CONSTRUCTION APPRENTICESHIP PROGRAMS

CAREER TRAINING FOR CALIFORNIA'S RECOVERY

KEY FINDINGS

- Construction work has two faces. It can provide stable, middle-class careers or temporary, hazardous, dead-end jobs.
- Apprenticeship programs strengthen communities by providing career paths and consistent health insurance for people from disadvantaged backgrounds. They also benefit the building industry by reducing workplace injuries, reducing turnover and providing a motivated and well-trained workforce.
- Most apprenticeship programs in California (82%) are joint labor-management programs established through collective bargaining. Those programs produce almost all (92%) of the state's apprenticeship graduates.
- The joint labor-management programs are more successful than unilateral management programs at removing barriers to graduation and therefore have much higher completion rates.
- Local policies are needed that encourage and support successful apprenticeship programs. These include local hiring requirements, resources for support services, and using the public contracting process to set and enforce standards.
- With a proven record of success in producing a skilled workforce, apprenticeship programs provide the best means to train workers in the skills needed for the new green economy.

BY CORINNE WILSON, CENTER ON POLICY INITIATIVES, SEPTEMBER 2009

EXECUTIVE SUMMARY

The current economic downturn has caused vast unemployment in California's construction industry. In the year ending in June 2009, the state lost almost a fifth (18.6%) of its construction jobs, the greatest percentage among all major industries.[1] Getting workers back on the job is crucial to getting the California economy back on its feet.

Yet, increased employment is not enough for an equitable recovery. The construction industry's historically good jobs have been depleted by the squeeze on the middle-class over the past 30 years. And the industry is shifting to a green economy, with a focus on new skills, in response to climate change and high energy costs. As the economy revives, new construction jobs must include middle-class career paths and training in skills for the green economy.

As this report demonstrates, building trades apprenticeship programs provide the best model to keep the construction industry on the high road and provide high-quality jobs, to the benefit of the industry, the workers and the greater community.

[1] California Employment Development Department, Labor Market Division. 2009. California Employment Highlights for July 2009. Current Employment Statistics (CES) Program.

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ECONOMIC TRENDS

An historical look at the middle-class shows that as worker productivity increases, wages also increase. Between 1947 and 1979, worker productivity and income doubled together. Since the 1980s, however, incomes have grown only a quarter as much as worker productivity. Since 2000, middle-class families have experienced a nearly 4% decline in real income while productivity has increased 18.5%.[2]

The disconnect between wages and productivity means that the benefits of increased productivity have not been shared equally. In fact, half of overall economic growth from 1993 to 2007 went to the top 1% of incomes. In the boom times of 2000-2007, the top 1% of incomes captured two-thirds of the economic growth.[3]

Besides family-supporting wages, a good, middle-class job encompasses employer-provided health insurance, pensions, paid vacation and holidays, sick leave and family leave, a safe and healthy workplace, some degree of employment security and opportunities for advancement.[4] The history of "good jobs" over the last three business cycles (1980s, 1990s, and first half of 2000s) shows a sharp deterioration in the provision of benefits.[5] For the years 1979-2006, the share of jobs with employer-provided health insurance declined 5.3% and those with employer-provided pensions declined 6.4%.[6]

Rebuilding the middle class will require reconnecting worker productivity with compensation through the creation and support of good jobs.

Definition:
Green jobs
Jobs with family-supporting wages and benefits, in fields that contribute significantly to preserving or enhancing environmental quality.[7]

Shifting to the Green Economy

The new, green economy is changing the face of construction, with new types of jobs using new technologies and innovations on current practices. Solar panel installation or energy efficiency auditing are examples of new green jobs that build on skills that trained and qualified construction workers have had for years.

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[2] Middle Class Task Force (MCTF). The Vice President of the United States. 2009. *The American Recovery and Reinvestment Act: Helping Middle Class Families.*

[3] Saez, Emmanuel. 2009. Striking it Richer: The Evolution of Top Incomes in the United States. Updated version of an article which appeared in *Pathways Magazine*. Stanford Center for the Study of Poverty and Inequality, Winter 2008, 6-7.

[4] Definition taken from Schmitt, John. 2007. *The Good, the Bad, and the Ugly: Job Quality in the United States over the Three Most Recent Business Cycles.* Center on Economic and Policy Research (CEPR) and Sarah White and Jason Walsh. 2008. *Greener Pathways: Jobs and Workforce Development in the Clean Energy Economy.* Center on Wisconsin Strategy (COWS), The Workforce Alliance and The Apollo Alliance.

[5] Schmitt, John. 2007. *The Good, the Bad, and the Ugly: Job Quality in the United States over the Three Most Recent Business Cycles.* Center on Economic and Policy Research (CEPR).

[6] Schmitt, op cit.

[7] White, Sarah and Jason Walsh. 2008. Greener Pathways: Jobs and Workforce Development in the Clean Energy Economy. Center on Wisconsin Strategy (COWS), The Workforce Alliance and The Apollo Alliance.

> THE CONSTRUCTION INDUSTRY HAS THE HIGHEST CONCENTRATION OF CONTINGENT WORKERS…AND THE LOWEST RATE OF EMPLOYER-PROVIDED HEALTH COVERAGE AMONG CALIFORNIA'S NON-FARM INDUSTRIES.

THE TRUTH ABOUT CONSTRUCTION

The construction industry in California has two faces: the first is a high-road industry with family-sustaining wages, healthcare and pension benefits, safe working conditions, career stability and opportunity for advancement. The other is a low-road industry with low pay, no benefits, dangerous conditions and frequent periods of unemployment.

According to a study by the Construction Industry Institute, both contractors and workers report the same issues with recruitment and retention: unsafe job sites, insufficient wages and benefits, impermanency of employment, poor working conditions and poor treatment of employees.[8]

Construction is Hazardous

In 2007, the construction industry nationally accounted for 20% of workplace deaths and 10% of all workplace injuries and illnesses.[9] California, Texas and Florida account for more than 25% of all non-fatal construction injuries and illnesses resulting in lost work days nationally.[10]

The total cost of death and injury in the U.S. construction industry is estimated at nearly $13 billion (in 2002 dollars).[11] On average, when a construction worker dies, the overall loss is estimated to be $4 million and a non-fatal injury that results in lost workdays costs approximately $42,000.[12]

Construction Jobs are Low-Wage, Temporary and Lack Benefits

In 2005, more than 120,000 construction workers in California were in occupations that paid less then $30,000 per year based on the weekly wage.[13] In addition, many construction workers are not employed year-round, resulting in a much lower actual annual income.

Typically on construction projects, a worker's skill set may be needed only during certain phases, resulting in lay-offs, unemployment and loss of benefits. The construction industry has the highest concentration of contingent workers – defined as workers who do not have an implicit or explicit contract for on-going employment – of any non-farm industry in California.[14] Contingent workers are twice as likely as permanent workers to report household or family income less than $27,000 a year and are much less likely to have employment-based healthcare or pensions.[15] The lower a worker's educational attainment, the higher the incidence of contingent work.

In 2005, at the height of the building boom, the construction industry had the lowest rate of employer-provided health coverage among California's non-farm industries – only 35%.[16] The construction industry accounted for 15% of the state's chronically uninsured, with only 7.3% of the workforce.[17] More than a quarter (27%) of construction workers were uninsured for the entire year while more than 40% were uninsured at least part of the year.[18]

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[8] Construction Industry Institute. 2000. *Attracting and Maintaining a Skilled Workforce*. Research Summary 135-1.

[9] Occupational Injuries and Illnesses: Industry Data and Census of Fatal Occupational Injuries, 2007. Source: Bureau of Labor Statistics.

[10] Samuel W. Meyer and Stephen M. Pegula. 2004. *Injuries, Illnesses, and Fatalities in Construction, 2004.* http://www.bls.gov/opub/cwc/print/sh20060619ar01p1.htm

[11] CWPR- The Center for Construction Research and Training. 2007. *The Construction Chart Book,* 4th ed. Sect. 48. http://www.cpwr.com/pdfs/CB%204th%20Edition/Fourth%20Edition%20Construction%20Chart%20Book%20final.pdf

[12] CWPR, op cit.

[13] Weekly wages and monthly employment for Construction Industry in 2005. Source: California Employment Development Department, Labor Market Information Division. Quarterly Census of Employment and Wages (QCEW).

[14] California Employment Education Department. 2006. *Contingent Workers Bolster California Work Force.* http://www.labormarketinfo.edd.ca.gov/article.asp?ARTICLEID=626

[15] Contingent and Alternative Employment Arrangements, February 2005. Source: U.S. Bureau of Labor Statistics. http://www.bls.gov/news.release/History/conemp.txt

[16] BLS, op cit.

