3: Average Hourly Earnings Comparisons shows, the hourly average earnings in all manufacturing other than construction advanced between 1967 and 1997; in construction, however, the wages decreased. Not only have the real wages of construction workers decreased while other wages increased, so too construction wages lost their historic relative advantage when compared to entry-level jobs in other industries.

Figure 3: Average Hourly Earnings Comparisons



Other data from the records of the Building Trades Department of the AFL-CIO illustrate this trend of eroding wages, not compared to other industries, but in absolute terms as illustrated in Figure 4: Employment and Wages in the U.S. Construction Industry. The mean wage for all workers in construction has eroded from $14.90 in 1985 to $13.95 in 1997. The mean union wage has eroded from $20.63 to $18.52 over the same period of time to the non-union wage, which eroded, but only from $13.18 to $12.82.

Figure 4: Employment and Wage Trends in U.S. Construction Industry (97 dollars)

	1985	1986	1987	1990	1991	1992	1995	1996	1997
Employment (1000s)	5222	5468	5608	5667	5115	5049	5658	5874	6201
Union Membership (% of total employment)	23.1	23.3	21.9	22.5	22.4	21.6	18.9	19.7	19.7
Mean Wage (All Workers)	$14.90	$15.06	$15.20	$14.78	$14.34	$14.15	$13.83	$13.97	$13.95
Mean Union Wage	$20.63	$20.94	$20.64	$19.19	$19.18	$18.93	$18.65	$18.33	$18.52
Mean Non-Union Wage	$13.18	$13.27	$13.67	$13.51	$12.95	$12.84	$12.69	$12.90	$12.83
Ratio of Union:Non-Union Wage	1.56	1.58	1.51	1.42	1.48	1.47	1.47	1.42	1.44
Weekly Earnings (All Workers)	$599	$606	$600	$601	$585	$563	$567	$571	$560

Source: Compiled from Barry T. Hirsch and David Macpherson. *Union Membership and Earnings Data Book: Compilations from the Current Population Survey* (Washington, D.C.: Bureau of National Affairs, Inc., 1996, 1997, and 1998)

While an increase in the percentage of open or merit shop work partially accounts for the downward trend in wages in overall construction over this time period, it does not account for the total wage decrease, the decrease in union wages, or the decrease in wages in any given craft. Therefore, it is clear that these wage trends have adversely affected the construction industry's ability to attract and hold qualified workers within the industry.

Poor Public Image of the Construction Industry. Research on how individuals choose occupations suggest that, over the past several generations, individuals do not exactly choose an occupational role; rather, they often find a job by happenstance and from that job pursue additional opportunities. However, this process is not as random as it may initially sound. Further investigation indicates that individuals "choose negatively." That is, they eliminate some jobs and occupational options, often even fairly early in their life, as undesirable opportunities that they do not pursue in the future, even by chance. Therefore, the range of potential occupational goals for individuals are limited to those jobs that they either view positively of neutrally in the future (Rice, 1991).

This situation seems to have occurred within the construction industry as the image of this industry has slipped from that of a desirable occupation to that of an undesirable occupation for the majority of the younger population. Studies provide evidence about the desirability of the construction industry as an occupational choice. For example, in the Jobs Rated Almanac (1990), a document that lists 250 best and worst jobs in the economy, "construction worker" is listed under the category of 10 worst jobs. More specifically it is ranked 248 out of the 250 occupations that were rated by young job seekers. Only the occupations of migrant farm worker and fisherman ranked below construction worker.

In 1996, *The Wall Street Journal Job Almanac* again surveyed young people to determine careers they were interested in pursuing. Data from that study revealed that "construction workers" still ranked 248 out of the 250 career choices. Moreover, the findings indicated that the unfavorable image of construction was based on several factors including the perceived lack of a career path in the industry, poor working conditions, physically-demanding work in hot and dirty situations, poor pay, and overall poor public image of the industry. These findings contrast to findings from the "Survey of Graduating High School Seniors" throughout the 1960s when construction ranked within the top five occupations as preferred job and career opportunities.

Image issues evolve over a long period of time and are built from general perceptions, feelings, pictures, interaction, and personal encouragement. Several studies suggest how this unfavorable image issue may have developed. For example, in the "Study of Construction's Image" recently conducted in the northwest part of the United States (Baron, 1999), several hundred high school students were interviewed about career choices and construction in particular. Eighty-four percent of interviewed students indicated that they would not consider a career in construction largely because of the unfavorable image of the industry. When asked to describe the "construction worker" in an open-ended question, answers such as "sleeze;" "butt crack;" "dirty;" "grunt;" "fat;" "lazy;" "unshaven;" "cigarette smoker;" "beer belly;" "overweight;" "scruffy;" were the typical response. In addition, a number of participants commented about the hard physical labor involved in construction and indicated that they has little interest in pursuing that kind of work. Moreover, one other consistent comment emerged related to student perception about construction: how workers treated women. Specifically, students suggested that construction workers "hoop and holler at women and harass women." These findings suggest that the image of construction today has personal, negative implications for young job seekers as they evaluate occupational choices.

Yet, this is not the only image issue for the construction industry. As one member of the CIP stated, "our media image is terrible." A review of articles in major newspapers over the last year from around the United States reveals relatively few positive articles about the construction industry. Positive articles appeared about the following subjects: vocational educational projects that completed and sold homes as low and moderate-income housing opportunities; several construction projects completed successfully and ahead of expectations; technological improvements; and local builders and/or unions joining forces to repair a public structure or complete a home. Unfortunately, the typical article dealt with cost overruns, delayed or late projects, traffic tie-ups, skill shortages, corruption issues, or structural collapses and ensuing injury. The prevailing media image of the construction industry and its workers is largely negative.

Image also emerges through interaction with and encouragement offered to potential job seekers by significant others in their lives – parents, friends, and other adults who they trust of admire. Today, young people receive relatively little encouragement to consider skilled craft careers from adults at school. This situation occurs, at least in part, due to encouragement from the school guidance personnel and teachers to pursue college and careers that require college degrees as opposed to careers in the skilled crafts. In fact, 84% of high school seniors plan to get

a four-year degree (NSBB, 1999). High school guidance personnel spend the majority of their student-contact time assisting students to consider various degrees and college options for several reasons. For example, one recent study (Walsh, 1990) found that guidance counselors expressed "limited personal awareness and low incentive to promote skilled construction trades" and therefore, did not do so. Researchers found that counselors were predominately women who had attended college and have little experience with technical work or with anything approximating the construction trades; they have little personal knowledge from which to speak. As recently reported in an article about the shortfall in numbers of vocational-technical graduates, "part of the problem is school guidance counselors who do not understand the technical sector. Despite the good wages available to the technically trained, the cultural environment funnels students into the professional (college-graduated) sector" (*Air Conditioning, Heating and Refrigeration News,* 1999). This lack of personal experience couples with their own participation in college as a strategy to find an occupation, means counselors are most comfortable recommending a similar path into work and careers to young job seekers.

Interviews conducted with guidance personnel for this study have reinforced the findings of Walsh's study. Counselors indicated that their typical experiences with the construction industry have been limited, relatively unpleasant, and consisted of three primary situations: (1) as women, many have been harassed when passing construction sites during some point of their lives; (2) many have experienced unpleasant encounters with home builders and remodelers about personal residences; and (3) many had witnessed workers they believed to have been trade workers, standing around or leaning on shovels. When asked if they referred students to construction as a career, one counselor summed up the general consensus by expressing, "I recommend construction only to kids who can't, period!" (Interviews, 1999).

This situation is compounded by the lack of encouragement to pursue construction by other individuals that are important in the lives of young job seekers. For example, no longer do athletic coaches of high school and college sports teams demand that student-athletes pursue construction activities during off-season and summer vacation. Instead, athletes are often encouraged to take part-time work so they can participate in ongoing training programs, suck as lifting weights and running, associated with the athletic department. Similarly, few parents encourage students to pursue careers in the skilled crafts. One survey recently revealed that even skilled craft workers rarely recommend the construction crafts as a career for their children. In fact, 70% of the workers surveyed reported that they did not recommend skilled craft careers; the vast majority instead recommended that their children pursue a college education and opportunities that emerge from that endeavor (CII Conference, 1998). One CIP member reported that an informal polling of his trade revealed that only about 20% of members had encouraged their own children to pursue the craft (Interview, 1999).

The image is further compounded by the perception that there is no clearly defined career path in construction when, in fact, there are many career paths, but they have not been well publicized. The industry has not articulated the linkages and opportunities for advancement among the dozens of occupations in the industry. Neither the general public not the school counselor is aware of how a craft worker might become a contractor, an estimator, a business agent, a craft

trainer, or an engineer. Even many participants in the industry are uncertain about how to move from one occupation to another, or how the scores of occupations in construction are linked together.

