

CALIFORNIA'S FORGOTTEN MIDDLE-SKILL JOBS

MEETING THE DEMANDS OF A 21ST-CENTURY ECONOMY

OCTOBER 2009



ACKNOWLEDGMENTS

California's Forgotten Middle-Skill Jobs was written for the Skills2Compete-California campaign by The Workforce Alliance (TWA), Washington, D.C., as part of its national Skills2Compete Campaign. The national version of this report, *America's Forgotten Middle-Skill Jobs*, is available at www.Skills2Compete.org.

The state and national efforts of the Skills2Compete campaign are made possible, in part, by general support from The Workforce Alliance's national funders, including the Ford Foundation, Joyce Foundation, Charles Stewart Mott Foundation, and Annie E. Casey Foundation. In addition, special thanks to the Joyce Foundation, Ford Foundation, the William and Flora Hewlett Foundation and the Bay Area Workforce Funders Collaborative for funding related to the production and release of this report.

We also gratefully acknowledge support for this report by

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EXECUTIVE SUMMARY

With a gross state product of \$1.8 trillion dollars, California is the eighth largest economy in the world, ahead of global powerhouses like Russia, Canada, India and Mexico. Our diverse state economy encompasses internet startups in Silicon Valley, the agricultural fields of the Central Valley and the bright lights of Hollywood. We're also home to some of the largest college systems in the world. Our state's sheer size combined with the breadth and depth of our industrial base and extensive education system have long put California at the forefront of economic innovation and opportunity nationwide.

However, we face deep, systemic economic problems today that threaten to undermine the programs, policies and industries that have long made us strong. Our ranking as a national innovator is slipping. With layoffs, state budget cuts, housing foreclosures and business shutdowns dominating headlines for the past year, some may believe California's economy has gone into a permanent decline.

California has been through economic crises before, and we have always found our way out of them. The question this time around is whether we can develop the policies to prepare our workforce for a future turnaround. To do this, we must understand what kinds of jobs will be in demand, and to begin to prepare our workforce for them now.

Despite all the changes and challenges our state is experiencing today, and despite popular perception, one crucial fact will not change. **Middle-skill jobs represent the largest share of jobs in California—some 49 percent—and the largest share of future job openings.**

Middle-skill jobs are those that require more than a high school diploma but less than a bachelor's degree. Prior to the recession, California was already experiencing shortages of middle-skill workers in crucial industries. Much of the job creation fostered by the American Recovery and Reinvestment Act will be in middle-skill jobs. With rising unemployment in the state, this is precisely the time to ensure we are training the middle-skill workforce that will be critical to our economic recovery and long-term success.

Addressing the need for middle-skill workers will require attention not only to educational opportunities for young people, but also for those already in the workforce.

Fifty-eight percent of the people who will be in California's workforce in the year 2020 were already working adults in 2005—long past the traditional high school-to-college pipeline.

Who are middle-skill workers? They are the construction workers who build and repair our homes, bridges, and roads. The health care workers who care for us and our loved ones. Truckers who keep our stores supplied. Police and firefighters who keep us safe. The term middle-skill refers to the level of education required by a particular job. It should not be confused with the actual competence and capacity of workers and occupations—many middle-skill occupations require highly skilled trade and technical workers with several years of training and on-the-job experience.

Federal funds from the stimulus bill are expected to create new jobs and many of these will be middle-skill, especially in green jobs, construction, manufacturing and transportation. Matching the skills of our workforce to meet this demand will help our economy recover more quickly and prepare us for better times ahead. But it doesn't end there. Retirement of large numbers of baby boomers will exacerbate demand for middle-skill workers, once the recovery begins.

California has made significant investments in training its workforce. But even before recent state budget cuts, these investments were not keeping up with the demand for middle-skill workers. We must take proactive policy actions to align our workforce and education resources to better meet the state's labor market demand. We must also make significant investments in training programs that will prepare many more California residents—laid off workers, workers in low-wage jobs, potential workers with low basic skills—for better, more plentiful middle-skill jobs and careers. And we must address our state's structural budget issues that will prevent us from sustaining these investments in the future.

If we are to realize our state's full economic potential, educational access must reflect the demands of a 21st-century economy and the realities of the 21st-century workforce. The following vision can shape our state's workforce and education policies and investments to meet these 21st-century realities:

Every Californian should have access to the equivalent of up to two years of education or training past high school—leading to a vocational credential, industry certification, or one's first two years of college—to be pursued at whatever point and pace makes sense for individual workers and industries. Every person must also have access to the basic skills needed to pursue such education.

Businesses, labor, educators, community-based organizations and others must work together on this ambitious goal. Policymakers must step in with strong political leadership and commitment to ensure that California has the middle-skill workforce we need to recover and thrive.



INTRODUCTION

With a gross state product of \$1.8 trillion dollars, California is the eighth largest economy in the world, ahead of global powerhouses like Russia, Canada, India and Mexico.¹ More than 16 million workers were employed in California in June 2009.² California recently ranked among the top ten in a Kauffman Foundation report about states best positioned to succeed in the new economy.³ Over the years, California's sheer size combined with the breadth and depth of its industrial base and extensive education systems have put our state at the forefront of economic and industrial innovation and opportunity nationwide. However, our ranking in the Kauffman Foundation report has fallen from number two in 1999 and from number five in 2007.

Like much of the nation, California is still grappling with the national economic crisis. Housing values that boomed in the late 1990s and early 2000s have collapsed, dragging the rest of our economy down with them. Tax revenues have plummeted; layoffs have soared. Unemployment rates have remained above 10 percent for months, with Imperial County reaching more than 30 percent.⁴ The state's underlying structural deficit, which existed prior to the national recession, has made it even harder to stay afloat in the national economic climate. Following multiple rounds of severe cuts, the state's General Fund budget for 2009-10 is now about \$84.6 billion—compared with about \$103 billion in expenditures during 2007-8—and further cuts are likely.⁵

Economists are beginning to predict the end of the recession, and California must begin to prepare for the turnaround. Ninety-eight Fortune 500 companies make their headquarters in California—companies as varied as eBay, the Gap, Amgen, Chevron, KB Home and Del Monte.⁶ We must ensure these and the many industries that make up California's economy can find workers with the right skills to help them stay and grow.

Education and training has played a key role in meeting the skill needs of our employers and ensuring our state's growth and success in recent years. California Community Colleges are the largest higher education system in the world, serving more than 2.9 million students each year. Two of the largest university systems in the country, the California State University and the University of California serve more than 650,000 more.

HIGHLIGHT 1

What is a middle-skill job?

Some 43 percent of all job openings in California between now and 2016 will be in middle-skill jobs.

What is a middle-skill job?

One that requires more than a high school diploma but less than a four-year college degree. The term middle-skill refers to the level of education required by a particular job. It should not be confused with the actual competence and capacity of workers and occupations—many middle-skill occupations require highly skilled trade and technical workers with several years of training and on-the-job experience.

Who provides middle-skill training?

Community colleges, apprenticeship programs, nonprofit community-based training organizations, and private career schools.

How can we meet the demand for middle-skill and high-skill jobs?

Every working Californian should have access to the equivalent of up to two years of education or training past high school and the basic skills needed to enter that training.

Despite this strong workforce preparation system, prior to the recession, businesses across the state were reporting the negative impact of skilled worker shortages on their productivity and growth. When the economy turns around and employers begin hiring again, these shortages will return. Recent cuts to our education and training systems will make it harder to address these skill shortages. Our state's structural deficit, if not addressed through fiscal reform, will outlive the recession, making long-term investments in our workforce challenging.

The first step to ensuring California's employers have the skilled workforce they need for the recovery and beyond is to understand the skill demands of our state's current and future labor market. Despite popular perception, this report finds that almost half of all jobs in California are middle-skill jobs. Middle-skill jobs are those that require more than a high school diploma but less than a bachelor's degree. This report further finds that middle-skill jobs will make up the largest segment of California's total labor market in the foreseeable future. To regain our edge and ensure we can take advantage of the job creation generated by the economic recovery, California must stop disinvesting in high- and middle-skill education and training now to ensure our businesses have the talent they need now and in the future. At the same time we must also make investments to improve the basic skills of our low-skill workers and those with barriers to employment. Given the fundamental demographic changes underway in our state, it is essential that system and policy reforms focus on inclusion and equity. These investments must focus not only on access, but also on completion, so that all Californians can succeed and be a part of our state's economic recovery.