[17] Center on Policy Initiatives (CPI). 2009. *Construction: Working Without a Healthcare Net.* http://www.onlinecpi.org/downloads/ConstructionReport_webversion.pdf

[18] CPI, op cit.

REGISTERED APPRENTICESHIP: THE BASICS

Apprenticeship is a combination of on-the-job training and related instruction in which workers learn the practical and theoretical aspects of a highly skilled occupation.[19] The apprentice works side-by-side with a journeyworker to attain demonstrable competency in the craft.[20] Apprenticeships are time-intensive and require high standards of performance.

Oversight of registered programs is provided directly by the U.S. Department of Labor for 25 states and through state-approved agencies in the other 25 states.[21]

How Apprenticeship Differs From Other Training

The strict legislative regulation over apprenticeship programs creates a unique immersion training system and sets it apart from others, such as paid internships. The apprentice and the program sponsor sign an apprenticeship agreement, which contains the terms and conditions of the employment and training of the apprentice.[22] Included in the agreement is the graduated wage scale to be paid to the apprentice throughout the program, the required hours and skills learned in on-the-job training and related technical instruction and performance standards.[23]

A registered apprenticeship program must meet government-mandated standards of quality and quantity of instruction.[24] Further, the sponsor must provide adequate and safe equipment and facilities, and safety training for apprentices on the job and in related instruction. Most apprenticeship programs require 3-5 years of training with between 2,000 and 8,000 hours of on-the-job training and 144 hours of related technical instruction.[25] Advancement depends on the apprentice's work record and progress in related instruction.[26]

An apprenticeship graduate has completed a specified minimum number of on-the-job training hours and related technical instruction hours, and has demonstrated competency in the skills and knowledge necessary for work at the highest standards.[27] Each program evaluates apprentices regularly, usually every 6 or 12 months, with both on-the-job performance assessments and written exams. Wage increases and continuation in the program depend on successful demonstration of competency. [28]

Apprentices emerge from the programs proficient in safety and environmental laws and regulations, first aid and CPR, mathematics, drafting, blueprint reading and other sciences connected with the trade.[29] Often included is training in diversity, sexual harassment, personal development, environmental remediation and jobsite management.[30]

Definitions

Competency:
The attainment of manual, mechanical or technical skills and knowledge, as specified by an occupational standard and demonstrated by an appropriate written and hands-on proficiency measurement.

Journeyworker:
A worker who has attained a level of skill, abilities and competencies recognized within an industry as having mastered the skills and competencies required for the occupation.

On-the-Job Training (OJT):
An outline of the work processes in which the apprentice will receive supervised work experience and training on the job, and the allocation of the approximate time to be spent in each major process.

Related Technical Instruction (RTI):
An organized and systematic form of instruction designed to provide the apprentice with knowledge of the theoretical and technical subjects related to his/her trade.

Source: Code of Federal Regulations, 29 CFR 29 "Labor Standards for the Registration of Apprenticeship Programs."

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[19] U.S. Department of Labor. *Apprenticeship*. http://www.dol.gov/dol/topic/training/apprenticeship.htm
[20] California Apprenticeship Coordinators Association. *Apprenticeship: Pathways to Success.* http://www.calapprenticeship.org/
[21] Lerman, Robert, Lauren Eyster and Kate Chambers. 2009. *The Benefits and Challenges of Registered Apprenticeship: The Sponsors' Perspective.* The Urban Institute on Labor, Human Services and Population. http://www.urban.org/UploadedPDF/411907_registered_apprenticeship.pdf
[22] 29 CFR 29 *"Labor Standards for the Registration of Apprenticeship Programs."* Code of Federal Regulations.
[23] 29 CFR 29, op cit.
[24] 29 CFR 29, op cit.
[25] U.S. Department of Labor. *Apprenticeship FAQs.* http://www.doleta.gov/OA/faqs.cfm
[26] California Apprenticeship Coordinators Association. *Apprenticeship: Pathways to Success.* http://www.calapprenticeship.org/
[27] U.S. Department of Labor, Employment and Training Administration. *At-a-glance: Three Approaches to Apprenticeship Completion*. http://www.doleta.gov/OA/pdf/Three_Approaches_Apprenticeship_Program_Completion.pdf
[28] U.S. Department of Labor, Employment and Training Administration. *At-a-glance: Three Approaches to Apprenticeship Completion*. http://www.doleta.gov/OA/pdf/Three_Approaches_Apprenticeship_Program_Completion.pdf
[29] California Department of Industrial Relations, Division of Apprenticeship Standards. *Minimum Industry Training Criteria.* http://www.dir.ca.gov/DAS/mitc.htm
[30] California Department of Industrial Relations, Division of Apprenticeship Standards, op cit.

TABLE 1:
Apprenticeship Program Requirements for Selected Crafts
Top 10 crafts sorted by total number of apprentices graduated from programs

Craft	Years	On-the-job hours	Classroom hours/year
Carpentry	4	4,800	144
Electrician, Residential	3	4,800	160
Commercial/Industrial	5	8,000	160
Plumbing	4	7,200	200
Operating Engineer	4	6,000	144
Sheetmetal	4	6,500	160
Laborer	2	3,000	216
Painting & Decoration	3.5	7,000	114
Roofers	3.5	4,000	144
Plumbing	4	7,200	200
Air conditioning & refrigeration	5	7,500	216
Carpet, Linoleum & Soft Tile	4	6,400	160

Source: California Department of Industrial Relations, Division of Apprenticeship Standards. Minimum Industry Training Criteria. http://www.dir.ca.gov/DAS/mitc.htm

THE VALUE OF APPRENTICESHIPS

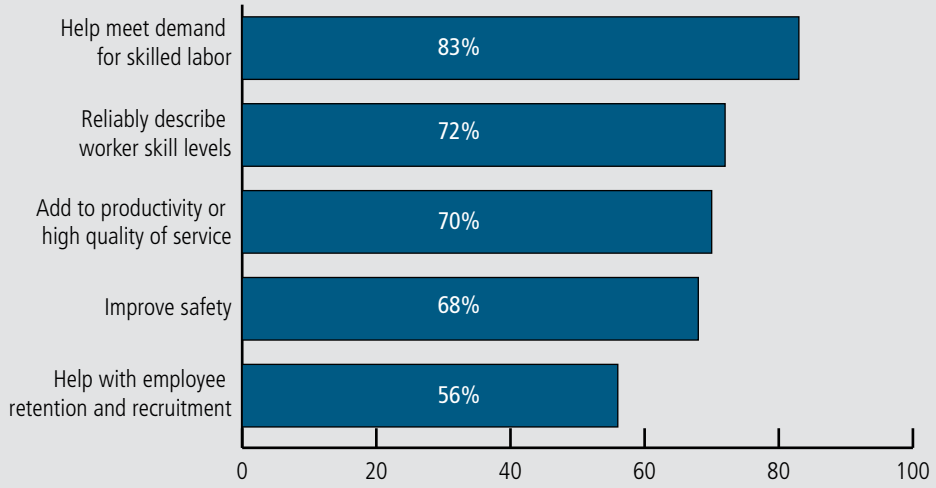
Apprenticeship programs benefit the entire community by providing good wages, health insurance and career stability for disadvantaged community residents. The stringent training also helps ensure high quality public works projects and cost containment by decreasing turnover, workplace accidents and lost productivity.

The Value for Industry

Apprenticeship programs provide skilled workers trained to employer specifications, and lead to reduced turnover, improved on-the-job safety and higher quality results, according to a study commissioned by the U.S. Department of Labor.[31]

The value of apprenticeship training is extolled by the Construction Users Roundtable (CURT), comprised of some of the largest companies in the U.S., including Boeing, Procter & Gamble, General Electric, and the U.S. Army Corps of Engineers. CURT recommends that end users or owners require the contractors working for them to commit to training programs as a prequalification for doing business.[32]

FIGURE 1: PROGRAM SPONSORS REPORT THAT APPRENTICESHIPS:



Source: Lerman, Robert, Lauren Eyster and Kate Chambers. 2009. The Benefits and Challenges of Registered Apprenticeship: The Sponsors' Perspective. The Urban Institute on Labor, Human Services and Population.

[31] Lerman, Robert, Lauren Eyster and Kate Chambers. 2009. *The Benefits and Challenges of Registered Apprenticeship: The Sponsors' Perspective.* The Urban Institute on Labor, Human Services and Population. http://www.urban.org/UploadedPDF/411907_registered_apprenticeship.pdf

[32] Construction Users Roundtable. 2004. *Confronting the Skilled Workforce Challenge.* White Paper 401.