Another situation also contributes to the image problem of the construction industry, in the organized sector in particular. That issue seems to relate to several factors, although there is relatively little quantitative research to support the contentions. A primary perception is that too often the union sector is viewed as over priced and either controlling of out of control. For example, in a recent survey conducted by the Angus-Reed Group for the Construction Labor Relations Association in Canada (1990), data indicated that project owners and decision-makers on contracts viewed the organized sector on large infrastructure projects. However, it was not an unqualified finding; project owners and decision makers also believed that in Canada (where it is somewhat easier legally to organize) unions have become "far too powerful" and that union demands have resulted in under-productive and overpriced projects. Moreover, the decision makers perceived that unionized contractors failed to deal adequately either with resolving work disruptions of initiating flexible scheduling. More recent conversations have revealed that the "overpricing" concern has been focused on the issue of labor rates of union workers without any knowledge of the emerging data on productivity differences that demonstrates that union workers greatly outpace the worker in the non-union sector (Allen, 1994 and Rice and Allen, 2000). However, the perception of image difficulties in the US arising form work disruptions also was voiced as an on-going concern by management and union representatives interviewed for this study (Rice, 2000).

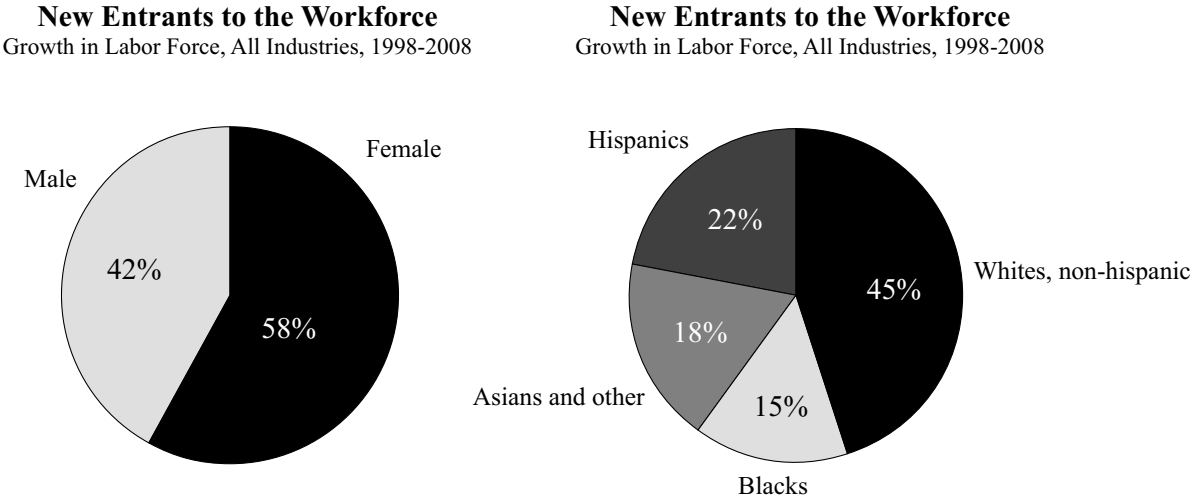
Changing Demographics. The demographics of the skilled workforce present an interesting and complicated picture for the construction industry. Data indicate that demographics are a contributing factor to the skills shortages situations and offer interesting potential solutions. The data suggest that the workforce in the construction industry today has the following characteristics:

1. It is more male and white than many other industries;
2. It is generally younger than the workforce of the total economy;
3. It loses workers out of the industry at an earlier are than other industries; and
4. It is older than it ever has been in the past.

The Department of Labor released a study entitled "Opportunity 2000" in the late-1980s with projections that revealed that the American workforce will grow slowly, become older, and be composed of more females and minorities, over the next 20 years. In addition, there will be fewer and a smaller percentage of white males – the group that comprises the vast majority of construction's workforce. Instead, the primary pools of new workers will include immigrants, minority men and women, and Caucasian women at rates of 20%, 20%, and 40%, respectively.

As illustrated in Figure 5: New Entrants to the Workforce, the actual growth rates vary slightly from the projections, but generally indicate that women and minorities are the most rapidly growing segments of the workforce (BLS, 1999).

Figure 5: New Entrants to the Workforce



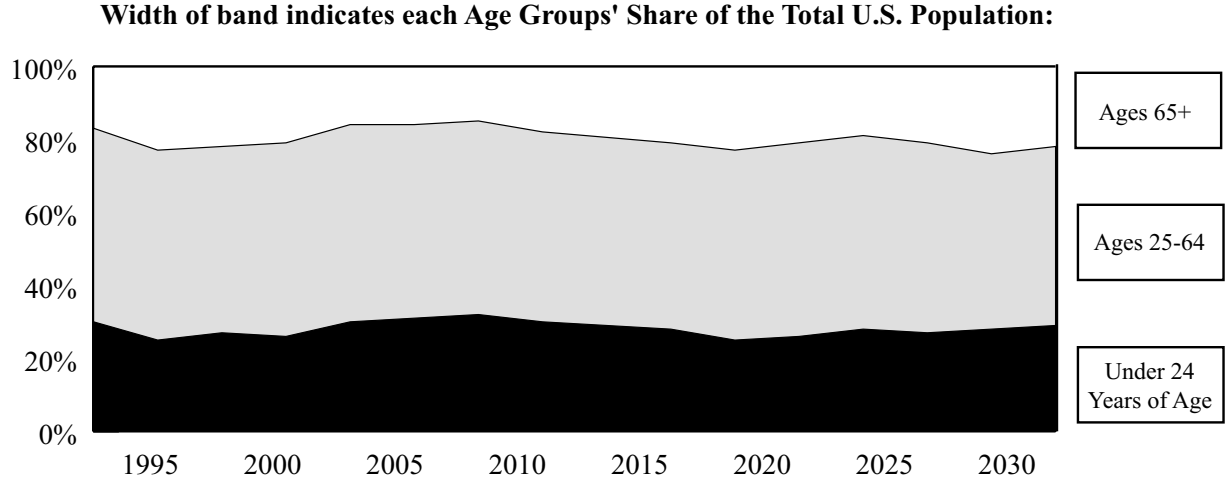
Given that the pool of available workers has been changing dramatically over the last decade, the question becomes, "Has the composition of the construction workforce changed with the pool?" The Center to Protect Worker's Rights (1997) recently analyzed demographic data on the construction industry that suggested that the industry has made limited progress in recruiting minorities into working for the industry. More specifically, the construction industry has held level at 11% of racial minorities including African Americans and Indigenous Peoples. The percentage of Hispanic workers has increased from 9% in 1995 to 19% in 2000 and is projected to reach at least 14% by 2020. Likewise, the percentage of Asian construction workers has increased 4% to 5% in the last five years. And while some trades and crafts have recruited extensively among the emerging pools of available workers, and, therefore, apprentice classes more closely reflect the general population, other trades have almost no minority membership.

And as apprentice ship classes have grown to incorporate additional numbers of women and minorities, apprenticeship instructors have begun to address the language issues incumbent with inclusion of immigrants. English language instruction is being incorporated as a necessary addition to related instruction; some training funds are seeking bilingual instructors to provide both hands-on and classroom based theoretical training; and both unions and management are grappling with how to ensure adequate communication at the work-site, especially between craft workers and supervisory personnel. The issue is particularly critical to ensure worker safety and because a number of high-hazard and of high security jobs have "English-only" rules.

The same study by the Center to Protect Worker's Rights (1997) also reports the percentage of women by industry. In that report, the data indicate that about 10% of the construction workforce is female and that most of these women work in clerical, administrative, or managerial positions. All but 2% of the women in construction work in these job titles, while relatively few work in the trades. While these numbers illustrate some growth, they do not yet reflect the demographics of the new pool of available workers.

Even so, because the absolute numbers of applicants is shrinking, the average age for the labor force is increasing. According to the Bureau of Labor Statistics, the labor force for all industries between the ages of 45 and 65 is expected to grow faster than any other age group over the next five years. The Center to Protect Worker's Rights has used Bureau of Labor Statistics to project each age group share of the total U.S. population from 1995 to 2030 as reflected in Figure 6: American Ages, 1990-2030.