California has some important policies in place to address the state's shortage of middle-skill workers. In April 2009, Governor Arnold Schwarzenegger announced the Allied Health Initiative, a project that will invest \$32 million in public and private funds into training primarily for middle-skill jobs in the health care sector. This money will be invested in educational programs for careers like imaging specialist, lab technician, and respiratory therapist—well-paying professions that have experienced critical shortages. In addition, the California Workforce Investment Board (CWIB) voted in 2008 to realign its work to better support “sector strategies,” industry-sector-based partnerships that align a region's workforce, education and training assets to meet critical industry workforce needs.

The California's community college system's Career Technical Education initiative has helped community colleges and schools align curricula along career pathways, and launch a large-scale demonstration project, the Career Advancement Academies. These Advancement Academies have established pipelines to high wage careers for under-prepared and underemployed youth and adults by addressing their basic skills and ESL needs in the context of career technical training in key industry sectors.

The Community Colleges have also launched a Basic Skills Initiative (BSI) to provide statewide training and support to address the professional development needs of community college administrators, faculty and staff who teach basic skills and English as a Second Language (ESL) instruction. BSI is designed to address the estimated 75 to 90 percent of students who enter community colleges needing some kind of basic remediation. More closely aligning the work of the BSI with Career Technical Education could deepen and expand its impact.

These are important pieces of a strategy to address the state's need for middle-skill workers and ongoing cuts due to the state budget crisis. More must be done.

California needs a bold and broad vision to address the educational and economic challenges facing our state during these tough times and beyond. Those challenges demand **a truly transformative vision that allows every worker to be a part of economic recovery: guaranteed access to up to two years of postsecondary education or training.** Every Californian must have the opportunity to earn the equivalent of up to two years

of education or training past high school that leads to a vocational credential, industry certification, or one's first two years of college. It must be available at whatever point and pace makes sense for individual workers and industries. It must be designed to serve not only those who transition directly from high school to college, but also those who enter postsecondary education and training while working or after spending time in the workplace. We must draw on best practice research about institutional and program practices that have proven successful in boosting participation and success rates of Californians that come from low income, immigrant, and communities of color. We must design and deliver programs in a way that ensures equally high completion rates for all populations. We must further ensure that every Californian has access to the basic skills needed to pursue postsecondary education.

America has done this successfully before. There are precedents for resetting and raising the bar for educational attainment, and there is strong evidence that such broad human capital investments yield substantial dividends for both workers and businesses.

Our need for qualified middle-skill workers today is greater than ever before. We must re-invest in policies and programs that will prepare our workforce for economic turnaround. We must ensure that we can sustain these investments well into the future by addressing our state's structural deficit—which will outlive the national recession—through meaningful fiscal reform. Taking the necessary steps to match the skills of our workforce with employer demand will help our economy recover more quickly, take advantage of the resulting job creation, and prepare us for sustained prosperity into the future.

Investing in California's workers so that they can fill middle-skill jobs makes sense for California, and for our nation as a whole.



CALIFORNIA'S FORGOTTEN MIDDLE-SKILL JOBS

Conventional wisdom and the mainstream policy discussion in California hold that our nation has evolved into an “hourglass” or “dumbbell” economy: a bifurcated labor market with a small number of highly skilled, highly paid workers and a much larger number of low-skill, low-paid workers. Many people believe that high-skill jobs requiring a bachelor-level or higher education are the only key to economic competitiveness and success. Within such a model, middle-skill occupations—the jobs that fueled the expansion of the world’s largest economy in the 1950s and 60s and provided the foundation for a robust American middle class—are on the verge of extinction.

It’s a bleak picture, to be sure. It’s also a myth.

The truth is that **middle-skill jobs, which require more than a high school education but less than a four-year degree, currently make up the largest segment of jobs in the U.S. economy, and will continue to do so for years to come.**

While middle-skill jobs have declined slightly as a portion of total employment nationwide, roughly half of all employment today is still in middle-skill occupations. And nearly half (about 45 percent) of all job openings between 2004 and 2014 will be at the middle-skill level. This compares with one-third of job openings in high-skill occupational categories and 22 percent in occupations requiring no more than a high school degree.⁷

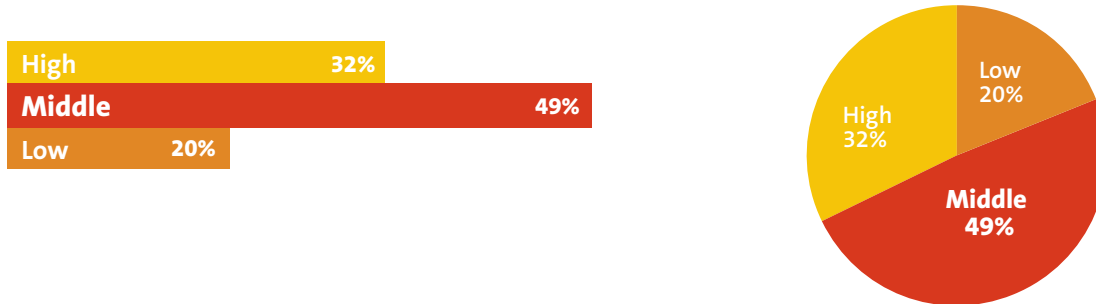
The national picture holds true in California as well. In 2008, 49 percent of all California jobs were middle-skill jobs, representing more than 7.4 million workers (Fig. 1, Table 1). The demand for middle-skill workers in the state will remain high in the decade between 2006 and 2016, with more than 2.7 million middle-skill job openings—43 percent of all job openings—expected during this time. This compares to low-skill jobs and high-skill jobs, which will account for 25 percent and 32 percent of openings respectively (Fig. 2, Table 2).

What’s more, *as federal economic recovery funds are invested, a large share of the jobs they create will be middle-skill jobs* building and repairing roads, manufacturing renewable energy products and caring for our aging population. Mark Zandi, Chief Economist at Moody’s, projects that by the fourth quarter of 2012, stimulus spending from ARRA will substantially improve employment nationwide in several industries dominated by middle-skill jobs, including construction (802,800 jobs), manufacturing (589,700) and transportation and warehousing (129,600).⁸

Despite these numbers, policymakers at both the federal and state levels have increasingly focused on college and university education, without proportionate attention to middle-skill jobs, and the education and training investments needed to ensure that workers have the skills they need to succeed in these vital occupations. This represents a lost opportunity to invest in our economy, both the immediate recovery and our long-term economic future.

Demand for Middle-Skill Jobs is Strong, Will Remain Strong in California

FIGURE 1. California Jobs by Skill Level, 2008



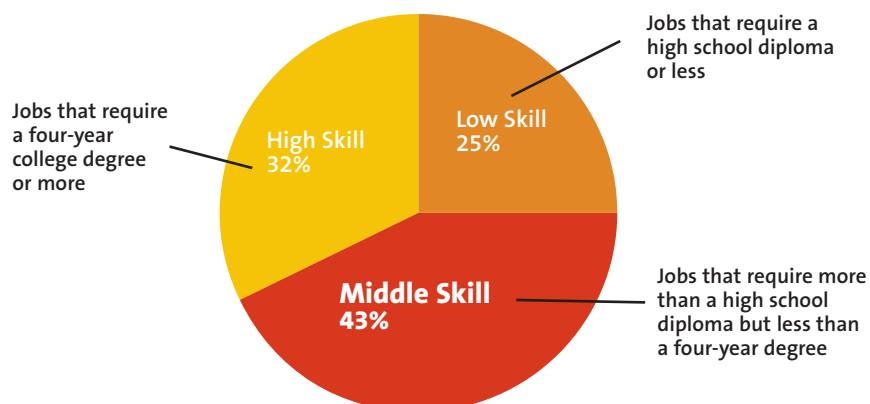
Source: Calculated by TWA from the Bureau of Labor Statistics website.