> APPRENTICESHIPS LEAD TO CAREERS WITH HIGHER AVERAGE WAGES AND PROMOTE JOB STABILITY THROUGH SKILL CERTIFICATION AND PORTABILITY

The Value for Workers

Most apprenticeship programs provide good jobs from the beginning, with fair wages, family healthcare benefits, a pension plan, paid sick days, a safe work environment and employment stability. Program completion secures these advantages for an entire career.

Wages and Career Stability

Apprenticeships lead to careers with higher average wages and promote job stability through skill certification and portability. Apprentice wages start out as a percentage of the journeyworker hourly rate, significantly higher than minimum wage, and increase regularly as competency is demonstrated.[33]

As Table 2 demonstrates, apprentices in San Diego County begin at a basic hourly rate equal to more than $28,000 per year. Program graduates make a basic hourly wage equating to nearly $60,000 annually.

Moreover, a certificate of completion signifies attainment of nationally and globally recognized skills.[34] With the portability of credentials a worker can move between projects and employers with a documented set of skills on their resume, thereby facilitating the hiring process and ensuring the correct pay rate commensurate with skill level.

Many apprenticeship programs have formal agreements with 2- and 4-year colleges and universities which offer credits for the education received.[35] A worker can use accumulated credits to pursue a college degree later in life, facilitating transition to another career, if desired.

TABLE 2:

Apprenticeship Basic Hourly Wage Increase Schedule, San Diego County, California, Q1 2009*

Wage increases dependent upon successful completion of training segments

Years in Program	Part of year (1/2)	Carpenter, Commercial	Electrician, Inside Wireman	Plumber, Pipefitter, Steamfitter
		Wage level per 600 on-the-job training hours	Wage level per 800 on-the-job training hours	Wage level per 1,600 on-the-job training hours
1	1st	$14.54	$14.54	
	2nd	$16.15	$15.99	$16.65
2	1st	$19.38	$17.45	
	2nd	$21.00	$18.90	$19.97
3	1st	$22.61	$20.36	
	2nd	$24.23	$21.81	$23.30
4	1st	$25.84	$23.99	
	2nd	$29.07	$25.45	$26.63
5	1st	——	$28.35	
	2nd	——	$29.81	$29.96

**Source: California Department of Industrial Relations, Division of Apprenticeship Standards, Public Works Apprentice Wage Sheets. http://www.dir.ca.gov/DAS/PWAppWage/PWAppWageList.asp*

[33] California Department of Industrial Relations data for end of 2008. *Apprentice wage determinations* http://www.dir.ca.gov/DAS/PWAppWage/wage/08237400pdf?VarWageId=08237400 and Prevailing Wage determinations http://www.dir.ca.gov/dlsr/PWD/Determinations%5CSanDiego%5CSD-023-102-4.pdf

[34] U.S. Department of Labor. *Registered Apprenticeship: A Solution to the Skills Shortage.* http://www.doleta.gov/atels_bat/pdf/fsfront.pdf

[35] California Department of Industrial Relations, Department of Apprenticeship Standards. *Educators home page.* http://www.dir.ca.gov/das/educators.htm

PAYING PREVAILING WAGE STRENGTHENS FAMILIES

California and many other states require that contractors pay Prevailing Wage on public projects, but cities can selectively opt out. For example, the City of San Diego requires prevailing wage only on projects worth more than $10 million, and the City of Vista recently voted to abandon prevailing wage completely.[38] Prevailing wage requirements invest in communities by providing good wages and benefits, and protect taxpayers from the hidden costs of supporting the uninsured and the working poor.[39]

In California, the Department of Industrial Relations reviews the wages and compensation paid to workers in the local area and sets the local prevailing wage at the level most commonly paid to workers in each classification.[40] Prevailing wage is also required for apprentices.[41]

As Table 3 illustrates, prevailing wage creates middle-class jobs by determining the amount of employer contributions to worker benefit funds, including health insurance, pension, holidays and vacation, and training.

Prevailing wage requirements:

- Do **not** increase cost, because workers who earn more are more productive. Also, workers are safer, lowering worker's compensation costs.[42]
- Increase rates of health coverage and self-sufficient retirement through pensions.[43]
- Improve worker safety by encouraging better training and use and retention of experienced workers.[44]
- Encourage minority participation in apprenticeship programs, creating pathways out of poverty for local workers.[45] States with prevailing wage laws have nearly 20% more minorities in construction apprenticeships than states that do not require prevailing wage.[46]

Definition:
Prevailing Wage
Contractors bidding on construction built with public subsidy must compensate all workers on the project equally, based on their occupational classification.[36] Federal prevailing wage was created in 1931 by the Davis-Bacon Act, "specifically to protect communities and workers from the economic disruption caused by competition arising from non-local contractors coming into an area and obtaining federal construction contracts by underbidding local wage levels."[37]

Healthcare and Pension Benefits

Many apprenticeship programs give workers access to health coverage and pension benefits, and when the program sponsor is part of a multiemployer trust, workers have benefits portability between jobs.[47] Without that structure, the frequent job changes in construction can result in loss of health insurance and pensions, which generally are accessed through employers in the United States.

Multiemployer plans are created through collective bargaining. With this structure, 83% of unionized construction workers had job-based health coverage compared to only 48% in the nonunion sector of the industry in 2005.[48] Unionized workers are also 23% to 54% more likely to be in employer-provided pension plans.[49]

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[36] California State Labor Code, Div. 2, Part 7. Chp. 1, Sec. 1771.

[37] U.S. Department of Labor. 2002. *Prevailing Wage Resource Book, 11/2002*. http://www.wdol.gov/docs/WRB2002.pdf

[38] Tenbroeck, Craig. Vista: Unions seek to overturn prevailing wage ruling. North County Times. June 30, 2009. and City of San Diego Council Resolution R-298185. A Resolution rescinding *Resolution No. R-251555; and authorizing the advertisement of certain public works municipal affair projects as subject to state prevailing wage requirements.* Adopted July 14, 2003.

[39] Fiscal Policy Institute. 2006. *The Economic Development Benefits of Prevailing Wage.* http://www.fiscalpolicy.org/FPI%20Prevailing%20Wage%20Brief%20May%2006.pdf

[40] California State Labor Code, Div. 2, Part 7. Chp. 1, Sec. 1773.

[41] California State Labor Code, op cit., Sect. 1777.5(b).

[42] Mahalia, Nooshin,. 2008. *Prevailing Wages and Government Contracting Costs: A Review of the Research.* Economic Policy Institute (EPI), Briefing Paper 215. http://www.epi.org/publications/entry/bp215/

[43] Petersen, Jeffery S. 2000. Health Care and Pension Benefits for Construction Workers: The Role of Prevailing Wage Laws. *Industrial Relations.* Vol. 39, No. 2.

[44] National Alliance for Fair Contracting (NAFC). 2003. *In Defense of Prevailing Wage Laws: Studies and Reports by The Experts.* http://www.lecet.org/Clearinghouse_Public/LECET/NAFC/in_defense_of_prevailing_wage_laws.pdf

[45] NAFC, op cit.

[46] Philips, Peter Ph.D. 1999. *Kentucky's Prevailing Wage Law: It's History, Purpose and Effect.* University of Utah.

[47] Philips, op cit.

[48] CWPR- The Center for Construction Research and Training. 2007. *The Construction Chart Book*. 4th ed. Sect. 26.http://www.cpwr.com/pdfs/CB%204th%20Edition/Fourth%20Edition%20Construction%20Chart%20Book%20final.pdf

[49] Mishel, Lawrence and Matthew Walters. 2003. *How unions help all workers.* Economic Policy Institute (EPI). Briefing paper #143. http://www.epi.org/publications/entry/briefingpapers_bp143/

Table 3
Prevailing Wage: Hourly Wage & Employer Contributions for Selected San Diego County Apprentices
Year Two of Program

	Basic Hourly Wage	Employer Contributions					Total Hourly Wages
		Health & Welfare	Pension	Vacation/ Holiday	Training	Other	
Carpenter	$21.00	$3.95	$2.91	$3.30	$0.42	- 0 -	$31.58
Electrician, Inside Wireman	$18.90	$5.12	$2.83	- 0 -	$0.56	$0.16	$27.57
Plumber/Pipefitter/Steamfitter	$19.97	$6.02	$0.31	$1.79	$0.32	$0.39	$28.80
Operating Engineer	$28.55	$7.95	$5.05	$2.82	$0.56	$0.17	$45.19
Sheet Metal	$19.33	$3.42	$2.63	- 0 -	$0.68	$0.46	$26.52
Laborer	$19.01	$4.26	$0.39	$2.62	$0.64	$0.30	$27.22
Painter	$14.21	$4.60	$0.15	$0.30	$0.34	$0.67	$20.27
Roofer	$16.02	$4.76	$1.62	- 0 -	$0.10	$0.20	$22.70
Heating, Ventilation & Air Conditioning**	$19.62	$6.38	$1.13	- 0 -	$0.70	$0.25	$28.08
Carpet	$20.01	$6.00	$0.94	$0.23	$0.45	$0.15	$27.78

**Source: California Department of Industrial Relations, Division of Apprenticeship Standards, Public Works Apprentice Wage Sheets. Q1 2009*
http://www.dir.ca.gov/DAS/PWAppWage/PWAppWageList.asp
***Los Angeles and Orange counties*

A SURVEY OF 8,000 CONSTRUCTION LABORERS IN WASHINGTON FOUND THAT HEALTH AND SAFETY TRAINING DECREASED THE LIKELIHOOD OF WORKERS' COMPENSATION CLAIMS BY 12%.