Figure 6: American Ages, 1990-2030

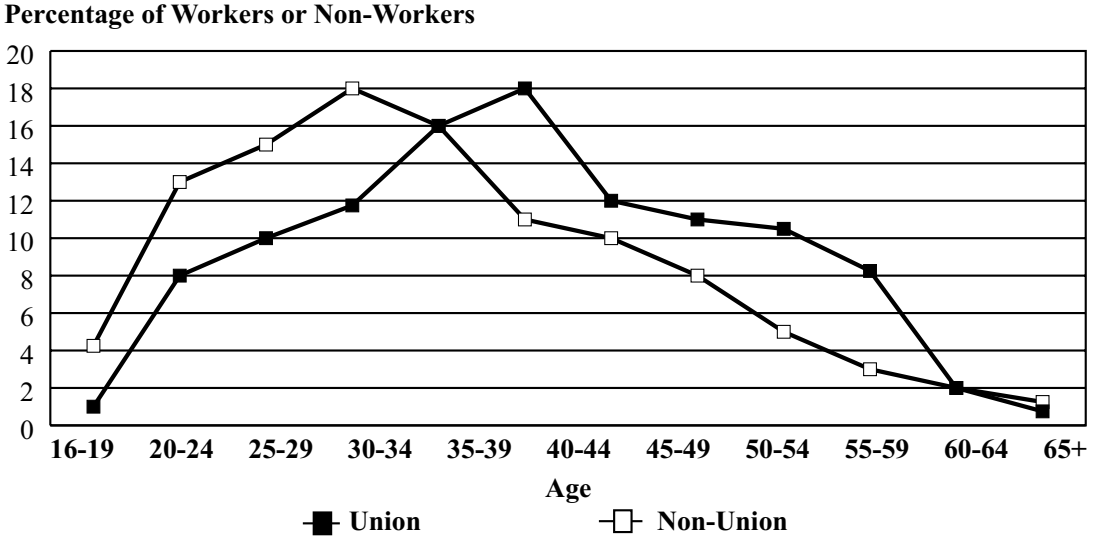


The 65 and older age group is expected to comprise slightly over 20% of the population by 2030; there simply will be fewer available workers of younger ages. This information means that employers well need to find ways to retain workers in the 45 to 65-year age group beginning in 2000. Yet, workers in the construction industry tend to be younger than in other industries as illustrated in Figure 7: Age Distribution of Workers (Bureau of Labor Statistics, 1995). The prime work years appear to be ages 25 to 44; after that age, many leave the construction workforce, in part due to the physically demanding and mobile (moving from one job to the next) worksites. In fact, these two elements of construction will make is more difficult to attract and hold "older" workers in the long term.

Figure 7: Age Distribution of Workers

However, the Construction Labor Research has studied age data over time and discovered that in the last decade, perhaps instead of attracting new workers from available pools of women and minorities, the construction industry instead has shifted to become a slightly older industry. That is, the portion of workers 45 to 55 years old has increased dramatically from 1988 to 1997 while the proportion of workers 55 and older has remained unchanged at approximately 9%. Equally interesting, the CLRC also discovered that the union construction labor force is older than the non-union construction labor force, as illustrated in Figure 8: Age Distribution in Construction, by Union Status (CLRC, 1998). The capacity of the organized sector to retain workers longer in their careers than does the non-union sector is due to improved pay, benefits, and safety. However, one of the unintended consequences of this situation is that the real impact of skill shortages has been delayed by keeping workers who in previous decades might already have left the industry. It also means that the retirement of skilled craftsmen poses a particular risk to exacerbating the skills shortage situation.

Figure 8: Age Distribution in Construction, by Union Status, 1995



As the Construction Labor Resource Council points out, "the portion of the workforce which is older varies widely by craft." Figure 9: Percentage of Older Workers depicts the percentage of workers in several age groups by various crafts within the construction industry (CLRC, 1998). It highlights, for example, the impending need to replace millwrights in the coming decade. So too, there will be a serious need to replace retiring operating engineers, pipefitters, sheet metal workers, electricians and bricklayers.

Figure 9: Percentage of Older Workers

	Age 55-64	Age 50-64
	%	%
Boilermakers	6.2	25.0
Bricklayers	10.4	16.2
Carpenters	6.3	12.9
Electricians	9.0	16.5
Elevator Constructors	2.1	15.6
Ironworkers	8.0	21.2
Millwrights	17.9	28.2
Operating Engineers	9.8	17.7
Painters	7.9	13.4
Pipefitters/Plumbers	10.8	21.0
Sheet Metal workers	9.8	16.3

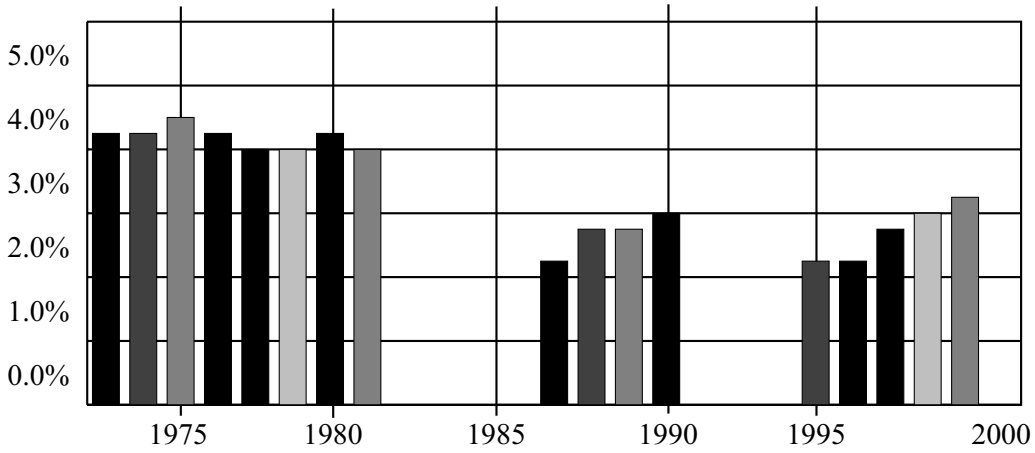
Under-Use of Available Resources. Another factor contributing to the skills shortages in the construction trades is the under-use of available resources. This factor contains two parts: (1) under-use of the apprenticeship and training system and (2) failure to clarify the career opportunities within the construction industry so as to produce and promote clear career paths.

Apprenticeship has been the method through which workers have learned the skilled crafts for thousands of years. It is a refined, honored, and well-established system through which beginning workers master the practices and theory associated with a chosen craft over time. The formal system involves earning while learning as apprentices work full-time and attend formal schooling that provides the related instruction portion of the apprenticeship. As illustrated in Figure 10: Apprenticeship Percentage of Construction Employment, 1973-1998, during the 1970s, a significant portion of the Union workforce was involved in the apprenticeship program. During that period of time, approximately five percent of the entire workforce was training in a formal, registered apprenticeship program. Typically, the programs lasted about three to four years with apprentices progressively mastering additional skill levels and earning higher wages at each stage of apprenticeship. Moreover, data suggest that the overwhelming majority of approximately 200,000 apprentices in the system during those years were associated with the construction trades.

During that time, the apprenticeship program provided two critical benefits to the organized industry. First, it provided replacement workers at about the rate of retirement within the skilled crafts. And while not all skilled workers came into the crafts through the formal apprenticeship and training system, the system enabled expansion of the construction industry with skilled craftsmen during this period.

Equally important, those craft workers who completed their apprenticeship program worked more hours and more often became superintendents and foremen (Marshall, Franklin and Glover, 1974). Not only were these journeyworkers who had trained as apprentices well-skilled in the craft, but also, they became the supervisors who have ushered in innovation in construction during the past 20 years. In fact, one could make the arguable case that a sizable portion of the rise in productivity during the 1990s can be associated both with changing technology and with the cadre of trade supervisors and master craft workers who were trained through the apprenticeship system in the 1970s.

Figure 10: Apprentice Percentage of Construction Employment, 1973-1998



Note: After 1990, Figures exclude CA, NY, NC, VA, WI and 11 others

However, during the recessions of the 1980s, the apprenticeship and training system fell on "hard times." Not only were the number of "man-hours" worked in the skilled crafts significantly less than they had been in the previous decade, but also, many of the apprentices in the system were unable to maintain continuous employment. Therefore, they lost "standing" in apprenticeship of simply left the skilled trades for other work opportunities. Even those who completed training had difficulty finding work. Equally important, the most talented apprentices usually left the system because they found greater opportunities elsewhere. As illustrated in Figure 10, relatively few apprentices were involved in construction during the height of the recession in the early-1980s; the situation during the late-1980s and early01990s, while showing some improvement, still has resulted in only about 3% of the construction workforce actually being individuals of the construction workforce actually being individuals indentured in the registered apprenticeship system.

As a result, two problems arise from that situation: the total number of apprentices involved in the apprenticeship and training system does not equal demand, and the distribution of apprentices across trades is uneven and not necessarily matched to specific need. Too few apprentices being trained. The U.S. Department of Labor Bureau of Apprenticeship Training reports that only about 65% of the 280,000 registered apprentices work in the construction industry. That number suggest that there are about 180,000 construction-related apprentices being trained in registered apprenticeship and training programs. That number is not enough graduates to meet the replacement needs of the trades, let alone match the estimated number of skilled craftsmen needed each year for the next 10 years. For example, the BLS estimates the actual needs of the construction industry in the United States. At best, the registered apprenticeship programs will produce approximately 45,000 apprentices per year over the next four years; that number is approximately one-quarter of the most reliable estimates of the actual skilled labor needs

of the construction industry. As one member of the CIP put it, "Our workforce is getting older, yet we are not training enough skilled craft workers to replace those who are lost to retirement, much less to meet expansion needs." (Interviews, 1999).

Two quick measures of how well the training resource is being used can be derived. The first can be found by comparing the numbers of trainees in formal apprenticeships with the number of working members in the 50-64 year-old age group. Several jointly trusted training trusts looked at this calculation, recognized that the apprenticeship and training program is in under-used resource, and moved aggressively to expand their apprenticeship roles. Many other trades have not yet recognized that the under-use of this resource is a contributing factor to skills shortages. In fact, the phrase offered by at least three members of the CIP sums up the overall situation of the use of apprenticeship as a resource. As these members individually stated, "Apprenticeship remains the best kept secret in the construction industry and in education in the United States." (Interviews, 1999). Even so, notoriety alone will not address the issue, it will require resolve to redress the issue.