TABLE 1. California Jobs by Skill Level, 2008

	Employment	Percent
Total, All Occupations	15,212,610	100.0%
Management	839,280	5.5%
Business and Financial	766,830	5.0%
Professional and Related	3,189,750	21.0%
Total, Bachelor's Degree Required	4,795,860	31.5%
Sales and Related	1,556,330	10.2%
Office and Administrative Support	2,675,940	17.6%
Construction	729,030	4.8%
Installation and Repair	503,990	3.3%
Production	952,870	6.3%
Transportation and Material Moving	996,200	6.5%
Total, Some Postsecondary Required, Not a Bachelor's Degree	7,414,360	48.7%
Service Occupations	2,812,610	18.5%
Farming/Fishing/Forestry Occupations	189,790	1.2%
Total, No Postsecondary Required	3,002,400	19.7%

Source: Calculated by TWA from the Bureau of Labor Statistics website.

FIGURE 2. California’s Total Job Openings by Skill Level, 2006-2016



Source: Calculated by TWA from California Employment Development Department data.

TABLE 2. California Jobs and Total Job Openings by Skill Level, 2006-2016

	Employment		Job Openings	
	2006	2016	Number	%
Total, All Occupations	17,173,500	19,683,800	6,322,700	100.0%
Management	1,094,500	1,206,600	332,600	5.3%
Business and Financial	823,200	966,900	280,500	4.4%
Professional and Related	3,418,000	4,137,500	1,420,600	22.5%
Total, Bachelor's Degree Required	5,335,700	6,311,000	2,033,700	32.2%
Sales and Related	1,769,100	2,026,800	783,800	12.4%
Office and Administrative Support	2,810,600	3,081,000	863,700	13.7%
Construction	1,043,200	1,174,600	304,500	4.8%
Installation and Repair	558,600	624,200	154,400	2.4%
Production	1,020,800	1,061,600	242,300	3.8%
Transportation and Material Moving	1,097,300	1,215,800	369,500	5.8%
Total, Some Postsecondary Required, Not a Bachelor's Degree	8,299,600	9,184,000	2,718,200	43.0%
Service Occupations	3,219,000	3,867,700	1,491,000	23.6%
Farming/Fishing/Forestry Occupations	319,200	321,200	79,800	1.3%
Total, No Postsecondary Required	3,538,200	4,188,900	1,570,800	24.8%

Source: Calculated by TWA from California Employment Development Department data.

HIGHLIGHT 2

Missing the Roots in the STEM

Policymakers have become increasingly concerned about U.S. global competitiveness in recent years, and a broad consensus has developed about the need for a strong science, technology, engineering, and math (STEM) workforce to support innovation industries and emerging technologies. In particular, business and political leaders have called for increasing the number of students receiving bachelor or advanced degrees in these fields.

However, these highly skilled professionals aren't the only STEM workers in short supply. Employers have indicated there is a significant shortage of the technicians and middle-skill workers needed to implement the new technologies developed by highly skilled innovators. In California between 2006 and 2016 among STEM occupations that are expected to have worker shortages, there will be 18,460 job openings annually that will require an associate degree and 3,590 that will require some other level of postsecondary vocational education short of an associate degree. This adds up to 44.2 percent of all STEM jobs in occupations with expected shortages.⁹

Nationally, a 2005 National Association of Manufacturers report found that while 35 percent of manufacturers anticipated a shortage of scientists and engineers, more than twice as many respondents anticipated a shortage of skilled production workers, precisely the kind of middle-skill jobs that require more than high school but less than a four-year degree.¹⁰

In a recent solicitation for grant proposals, the U.S. Department of Labor emphasized the importance of the middle-skill STEM workforce:

“The STEM workforce pipeline challenge is not just about the supply and quality of the baccalaureate and advance degree earners. A large percentage of the workforce in industries and occupations that rely on STEM knowledge and skills are technicians, including others who enter and advance in their field through subbaccalaureate degrees and certificates or through workplace training. Creating interest and preparing more Americans to be productive in STEM-related jobs will require attention to segments of the workforce that are often overlooked in STEM discussions: incumbent workers who need skills upgrading, dislocated workers who are trying to find new jobs in industries with a future, and individuals from groups traditionally underrepresented in STEM fields.”¹¹

A truly comprehensive innovation agenda must address the demand for both highly educated innovation professionals and the middle-skill workers needed to implement their innovations. These middle-skill workers are at the roots of a successful STEM strategy, nationally and in California.



THE FACE OF CALIFORNIA'S MIDDLE-SKILL JOBS

What is a middle-skill job? It requires education or training past high school, but not a four year degree. You may not know it, but you probably see people working in middle-skill jobs every day.

In fact, our communities and state rely on middle-skill jobs. **Middle-skill workers are the police officers and fire fighters who keep us safe. They are the medical technicians and echnologists who keep us healthy. They are the air traffic controllers, electricians, and mechanics who keep our infrastructure up and running.** They are local, hands-on jobs, meaning they are unlikely to be outsourced to other countries.

Many of these are well-paid jobs, offering California workers a chance at economic security and prosperity. As illustrated in Table 3, these are jobs with good earning potential. Many offer median earnings that exceed the 2008 California overall median of \$36,440. Many of these jobs also require highly technical skills and years of training and on-the-job experience. For example, electrician apprenticeship programs certified by the State of California take five years of on-the-job experience and classroom training.

HIGHLIGHT 3

Do all middle-skill jobs pay high wages?

Of course, not all middle-skill occupations pay well or have meaningful advancement opportunities. Skills are only part of the economic success equation. But nationally, growth in demand for many middle-skill occupations has been fast enough to generate not only strong employment growth, but also rapid growth in wages.

Regional research supports the connection between many middle-skill jobs and good wages. For example, in California's infrastructure sector, about 42 percent of jobs from 2006-2016 are expected to be at the middle-skill level with an average wage of \$41,868, nearly fifteen percent higher than the state median wage.¹²

California is a leader in apprenticeship programs, where some 66,196 apprentices are registered in over 675 programs, earning wages while they learn on the job. Nearly sixty percent of California's apprentices are minorities, and nearly five percent of all apprentices are women. They work in fields such as electrician (median wage \$51,359) and operating engineer (\$62,279).¹³

At the national level, the data tell a similar story. Between 1997 and 2005, American workers on the whole saw an overall real wage increase of just 5 percent (adjusting for inflation). At the same time, many middle-skill occupations saw significantly higher wage increases.

