



APPRENTICESHIP

Completion and Cancellation
in the Building Trades

MATT HELMER AND DAVE ALTSTADT

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Table of Contents

Acknowledgements	2
Key Terms	4
Executive Summary	5
Introduction	11
Previous Research Informing this Report	14
Research Methodology	15
Overview of Completion and Cancellation Rates in Construction Apprenticeship	16
Barriers to Apprenticeship Completion in the Construction Industry	30
Financial Security	31
Workplace Environment	32
School and Academic Skills	36
Personal and Life Challenges	37
Drivers of Success in Construction Apprenticeship	40
Personal Commitment to a Career in Construction	40
Strong Determination, Work Ethic, and Desire to Learn	40
A Supportive Workplace that Prioritizes Skills and Career Development	41
A Support Network to Ease the Burdens and Obstacles of Apprenticeships	42
Efforts to Support Apprenticeship Completion	43
Pre-Apprenticeship Programs	43
Retention Counselors	43
Mentoring Efforts	44
Apprenticeship Academy	46
Department of Transportation Funding for Pre-Apprenticeship Programs and Support Services	46
Recommendations	48
For Policymakers and Investors	48
For Pre-apprenticeship Programs	49
For Apprenticeship Programs and Industry Leaders	49
Conclusion	51
Appendix A: Notes on Federal and State Data Sources Used in this Report	51
Appendix B: Registration and Demographic Information of Construction Apprentices	52
Appendix C: Statistical Appendix	52

Key Terms

Active Apprentices Active apprentices are still enrolled in their apprenticeship program. For the purposes of calculating completion rates in apprenticeship, active apprentices also include those who are suspended or have been reinstated.

Advanced Standing Apprentices who have prior experience in the trades or prior technical instruction may be granted credit toward their apprenticeship, thus reducing the number of required training hours. These apprentices with credits are referred to as having advanced standing.

Apprenticeship Program Sponsors An apprenticeship sponsor can be an individual employer, employer association, or partnership between employers and labor unions. Sponsors recruit, screen and hire apprentices, and develop the agreements with apprentices that determine the length and content of the training and the wages an apprentice will earn.

Cancelled Apprentices Cancelled apprentices are those whose training agreement with their sponsoring employer has ended. Apprentices or employers can initiate the process to end the training contract.

Completed Apprentices Completed apprentices have finished their on-the-job and classroom training requirements. These apprentices receive a credential from the Office of Apprenticeship or the State Apprenticeship Agency certifying that they completed their apprenticeship and acquired the necessary skills to be a journey worker.

Journey worker A journey worker is an apprentice who has completed his or her program of study and demonstrated proficiency in a trade.

Pre-apprenticeship Program Pre-apprenticeship program is the term most commonly used to describe workforce development programs that prepare people, particularly low-income individuals and non-traditional construction workers such as women and minorities, to enter employment or apprenticeship in the construction trades.

Probationary Period An apprentice's probationary period is up to one year or 25 percent of the length of the apprenticeship, whichever is less, according to the U.S. Department of Labor. The probationary period has traditionally been used by apprenticeship sponsors and apprentices to determine if the apprenticeship contract is beneficial to both parties.¹

Registered Apprenticeship Registered Apprenticeship programs — operated by employers, employer associations and labor-management partnerships — offer workers an opportunity to earn a wage by working at a job site while learning a skilled trade through a combination of on-the-job training (OJT) and related technical instruction (RTI) or classroom instruction. The federal labor department's Office of Apprenticeship (OA) and State Apprenticeship Agencies (SAAs) administer Registered Apprenticeship programs.

Reinstated Apprentices Reinstated apprentices previously registered in a Registered Apprenticeship, cancelled, and then re-registered in a program within the same trade. Reinstated apprentices are considered active in calculating completion and cancellation rates.

Suspended Apprentices An apprenticeship may be temporarily suspended due to misconduct by the apprentice, health-related issues, or other circumstances affecting the apprentice's ability to work and participate in training. Suspended apprentices are considered active apprentices when calculating completion and cancellation rates.

¹ U.S. Department of Labor, Employment and Training Administration, "At a Glance: Probationary Periods and Cancellations Apprenticeship Final Rule, 29 CFR Part 29," October 29, 2008, http://www.doleta.gov/oa/pdf/Probationary_Periods_Cancellations.pdf (accessed 10 March 2013).