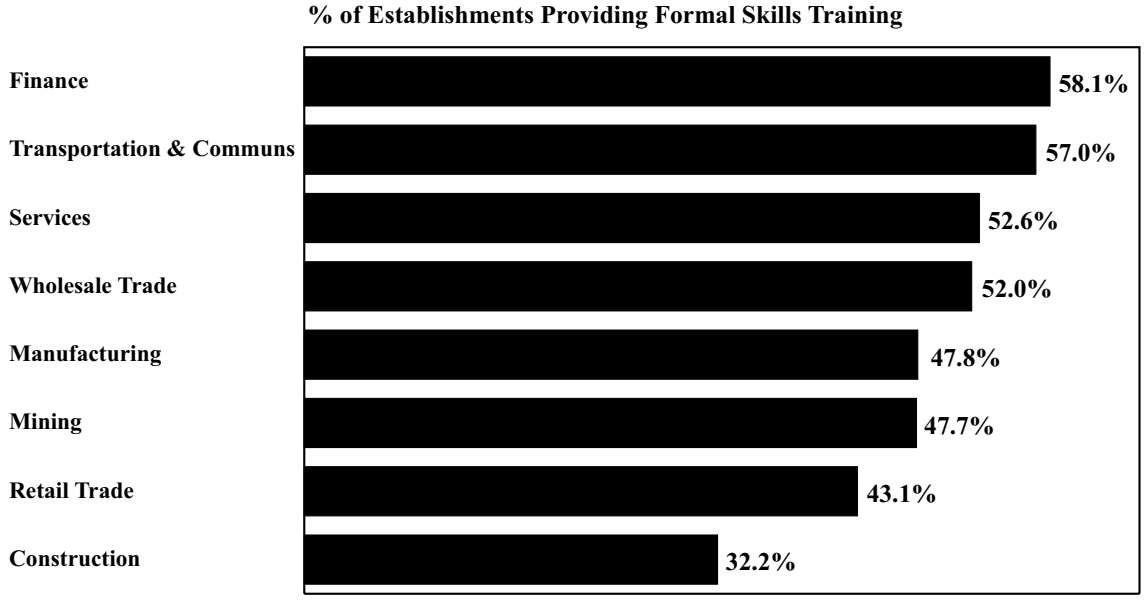
The second measure of utilization of the training resource can be found by comparing training capacity with use and opportunity. Data from the organized sector indicate that each year well over 3,000 trained trade instructors provide instruction to over 350,000 apprentices and journeyworkers in the trade at more than 2,000 training facilities. Over 175,000 of these workers are apprentices; thus, while journeyworker training is occurring, it is reaching only about 15% of eligible members each year. Additionally, in some crafts, almost no journeyworker training is provided.

The second part of the Under-Used Resources factor is the career path within the construction industry. As a recent *Engineering News Record* article points out, "construction employment is thought [by the general population] to be short-term and transitory work that lacks stability and clear career advancement" (ENR, 1996). Several reasons account for an unclear path. First, a survey of CIP members revealed that few organizations had considered developing a career path as a strategy, and in fact, it is a relatively new idea within American industry. Second, in the U.S., publicly expressed career paths always have been linked directly to formal education and training. However, as illustrated in Figure 11: Percentage of Establishments Providing Any Formal Job Skills Training by Industry, 1993 (The Construction Chart Book, 1998), the construction industry ranks lowest of all major industries in the United States in providing formal training to its members. Historically, most of the construction organizations that provide training are in the organized sector as workers are trained in registered apprenticeship and training programs, union officials are trained enough through the National Labor College and in union training efforts, and contractor staffs are trained through the programs of contractor associations and formal higher education.

Third, training in the construction industry has been isolated. Rarely has construction training been integrated into the formal fabric of the education and training systems in the United States. With the exception of some innovative programs during the 1970s and until individual trade and Building Trades Department initiatives during the last three (3) years, there has been

relatively little articulation of apprenticeship and training with the broader education system in the United States. Therefore, there was no systematic way that a worker entering a construction trade could move in and out of formal education or receive credit for the training that they have received at work toward continuing career growth in the industry.

Figure 11: Percentage of Establishments Providing Any Formal Job-Skills Training by Industry, 1993



In general, the industry has been isolated from the formal education and training community. People move in and out of various career positions from the trades to supervision, to safety specialists, to managerial positions with little regard to a formal system of advancement. Some jobs require field experience while others do not; relatively few jobs or degrees provide credit for life experience and skills that workers may have mastered in the field performing work; relatively few articulation agreements exist among institutions and the industry; and almost no understanding of how a career path might work within the industry can be found. It is little surprise that in response to a question about career path, several guidance professionals responded by saying that they viewed work in construction as "a dead-end opportunity with no chance of continuing advancement" (Interview, 1999).

Lack of Targeted Recruitment Strategies. Historically, within the entire company, individuals have found work primarily through connections with other people and word-of-mouth referrals. This situation has been true not just in the construction industry, but also in other industries where over half of all jobs are found through these methods (*Occupational Outlook Quarterly,* 1976-1990). However, the tight labor market of the late-1990s, coupled with the movement toward more high-tech specialized skills, has resulted in the situation where workers with-

in the entire economy are finding jobs not simply through word-of-mouth, but also through intentional recruitment efforts made by industries and companies. These efforts now often include job fairs, recruitment agencies, signing bonuses, benefits and choice of benefits. The construction industry, however, with the exception of participating in school job fairs, has over the last several years have indicated that most of them found their way into the skilled crafts through word-of-mouth and/or connection of family or friend. Relatively few apprentices found their way to skilled craft training through the primary means of recruitment that the industry has used, especially apprenticeship programs—advertising through employment agencies and newspapers or school job fairs. (Rice, 1996).

A review of apprenticeship standards indicates that the primary means of recruitment into skilled crafts as expressed in Affirmative Action Plans has been through public service announcements and newspapers ads. The data suggest that few other intentional targeted activities have been undertaken within the construction industry.

A quick view of information from places that serve available pools of potential new entrants confirms this finding. For example, a review of the information in several guidance offices produced relatively little information on the construction industry. Aside from pamphlets on home building an generic descriptions of different occupations in electronic occupational description systems, little information was available. In addition, the guidance counselors could not supplement that information with personal experience about the value of the construction industry or the career possibilities within that industry.

However, there are some recruitment efforts ongoing in the industry; specific activities to attract new entrants reveal some good ideas, but no overall concerted strategy for recruitment. Among the specific activities are at least the following:

- **Some innovative school-to-work programs appear to pay dividends in recruiting new workers to the skilled crafts.** However, these programs are the exception, not the rule. Formalized school-to-work is a relatively new idea to all industries including the construction industry.

- **Most programs participate in work/job fairs in local schools.** However, schools have not been an international high-priority target of the construction trades recruiting effort. Relatively little information on the industry has been provided and little effort has been generated to educate and convince guidance counselors and vocational education teachers to encourage and refer able and qualified students into the construction trades. Also, other kinds of novel career exploration activities that have occurred with other industries such as field trips, job shadowing, mentoring, interactive CD-ROMS, video tape presentations, and guest speakers typically have not been developed with the construction trades, in part due to insurance issues that disallow minors on construction sites and in part due to no one undertaking the activity.

The construction trades have identified a limited number of pools of available individuals for recruiting into the industry; high school students, Job Corps participants, women in construction programs, and some local job service systems. Largely ignored have been other potentially important and accessible pools of individuals including at least the following: individuals exiting the military service who have transferable skills and/or particular construction skills training (the Building Trades Department's initiative with the military over the last year is working to resolve this problem); community college students; early leavers from four-year colleges where over 50% of high school seniors who enroll do not finish; Community-Based Organizations, particularly in both urban and highly rural areas, which provide services to pools of youth and young adults; reduction-in-force workers from plant closings and base closings; churches, particularly in rural areas and that serve immigrant populations; and immigrant community organizations.

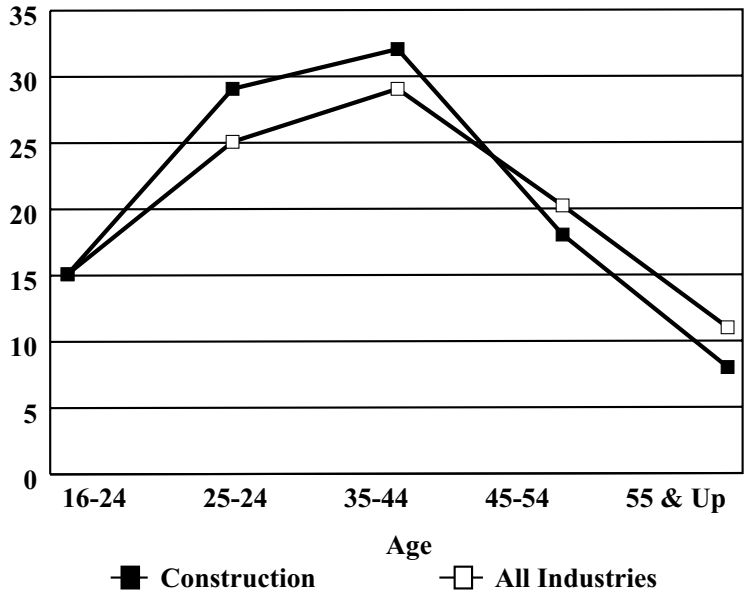
The evidence indicates that all these potential pools of applicants would be responsive if the construction industry designs the right message, chooses the right media, and develops specific training and services that meet the needs of the characteristics of each of the pools of applicants.