Thirty Middle-Skill Jobs California Can't Live Without

TABLE 3. Projected California Demand for 30 Middle-Skill Occupations, 2006-2016

	Employment		Net Change		Job Openings	Median Earnings 2008
	2006	2016	Number	%		
Computers						
Support Specialists	61,100	71,600	10,500	17.2%	29,400	\$48,160
Specialists, Other	32,600	39,400	6,800	20.9%	15,400	\$77,360
Construction						
Carpenters	210,000	235,700	25,700	12.2%	54,100	\$51,230
Electricians	68,300	75,300	7,000	10.2%	24,600	\$52,690
Painters	73,700	83,900	10,200	13.8%	23,300	\$39,020
Operating Engineers	34,400	39,800	5,400	15.7%	12,100	\$63,010
Plumbers	56,000	62,900	6,900	12.3%	18,500	\$50,050
Healthcare						
Dental Hygienists	22,400	30,400	8,000	35.7%	12,300	\$87,460
Diagnostic Medical Sonographers	3,300	3,900	600	18.2%	1,100	\$72,690
Licensed Vocational Nurses	57,700	67,800	10,100	17.5%	25,800	\$47,470
Medical Lab Technicians	10,500	12,300	1,800	17.1%	3,400	\$38,280
Radiology Technicians	15,200	17,700	2,500	16.4%	4,600	\$61,340
Respiratory Therapists	10,800	13,400	2,600	24.1%	4,200	\$64,110
Surgical Technologists	8,200	10,400	2,200	26.8%	4,700	\$46,170
Installation, Maintenance, and Repair						
Aircraft Mechanics	11,700	13,200	1,500	12.8%	2,700	\$57,580
Auto Mechanics	79,000	90,200	11,200	14.2%	27,000	\$39,190
Bus/Truck Mechanics	28,500	32,200	3,700	13.0%	9,900	\$45,290
Heating and AC Installers	19,700	22,200	2,500	12.7%	6,000	\$45,730
Industrial Machinery Mechanics	14,200	17,200	3,000	21.1%	5,400	\$51,180
Mobile Heavy Equipment Mechanics	13,100	15,500	2,400	18.3%	5,000	\$53,520
Transportation						
Air Traffic Controllers	2,400	2,800	400	16.7%	1,100	\$122,800
Heavy Truck Drivers	147,300	168,900	21,600	14.7%	47,700	\$40,310
Public Safety						
Emergency Medical Technicians	12,100	14,800	2,700	22.3%	4,100	\$27,090
Fire Fighters	26,700	31,600	4,900	18.4%	14,600	\$61,880
Police Officers	61,300	72,200	10,900	17.8%	27,300	\$75,310
Other						
Civil Engineering Technicians	8,400	9,200	800	9.5%	2,400	\$59,370
Claims Adjusters	31,200	35,000	3,800	12.2%	11,800	\$60,030
Legal Secretaries	24,700	31,200	6,500	26.3%	9,700	\$48,640
Machinists	32,500	36,000	3,500	10.8%	8,500	\$36,030
Paralegals	35,900	41,000	5,100	14.2%	10,800	\$54,800

* 2008 median annual earnings for all occupations in California = \$36,440

Source: Projections data tabulated using California Employment Development Department data. Median Earnings data from the Bureau of Labor Statistics.

HIGHLIGHT 4

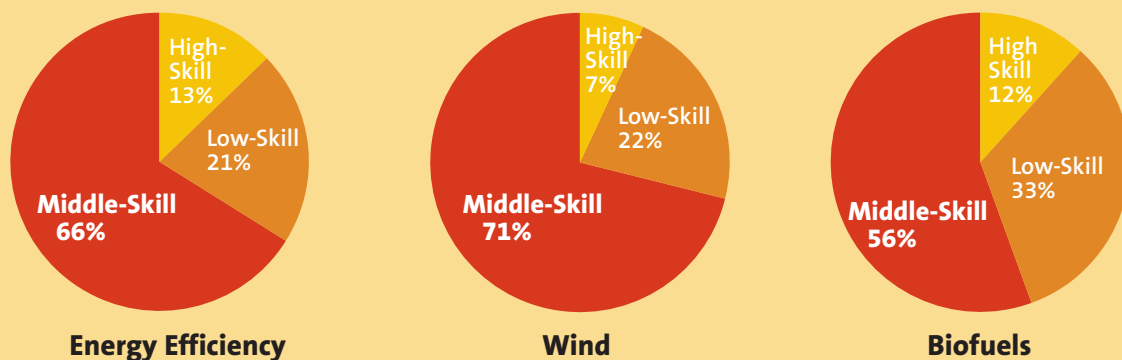
The Middle of the Green Revolution

More than ever before, policymakers and business leaders are paying attention to clean energy industries and technologies, which promise profound environmental and economic benefits for all Americans. One of the highest priorities in federal and state economic recovery policies has been strong investment in creation of a “green economy” and “green jobs.” But what are those jobs?

A recent report by the Center on Wisconsin Strategy, the Apollo Alliance, and The Workforce Alliance found that the skills needed in the green economy closely mirror the middle-skill demands of the labor market as a whole. *Greener Pathways* examines emerging opportunities in the energy efficiency, wind, and biofuels sectors, and urges stakeholders to scale up green job training by leveraging existing state and local workforce development systems.¹⁴

Green Jobs are Middle-Skill Jobs

FIGURE 3. U.S. Employment in Green Industries by Skill Level, 2004



Source: Tabulated by TWA from the US Bureau of Labor Statistics website.

California researchers see much employment promise in the emerging green economy. One study from the University of California-Berkeley found that “The renewable energy sector generates more jobs per megawatt of power installed, per unit of energy produced, and per dollar of investment, than the fossil fuel-based energy sector.”¹⁵ That study further found that environmental protection laws are not the reason why jobs in the fossil fuel industry have declined in recent years.



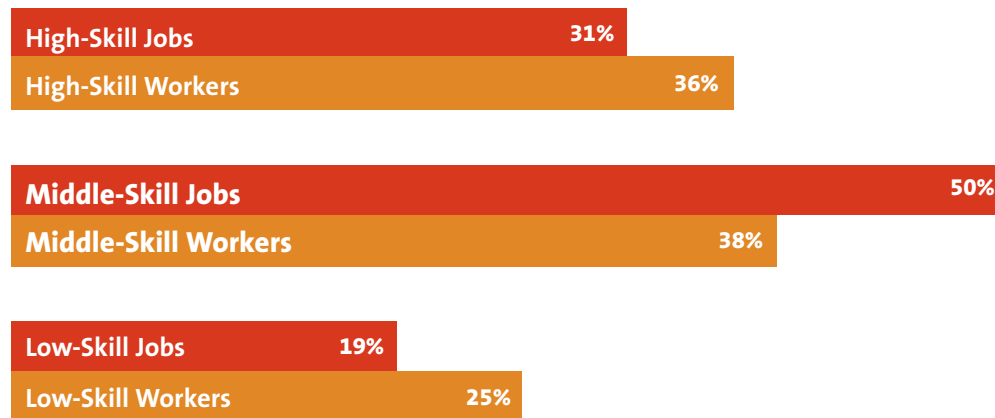
CALIFORNIA'S MIDDLE-SKILL GAP PAST AND FUTURE

Our state's economic recovery and long-term future depend in part on ensuring an adequate source of skilled workers to fill middle-skill jobs. Those middle-skill jobs are going to comprise the main portion of employment and worker-generated economic activity in our state.

California has been experiencing a shortage of middle-skill workers (Fig. 4). In 2007, about half of all jobs were classified as middle-skill, but only 38 percent of California workers had the education and training required to fill those positions. In reality, the gap was likely even greater in certain industries because many workers trained to the middle-skill level—and even those with bachelor's degrees—did not have the specific technical skills needed. This means that thousands of well-paid and rewarding jobs were going unfilled in the state, in industries that are and will be essential to California's economic portfolio.

California's Skills Mismatch: A Middle-Skill Gap

FIGURE 4. California's Jobs and Workers by Skill Level, 2007



Sources: California Employment Development Department and US Bureau of the Census

One should not interpret Figure 4 to suggest that California has an overabundance of workers with bachelor's degrees. As in the middle-skill category, the high-skill data does not tell the whole story. While many Californians have bachelor's and advanced degrees, many of these degrees are not in the occupations and professions that are in greatest demand. A number of key industries in the state have experienced acute shortages of high-skilled workers in the recent past and are likely to experience shortages again once the economy recovers. And a number of studies, including those by the Public Policy Institute of California,¹⁶ have identified the need for more bachelor's and advanced degrees in a number of economically critical industries. What Figure 4 adds to the state's skills conversation is the fact that there are also acute shortages at the middle-skill level, the largest segment of our economy.

While California, like the nation, is experiencing high levels of unemployment due to the current economic downturn, as the state moves into recovery employers will once again face the challenge of finding qualified middle-skill workers. This could inhibit economic growth. What's more, as federal Recovery Act dollars flow to the states, a major portion of the resulting job growth will be at the middle-skill level, making middle-skill training a key piece of the recovery puzzle. Guaranteed access to two years of postsecondary education or training is a crucial investment right now to ensure our state's workforce will be trained and ready to be part of the economic recovery.