Worker Safety

Safety training is highly effective in preventing workplace accidents and injuries, which saves money. A survey of 8,000 construction laborers in Washington found that health and safety training decreased the likelihood of workers' compensation claims by 12%. Among workers ages 16-24, there were 42% fewer claims.[52]

Apprenticeships in the building trades provide certified and coordinated instruction in building and earthquake codes, environmental laws and safety, including hazardous materials handling and remediation.[53] Minimum apprenticeship training for all crafts must include safety instruction provided on-the-job and in the classroom.[54] In California, most crafts require first aid, CPR, tools and materials safety.[55]

Definition:
Multiemployer trust
A benefits plan that covers the workers of two or more unrelated companies in accordance with a collective bargaining agreement.[50] In industries where seasonal or irregular employment and high labor mobility are common, like construction, few workers would qualify under a single company's plan due to eligibility requirements.[51]

[50] Employment Benefit Research Institute (EBRI). 2009. *Fundamentals of Employee Benefit Programs.* 6th ed. http://www.ebri.org/publications/books/index.cfm?fa=fundamentals
[51] EBRI, op cit.
[52] Xiuwen Dong, Pamela Entzel, Yuring Men, Risanna Chowdury, and Scott Schneider. 2004.. Effects of Safety and Health Training on Work-related Injury Among Construction Laborers. *Journal of Occupational & Environmental Medicine.* 46(12), pp. 1222-1228.
[53] California Department of Industrial Relations, Department of Apprenticeship Standards. *Minimum Industry Training Criteria.* http://www.dir.ca.gov/das/mitc.htm
[54] 29 CFR 29 "*Labor Standards for the Registration of Apprenticeship Programs.*" Code of Federal Regulations.
[55] California Department of Industrial Relations, Department of Apprenticeship Standards. *Minimum Industry Training Criteria.* http://www.dir.ca.gov/das/mitc.htm

APPRENTICESHIPS SUCCEED BECAUSE LABOR AND MANAGEMENT WORK TOGETHER

Due to the resources required to adequately train workers, the structure of sponsorship plays an important role in the success of the program. Apprenticeship programs can be sponsored by a single employer, a group of employers or a group of employers in cooperation with labor. Sponsors plan the training, review apprentice progress, maintain the records of appropriate progress and pay for the program.[56] The total cost can be $40,000 to $200,000 per apprentice, depending on the trade and length of apprenticeship.

The sponsor must have the ability to hire and train apprentices in a real work environment. If the sponsors don't provide steady work, the apprentices have fewer opportunities to earn wages and thereby remain in the program.

The Vast Majority of California's Apprenticeship Programs are Joint Labor-Management

Table 4: Advantages of joint labor-management apprenticeship programs

California State Certified Apprentice Programs	Number of Programs		Number of Graduates (Individuals) 2002 - 2007	
	Joint Labor-Mgmt	Unilateral Mgmt	Joint Labor-Mgmt	Unilateral Mgmt
Asbestos Workers	2	none	186	none
Boilermakers	1	none	62	none
Bricklayer	3	2	110	16
Carpentry	25	3	4,449	337
Carpet, Linoleum & Soft Tile	2	1	330	2
Cement Masons	3	none	520	none
Drywall / Lather	9	2	1,904	none
Electrical & Electronic	29	9	4,362	1,110
Elevator	2	none	617	none
Engineer	4	3	2,026	13
Glazier & Glass Workers	6	none	437	none
Heating, Ventilation & Air Conditioning	8	2	532	246
Iron & Steel Workers	8	none	2,116	none
Laborers	8	2	1,540	56
Lineman	1	2	324	37
Millwright	2	none	185	none
Painting & Decorating	5	4	1,033	66
Plasterers	4	none	294	none
Plumbing	29	6	2,769	306
Roofers	7	2	618	115
Sheet Metal	9	2	1,654	114
Surveyor	2	none	482	none
Tile Layer/Setter	8	none	976	none
Total	**177**	**40**	**27,526**	**2,418**
Percentage	**82%**	**18%**	**92%**	**8%**

Source: California Department of Industrial Relations, Division of Apprenticeship Standards dataset. April 2009.

Joint labor-management (joint) programs sponsor the majority of apprenticeship programs offered in California and graduate the vast majority of apprentices. The sponsorship structure, meaning whether the sponsor is joint or unilateral management, is a key component to the strength of a program. Cooperation and a shared commitment to training unite employers and workers to create the success of joint programs.

In California, 217 registered programs train apprentices in 23 trades. Joint labor-management programs provide 82% of those programs and offer training in all trades. In 10 trades, only joint programs are offered.

Definitions:

Sponsor
Any person, association, committee, or organization operating an apprenticeship program and in whose name the program is (or is to be) registered or approved.

Joint labor-management (joint)
Composed of an equal number of representatives of the employer(s) and of the employees represented by a bona fide collective bargaining agent(s)

Unilateral
An apprenticeship program sponsor without a bona fide collective bargaining agent.

Source: Code of Federal Regulations, 29 CFR 29 "Labor Standards for the Registration of Apprenticeship Programs."

[56] *29 CFR 29 "Labor Standards for the Registration of Apprenticeship Programs."* Code of Federal Regulations.

Joint Programs Have More Graduates and Higher Completion Rates

Ninety-two percent (92%) of California's nearly 30,000 apprenticeship graduates in 2002-2007 were from joint labor-management programs (Figure 2). Since program completion is what secures middle-class career wages and benefits, the ability of apprentices to succeed is vital.

Completion rates in joint programs are higher because they are more established and better funded, according a Government Accountability Office report.[57] Joint apprenticeship training trusts are funded through collective bargaining, meaning that member workers agree to have a small part of their paycheck deposited by the employer into the trust.

Definition:
Completion rate
The percentage of an apprenticeship cohort who receive a certificate of apprenticeship completion within one year of the projected completion date.

Joint labor-management programs use a multi-employer structure, with several signatory contractors, to keep apprentices fully employed to fulfill their on-the-job training hours. Joint programs generally take responsibility for placing apprentices with employers, rather than requiring the apprentices to look for work and experience intermittent unemployment. Through local chapter affiliation and portability agreements, apprentices in joint programs keep their benefits and are more likely to find work in other areas with another local.[58]

Ninety-five percent (95%) of women and 92% of people of color graduating from apprenticeship programs are in joint labor-management programs (Figure 3 and Figure 4).[59]

Joint labor-management sponsored apprenticeship programs have a significantly higher completion rate (49%) than unilateral programs (33%) across the board. In many of the largest trades, the joint program completion rates are 20-30% higher than unilateral programs (Figure 5, Page 12).[60]

FIGURE 2: TOTAL GRADUATION

California Construction Apprenticeship Programs Individual Completions by All Persons 2002-2007

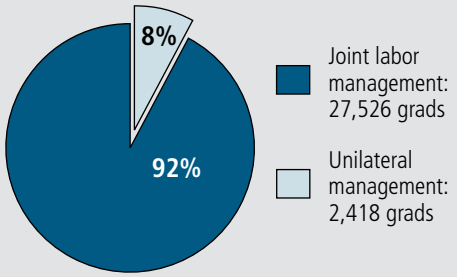


FIGURE 3: WOMEN GRADUATES

Apprenticeship Program Completions by Women in California, 2003-2008 (Individuals)

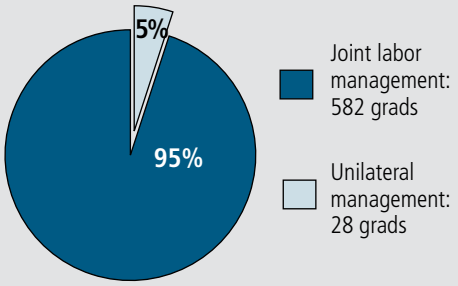
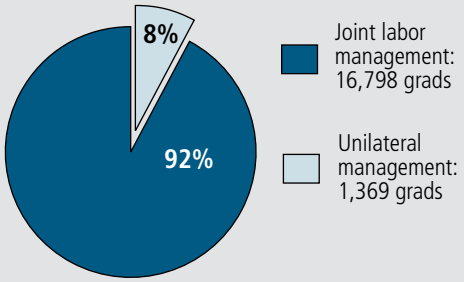


FIGURE 4: MINORITY GRADUATES

Apprenticeship Program Completions by Minorities in California, 2003-2008 (Individuals)



Source for above figures: California Department of Industrial Relations, Division of Apprenticeship Standards dataset. April 2009.