Executive Summary

Registered Apprenticeship has been a valuable training approach in the construction industry and other sectors for decades. The National Apprenticeship Act (Fitzgerald Act), first enacted in 1937, helped create over 25,000 Registered Apprenticeship programs across the country. In 2011, approximately 130,000 individuals entered a Registered Apprenticeship program and nearly 400,000 overall were active in a program.² Registered Apprenticeship programs provide individuals with an opportunity to “earn and learn” through a training model that combines related technical instruction (RTI) or classroom instruction with structured and paid on-the-job training (OJT) experiences. Dependent largely upon private funding, apprenticeship training is driven by employer demand, which affects both the training content and the number of workers trained. By developing workers with the skills that employers need, apprenticeship programs help provide the construction industry with a reliable pipeline of skilled workers. For workers, Registered Apprenticeship in construction offers a clear path to a well-paying career. Apprentices have the opportunity to develop a skilled craft through both classroom experience and hands-on experiential learning on the job site. They also earn a paycheck while they are training, which prevents them from having to make the difficult choice faced by so many workers between working or going to school.

Long viewed as the premier training system for the building trades, Registered Apprenticeship programs face some heightened pressure to increase the percentage of apprentices who complete training and attain a journey license. Missed career opportunities for unsuccessful apprentices, perceptions about the construction industry’s shrinking talent pool, and high training costs for employers are driving industry stakeholders to examine the issue of apprenticeship cancellation. Also raising concern is the high cancellation rate for minorities and women who are already under-represented in construction apprenticeships and in the industry’s workforce overall.

Many have sought in recent years to determine the magnitude and primary causes of apprenticeship cancellation, to learn how cancellation rates fluctuate over time, and to identify and implement effective ways to raise completion rates. Building upon these efforts, the Aspen Institute Workforce Strategies Initiative (AspenWSI) conducted this study, which analyzes national- and state-level data on apprenticeship cancellation rates, as well as findings from multiple field interviews about why some apprentices achieve journey-level status while others cancel out of apprenticeship programs. With support from the Annie E Casey Foundation, the AspenWSI study also presents emerging program strategies and policy recommendations designed to curb cancellation among building trades apprentices.

In an analysis of a national dataset from the Office of Apprenticeship and state datasets, AspenWSI found that:

- ▶ **Although apprenticeship completion rates vary, it is not uncommon for nearly half of construction apprenticeship agreements initiated in a given year to be cancelled.** Of the 121,000 apprenticeship agreements in construction started between 2006 and 2007 from the national data set, 46 percent were cancelled by May 2012. Of the remaining agreements, 36 percent were completed and 18 percent remained active. A literature review and analysis of data from individual states examined cancellation rates during time periods outside of the current recession and found that cancellation rates around 50 percent during times of economic growth are also not uncommon.
- ▶ **The Great Recession has led to high numbers of apprentices cancelling or taking longer to complete their programs.** Without work and the opportunity to accumulate OJT hours toward their training, apprentices may seek employment elsewhere or may take longer to complete their programs. Of construction apprentices in our national dataset who started their apprenticeship in 2008, 55 percent had already cancelled by May 2012, compared to only 44 percent of those who began their apprenticeship in 2006 before the recession began. Millions

² U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship, “Registered Apprenticeship National Results: Fiscal Year 2011,” http://www.doleta.gov/OA/data_statistics.cfm (accessed 20 December 2012).

of construction jobs were also lost during the recession, which likely contributed to a large number of apprentices cancelling. Because of the recession, apprentices are taking longer to accumulate OJT training hours and complete their programs, which is lengthening the time they spend in their apprenticeship.