California's middle-skill challenge is exacerbated by problems at both the high and low ends of the skills spectrum. At the high end, education policies that focus exclusively on four-year college degrees mean that as baby boomers retire and younger workers get older, the share of middle-skill workers available will fall, even as demand for those workers rises. At the low end we have a growing number of residents who lack the basic reading, math and other basic skills needed to qualify for middle-skill training programs.

Greater Pain in High Demand Industries

Employers themselves underscore the challenges facing California in specific industries. For example, according to the Campaign for College Opportunity, in the clinical laboratory scientist profession alone, the supply of workers through 2016 will fall short by 559 percent.¹⁷

In a 2006 survey of members of the California Manufacturing and Technology Association, respondents reported that the single most important business challenge they were facing in California was "sustaining and/or acquiring a skilled workforce," more so than workers' compensation costs, energy costs, or taxes.¹⁸

In another example, Pacific Gas and Electric (PG&E), one of the largest combination natural gas and electric utilities in the United States, estimated in 2008 that it will need to hire more than 1,000 workers over the next three years in high-wage middle-skill jobs like utility worker, apprentice lineworker, instrumentation technician, apprentice mechanic, apprentice welder and power/electrical engineer.¹⁹ Although the recession may have delayed some of the retirements that will lead to many of these open positions, the age structure of PG&E's current workforce means that the hiring need is still pressing

California Educational Projections: A Growing Middle-Skill Challenge

California educational projections (Figs. 5, 6 and 7) suggest the shortage of workers to fill middle-skill jobs that our state saw in 2007 is likely to worsen. During the fifteen years between 1990 and 2005, the California saw an increase in residents with educational attainment at the high-skill level. Residents with middle-skill and low-skill education levels fell. **But our state will see a significant change in these trends over the subsequent fifteen years, when the proportion of low-skill workers in California's workforce is likely to increase at the same time that the percentage of high-skill workers is projected to decline. The decline in middle-skill workers will continue at an increased pace.**

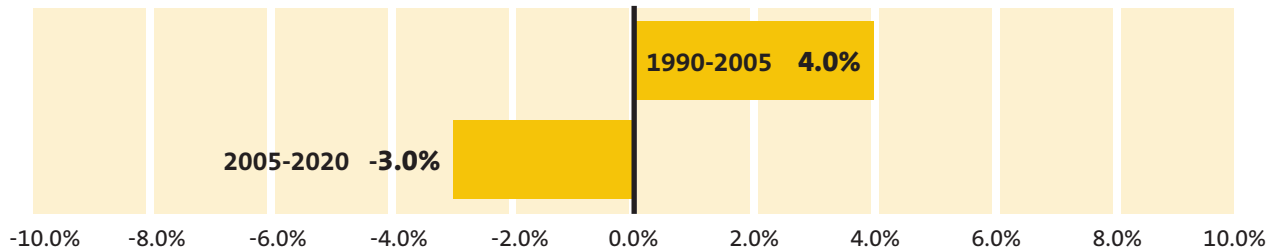
This trend is due in part to retirements and the aging workforce. Middle-skill, blue-collar workers are less likely to delay retirement than high-skill, white-collar workers. Immigration trends are likely to do little to offset this loss of middle-skill workers, as most workforce growth in the state due to in-migration will likely occur at the low-end of the skill spectrum or at the high-end of the skill spectrum (for example, engineers brought in from overseas through H-1B visas). Meanwhile, California's share of the nation's immigration is falling at all levels.²⁰

As more California-born residents stay and fewer people migrate to the Golden State, we must make greater investments in preparing our workforce for the jobs that are available here.

If not addressed, these educational trends will only make it harder for California businesses to meet their needs from the state's available workforce, stifling economic recovery and growth, while limiting opportunity for thousands of California workers to advance within the state's economy.

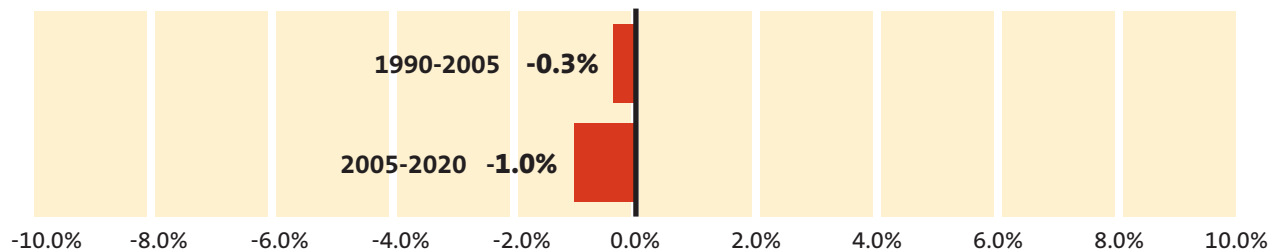
California's Future Middle-Skill Gap: Educational Attainment Past and Future

FIGURE 5. Percentage Change in High-Skill California Workers, 1990-2020



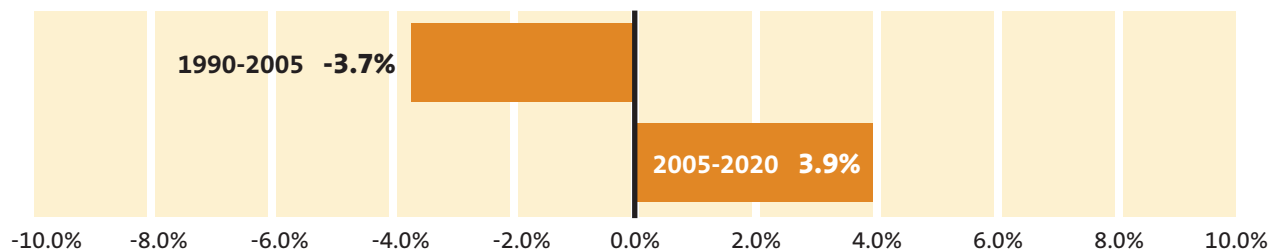
The number of workers prepared for high-skill jobs rose by four percent between 1990 and 2005. However, their ranks are expected to fall by three percent by the year 2020 (Fig 5, Table 4).

FIGURE 6. Percentage Change in Middle-Skill California Workers, 1990-2020



At the same time, the number of workers prepared for middle-skill jobs fell slightly between 1990 and 2005 (Fig 6, Table 4). Their numbers are expected to drop more rapidly through 2020, for a fall of one percent.

FIGURE 7. Percentage Change in Low-Skill California Workers, 1990-2020



After falling by 3.7 percent since 1990, the number of workers educated at the low-skill level is expected to rise by 3.9 percent by the year 2020 (Fig 7, Table 4).

Sources, Figures 5-7: 1990-2005 attainment calculated by TWA using December 1990 and 2005 CPS data. Current attainment calculated by TWA using December 2005 CPS data. 020 attainment projected by TWA using demographic data from the December 2005 CPS and population projections calculated by RAND California Statistics.

TABLE 4. Actual and Projected Change in California Workers' Educational Attainment, 1990 - 2020

	1990	2005	2020	Change 1990-2005	Change 2005-2020
Low-Skill	29.4%	25.8%	29.7%	-3.7%	3.9%
Middle-Skill	39.6%	39.3%	38.3%	-0.3%	-1.0%
High-Skill	31.0%	35.0%	32.0%	4.0%	-3.0%
Low-Skill	4,463,291	4,541,151	6,239,678	77,860	1,698,527
Middle-Skill	6,004,679	6,925,274	8,054,557	920,595	1,129,284
High-Skill	4,700,532	6,162,774	6,721,504	1,462,242	558,730
Total	15,168,500	17,629,200	21,015,739	2,460,698	3,386,540

Source: Current and past attainment calculated by TWA using December 1990 and 2005 CPS data. Current and past total labor force estimated by the California Employment Development Department. 2020 attainment projected by TWA using demographic data from the December 2005 CPS and population projections calculated by RAND California Statistics.