BARRIERS TO PROGRAM COMPLETION

Program sponsorship has two main challenges: failure to complete the program and the loss of a trained worker to another employer, or "poaching."[61] These problems increase the cost of training and threaten continuation of the programs.

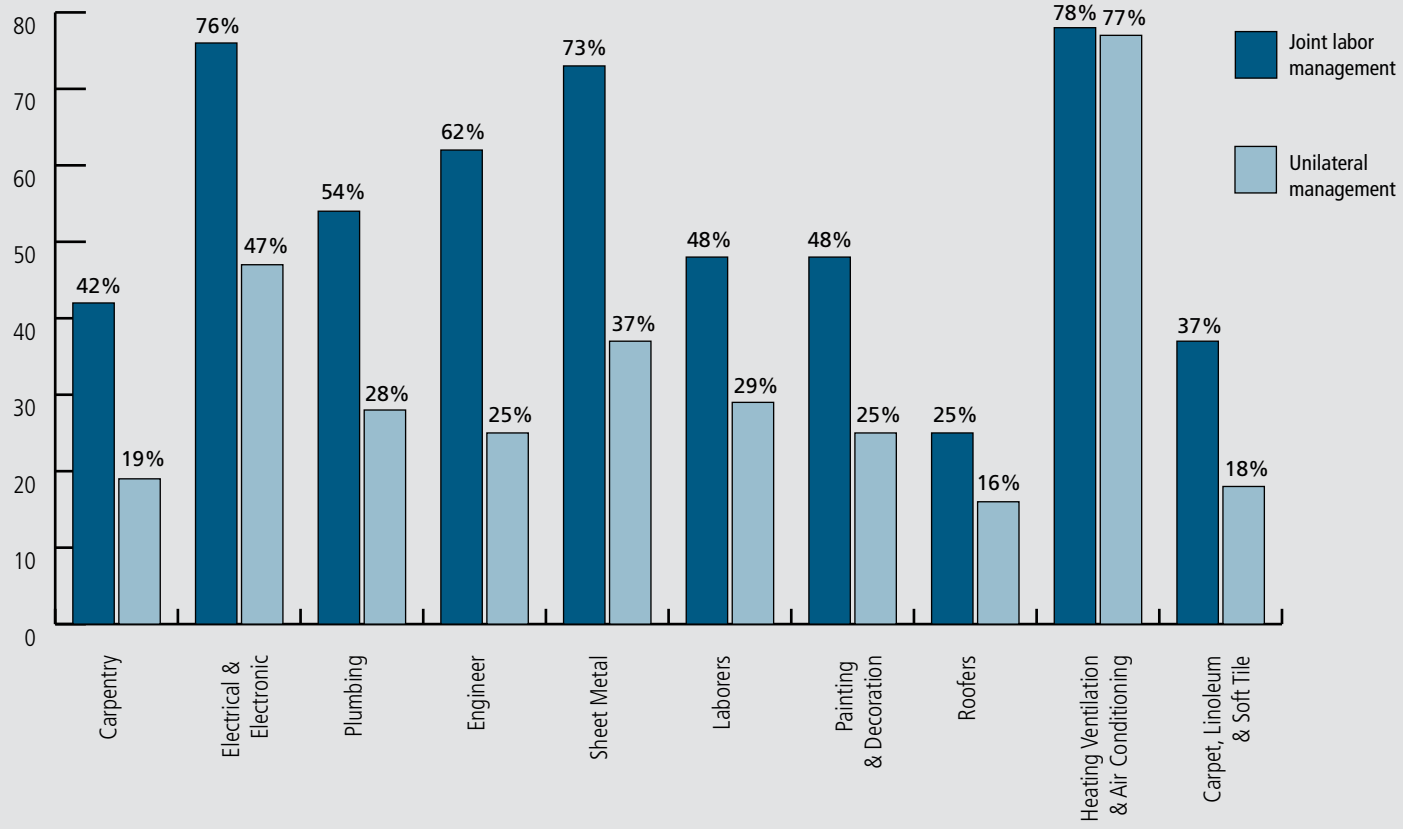
Dropouts

Apprenticeship programs are rigorous. It is full-time, physically

[57] Government Accountability Office (GAO). 2005. *Registered Apprenticeship Programs: Labor Can Better Use Data to Target Oversight. Report to Congressional Requesters.* http://www.gao.gov/new.items/d05886.pdf
[58] GAO, op cit.
[59] Apprenticeship dataset received from the California Department of Industrial Relations, Division of Apprenticeship Standards, April 2009.
[60] Apprenticeship dataset, op cit.
[61] Lerman, Robert, Lauren Eyster and Kate Chambers. 2009. *The Benefits and Challenges of Registered Apprenticeship: The Sponsors' Perspective.* The Urban Institute on Labor, Human Services and Population. http://www.urban.org/UploadedPDF/411907_registered_apprenticeship.pdf

FIGURE 5: CALIFORNIA CONSTRUCTION APPRENTICESHIP PROGRAMS COMPLETION RATE BY CRAFT, 2002-2007

Top 10 crafts by number of graduates. Completion rate weighted average



Source: California Department of Industrial Relations, Division of Apprenticeship Standards dataset, April 09

Methodology: Most data used in this report come from the California Department of Industrial Relations, Division of Apprenticeship Standards. One dataset listed individual program completions by sponsor for gender and ethnicity and was received at the end of March 2009. The other dataset listed program completions by sponsor for all persons and was received mid-April 2009. Weighted averages were created by multiplying total intake of apprentices for each sponsor for 2002-2007 by average completion rate after the 1st year. The results for each sponsored program within each trade were added together. This total was then divided by total average annual intake rate to find the weighted average for each trade by type of sponsor.

demanding work, with classroom instruction and studying after work or on weekends. It can be difficult to juggle time commitments or manage the stress of constant training challenges and evaluations. An apprentice needs both personal commitment and a support system to be successful. This is even more critical if the apprentice comes from an at-risk background.

Social service or support programs within the community can help apprentices succeed by providing needed additional services, such as substance abuse or mental health counseling, childcare, or small loans for reliable transportation. Using assessments and case management to assist apprentices in identifying personal barriers to success and then connecting them to support services can address many of the reasons for dropping out.[62]

The most commonly cited reasons for non-completion of a program were:[63]

- 36% – personal reasons (family needs, mental health or substance abuse problems, physical illness or legal issues).
- 32% – performance problems on the job or in the classroom.
- 30% – gained craft certificate or took another job before completion.

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[62] The Apollo Alliance, et al. 2008. *Green-Collar Jobs in America's Cities: Building Pathways Out of Poverty and Careers in the Clean Energy Economy.* http://apolloalliance.org/downloads/greencollarjobs.pdf

[63] Lerman, Robert, Lauren Eyster and Kate Chambers. 2009. *The Benefits and Challenges of Registered Apprenticeship: The Sponsors' Perspective.* The Urban Institute on Labor, Human Services and Population. http://www.urban.org/UploadedPDF/411907_registered_apprenticeship.pdf

WORKER STORY: Iron Woman

"I was working in retail and was tired of it. I wanted a career and something that would keep me outside, healthy and happy," says 28-year old ironworker Mariko Preston. "I began training in ironworking in New Orleans but was looking to get out. Katrina helped with that."

Following Hurricane Katrina, Preston was evacuated by the American Red Cross to San Diego. She approached the staff at Ironworkers Local 229, she remembers. "They said OK. Show us what you got."

Five years later, Preston is a journey-level iron worker with comprehensive welding certifications and on-the-job experience in welding for infrastructure like highways, bridges and dams and for skyscrapers.

A 5'3" African-American woman, Preston says, "I work smarter, not harder. Being a woman in the trades, it's hard enough, especially as an ironworker, to go out on the job and think you are going to get paid as much as the next guy. When I'm in the union, I know that they have to treat me fairly, and we are all going to get paid the same."

And Preston credits her joint labor-management apprenticeship with teaching her more in a few years than she ever would have learned as a nonunion worker.