- ▶ **The majority of apprentices who cancel out of their programs do so during the first one to two years.** Nearly 57 percent of the cancelled apprenticeship agreements initiated between 2006 and 2007 from the OA national data set were cancelled within the first 24 months. State data also show high percentages of apprentices cancelled during the first and second year of training.
- ▶ **The timing of cancellation for many apprentices falls within their probationary period.** Apprentices' probationary period is up to one year or 25 percent of the length of the apprenticeship, whichever is less. During this period, an apprentice tries out a new career and employer while the apprenticeship program further assesses the apprentice's ability to work in the industry. For apprentices registered between 2006 and 2007 in a program with 8,000 hours training, which includes a mix of on-the-job training and classroom instruction, 26.5 percent of those who cancelled did so during the first 12 months, roughly the length of the probationary period. Of the apprentices who remained after the first year, 41 percent completed, while 40 percent cancelled and 19 percent remained active.³
- ▶ **Minorities tend to cancel at higher rates than their white counterparts.** Among apprentices who entered the system between 2006 and 2007, 49 percent of minorities cancelled and 32 percent completed, while 44 percent of whites cancelled and 38 percent completed.⁴ State-level data from Massachusetts, Washington and Wisconsin also show minority groups fare worse with apprenticeship than their white counterparts.
- ▶ **Women cancel out of construction apprenticeships at higher rates than men.** Of construction apprentices registered between 2006 and 2007, 51 percent of women cancelled versus 46 percent of men.⁵ Data sets on construction apprentices in Ohio, Washington, and Wisconsin also show men completing at much higher rates and cancelling at lower rates than women.
- ▶ **Apprentices with less formal education struggle to complete construction apprenticeships.** Slightly more than 44 percent of construction apprentices who registered between 2006 and 2007 with a high school diploma or more cancelled while 54 percent of those with a GED or less cancelled.⁶ State-level data from Washington also shows apprentices with higher education levels cancelling in lower percentages than those with lower levels of education.
- ▶ **The cancellation rate of apprentices varies by the age of apprentices when they register for their program, with those between ages 25-34 experiencing the lowest cancellation rate and highest completion rate.** Apprentices who registered between 2006 and 2007 between ages 25 and 34 had the lowest cancellation rate of all age groups at 44 percent, compared to 47 percent of those ages 16-24, 47 percent of those ages 35-44, and 52 percent of those 45 and over.⁷

³ It is important to note that we calculate completion rates differently from the Office of Apprenticeship. Our analysis looked at all apprenticeship agreements including those that cancelled regardless of when they cancelled. The Office of Apprenticeship calculates completion and cancellation using a methodology that does not include apprenticeship agreements cancelled within a "probationary period," which is up to one year or 25 percent of the length of the apprenticeship, whichever is less. For more information, please see http://www.doleta.gov/oa/bul10/Bulletin_2011-07_Completion_Rates.pdf.

⁴ Independent sample t-test revealed a statistically significant difference between minority and white apprentices' cancellation rates. $t(18.917)=13268, p=.000$

⁵ Independent sample t-test revealed a statistically significant difference between men's and women's cancellation rates. $t(5.822)=3190, p=.000$

⁶ Independent sample t-test revealed a statistically significant difference between those with a high school education or more and those with a GED or less. $t(-28.151), 43531, p=.000$

⁷ Independent sample t-test revealed a statistically significant difference between those ages 25-34 with all other groups: ages 16-24, $t(10.692)=97110, p=.000$; ages 35-44, $t(6.717), 30807, p=.000$; ages 45 and over, $t(11.458), 7048, p=.000$.

- ▶ **Cancellation rates differ among various construction occupations and between union and non-union programs.** Among construction apprenticeship agreements initiated between 2006 and 2007, 57 percent in non-union programs were cancelled by May of 2012, compared to 44 percent in union programs.⁸ Over the same time period, cancellations ranged from 22 percent in elevator installer and repair apprenticeship programs to 64 percent in roofing programs.
- ▶ **Apprentices who entered their program with advanced standing tended to complete faster and in higher percentages than those without prior credit.** Among apprenticeship agreements initiated between 2006 and 2007, 37 percent of those with credits awarded for either OJT or RTI, or both, have been completed and 46 percent cancelled. Slightly more than 48 percent of those without OJT or RTI credits cancelled and 31 percent completed.⁹
- ▶ **Apprenticeship completion rates in construction compare favorably to community college graduation rates.** Construction apprenticeship programs are not alone in facing challenges to improve their participants' completion rate. Only 22 percent of full-time students who enrolled in a community college for the first time in the fall semester of the 2003-2004 year earned a certificate or associate's degree at any institution within six years, according to a National Center for Education Statistics study.¹⁰ And, data in 2010 on all community college students by Complete College America also showed completion rates in certificate and degree programs below what we found in construction apprenticeship.