The Middle-Skill Gap and California's Future Workforce

We cannot address this growing middle-skill challenge by focusing our education and training dollars solely on the next generation of workers who are coming out of high school. The fact is that **58 percent of the people who will be in California's workforce in the year 2020 were already working adults in 2005—long past the traditional high school-to-college pipeline** (Fig. 8).

For that reason, to meet the demand for middle-skill workers we must target substantial training and education to adults who are working or could be working today. This will require examining current student support policies. For example, Cal Grants, California's financial aid program, is designed to focus primarily on traditional students—those who go straight from high school to universities. These are crucial investments, but they must be accompanied by significant investments in the adult workforce.

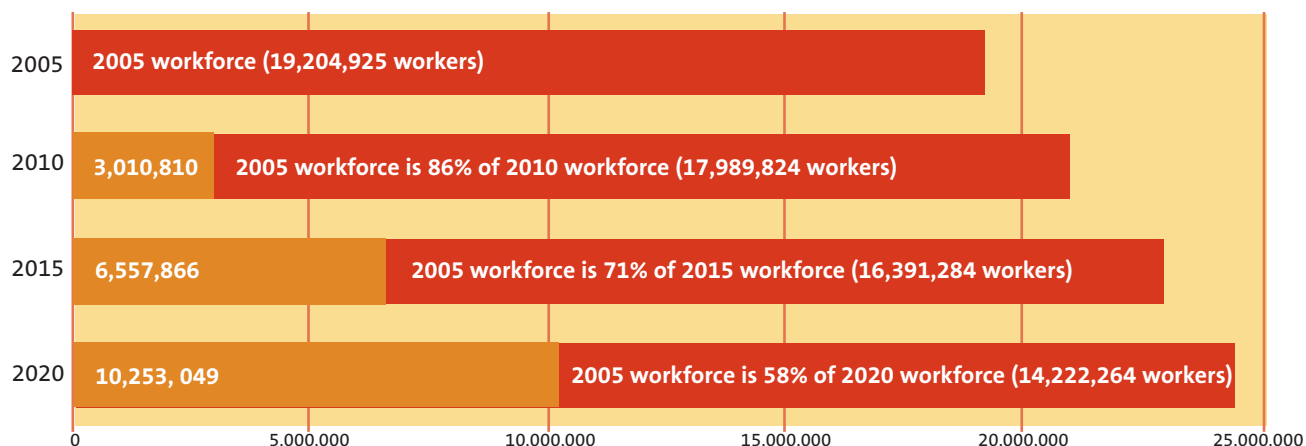
This disconnect between postsecondary education investments and employment opportunities must be addressed. Community colleges, adult education programs and registered apprenticeship programs are key to balancing these investments, but recent state budget cuts have been devastating to these systems. Those cuts will significantly reduce the training and education resources available to working-age adults.

California must take proactive policy actions to realign its workforce and education resources to better meet the state's labor market demand. This also must include major investments in training programs that will prepare many more California residents who are now at the low-skill level for middle-skill jobs and careers.

California's Workforce of Tomorrow is in the Workforce Today

FIGURE 8.

Working California Adults Age 20-64 in the Current and Projected Population, 2005-2020



Source: Calculated by TWA using population projections from RAND California Statistics.

An Even Greater Basic Skills Crisis?

The data supporting education demand projections probably underplays the need for more broadly based basic skills education nationally.²¹

Despite increases in U.S. educational attainment over the last twenty years, the National Assessment of Adult Literacy (NAAL) indicates only a slight increase in quantitative (math) skills between 1992 and 2003, and no improvement at all for prose and document literacy. Nationally, 93 million adults lack the literacy to participate in postsecondary education and training. This means that tens of millions of Americans cannot access middle-skill education and training programs because they lack basic English and math skills, or do not have a high school education.

Even for those who enter postsecondary education, basic skills can be a barrier to success. Nearly two-thirds of community college students nationwide must take at least one remedial course.²² In California, those rates have been estimated to be as high as 75 to 90 percent.²³

Like the nation as a whole, California faces substantial challenges when it comes to basic skills, only on a much greater scale than many states. More than four million adult Californians age 18 to 64 do not have a high school diploma.²⁴ In 2003, 23 percent of Californians lacked basic prose literacy skills.²⁵ Only 14 percent of California adults with less than a high school diploma are enrolled in adult basic education, and only 14 percent of residents with limited English proficiency are enrolled in English as a Second Language (ESL) classes.²⁶ While these numbers are low, the good news is that in both cases, California is doing better than the national average.

This evidence suggests that California faces challenges in meeting the basic skill attainment levels needed to grow its middle-skill workforce. With the right basic skills training, many more Californians could prepare to enter and succeed in middle-skill training and middle-skill jobs.

Recognizing these challenges and opportunities, Board of Governors of the California Community Colleges adopted a comprehensive, statewide Career Ladders policy focus designed to improve postsecondary career pathway access and completion for underserved populations. In 2007 the community college system launched the Career Advancement Academy initiative, a major demonstration project designed to create pathways for low-skill, underemployed and unemployed workers to attain the basic and technical skills they need to move up into middle-skill jobs in industries including energy, biotechnology, allied health, building and construction trades,

transportation and logistics, and manufacturing. The philanthropic community recognized the value of the initiative from the beginning and partnered to provide key support—including support for documentation, data tracking and independent evaluation. Early results from the Academies are very promising.



CLOSING THE GAP

The Face of Middle-Skill Education and Training

Who provides training and education for middle-skill jobs? The good news for Californians is that there are many different options.

While education for high-skill jobs is limited to college or post-graduate degrees, education for middle-skill jobs can come in many different forms (Table 5). The most commonly-known setting is the community college, but it is not the only place. Middle-skill education and job training programs include vocational certificates, associate degrees, apprenticeship programs—and can be found in many different settings, including community and technical colleges, community based training organizations, and workplaces.

An associate degree allows students to enter the workforce immediately upon completion of the degree. Associate degrees are generally required for occupations such as registered nurse, radiological technologists, and automotive technician. Vocational certificates guarantee certification of the knowledge and skills needed to perform the duties of a given occupation, according to regulations or nationally accredited standards. They generally require less classroom time than associate degrees, offering a path for individuals to develop and verify career technical skills. They are also extremely useful for individuals already in the workplace as a means of reinforcing existing skills sets and acquiring new skills. Examples of jobs where a vocational certificate could be valuable include dental and legal assistants, computer network specialists, and web designers.

Apprenticeships are supervised employment programs that combine classroom instruction and on-the-job training. Generally offered directly by employers or through labor/management partnerships, apprenticeships can be found in such high-demand careers as electrician, aircraft mechanic, or plumber. Both the state and federal governments oversee apprenticeship programs to ensure they meet standards of curriculum and workplace conditions. California has a number of registered apprenticeship programs and could benefit by further expanding this option.

There are Many Different Pathways to Middle-Skill Jobs

TABLE 5: Types of Training Programs for Middle-Skill Jobs

	Associate's degree	Vocational certificate	Apprenticeship
Time to complete	Two years, full time	Up to a year	Two to four years
Availability	Community college	Community college, community-based organization, technical school, workplace	Partnership between unions and employers
Examples of types of jobs	Radiation therapist, licensed practical nurse, computer specialist	Dental assistant, legal assistant, auto mechanic, firefighter	Electrician, aircraft mechanic, plumber

For workers whose basic skills are not at a level that allows them to enter these types of education and training programs, there are program options that teach English, basic reading and math skills in the context of occupational skills. These programs often connect to a specific job that is on a defined career ladder, apprenticeship or to further education that results in a middle-skill credential.

In order to develop our state's middle-skill workforce to meet demands in the economic recovery and beyond, we must target significantly more resources toward a variety of middle-skill and basic skill training programs. We must create more flexible, demand-driven systems that allow working adults to return to training and education from time to time, to upgrade their skills and to earn additional certifications and degrees.