Poaching

The loss of a trained worker to another employer, known as "poaching," can lead to underinvestment in an employer's workforce.[64] In order to maximize profits in the short-term, some contractors may choose to hire others' apprentices or journeyworkers rather than make the long-term investment to sponsor their own training programs.[65]

The focus on selecting the lowest bidder for construction projects can exacerbate "poaching." When bidding, contractors may cut training costs to reduce total overhead as much as possible and win the work. This fierce pressure to contain labor costs and undercut the competition encourages employers to poach workers from other contractors rather than incur the costs of training.[66]

Joint labor-management programs report less concern with dropouts and "poaching."[67] Steady work, higher wages and health insurance may resolve many of the personal reasons for dropping out of a program. A steady paycheck at a family-sustaining level may allow workers to pay for childcare or other assistance, while health insurance provides treatment for physical illness, substance abuse or mental health issues.

Joint programs pool their training costs and resources, creating a "fair playing field" among union contractors, thereby negating the disincentive to provide training and the incentive to poach.[68]

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[64] Organization for Economic Co-operation and Development (OCED). 1994. *The OECD Jobs Study: Facts, Analysis, Strategies.* http://www.oecd.org/dataoecd/42/51/1941679.pdf

[65] Kotler, Fred. 2009. Project *Labor Agreements in New York State: In the Public Interest.* Cornell University Industrial and Labor Relations School, Cornell University.

[66] Kotler, op cit.

[67] Lerman, Robert, Lauren Eyster and Kate Chambers. 2009. *The Benefits and Challenges of Registered Apprenticeship: The Sponsors' Perspective.* The Urban Institute on Labor, Human Services and Population. http://www.urban.org/UploadedPDF/411907_registered_apprenticeship.pdf

[68] Kotler, Fred. 2009. *Project Labor Agreements in New York State: In the Public Interest.* Cornell University Industrial and Labor Relations School, Cornell University.

NECESSARY POLICIES TO SUPPORT APPRENTICESHIP PROGRAMS

The success of apprenticeship programs in creating middle-class careers depends on supportive public policies. Effective policy options include funding the programs and support services, requiring contractors to pay prevailing wage and hire apprentices on more projects, and enacting responsible contracting standards.

Definition:
Responsible contracting policies
Prohibit public contracting with employers who violate workplace, tax or other laws. They can also provide a mechanism to favor employers who provide good jobs – good wages and benefits, a safe workplace – and comply with workforce standards.[69]

Career Ladders - Pathways out of Poverty

A career ladder or pathway out of poverty is a succession of training and support systems that prepare workers for a series of jobs with increasing skill requirements and compensation, providing a bridge from unemployment or dead-end jobs into middle-class careers.[70] Career ladders focus on community members who traditionally face multiple barriers to employment – low-income, people of color, women, unemployed, homeless, ex-offender, returning veterans or those lacking a high school diploma or GED.

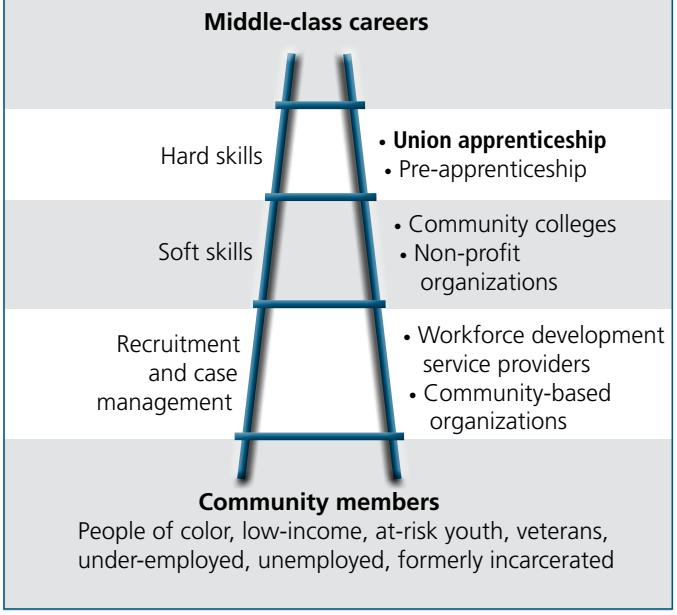
A comprehensive career pathway links job seekers, employers, community organizations, educational institutions and the workforce development system, creating "wrap-around" services.[71] Apprenticeship is a key step.

Recruitment and Case Management
Community-based organizations and workforce development providers help connect community members with career pathway programs. They provide skills assessments, identify participant needs and coordinate support services. Some community members need case management assistance along the entire pathway out of poverty. Case management assistance is often necessary for ex-offenders or youth, those with a history of substance abuse, or to help low-income people remain qualified for assistance until they become stably employed.[72]

Soft Skills
Nonprofit organizations and community colleges provide soft skills, including job hunting skills, workplace etiquette, communication skills, conflict management, as well as assistance with obtaining a driver's license or GED.[73]

Hard Skills
Nonprofit organizations, labor unions and employers provide the actual on-the-job skills training for careers through pre-apprenticeship and apprenticeship programs.[74]

FIGURE 6:
STEPS UP THE CONSTRUCTION CAREER LADDER



Adapted from The Apollo Alliance, et al. 2008. Green-Collar Jobs in America's Cities: Building Pathways Out of Poverty and Careers in the Clean Energy Economy.

[69] Sonn, Paul K. and Tsedeye Gebreselassie. 2009. The Road to Responsible Contracting: Lessons from States and Cities for Ensuring That Federal Contracting Delivers Good Jobs and Quality Services. National Employment Law Project (NELP). http://nelp.3cdn.net/fd1c66786fb98867e7_1dm6brs8l.pdf

[70] Mitnik, Pablo and Matthew Zeidenberg. 2007. *From Bad to Good Jobs? An Analysis of the Prospects for Career Ladders in the Service Industries.* Center on Wisconsin Strategy (COWS). http://www.cows.org/about_publications_detail.asp?id=399. and The Apollo Alliance, et al. 2008. *Green-Collar Jobs in America's Cities: Building Pathways Out of Poverty and Careers in the Clean Energy Economy.* http://apolloalliance.org/downloads/greencollarjobs.pdf

[71] The Apollo Alliance, et al. 2008. *Green-Collar Jobs in America's Cities: Building Pathways Out of Poverty and Careers in the Clean Energy Economy.* http://apolloalliance.org/downloads/greencollarjobs.pdf

[72] The Apollo Alliance, et al, op cit.

[73] The Apollo Alliance, et al, op cit.

[74] The Apollo Alliance, et al, op cit.

Careers

Graduates of apprenticeship programs become journeyworkers. With increasing experience and continuing education, many later become foremen, supervisors or contractors.

Definition:
Pre-apprenticeship
A program that provides contextualized training in the basic skills used in the building trades and prepares students for entrance into an apprenticeship program. Many programs train on smaller and less complex construction projects, such as a model structure on the program site, or in residential weatherization of community homes.

None of this is cheap. Providing the diverse services necessary for moving an at-risk community member to self-sufficiency requires resources. Some funds come from government programs and others through nonprofit or charitable organizations. Regardless, programs like these need both policy and financial support, especially in today's economy.

Local Hire Requirements

On-the-job training is the main component of the apprenticeship system. Each apprentice must stay fully employed to complete their program on time. Therefore, a shortage of jobs limits the availability of apprenticeships for community residents.

Local hire policies provide local jobs and also incentivize the creation of career ladders by moving community members into apprenticeship programs and into middle-class careers. Local hire policies require that a certain number of journeyworkers and apprentices who are residents of the local area to be employed on development projects. Many local hire policies also require a set participation rate by "at-risk" residents or living in poverty. Local hire is a concrete mechanism to ensure that the investment of public funds into the community helps low-income residents.[78]

A successful example of local hire policies in action, the City of Los Angeles implemented local hire after an audit of the 1996 City Hall renovation project showed that less than 2% of project work hours were performed by local residents.[79] The City's Department of Public Works now requires that 30-40% of project hours be performed by City residents. Because of that policy, $41.5 million has been reinvested in the City through the estimated wages and benefits paid to 2,600 local residents and 2,300 apprentices employed on nine Public Works projects.[80]

CASE STUDY: Los Angeles Unified School District "We Build"

Since 1999, the Los Angeles Unified School District (LAUSD) has strived to use local district residents to perform at least 50% of total hours worked on bond projects. The local-hire policies cover over $27.1 billion dollars of bond funds, the largest school construction project in the nation. Through diligent, innovative administration and community partnerships, 33% or 19,509 local residents have been employed on LAUSD projects, as of March 2009.[75]

Due to the size and scope of the bond projects, LAUSD has created an internal department to facilitate local hire and community partnerships, called We Build. We Build connects community members with pre-apprenticeship training through both the LAUSD Division of Adult and Career Education Training Centers and the nonprofit Century Community Training Program. Completion of the pre-apprenticeship program places workers in a competitive position to enter union apprenticeship programs and be employed by contractors working on bond construction projects.[76]

The Century Community Training Program is one example of an organization providing "wrap around" services. Trainees receive hands-on experience building on-site model structures where they learn the basics of several trades, including concrete pouring, residential plumbing and electrical systems, reinforcing iron setup and basic framing. Daily physical agility and endurance-building exercises help prepare trainees for the physical demands of construction. Classroom instruction includes shop math, written test-taking, blueprint reading and OSHA 10-hour safety certification. Trainees also receive case management services and job placement assistance, with 85% of graduates entering union apprenticeship programs.[77]

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[75] Los Angeles Unified School District. *We Build.* http://www.laschools.org/contractor/webuild/ and *"We Build" Program Update & UCLA Labor Center Study Summary.* Facilities Committee Report. March 5, 2009. Received from We Build program upon request.