Poor Retention of Workers. The issue of retention has received little attention in the literature as a contributing factor to worker and skills shortages. In a recent study entitled "Maintaining Skilled Construction Workers" (Weldzius, 1998), researchers addressed retention; however, their concern was how to keep workers on a single job through completion of that activity for open shop contractors. These researchers did not address how to maintain skilled craft workers in a given trade or in the broader industry for a longer period of their work life. Indeed, this latter issue is the subject of this White Paper.

As pointed out in the data previously cited from the Construction Labor Research Council (CLRC, 1998), construction craft workers compared to other occupations find their prime working years from ages 25 through 44 as illustrated in Figure 12: Work Force Age Distribution for Construction and All Industries. The data further illustrates that there is little difference in the portion of construction workers under 25 relative to other industries, suggesting that historically, construction has attracted its share of new entrants; rather, the difference occurs in that skilled craft workers are less likely to remain in the construction industry through what is generally considered their full working life. They leave the construction trades during their 40's to pursue other opportunities. The reasons they leave are just now being investigated but include factors such as the difficult physical labor involved in construction and the toll that it takes on bodies as they age; movement into other industries that use their existing skills but which provide steadier work and other more desirable working conditions; the opportunities to pursue occupations in industries with clear career paths, given that most adults now work three distinctly differently occupations during the course of their work lives; and the fact that many workers complete 20 to 25 years for

their construction pension and decide to do something else with the rest of their lives. As a result, the construction industry loses many of its most skilled workers at a time when their skills are at maximum levels in terms of safety, experience, quality, and the capacity to solve problems.

Figure 12: Work Force Age Distribution for Construction and All Industries



The retention issue is compounded by demographics and lack of awareness in the entire economy about how serious the problem may be. As pointed out by D H Powell, the Director of Behavioral Science at Harvard in his recent book entitled The Nine Myths of Aging: Maximizing the Quality of Later Life (1998), after the 1960's, there has been a baby bust" cohort. Between 1978 and 1989, there were about one million (1,000,000) fewer births per year in the U.S. than had occurred between 1950 and 1970. The result is that from 1990 to 1997, employees over the age of 50 increased by 21%, while the overall number of employees increased by just 9%.

Relatively few industries have recognized or adjusted to the realities of older workers. As Dr. Powell points out, "It looks like only about 10% of senior executives seem to be aware that this [failure to retain older workers] is a problem. Probably not more than 15% of companies [and maybe none in construction] have any kind of program in place to retain older workers. And, the baby boom-to-bust transition is very real. The statistics don't lie. If companies continue to ignore the aging workforce problem, what's going to happen is that they will completely stress out the employees they have 'on board.' There will be an epidemic of migraine headaches, gastrointestinal problems, high blood pressure, and heart problems. In short, [most] companies will not be able to retain or attract workers from their mid-forties on."

However, with some crafts, age is not the only retention issue. There also is a retention issue in terms of maintaining skilled craft workers through the term of their apprenticeship. The cyclical nature of the construction industry-given that work is subject to both "boom and bust"

economic cycles as well as inclement weather-results in large number of craft workers finding alternative employment during "bad" times and continuing with that alternative employment. And while the alternative employment usually offers lower dollar-per-hour returns than does construction, it may offer many more hours of work per year and/or work at a fixed location and/or usually work located where environmental elements are not an issue. Union records indicate that typical construction workers may average 1,600 to 1,700 hours per year in a work year of about 2,100 hours.

Retention in registered apprenticeships for some trades is strong, but could be stronger. Apprentices who drop out seem to do so for several reasons in addition to the cyclical nature of the industry, including the following: (a) the need for a higher wage more quickly than that allowed by advancing through the last term(s) of apprenticeship; (b) difficulty with the rules/terms of apprenticeship; (c) difficulty with successfully completing the training; and/or (d) feeling alienated from and not being integrated into the "community" offered in a specific trade situation.

Interviews with CIP members suggested that both the low starting rate of pay in some apprenticeships and/or relatively slower progress toward higher pay rates in the later terms of apprenticeship contribute to apprentices leaving the program before completion. As one member states, "Sometimes apprentices late in their terms believe they can command a journey worker rate elsewhere [in another region or with a non-union contractor] and leave the program. Too often, we lose them as a union member and a resource to the contractor." Another CIP member expanded on the idea by adding, "And too often, they get an 'attitude' about unions because they think they were being exploited just before they decided to leave." (Interviews, 2000)

Several CIP members also addressed the issue of apprentices either being unable to succeed in school or being unable to live by the rules and terms of apprenticeship and training systems. CIP member perceptions tied together these two factors. They perceived that sometimes top-of-the-class apprentices have become disgruntled if/when standards have been relaxed to accommodate other apprentices who either have stretched rules or who may be having difficulty performing. Instead, members advocated "tightening apprenticeship standards to help ensure quality and providing additional training and educational assistance so apprentices who they hired."

B.J. Vondersmith, Executive Vice President of the Mechanical Contractors of Maryland, offered an even more detailed suggestion about the idea when he wrote, "We [must] provide assistance to those [apprentices] who are not among the academically sturdy, but who nevertheless show up for work on time, work productively, respond to direction and suggestion, come to school faithfully, and try hard to succeed knowing they lack some basic skills" (*Count Comment,* 1998). Taken together, this data suggests that retention is an issue that contributes to the workforce shortage and that some strategies to address the issues of retention might provide a short- and medium-term solution to the growing skills shortage.

Changing Preferences and Skills of Target Groups of New Workers. Data on the generation emerging from high school and college between 1995 – 2010 suggest that this group of individuals has somewhat different interests, skills, and values than previous generations. Among the things that this generation of young people value more centrally than in previous generations, according to survey research are: money; benefits like paid vacation; visual stimuli; technology; intellectual challenges; and creature comforts. They work well with cause and effect and incremental reinforcement. May young people prefer not to work outdoors and have had relatively little experience with physical labor. In fact, public health information illustrates that the new generation is the least physically-fit and most obese in the history of the United States. Their personal biographies include little physical work (Public Health Service, 1999). The games they grew up playing were video and computer games rather than physical activities; their attention spans and willingness to experience delayed gratification are shorter than previous generations. Therefore, they seemed somewhat ill-suited to work in the construction industry where tasks often include working in the elements and usually in physically demanding ways.

However, some of the other issues are manageable within the construction industry if the industry decides to promote its characteristics as strengths rather then allow them to be viewed as liabilities. For example, new technology is rapidly being integrated into the construction industry; physical work can be viewed as a challenge; there is a terrific opportunity to work on a team to produce a product that will last for generations; and there are different problems to solve every day at work. Likewise, local participation on the Site Safety and Health Committees has resulted in dramatically improved safety records in the industry in the last ten years. However, these opportunities seem to have been largely ignored.

Even some of the changing preferences of new young workers might be addressed positively. For example, the on-going study of the Building and Construction Trades Department of temporary employment services for manpower suggests that several adaptations of personnel practices may be received favorably by the younger worker-daily pay in cash, web-based job listings, and benefits menus are elements that temporary workers express as a value.

Further complicating this issue of changing preferences are the lack of basic skills this new generation brings to the industry. Overall standardized test scored as well as the experience of training funds and employers suggest that basic skill levels are poor, making apprenticeship training more expensive and longer. As one training trust fund administrator suggested during an interview for this project, “We spend fully 30% of our training budget providing basic skills to new members who should have left school with those skills in the first place.” (Interview, 2000). CIP members echoed similar concerns as they indicated that “many apprentice applicants cannot succeed with the entry requirements;” “applicants and too many new apprentices lack even basic math and reading skills;” and, “we have difficulty finding apprentices who can do the work.”

The literature review for this project produced studies and projects that also support this issue as a problem. For example, one study of training offered in smaller companies (Vencill and Others, 1991) illustrated that successful basic skill training programs for workers were necessary because too many workers were unable to perform their job satisfactorily because of inadequate

basic skills at the time they were hired. Moreover, the researchers agreed that necessary basic skills training had to be targeted at fourth- to eighth-grade skill levels to reach the trainee because materials at the 12th grade level were too difficult for trainees to use successfully.