California has a number of exemplary middle-skill education and training opportunities that can serve diverse populations. These are just a few examples:

- ◆ Launched in 2008 at Laney College in Oakland with funding from the PG&E Corporation Foundation and East Bay Career Advancement Academy, the Pacific Gas & Electric Company's (PG&E's) PowerPathway Program recruits and trains workers for jobs in the energy sector through several community colleges around the state. The program offers courses for a variety of skill and background levels. The Bridge program provides introduction to the energy industry and customized coursework for participants needing additional attention to literacy and mathematics skills, strengthening their preparation and eligibility for employment at PG&E. Endorsed programs offer longer term training leading to certificates or associate degrees; capstone courses provide additional skills development for those with certificates or associate degrees. Partnerships with local Workforce Investment Boards provide recruitment, support services and resources for trainees.
- ◆ The Sacramento Employment and Training Agency (SETA) construction partnership promotes the inclusion of women and minorities in the construction sector. SETA works with the City of Sacramento Utilities Department, County of Sacramento Public Works, the Sacramento Sierra Building and Construction Trades Council, the North State Building Industry Association, CalTrans, the Teamsters, and others to train low-wage workers, women, TANF recipients, and dislocated workers for highway construction. These efforts have increased participation by women in the area's construction sector. The Public Works Project more than tripled the number of women working in county public works blue-collar jobs and established a new trainee classification that makes it easier for women to access these jobs.
- ◆ The California Transportation and Logistics Institute (CaTLI) is a nonprofit formed in 2007 in partnership with the California Community College (CCC) and the California State University (CSU) systems, and coordinated by the L.A. County Economic Development Corporation (LAEDC). CaTLI provides customized training for employers for new and/or incumbent workers. CaTLI also provides industry driven skills training certificate and degree programs from high school to the university level. Working with its partners, CaTLI has helped map out career opportunities and pathways within the industry's diverse modes of transportation (air, rail, road and water) and its sub-sectors: Transportation, Logistics Support, Warehousing and Storage, Supply Chain Management, and Safety and Security. Within each sub-sector, training is needed across entry-, mid-, supervisory and manager levels.

- ◆ The Health Care Workforce Development Program (HCWDP) was established by Service Employees International Union (SEIU) Local 721 and Los Angeles County as a labor-management educational partnership, implemented by the Worker Education & Resource Center (WERC). HCWDP offers basic skills preparation, career path training, test preparation, help with licensure as well as placement assistance for existing L.A. County Department of Health Services workers. The program provides coaching and counseling services. The HCWDP also partners with the Los Angeles Community College District, supporting enrolled workers so that they are successful in college level health care programs.
- ◆ Funded by the Governor's Workforce Investment Act discretionary funds, the East Bay Green Job Corps (EBGJC) is a regional education and workforce initiative targeting underprepared and hard to serve youth age 18 to 24 with soft and hard skills training and community service internships to move them into jobs and education aligned to high job growth green job sectors. EBGJC is founded upon several regional efforts that target green sector workforce development and the creation of contextualized education pathways for educationally underprepared youth, including the East Bay Green Corridor Partnership; East Bay Career Advancement Academies, Oakland Green Job Corps and Richmond BUILD.
- ◆ The City College of San Francisco and Jewish Vocational Services of San Francisco formed a partnership in 1992 to address the looming nursing crisis. Together they built a one-semester foreign nurse refresher program to help immigrants with nursing degrees in other counties transition into the San Francisco workforce. JVS provided robust support services to help assure the academic and employment success of program participants. In the early 2000s the partnership was expanded to help City College deal with a 40% attrition rate in its Associate Degree nursing program. Today, all students are offered JVS wrap-around services during orientation, including child care, health care, tutoring, career counseling and placement services. JVS staff is on site at the college and uses an early alert system to quickly identify and address potential barriers to student success.
- ◆ The Utilities and Construction Prep Program at Los Angeles Trade Technical College prepares low-skilled youth and adults for entrance into utilities or the construction trades. The program incorporates contextualized math and English; career counseling; pre-employment skills; applied construction skills and workplace fitness and conditioning. Students then move into certificate programs and employment as well as continuing opportunities to earn a degree. Combining both utilities and construction preparation in the early weeks allows students to choose the path that best suits their interests and background; the construction trades are generally more accessible to youth and adults who have been court involved, while this would be barrier to employment in the utilities industry. UCPP is based on strong partnerships among L.A. Department of Water and Power, Southern California Gas Company, the Electrical Training Institute of Southern California, IBEW Local 11, IBEW Local 18-LADWP Joint Training Institute, UAW Labor Employment and Training Corp, the L.A. Infrastructure and Sustainable Jobs Collaborative, Regional Economic Development Institute, the L.A. Career Advancement Academy; and Women in Non Traditional Employment Roles (WINTER).

A 21st-Century Skill Guarantee

If we are to realize our state's full economic potential, educational access must reflect the demands of a 21st-century economy and the realities of the 21st-century workforce. Given that the largest portion of California jobs are at the middle-skill level and the majority of future workers are already in the workforce today, the Skills2Compete-California campaign supports the following vision for our state:

Every Californian should have access to the equivalent of up to two years of education or training past high school—leading to a vocational credential, industry certification, or one's first two years of college—to be pursued at whatever point and pace makes sense for individual workers and industries. Every person must also have access to the basic skills needed to pursue such education.

It's an ambitious goal, but not an unprecedented one. Throughout our nation's history, federal and state policymakers have elevated educational guarantees to meet the changing skill requirements brought on by economic and technological change. And, indeed, leaders in California have already taken some steps to address similar challenges in the 21st century. But there is more to be done.

Historical Precedents

As the nation transitioned from an agricultural economy to an industrial economy in the mid-nineteenth century, policymakers across the United States realized that a broader skill set was required from a much greater segment of the population. This was one important factor in the development of the high school movement to provide a free public education to all citizens. Between 1910 and 1930, the proportion of seventeen-year-olds in secondary education increased from less than 9 percent to 30 percent, fueling the expansion of America's great cities and industries. By the late 1990s, nearly 70 percent of U.S. students were graduating with a high school diploma. Universal secondary education is now understood as one of the fundamental guarantees the U.S. makes to its citizens.

By the middle of the 20th century, society realized that postsecondary education and training would allow the United States to flourish. This was the atmosphere in which the GI Bill was passed in 1944. Between 1944 and 1956, nearly 8 million returning servicemen and servicewomen used the GI Bill. People pursuing four-year college degrees accounted for about a quarter (2.2 million) of those benefiting from the program. **But a much larger—and typically forgotten—6 million GIs pursued middle-skill training.** As such, a broad-based investment in middle skills was a major part of America's post-war prosperity.

State Skill Guarantees

Unfortunately, more recent federal investments in postsecondary education and job training have been in decline. The Recovery Act is making significant contributions to those education and training programs, but it constitutes a one-time, relatively short term investment. The overall long-term trend has been downward.

However, some forward-thinking states and policymakers have been making vital commitments to the skills and economic security of their citizens, recognizing that a new minimum level of skills and education should be made available to state residents.

For example, in spring 2004, the Washington State Board for Community and Technical Colleges began ten innovative demonstration projects that tested traditional notions that

students must first complete all levels of basic education before they can begin workforce training. This Integrated Basic Education and Skills Training (I-BEST) program pairs English as a second language (ESL)/adult basic education (ABE) instructors with professional-technical instructors in the classroom to concurrently provide students with literacy education and workforce skills while earning credit toward a certificate or degree. The initiative seeks to help underserved populations reach the “tipping point” of at least one year of technical training that will allow them to advance toward a livable wage. The pilots resulted in significantly higher completion rates and wage gains for the participants. Washington State has developed a funding mechanism to support this more expensive, yet highly effective model, by reimbursing community colleges at a higher rate for approved I-BEST programs.

The Georgia HOPE Grant program, funded with lottery proceeds, pays tuition, fees, and up to \$300 for books for Georgia residents to earn a certificate approved by the state Department of Technical and Adult Education (or a comparable program of study approved by the Board of Regents) in a public technical college or public college or university. The HOPE Grant program does not have income- or merit-based criteria for eligibility (although recipients must make satisfactory academic progress while receiving it) and allows part-time attendance. According to the state Department of Technical and Adult Education, enrollment in public technical colleges has increased by 110 percent since the HOPE program began.