[76] Los Angeles Unified School District. *We Build.* http://www.laschools.org/contractor/webuild/

[77] Information from the Century Community Training Program website. http://www.centurycommunitytraining.org/

[78] Kathleen Mulligan-Hansel, PhD. 2008. *Making Development Work for Local Residents: Local Hire Programs and Implementation Strategies that Serve Low-Income Communities.* Partnership for Working Families. http://www.communitybenefits.org/downloads/Making%20Development%20Work%20for%20Local%20Residents.pdf

[79] City of Los Angeles Bureau of Contract Administration, Project labor agreement documents posted online. http://bca.lacity.org/index.cfm?nxt_body=local_hiring.cfm

[80] Manny Perez, 2009. *Local Hire in the City of Los Angeles.* City of Los Angeles, Department of Public Works, Bureau of Contract Administration. Presentation to the San Diego Unified School Board, January 2009.

Good Jobs in the Green Economy

The Green Training Trailer is a mobile classroom that travels nationwide teaching union apprentices the latest in green technologies in the plumbing, heating and mechanical trades.

The green economy is large and growing rapidly. According to the American Solar Energy Society, renewable energy and energy efficiency generated $970 billion in revenues and 8.5 million jobs in 2006.[81] By 2030, ASES estimates that 1 in 4 U.S. workers will have jobs involving renewable energy or energy efficiency.[82]

With that much of our economy at stake, policy decisions are needed today to ensure high-road, middle-class careers for the future. Increasing numbers of state and local governments and agencies are addressing climate change through requiring buildings to be certified "green" and to increase use of renewable energy. The City of Los Angeles, for example, does both. All new buildings over 50,000 square feet must be LEED certified, City buildings over 7,500 square feet must be retrofit to LEED Silver standards and the Los Angeles Department of Water and Power has an aggressive solar incentive program.[83]

Achieving maximum energy efficiency requires a "whole-building" approach and correct construction and installation.[84] Industry analysts recommend certification of contractors as a means to ensuring proper installation.[85]

Apprenticeship training already incorporates green skills and provides the workforce certified in these skills. Together with a strong foundation in skills of the trades, apprenticeship graduates already are well prepared for most green economy jobs.

For example, solar electric systems require electrical training and licensing, and solar water systems require training in plumbing.[86] Apprentices in the United Association of Journeymen and Apprentices of the Plumbing and Pipefitting Industry (UA) learn how to be green plumbers.[87] In the 32-hour, LEED-approved course, apprentices receive training in water conservation technologies such as gray, recycled and wastewater treatment; solar hot water systems; reducing the energy consumption of heating and cooling appliances, and performing energy and water audits.

Weatherization Pre-Apprenticeships

For the last 32 years, the Department of Energy Weatherization Assistance Program (WAP) has helped low-income families permanently reduce their energy bills by making their homes more energy efficient.[88] Basic construction skills are used to address comprehensive energy usage, water consumption and related health and safety improvements. Weatherization workers seal leaks, replace or repair windows, add insulation and repair duct work, upgrade heating and ventilation appliances, and install water-saving devices, among other tasks.[89]

Definition:
Leadership in Energy and Environmental Design (LEED):
A green building certification system providing third-party verification that a building or community was designed and built using strategies aimed at improving performance and stewardship of resources and sensitivity to their impacts.[92]

Since weatherization uses the same basic skills as many of the construction crafts, it is a perfect fit for pre-apprenticeship programs. Community-based organizations and the Laborer's International Union of North America (LIUNA) are creating programs to train community members in weatherization as a pathway into apprenticeships and out of poverty.[90] Moreover, the American Recovery and Reinvestment Act (ARRA) includes commitments to weatherizing 1 million homes and requires payment of federal prevailing wage to workers.[91] Combining ARRA funds for the WAP program with pre-apprenticeship programs will provide good jobs at an early stage of the pathway out of poverty.

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[81] Bedzec, Roger. 2007. *Renewable Energy and Energy Efficiency: Economic Drivers for the 21st Century.* American Solar Energy Society (ASES). http://www.ases.org/images/stories/ASES-JobsReport-Final.pdf

[82] Bedzec, op cit.

[83] City of Los Angeles, *EnvironmentLA. New Green Building Program.* http://www.lacity.org/ead/environmentla/greenbuilding/newgreenbuilding.htm and City of Los Angeles. *Green Retrofit and Workforce Program Ordinance.* Administrative Code, Div. 7, Chp. 3, Art. 5.

[84] U.S. Department of Energy, Energy Efficiency and Renewable Energy. Building Technologies Program. *Commercial Buildings.* http://www1.eere.energy.gov/buildings/commercial/whole_building_approach.html and U.S. and Green Building Council. *LEED Rating Systems.* http://www.usgbc.org/displaypage.aspx?CMsPageID=222

[85] Choi Granade, Hannah, et al. 2009. *Unlocking Energy Efficiency in the U.S. Economy.* McKinsey and Company. http://www.mckinsey.com/clientservice/electricpowernaturalgas/US_energy_efficiency/

[86] Op Cit. and Pollin, Robert, Heidi Garrett-Peltier, James Heintz and Helen Scharber. 2008. *Green Recovery: A Program to Create Good Jobs and Start Rebuilding a Low-Carbon Economy.* Center for American Progress (CAP) and Political Economy Research Institute (PERI). http://www.americanprogress.org/issues/2008/09/pdf/green_recovery.pdf

[87] GreenPlumbers, USA. *Green Plumbers Course Information.* http://www.greenplumbersusa.com/training-accreditation/course-information/#climatecare

WORKER STORY: From Apprentice to Contractor

Electrical contractor Andre Johnson credits his apprenticeship training as the most valuable factor in his growing business success. "In the apprenticeship, I learned about all aspects of the electrical trade – from residential to commercial, from tenant improvements to motor controls."

Johnson, 38, spent time in San Diego during his service in the Air Force during the first Gulf War, and knew this was where he wanted to plant roots. He later returned to San Diego to raise his family and work in the electrical industry.

Johnson began his electrical apprenticeship with IBEW in 1995. After completing the program, he worked as a journey-level electrician and then progressed to foreman with San Diego-based Robinson Electric. Gaining experience and business acumen along the way, he then started Johnson Electric in the summer of 2006.

Johnson now employs local electricians and apprentices, and provides health care and retirement benefits, proving that a small business can provide family-sustaining careers and succeed.

"It is important to employ apprentices and make sure they are mentored and supported and learn all the aspects of the trade, so they can take their careers in whatever direction they want to go," Johnson said.

"It is not easy to start your company, but I did it," he said. "Now, young apprentices see me, and see that they could own a company one day, too."

SUMMARY

Completion of apprenticeship programs creates household self-sufficiency rather than a reliance on taxpayer-supported services. Construction workers are also consumers and taxpayers, so their wages and benefits are reinvested in the community as bills and mortgages are paid, local shops are patronized and workers have the time and health to participate in church, schools and other civic associations. Creating more local jobs for apprentices is the key to a strong local community. Rebuilding the economy means creating and supporting high-road, good jobs through policies that train and reward workers for their productivity.

RECOMMENDATIONS

1. State and federal "related technical instruction" funding for apprenticeship programs should increase, and funding should be provided for pre-apprenticeship and support services programs.
2. Projects receiving government subsidy should employ apprentices from registered programs at the highest allowed ratio for all trades.
3. Projects receiving government subsidy should utilize local hire policies that target low-income and/or disadvantaged workers through quality state-certified apprenticeship programs with a proven history of graduating apprentices.
4. Public contracting should give preference to responsible contractors and apprenticeship programs that provide health-care and pension benefits and OSHA safety training certifications.
5. Public contracting should utilize policies that reduce reliance on public assistance and that provide economic benefits to the community.