Internal Barriers. Interviews and discussions with CIP members as well as members of the Committee reveal a number of additional barriers and issues that contribute to the skills shortage issue. Each of these issues is an internal issue:

- **Location of training sites/facilities.** The location of many training facilities suggests that the programs have been moved away from population centers. Many sites cannot easily be accessed by public transportation or even easily reached by urban populations that own cars. Further, there often is little ongoing dialogue between urban officials who often serve as project owners and the training program officials. Additionally, the more remote locations separate the training locations from both the workforce and a relatively undeserved/underused urban pool of new workers.

- **Entry/selection requirements.** The entry and selection requirements to apprenticeship may be a barrier to some programs. While high standards are critical, the requirements must accurately reflect the skill needs of successful participants and skill levels of successful journey workers in the craft. Some crafts have not reconsidered apprenticeship and training standards for many years while other crafts may be using entry requirements as a substitute for skills because "nothing better is available." The real issue is to ensure that the requirements are valid. In addition, some apprenticeship programs continue to use limited enrollment periods to apply for apprenticeship, a practice that limits the number of applicants.

- **Involvement in programs.** Few contractors seem to work closely with training, either in specifying content or in ensuring that adequate numbers of apprentices actually work. It appears that few programs actually achieve their maximum specified ratio of apprentices to journey workers. Additionally, as several CIP members stated, "Sometimes it seems like contractors simply concede to or assume that unions will take care of training issues." In other situations, it seems that training staff seem to "fail to pursue information consistently from contractors" (Interviews, 2000)

- **Inadequate projections.** There appears to be little systematic effort or easily-used methodology for accurately projecting future work or future labor needs in a specific region. Moreover, the question of how to factor economic cycles into manpower training needs remains an issue that has not been successfully resolved.

- **Program Quality.** While most jointly-trusted training programs are excellent, some appear to have difficulty in several areas including monitoring on-the-job training; rotating apprentices through all phases of work activity; updating standards and related instruction curriculum; and better coordinating the issues of competency acquisition and time requirements in apprenticeship. Moreover, some crafts do not focus on training beyond apprenticeship, although that need continues to grow. In the open-shop sector, training programs often are absent altogether, or of highly-varied quality and duration. Relatively few programs are registered apprenticeship programs, and the completion rates are suspect.

- **Valuing unions and joint labor-management cooperation.** It appears that some crafts pay very little attention during related instruction to several critical ideas. For example, some fail to address the value and necessity of labor-management cooperation as a topic in related instruction. Others fail to teach explicitly the value, roles, and benefits of unions. Still others have not fully capitalized either on the potential relationship between providing member services and retaining workers long-term in the trade or on developing a social and community bond with apprentices during training. Each issue diminishes the value of the organized sector and potentially diminishes its ability to expand market share.

Existing Activities and Best Practices

Several existing activities and "best practices" demonstrate effective ways to help to overcome the skills shortages that exist within the construction industry. Upon examination, most of these strategies work especially well in the organized sector because of the structure that joint labor-management activities offer as a foundation and a means for sustainability. In the following discussion, each barrier is addressed in terms of activities and selected "best practices" that have been shown to help alleviate it.

Eroding Wages in Construction. As one member of the CIP stated, "If the question is not money, then the answer *is* money." (Interview, 1999) Several programs have found that adjusting wages and benefits may be one part of an answer for dealing with the issue of skills shortages. For example, several trades have increased the starting wage for the first term of apprenticeship from 40% or 50% of the wage of a journey worker to approximately 60% to 65% of the wage of a journey worker. This adjustment allowed the beginning wage to advance considerably beyond the amount currently paid in fast food and other entry-level jobs and, therefore, attracted more potential job applicants. In fact, this change together with a targeted promotion has resulted in expanding the applicant roll to more than double the number of slots available for apprenticeship for the first time in ten years in some trades.

However, adjusting the beginning wage is not the only answer. Programs that have begun dealing with the issue of wages also have adjusted the ongoing apprenticeship wage throughout the term of apprenticeship upward to keep apprentices in the system through graduation. So too, some trades are using performance testing in conjunction with experience to more rapidly advance individuals through apprenticeship. Moreover, a number of crafts have looked at other ways to adjust benefits. For example, some trades have waived the initiation fee for beginning apprentices and then pro-rated it over time so that it is paid later in the term of apprenticeship. Still other trades have reapportioned benefit contributions during the apprenticeship period. The apprentice's pension account is "credited" with time, but the money is actually carried on the check rather than as a contribution as a way to boost initial income. Still other trades and some open shop construction companies have created a menu of benefits that can change as members age. That is, early in a member's life when the actual dollars on the paycheck may be most important, that opportunity is available. Somewhat later, as maternity care and health issues become more important, that option takes precedence; even later, as welfare and pension issues come forward, those opportunities become part of the package. These crafts also are experimenting with creating funds that allow members to take paid vacation, sick leave, scholarship funds, and other kinds of benefits that historically may have been available in some industries but have not been available in the construction industry. Moreover, some crafts, through joint labor-management activities, are even investigating benefits such as childcare, mortgage loan programs, and other types of services and benefits that more closely match the actual needs and desires of the membership.

Some contractors and trades are adjusting work schedules as a temporary measure to help deal with the image issue. More specifically, as reported in both the *Engineering News Record* (1999) and *Craine's Detroit Business* (1999), project schedules have been lengthened and sequenced in metropolitan areas so as to provide more continuous employment for skilled workers. Some work even has been scheduled according to the weather to better sustain the work. Additionally, many job planners have begun scheduling overtime work-schedules of at least 6-10's as a strategy to boost pay and attract skilled workers in the region to a job.

Various areas of the country are negotiating "pay-for-skills and training" into collective bargaining agreements. That is, journey workers receive their pay increases only as they successfully complete additional, advanced training. Thus, as their skill base increases, their paycheck grows.

Poor Public Image of the Construction Industry. As previously discussed, the negative image of construction makes recruitment increasingly difficult. The negative image is especially strong within the general public and among guidance counselors. However, two strategies show particular promise for rebuilding a positive image for the industry: (a) integrating and presenting the skills of labor and the capacity of signatory contractors as a business within the community and (b) training guidance counselors.

The organized sector of construction always has recognized that labor is a type of business, but rarely have integrated themselves into the local or regional business community. However, in the last few years, local business agents in some crafts in a few areas have taken a different approach. For example, several ironworker business managers/agents have aggressively pursued the "business perspective," even in "right-to-work" states, with very positive results. In one area, for example, this perspective has increased market share by over 1000% in 10 years – from three to more than 40 signatory contractors, from 100 to about 800 working members, and from a dozen to almost 200 apprentices. Working from the business perspective has exceeded a full-time job for the Business Manager, but his success has enabled him to hire additional agents to perform other tasks.

The "business perspective" is a simple but comprehensive idea for how to approach union construction. It includes the following factors:

1. Skills are addressed as a commodity for sale.
2. The local union managers and agents join and actively participate in the Chamber of Commerce and other civic organizations.
3. The local "organizes" by marketing directly to/working with project owners like the Airport Authority rather than contractors, but they market union skills and union contractors.
4. The local union markets skills training through apprenticeship as an alternative to and/or in addition to college.
5. The local and the apprenticeship program provide a great deal of community service through participation in projects ranging from park clean-up to the United Way.
6. Union officials serve on various community boards and participate in local decision-making.
7. Union officials and the apprenticeship program intentionally teach and demand that members be aware of and maintain a professional image, on the job and in the community work. This means talking with and not harassing non-union workers; avoiding harassing the public; giving a day's work for a day's pay; and taking pride in their craft.
8. Union officials and members avoid harassing union signatory contractors. They do not picket or stop work; they look for ways to partner.
9. Union and apprenticeship officials publicly discuss and are involved with the quality of life issues like those that the union historically championed such as child labor laws; mandatory public education; and the 40-hour workweek.
10. The local operates the hiring/referral hall on a "call by name" basis and guarantees that the contractor will get the person he requests and/or the specific skills he asks for, the next day.
11. The apprenticeship-training program regularly hosts community events and involves local politicians in its activities.
12. The union has worked with employers to reduce and more accurately deal with "workers compensation" issues.

13. The local consciously markets itself as "new labor," without ties to the past image of the industry.

A second successful strategy is being used in the greater St. Louis area where several members of the building trades designed and operate a summer program called Building Futures/Foundation for Success to train school counselors and teachers about the building trades. The program functions similar to a summer camp where counselors and teachers come to the training sites of the carpenters, laborers, and floor layers to experience hands-on skills, consider the basic skills necessary to succeed as a craft worker, learn about opportunities in union construction, experience craft training, and work on their own lesson plans and/or presentations associated with the experience.

The program, now in its third year, is too new to thoroughly gauge success, but the interim products – lesson plans; video tape about opportunities in union construction; and presentations to school boards, PTAs, and student groups are "first quality" materials, and are receiving a great deal of exposure, and are generating positive feedback. For example, not only has "word-of-mouth" information generated a waiting list to participate, but also positive feedback has resulted in school officials having contributed additional analysis of trade tasks to further refine and develop the in-school curriculum in math to accommodate craft needs. Additionally, the program has begun to generate apprenticeship applications for participating trades.