AspenWSI's field interviews and focus groups conducted with apprentices, journey workers, union and association representatives, employers, government officials, and other community stakeholders in Cincinnati and Milwaukee, as well as other sites, found that:

- ▶ **Several factors can make completing an apprenticeship challenging.** Several common barriers to completion were cited, including financial insecurities (frequent lay-offs, low wages, poor saving habits and other money management skills), unsupportive work environment (inhospitable or hostile workplaces, inadequate on-the-job training), unsupportive programs (inadequate classroom instruction, limited oversight of job sites, insufficient support), poor fit for work (unrealistic expectations for work and apprenticeship requirements, weak math skills, misconduct, poor performance), personal and life issues (difficulty balancing work, school and family responsibilities; other issues related to child care, transportation, mental health, substance abuse). For some, one factor was dominant. But, many cited several factors that, combined, led to cancellation. Limited data from federal and state Registered Apprenticeship authorities on the reasons for cancellation further restrict the ability to identify a primary driver of cancellation.
- ▶ **Apprenticeship completion is achievable if the right attitude, work environment and supports are in place.** Apprentices are more likely to complete an apprenticeship if they are committed to a career in construction, have a strong work ethic and determination to overcome obstacles, work and train in a supportive environment that includes opportunities to learn on the job from skilled journey workers, and have access to a supportive network that helps them address various challenges of apprenticeship in the construction industry.

Aspen WSI's research on efforts by some communities and industry stakeholders to improve the completion rates of construction apprentices through retention counseling, mentoring and other supportive services, found these promising strategies:

⁸ Independent sample t-test revealed a statistically significant difference between union apprentices and non-union apprentices. $t(34.874), 34140, p=.000$

⁹ Independent sample t-test revealed a statistically significant difference in cancellation between those without credits and those with credits. $t(7.52), 44257, p=.000$

¹⁰ A.W. Radford, L. Berkner, S.C. Wheelless and B. Shepherd, "Persistence and Attainment of 2003–04 Beginning Postsecondary Students: After 6 Years," NCES 2011-151, Washington, D.C.: U.S. Department of Education, National Center for Education Statistics, <http://nces.ed.gov/pubsearch> (accessed February 2, 2013).

- ▶ In **Cincinnati**, Partners for a Competitive Workforce funded a two-year pilot project in which a retention counselor provided services to a cohort of union and non-union apprentices entering their first year in fall 2011. The counselor organized several peer group sessions and provided math tutoring to academically under-prepared apprentices. Project officials, apprenticeship program staff and apprentices said the biggest benefit of having the retention counselor is that apprentices have someone to listen to their problems and encourage them to continue pursuing their studies and career ambitions. Overall, 46 of the original 57 apprentices involved in the pilot project, or 81 percent, were still active in their programs as of June 2013.
- ▶ In **Milwaukee**, the Wisconsin Regional Training Partnership and BIG STEP (WRTP/BIG STEP) developed mentorship programs with funding from the Wisconsin Department of Workforce Development. WRTP/BIG STEP worked with the National Electrical Contractors Association (NECA) and the local International Brotherhood of Electrical Workers (IBEW) to develop and pilot an “internal” mentoring program that brings together journey-level electricians and electrical apprentices. As of February 2012, IBEW had 21 active mentors, and according to a recent survey, 30 percent of apprentices in the pilot program had met with their mentors during the past month. WRTP/BIG STEP also is developing an “external” mentorship program to connect women and minority apprentices with journey workers who may be outside of their employment network working on other jobs or in other trades.
- ▶ In **Seattle**, Apprenticeship and Nontraditional Employment for Women (ANEW) manages an industry-developed Apprenticeship Academy to provide mentors and training to 14 apprentices, which is designed to enhance their communication, conflict resolution and leadership skills. In addition, the academy offers apprentices opportunities to play a role in community projects and to provide input on how to support equitable workplaces on their job sites. Selected by apprenticeship program directors, all 14 apprentices remain active in their programs. They also formed an alliance that became an official subcommittee of the Washington State Apprenticeship Training Council and are involved in driving policy and practice changes to support apprentice success. ANEW plans to annually recruit and train a cohort of apprentices for the Apprenticeship Academy.
- ▶ In **Oregon**, the state Department of Transportation (ODOT) provided fuel and transportation assistance over a three-year period to 274 apprentices in the highway trades, as well as child care supports to 171 apprentices, and job site mentoring and retention services to 1,033 apprentices. ODOT paid for these supportive services by utilizing a little-known federal provision permitting state transportation departments to use up to one-half of one percent of their annual federal surface transportation and bridge funding on training programs and support services for under-represented and disadvantaged populations. Among apprentices receiving supportive services between March 1, 2011, and August 31, 2012, 88 percent of the female and minority apprentices were still active on August 31, 2012, compared with 84 percent of white male apprentices, according to Oregon’s Bureau of Labor and Industries. Evaluation of this early-stage effort is still being conducted.