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[88] U.S. Department of Energy, Energy Efficiency and Renewable Energy. *Weatherization Assistance Program.* http://apps1.eere.energy.gov/weatherization/

[89] U.S. Department of Energy, Energy Efficiency and Renewable Energy. Weatherization Assistance Program *Technical Assistance Center. Core Competencies Document.* http://www.waptac.org/sp.asp?id=1818

[90] Laborer's International Union of North America. *LIUNA Builds America.* http://www.liunabuildsamerica.org/weatherize and *MAAC Project. Green Career Opportunities.* http://www.maacproject.org/Weatherization%20Trainee%20Program

[91] Recovery.gov. *The Act.* http://www.recovery.gov/?q=content/act and U.S. Department of Energy, Energy Efficiency and Renewable Energy. *Weatherization Assistance Program.* http://apps1.eere.energy.gov/weatherization/

[92] U.S. Green Building Council. Intro – *What LEED Is.* http://www.usgbc.org/DisplayPage.aspx?CMSPageID=1988

APPENDIX: WORK DESCRIPTIONS AND ENROLLMENT REQUIREMENTS FOR SOUTHERN CALIFORNIA JOINT LABOR-MANAGEMENT APPRENTICESHIP PROGRAM OCCUPATIONS

TRADE	DESCRIPTION OF WORK	REQUIREMENTS
Allied Workers	Applying thermal insulation to pipes, ducts, boilers, vessels, etc., throughout the commercial and industrial industries.	Min. 18 yrs. old, H.S. diploma or GED, certified copy of birth certificate, CA ID, & SS card. Must pass math, English, & physical.
Boilermakers	Build & repair boilers, tanks, pipelines & refineries	Min. 18 yrs old, H.S. diploma or GED. Drug test.
Bricklayers/ Stonemasons	Build with masonry materials, bricks, blocks, stone, & marble.	Min. 18 yrs. old, CA ID & SS card. Drug test.
Carpenters	Erect wood framework in buildings, build forms for concrete, CA erect partitions, studs, joists, & rafters.	Min. 17 yrs. old w/ parental consent, good physical condition, & mechanical aptitude necessary. Also, CA ID & SS card. Drug test.
Carpenter - Acoustic Installer	Installs a variety of factory produced systems & construction material in commercial buildings & public structures.	Same as for Carpenter listed above. Drug test.
Cement Mason	Finishes concrete surfaces of floors, walls, streets, driveways, sidewalks, curbs, & gutters & sets forms & screens for all of the above. Assists in preparation & grading for pouring & removal of old concrete. Operates troweling machines & grinders.	Min. 18 yrs. old, H.S. diploma or GED, good physical condition, CA ID, & SS card. Drug test.
Drywall Finisher	Prepares drywall surfaces for painting. Individual must sand, prepare, tape, & do touch-up using hand applied operations or machine applied systems.	Min. 17 yrs. old w/ parental consent, CA ID, & SS card. Must have good physical condition & no fear of heights. Drug test.
Drywall Lather	Erects wood or metal framing, fastens metal studs, metal lath, & drywall with tie wires, screws, nails, clips, & staples. Work is mostly indoors & in high places.	Same as for Finisher above and needs to have good mechanical aptitude. Drug test.
Electrical	Apprentices perform all aspects of electrical/ telecommunication wire tasks in commercial, industrial, & residential construction.	Min. 18 yrs. old, H.S. diploma or GED, CA ID, SS card, & good physical condition. Must show proof of successful completion of 1 yr. of H.S. algebra or 1 semester college algebra & provide sealed transcripts. Must have reliable transportation. Math & aptitude exam given and drug test.
Elevator Constructors	Install & maintain elevators.	Min. 18 yrs. Old. H.S. diploma or GED. Aptitude test & personal interview.
Floor Covering	Apprentices learn to prepare sub-flooring & install new, resilient flooring & carpet installation.	Min. 18 yrs. old, CA ID, SS card & good physical condition. Drug test.
Glazing	Requires the use of hand tools, electric drills, electric metal saws, & glass polishing equipment. Also requires blueprint reading, layout work, handling, cutting, & processing glass of all sizes. Work is at various heights on ladders & scaffolds.	Min. 18 yrs. old, H.S. diploma or GED, Calif. ID, SS card, & good physical condition. Applicants should not have blood clotting issues. Drug test.
Ironworker	Apprentices are employed in four related segments of the trade: Structural Ironworker, Reinforcing Ironworker, Ornamental Ironworker, or Riggers & Machine Movers.	Min. 18 yrs. old, H.S. diploma or GED, CA. ID, SS card, & good physical condition. Must have own reliable transportation. Drug test.
Laborers	Support service for concrete, asphalt, landscape, pipelines, masonry & mining.	Min. standard evaluation & good physical condition. Drug test.

TRADE	DESCRIPTION OF WORK	REQUIREMENTS
Landscape & Irrigation Fitters	Apprentices acquire proficiency in layout, installation, and testing of irrigation systems. Also requires use of hand tools, power tools, and construction equipment related to the trade.	Min. 18 yrs. old, H.S. diploma or GED and good physical condition. Drug test.
Millwright:	Apprentices install & perform maintenance on machinery in factories & on precision work in nuclear power plants.	Min. 18 yrs. old, good physical condition, and mechanical aptitude necessary. Drug test and physical exam.
Operating Engineer:	Apprentices are heavy equipment operators & mechanics for major projects using rock, gravel, sand, or dredging operations.	Min. 18 yrs. old, H.S. diploma or GED, and strong physical condition. Must pass 3 part test: verbal, mechanical & math skills. Drug test.
Painter	Apprentices prepare surfaces & apply paint working on floors, walls, ceilings, & equipment in & outside of buildings. Paint is usually applied via brushes, spray guns, or rollers.	Min. 17 yrs. old w/ parental consent, and good physical condition. Transportation required. Drug test.
Pile Driver	Apprentices work in the early states of construction by driving metal, concrete, or wood pilings into the earth for base foundation.	Min. 17 yrs. old w/ parental consent, good physical condition, and mechanical aptitude necessary. Drug test.
Plasterer	Apprentices gain knowledge, skills, & techniques required for the plastering industry. Skills include: applications of scratch & brown coats, finish coats, as well as maintenance & operation of equipment, machine applied plaster & acoustic materials.	Min. 17 yrs. old w/ parental consent, functional reading writing, and math skills required. Also, must not have fear of heights or hard physical labor. Drug test.
Plaster Tender	Tending plasterers in all aspects of interior & exterior plaster, fireproofing & EIFS applications, scaffold building, pump & mixer operation of forklifts & other mechanical equipment.	Min. 18 yrs. Must have a CA drivers license, SS card & reliable transportation. Physical agility, oral interview & drug test.
Plumber & Pipefitter	Apprentices learn all aspects of plumbing and pipefitting for commercial, industrial, and residential construction.	Min. 18 yrs. old, H.S. diploma or GED w/ sealed transcripts, valid photo ID, and birth certificate. Must pass aptitude test at community college & drug test.
Roofers	Installation of all types of roofing including slate, tile, & composition. Also includes waterproofing.	Min. 18 yrs. old, valid photo ID, ss card, and ability to lift 100 lbs. Functional reading, writing, and math skills needed. Drug test.
Sheet metal	Apprentices lay out, cut, form, fabricate, assemble, & install sheet metal items. This trade works from blueprints, lays out the work, cuts and forms the metal, then welds, bolts, rivets, and solders as required.	Min. 18 yrs. old, H.S. diploma or GED, and good physical condition. Must pass community college math test & drug test.
Surveyor	Surveyors use advanced math to determine the proper location of property lines and various field & construction survey work. Measure elevations & distances for preparation of maps showing land surfaces, boundaries, & legal descriptions of property.	Min. 18 yrs. old, H.S. diploma or GED, strong algebra and geometry skills, and good physical condition. Must pass algebra & geometry test & drug test.
Teamster	Driving rock trucks, water trucks, flatbeds, semi tractor trailer & dump trucks.	Min. 18 yrs. for warehouse/commerical vehicle. Min. 20 yrs. for a class A or B license driving position. Drug test.
Tile Setters	Preparation and installation of tile.	Min. 18 yrs.

Source: San Diego Building & Construction Trades Council.2008. Apprenticeship Matrix. http://www.sdbctc.org/Apprenticeship.html

CONSTRUCTION APPRENTICESHIP PROGRAMS

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Center on Policy Initiatives
3727 Camino del Rio South,
Suite 100
San Diego, CA 92108
619.584.5744

www.onlineCPI.org

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