The program began with a grant as seed money to cover initial cost. Counselors and teachers are paid $500 each for attending the program and another $250 for preparing and using their lesson plan and presentation. Additionally, the Training Funds pay their own instructors for teaching participants as well as housing, feeding, and purchasing supplies used in training. However, rough estimates suggest the program operates at a cost of less than $1,000 per participant.

Among the factors and characteristics of the program are the following:

1. Teachers and counselors are those school officials who are in positions to directly refer and encourage students to enter the construction trades.
2. Participants are paid to participate, but on a sliding scale where they receive incremental pay for different levels of participation.
3. Participants can receive continuing education units or credits (CEU's) for participation.
4. The curriculum is broad-based, includes a great deal of "learning-by-doing;" and enables participants to experience part of craft training-as well as see/use facilities and instructional materials, and trainers.
5. Participants attend a follow-up dinner in the Fall to discuss how they used the Summer experience in their classroom, presentation, and job.
6. Participants experience a wide array of training-safety, basic tool use, classroom theory, and hands-on practice in at least three different occupational functions. They get to see how related instruction and hands-on training fit together.

Changing Demographics. Some internationals have recognized that minorities and women are potential skilled craft workers and are working to recruit them. For example, the asbestos workers, the ironworkers, and carpenters in the Southwest have recognized that the Hispanic community in that geographic area may be a fertile source of new applicants. Therefore, they have worked with both their existing Hispanic members and Hispanic community-based organizations (CBO's) to recruit specifically in that community. Among the recruiting techniques that have proved successful are creating literature and mementos such as T-shirts that are provided to members and potential applicants; offering English training to members and their entire family at union halls and training centers in the evenings and on weekends; hiring an "organizer" from/within the community who speaks the language, belongs to civic groups, and is favorably regarded; providing assistance with immigration processes; helping new members secure a GED; and working with community-based organizations to get the organized sector message of work, wage, and training opportunities into the community. Each of these crafts has found that formal education may not be fully available (or may not be perceived as available) to this immigrant population; therefore, at least some related instruction often is provided in Spanish as well as English.

Another "best practice" program to deal with changing demographics has been the Women in Construction and Apprenticeship and Non-traditional Employment for Women (ANEW) programs in areas such as Seattle, Chicago, and other metropolitan areas. Typically, the successful programs include a long period of pre-apprenticeship (up to six months for those who do not qualify for immediate entry into apprenticeship programs) where women master a series of skills and knowledge including tool recognition, tool use, materials recognition, and worksite norms. Programs also feature unique characteristics such as a selection technique that helps ensure that the women who are selected for the program have a high likelihood of succeeding. A two-appointment interview is used for intake, and then the applicant is asked to shape-up (assemble at work sites for job selection) with the program for two continuous weeks. ANEW helps applicants arrange childcare and to deal with other family matters before the shape up begins. The physical and psychological demands of the shape up (including harassment at the shape up sites) and the daily routine give the applicants a foretaste of what blue-collar work will be like. By the end of the two weeks, fifty percent of the applicants have changed their mind and the remaining women will likely last out the program and succeed on the job.

The program provides an extensive and comprehensive training program for the survivors. In addition to skills training, the curriculum includes training to help them develop gender-awareness, courses in women's and Black and Latin history, a course in civil rights law, a course in physical fitness to increase strength and stamina, and a course in nutrition. The technical and job skills training includes math, shop, tool recognition, trade exploration, and blueprint reading.

After the woman completes the training, she is helped to market herself to developers, contractors, and unions. They write letters, hold meetings, network, and try to develop sympathetic proponents with access to the employer. Most program graduates become apprentices and over half become journey workers.

Under-Use of Available Resources. Several trades have worked aggressively to expand the use of existing resources as a strategy to help address skill shortages within their industry. For example, several trades have dramatically increased the size of their apprenticeship program to bring new trainees into the system. Their apprenticeship programs now number several thousand apprentices in each region in the United States. And while no trade yet has sufficient apprentices in the system to match the number of journey workers who are retiring, the gap between the number of apprentices achieving journey worker status and the number of master craftsmen retiring is narrowing in several trades. Other trades have created relatively new apprenticeship programs to expand their numbers in an effort both to match the number of skilled workers who retire each year with those who are completing their apprenticeship program each year, and to generate enough skilled workers to enable signatory employers to expand market share.

Many trades have expanded their trainer-training programs to accommodate new apprentices. They have formalized Instructor Training/Development Certification programs that train master craft workers to become effective instructors, both in trade skills and during related training. The cadre of trained and certified instructors ensure that the number of apprentices that the system can successfully serve can be expanded sufficiently to meet retirement and expanding workforce demands within their industry.

For example, the United Association (UA) program (United Association of Journeymen and Apprentices of the Plumbing and Pipefitting Industry of the U.S. and Canada) was the first formal trade-sponsored Instructor Training Program. Now in its 46th year, the program operates at Washtenaw Community College and in conjunction with Michigan State University. The program operates annually as a 40-hour event as participants work toward completing a 200-hour program over five years. The UA Instructor Training Program serves almost 1500 trainers each year in two types of courses-professional courses that address teaching skills, and technical and/or hands-on courses that deal with technical aspects of related instruction and trade practices. Individual participant coursework is evenly divided among the two types of courses during the initial five-year training program. However, after completion of the fifth year, instructors are invited to continue participating in more extensive, multi-day courses in either technical or professional subjects.

In addition, several crafts have formalized articulation agreements with institutions of higher education that provide a start on the career path in construction and offer formal credit for completion of apprenticeship programs. Articulation agreements link specific courses and amounts of credit to specific groups and types of work experience. For example, several crafts recently have completed an articulation agreement with the National Labor College through which registered apprentices are simultaneously enrolled in college and apprenticeships. Then,

as they complete their formal apprenticeship program, they earn, in addition to journey worker status, either a two-year Associate of Arts degree or credit toward a four-year bachelors degree in Technical and Professional Studies. Other crafts not only have a two-year degree option, but also through other institutions have a four-year degree option in construction management that builds from the two-year degree. The Building Trades Department continues to work on programs for other affiliates with the National Labor College.

In many cases, the two-year degrees can be applied to continuing study in any field, but are particularly appropriate toward continuing study in fields such as construction technology, safety and health, labor-management relations, and a variety of fields in engineering. Moreover, the articulation agreements enable the college advising departments to begin to understand the construction industry and to build it into their everyday work with students. It also allows for an understandable message to be provided to high school career counselors who provide guidance to students as they consider careers from the eighth grade forward. The degrees and linkages allow students to gain a career and earn college credit at the same time.

The electrical industry and the Laborers each have undertaken the strategy of developing their career paths as a way to expand on existing resources. In each case, the joint labor-management group analyzed their work and identified the occupations within and closely associated with their work. (Each found more than 60 distinct occupational titles). Further, they investigated transferable skill sets and required training among identified occupations and are formalizing the information as a career path document to help explain the opportunities within the industry to members, potential new workers (and their families), and school officials. The documents also will be used to expand and sequence additional journey worker training and to forge articulation agreements with institutions of higher education.

Still other crafts are discovering that the local union and its business managers (agents) may be valuable and under-used resource. They have encouraged local union leaders to expand recruitment *and* contractor contracts jointly. As one member of the CIP put it, “Local union leadership is an under-used resource. In those places were skilled labor is viewed as a commodity and business decisions are made by the union on that basis-to assure its availability, there is rebuilding occurring. The agent is growing both the number of apprentices and the contractor base.” (Interview, 1999)

Lack of Targeted Recruitment Strategies. Some crafts and training programs have begun creating targeted recruitment activities for specific pools of potential applicants. That is, the industry sector has identified a pool of potential applicants in which they are interested and have designed a message and picked a medium to reach that particular pool. For example, the Building Trades Department is working on a project with all crafts to recruit from the military. This effort will include promotion as well as procedures to ease the transition from military to civilian life, with appropriate credit from military work and training applied to craft apprenticeship.

Other crafts also are experiencing improved recruitment through specific targeted promotion. For example, the electrical crafts/industry have created a series of ads and interactive CD-ROMS through which to reach out to schools and convey the message of the opportunities in the skilled trades to students. In this case, the industry studied the target audience-the preference for technology-based information; the preference for interactive opportunities; the visual learning style; and the message of money-and incorporated each of those characteristics into the targeted promotion. Additionally, they intentionally included a message that promotes and explains the career path in electrical work in the video.

The program combines video clips, narration, and information about each of several apprenticeable crafts. It also provides an explanation of the union a well as localized contacts throughout North America. The idea is to provide copies to school counselors throughout the country for students to use. Additionally, materials will be made available, through local JATC's and union locals to individuals who express interest in the trade. Data is suggesting that the technique may be highly effective in generating interest in the trade.

Another type of targeted recruitment activity is school-to-work programs. These efforts have been isolated throughout the United States and operate with varying degrees of success. Some programs such as the Indiana Tool Project, create a kit for high school-age students that describes the trades, opportunities, expectations, and real benefits that can be derived in terms that high school students understand.