In 2007, Michigan Governor Jennifer Granholm announced the creation of the No Worker Left Behind program in her State of the State address. The program, officially launched in August 2007, pays tuition of up to \$5,000 per year for two years for 100,000 Michigan workers to pursue a degree or certificate at a community college, university, or other approved training program in a high-demand occupation (determined on a regional basis). The state reprogrammed \$40 million in federal funds—primarily from the Workforce Investment Act and Trade Adjustment Assistance programs—to support the initiative. The separate Michigan Promise program guarantees every new high school graduate a \$4,000 scholarship for completing two years of postsecondary education at an eligible state institution.

The Benefits and Returns of a 21st-Century Skill Guarantee

The potential benefits and returns of a 21st-century skill guarantee are widespread. Guaranteeing up to two years of postsecondary education and training will benefit the individuals who get that training, strengthen the productivity of the state economy, and could increase public resources.

Simply put, more education means greater participation in the workforce and higher lifetime earnings. A recent examination of California’s adult learners found that about 80 percent of adults with an associate degree and 77 percent of adults with some college (but not a degree) participated in the workforce, compared to only 73 percent of adults with a high school education and 65 percent of adults with less than a high school education.²⁷ **In addition to higher work participation rates, adults with some college averaged about \$340,000 more in lifetime earnings than those with only a high school education, and adults with an associate degree averaged about \$523,000 more in lifetime earnings.**²⁸

These findings are consistent with national findings that the median worker with an associate degree earns about 33 percent more than a worker with only a high school degree, while workers with a bachelor’s degree earn about 62 percent more than workers with only a high school degree.²⁹ These national findings indicate not just that postsecondary education provides a significant earnings advantage for workers, but also that *on a per-year basis*, benefits for workers receiving a two-year degree are comparable to those receiving a four-year degree.

More education also is associated with lower unemployment. Nationally, in July 2009

unemployment for workers with less than a high school diploma was nearly 15.4 percent. For those with a high school diploma it was 9.4 percent, while for those who'd completed high school plus some college—our middle-skill level—the unemployment rate was 7.9 percent.³⁰

A guarantee of access to up to two years of postsecondary education for all workers would increase productivity and earnings in California. According to the Organization for Economic Cooperation and Development (OECD), each year of postsecondary education leads to an increased per capita output of between 4 and 7 percent.³¹ Increasing the average total schooling of a city's population by two years increases the wages of all workers by about 6 percent, regardless of individual educational attainment.³² And one additional year of schooling leads to an 8.5 percent increase in productivity in the manufacturing sector, and more than a 12 percent productivity increase in other industrial sectors.³³

A 21st-century skill guarantee for all Californians would also increase public resources. Increasing the number of U.S. adults with middle-skill credentials by 10 percent would increase federal tax revenue by \$14 billion,³⁴ and would save the federal government up to \$2,500 per person in reduced reliance on public assistance programs.³⁵



CONCLUSION

Middle-skill workers are at the heart of our nation's economic recovery, and they will serve as the backbone of our state economy for years to come. They will repair our roads and bridges, care for our sick and elderly, transport goods, keep our communities safe, and provide a host of other services we rely on daily.

California faces enormous economic challenges today, and our middle-skill workforce must play an important role in bringing our state back from the current crisis. In the short term, our workforce must be ready to meet demand as Recovery Act funds begin creating middle-skill jobs. In the long run, we must provide training and education needed to meet demand for the greatest portion of jobs in our economy.

Right now, our state's funding for training and education is built on the myth of the hourglass economy. We do not invest enough in training people for middle-skill jobs.

Without those investments, we cannot provide adequate resources to allow working adults to seek greater training and education to improve skills and advance in their careers. Without those education and training opportunities, our businesses and communities will suffer from a lack of qualified workers. Our economic recovery will be slowed.

As California receives Recovery Act funding, we have a unique opportunity to take a closer look at our economy and the importance of middle-skill jobs in it. What will we do to ensure our education and training policies reflect the reality of the job market?

While California has taken some important steps to address the growing shortage of middle-skill workers, **it is time for a bold, visionary step that will ensure all California workers can be a part of economic recovery and secure our place in a 21st-century economy.** At various times in our nation's history, visionary leaders have adjusted the basic level of education guaranteed to all Americans as a way to adjust to a changing economy and remain competitive. Universal high school and the GI Bill are examples of when we did this with great success in the past.

It's time to do it again by guaranteeing that all California residents have access to up to two years of postsecondary education or training. This should be the guiding vision for California's economic and education policy. It would provide our workers and businesses with the skills they need not only to rebuild and recover, but to compete in an increasingly competitive global marketplace.

How will we do this? Leaders from the business, labor, and training communities are ready to roll up their sleeves and make it happen, if they are supported by strong political leadership and commitment. It is time for California policymakers, educators, unions and businesses to unite with others around the country around this new vision, to champion the policies and strategies necessary to ensure that California recovers and thrives, and that our workforce is at the forefront of the innovation economy.

APPENDIX: METHODOLOGY

Table 1 and Figure 1: Data from the Bureau of Labor Statistics.³⁶ Occupational categories (high, middle, low skill) based on the methodology used in Holzer and Lerman, 2007.³⁷

Table 2 and Figure 2: Based on occupational projections for 2006-2016 by the California Employment Development Department.³⁸ Occupational categories (high, middle, low skill) based on the methodology used in Holzer and Lerman, 2007.

Figure 3: Data from the Bureau of Labor Statistics (BLS).³⁹ Occupations divided into skill levels (high, middle, low) based on educational attainment requirements as defined by BLS. Because BLS does not classify occupations as green jobs or not, this section of the report assumes that the skills distribution in green jobs is the same as the skills distribution that occurs across all related occupations.

Table 3: Based on occupational projections for 2006-16 by the California Employment Development Department, using recategorization of occupations according to BLS Education and Training Categories.⁴⁰ Jobs requiring at least moderate-term on-the-job training, related work experience, a post-secondary vocational award, or an associate degree were classified as middle-skill.

Figure 4: Based on occupational estimates for 2007 by the Bureau of Labor Statistics, and December 2007 Current Population Survey (CPS) data on educational attainment by state.⁴¹ Occupational categories (high, middle, low skill) based on the methodology used in Holzer and Lerman, 2007. Only workers in the labor market and at least 25 years of age (i.e., past traditional school age) are counted.

Figures 5, 6 and 7, and Table 4: Based on Current Population Survey (CPS) data for December 1990, and 2005⁴² along with population projection data by RAND California Statistics⁴³ and labor force estimates by the California Employment Development Department.⁴⁴

1989, 2005 and 2020 Educational Attainment: Past years' educational attainment data reported only for workers in labor force and aged 25 and over, using CPS data. 2020 projections calculated using static educational attainment model presented in Hanak and Baldasarre, 2005.⁴⁵ In that model, educational attainment figures are calculated for the state's current workers (workers aged 25-49 in 2005) for each of 12 different race, ethnicity, gender and age cohorts. Educational attainment for these cohorts is assumed to be static over the ensuing 15 years (2020), and educational attainment for new cohorts of workers (i.e., younger than 25 years in 2005) is assumed to mirror that of similar age-race-gender groups today. As such, changing educational attainment throughout the state's population is calculated based on projected demographic changes in the composition of the working population, and does not take into account possible changes in behavior, immigration, et.al.

Creating Skill Categories Using Educational Attainment Data: Skill attainment categories (high, middle, low) for 1990 created using a reclassification of CPS-reported "grades completed" that parallels the educational attainment categories later used by CPS, and reclassified in this table for current and future years using the same method as in Figure 4, p. 16.

Figure 8: Data from long-term population projections (2000 to 2030) by age cohorts, as calculated by RAND California Statistics.⁴⁶ Each cohort was either classified as a "current working age adult" or "not a current working age adult" based solely on age. Current working age was defined as ages 20 to 64.

ENDNOTES

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