The Building and Construction Trades Department has created a School-To-Work kit for middle school students to build industry awareness, given research findings that suggest that it is too late to build awareness in high school. The kit includes presentation outlines for building trades representatives, and a web page. The goals are to increase awareness of and respect for the industry; illustrate career opportunities/career paths; explain needed skills, promote apprenticeship opportunities; and help recruit new entrants into the skilled crafts.

Other programs have taken a different approach and involve high school students in the activities of the trade. For example, Notre Dame High School in Southern California has historically been aligned with the building trades and, over time, has recruited scores of individuals into the skilled crafts. In the school, the initial term of apprenticeship is completed as students work through an introduction into the crafts and the construction industry as part of their school curriculum.

A less expensive and potentially equally successful school-to-work model has been undertaken by the Building Trades Councils in the Northwest and the Northeast. In this program, called the Construction Career Academy, crafts work together to create one or two-week summer institutes to which high school counselors and students are invited. Participants are housed, fed, and trained at a residential facility owned by a training trust fund, and all the crafts who were part of the Building Trades Council participate in the program.

The students rotate through experiential activities that provide them with initial understanding of the craft and the type of work that the craft performs. Instruction is provided by regular apprentice trainers and includes safety training, classroom related instruction, and hands-on skill experiences. Some hard, physical work is experienced each day. Instruction also addresses the value of joint labor-management relations, the value of unions, and opportunities in the construction trades. Additionally, trainers emphasize the importance of mastering a series of math/measurement and science skills while still in school as key-to-long-term success in the construction industry. Moreover, they stress that the construction industry today is not that of yesterday; it is safer, uses high tech tools and equipment, and has a lot of room for personal and career growth.

The program is relatively inexpensive, given that it operates as a type of residential summer camp. Including the costs of food, housing, publicity, instructors, and materials/supplies, the average cost is about $3,000 per trainee. The program is entering its third year and has achieved moderate success. The first year, several high school seniors in the program became indentured apprentices. However, the 9th and 10th graders behaved like unruly teenagers at night. Therefore, in year two, only rising seniors were eligible to participate. The results for years two and three have been impressive in that over half of all eligible students became indentured apprentices in some craft before the end of the next school year.

A second school-to-work program also is experiencing considerable success. This one also is housed and administered by a Laborers-AGC Training Trust Fund but involves other building trades. It operates in Michigan and features several very unique features including the following:

1. It involves students in the junior-senior year of high school in an eight-week, paid summer program.
2. Students receive training for two weeks in tool use, materials, safety, and some construction skills.
3. They work on job sites for six weeks with union members and signatory contractors in the summer.
4. The parents are involved in the initial selection, orientation, and training process.
5. Students are assigned to a mentor-a journey worker with whom they work and who they shadow for the six weeks.
6. Contractors and union members are highly supportive of the program, as it has resulted in over half the participants becoming apprentices in some skilled craft.

Yet another strategy is national and regional teleconferences to high school and community college students. Both the IBEW and the NJATC, as well as the Associated Builders and Contractors (ABC), have used this strategy. In each case, a broadcast show was beamed to high schools and vocational schools. The program described and promoted the construction industry; discussed work, career, and training opportunities in the industry; and provided guidance on how to enter the industry. The sessions combined presentations, discussions, video clips, and audience

questions. Results suggest improved understanding about the industry by participants and at least some increased interest in pursuing a career.

Poor Retention of Workers. Retention programs also are receiving growing amounts of attention in some industries. As one recent study pointed out (Powell, 1998), "About three out of four workers in their 50's (at all levels) say they would like to continue to work, but on a reduced level." However, most workers feel that type of arrangement is not available to them.

Companies and industries are beginning to experiment with reduced-hour work options to accommodate older workers and keep their skills in use. Among the ideas in experiment are job sharing and project-specific employment.

Another strategy that impacts retention of both older and new workers is mentoring. Mentoring programs pair experienced and inexperienced workers in a formal relationship that provides for training, explanation of work organization, and connection to the organization. Research data (Sipe, 1995 and Weinberger, 1999) illustrate that mentoring programs across all types of work organizations, including construction, exhibit consistent findings. They dramatically boost retention of new workers, both within a specific organization and within the industry by building the allegiance of the new worker. They also boost retention of the seasoned veteran mentor by giving new meaning to their work life. Additional positive benefits include decreasing the "learning curve" of the new worker, increasing overall participation in the organization, developing appreciation for new workers, and relating better to the values and needs of others.

Apprenticeship is a type of mentoring program, although formal mentoring programs are even more successful at retention. Especially successful programs operate in the automotive and insurance industries as well as with Big Brothers/Big Sisters.

Changing Preference and Skills of Target Groups of New Workers. Several short-term strategies also hold promise for expanding the pool of existing workers. One set of strategies for addressing this issue is to better serve existing skilled craft workers. For example, the Construction Workers, INC (CWI) Canadian Visa Program has enabled several crafts to usher in Canadian members as "guest" workers on specific projects for a specific, temporary period of time to ease the shortage issues. Still other crafts have created a national qualification pool that lists workers, by special skills, who are willing to travel so that they can be involved on projects anywhere that temporary skills are needed, but not available.

The Visa program initiated by the International Union of Bricklayers and Allied Craftworkers and the International Council of Employers of Bricklayers and Allied Craftworkers holds promise as a short-term strategy. Working with contractors who identify their specific skill need, the union recruits members form Canada when work is slow. The Project Director makes the skills match, collects the information, completes the paperwork, coordinates activities between the affected local unions, and maintains communication with the craft worker. Typically, visas provide authorization for Canadian craft workers to work on US projects and are good for

up to eight months; workers can use their skills on multiple sites as long as they work for the same contractor within the same Standard Metropolitan Statistical Area. To date, over 500 skilled craft workers have participated in this program.

Other crafts such as the carpenters are moving to resolve skill shortage issues through a combination of organizing and expanding apprenticeship training. More specifically, they are organizing contractors and the labor force currently employed by that contractor. Then, they are entering that new group of workers into the later stages of apprenticeship (as needed) to refine and expand worker skills as a strategy both for expanding numbers of workers and the skill base of existing workers.

Other trades and industries have decided to organize coalitions of organizations including labor unions and employing contractors to improve the basic and employability skill levels of new workers who soon will be candidates for entering the occupation. Several models-the Boeing-Seattle model, the Southwestern Pennsylvania Consortia, and the skills standards development work of several trades have achieved particular success. In these efforts, management, labor, the schools and other community organizations have formed a partnership to revamp the high school curriculum for students in their regions. The partnership has worked to retool at least the math, science, and vocational curricula so as to improve the resulting skills, and more specifically, to "push" some of the entry level skill training necessary for new workers back into the schools.

The resulting courseware is an applied academics program that teaches traditional subjects in the context of specific work settings, uses problems from work as samples for teaching, and provides in-service staff development to teachers to improve their skills. Additionally, the programs are articulated with the state community college networks so that students who successfully complete the program earn credit toward an Associate of Arts degree. Moreover, students perform internships in manufacturing plants during the summer before they graduate to learn factory routine and help them consider how they may want to grow into the organization. At the conclusion of the program, completers become eligible for full-time employment.

Yet another strategy is to adjust operations and benefits to more closely mirror the desires of the available pool of new recruits for the industry. The Building Trades Department has taken the lead on this issue by studying how temporary employment agencies operate and what workers like about them. Among the things they have learned that might be incorporated into joint labor-management activities are at least the following: daily pay may be a real advantage to the new workers; electronic listings, notification, continuing contract, and work possibilities seem to be appreciated as new technology benefits menus; paid vacation funds are very popular; and pay in cash also is very popular.

Internal Barriers. Several crafts have initiated projects that illustrate strategies for dealing successfully with internal barriers. For example, several crafts have built new materials into related instruction on both the value/necessity of labor management relations and the value of unions. The Working Together materials of the Joint Roofing Industry is an excellent example of making the case for cooperation and explaining the important roles of each organization.

Other crafts have either relocated training facilities and/or established satellite or mobile training options to bring training both to the job site and urban areas. Other crafts have studied and are revising entry and selection requirements for apprenticeship to ensure that they closely mirror the needs of the craft. Some are even experimenting with providing remedial and/or additional training opportunities to boost the quality of applicants. Many crafts also have initiated specific programs to work with urban redevelopment projects, urban populations, and city officials to help in the rebuilding process.

Project Labor Agreements (PLA's) also are being used to address internal issues. For example, not only have they been used to provide timely site-specific training, but also they have been used to stimulate more broad-based recruitment and intake into apprenticeship.

Each issue analyzed in this White Paper has contributed to the existing and growing skill shortage in construction. Each issue is real and substantial; no issue can be solved by a single approach or strategy. Equally important, however, the identified activities and "best practices" illustrate that effective strategies can be devised and initiated to mitigate and overcome the shortages. Labor and management working together, can create opportunity and programs that build the labor force and better use the skills of construction craft workers. These findings, activities and practices are the basis of the ideas generated and presented in the ***Strategic Plan for Addressing Skill Shortages in the Construction Trades,*** the companion paper to this White Paper.