Given that apprenticeship completion can be challenging, particularly for women and minorities, AspenWSI offers several recommendations for consideration by policy makers, investors, pre-apprenticeship programs, apprenticeship programs and industry leaders.

- ▶ **Policymakers should invest in infrastructure projects that not only address growing concern about the condition of our nation’s infrastructure, but also keep more apprentices employed and in training, ensuring that our nation has a reliable construction workforce in the decades ahead.** To complete their programs, apprentices rely heavily upon employment opportunities to get their OJT hours. Many employment opportunities for apprentices could be generated by investments in building new highways, bridges, water and electrical systems, schools, hospitals, and more. More construction

projects alone, however, will not ensure apprentices get work on these projects. Apprenticeship utilization requirements, which guarantee that apprentices work a certain percentage of the total construction labor hours on a construction project, can help more apprentices access opportunities created by these investments and should be encouraged. Including a requirement for all contractors to participate in state or federally-registered apprenticeship programs on publicly funded projects would also help ensure these new projects are helping to increase demand for construction apprentices.

- ▶ **Policymakers should invest more resources to collect better data on apprentice outcomes, the reasons why apprentices cancel, and the different preparation, training and support strategies that lead to the best outcomes.** The experience of construction apprentices varies greatly and we need a stronger understanding of why apprentices succeed and fail in order to build stronger apprenticeship programs. With apprenticeship quickly expanding into other industries, more resources need to be provided to the Office of Apprenticeship to increase its data collection and evaluation capacities.
- ▶ **Policymakers should make public resources such as Workforce Investment Act (WIA) funds more accessible to apprenticeship programs to help provide support services to apprentices.** Apprenticeship programs and sponsors already assume the cost of training apprentices, and unlike other types of training and education, apprenticeship receives little in the way of public financing. More thinking is needed about how public funding streams could be leveraged to help pay for training, additional math tutoring, and support services. Making support services such as child care or transportation assistance available to apprentices through Department of Transportation funding or WIA would help address some of the barriers apprentices face in completing their programs.
- ▶ **Policymakers and investors should more strongly support pre-apprenticeship programs to improve long-term supports to apprentices.** Many pre-apprenticeship programs are successful at helping low-income individuals, including women and minorities, prepare for and enter construction apprenticeships. Pre-apprenticeship programs often struggle to find resources, however, to provide long-term support and assistance to apprentices. Ensuring that pre-apprenticeship programs have resources to support apprentices through the first year or two of their apprenticeship will increase their chances of success.
- ▶ **Investors and policymakers should help support, develop, and evaluate more mentoring and retention efforts, as well as encourage experimentation in strategies that support apprenticeship completion.** Pre-apprenticeship and apprenticeship programs are experimenting with promising strategies to address apprenticeship cancellation. Investing more resources to support these efforts and rigorously evaluating these strategies are needed to understand what is most effective in supporting the success of construction apprentices.
- ▶ **Pre-apprenticeship programs should build networking and mentoring opportunities for apprentices they place, and strive to support apprentices through the first year of their apprenticeship.** Pre-apprenticeship programs should use alumni and industry networks in order to build mentoring and networking opportunities for apprentices they place. In addition, pre-apprenticeship efforts should track and support apprentices through the first year of an apprenticeship when cancellation is most likely.
- ▶ **Apprenticeship programs should build in extra supports for the development of apprentices' math skills.** Math skills are critical to success in many of the construction careers. Many apprentices today, however, enter their apprenticeship with weak math skills, and some have not been in a classroom setting for some time. Apprenticeship programs should provide additional tutoring or instruction when possible, and partner with local community colleges or other organizations to help provide these supports.

- ▶ **Apprenticeship programs should experiment with flexible training options.** Many apprentices have family responsibilities. New classroom training options that ease the challenge of working and going to school at the same time should be considered.
- ▶ **Apprenticeship programs and industry leaders should increase oversight of OJT and job rotations.** Some apprentices are not receiving the OJT they need to develop the skills required to be successful. Stronger evaluation of the OJT apprentices are receiving and regular rotations to other employers is needed.
- ▶ **Apprenticeship programs and industry leaders should develop processes to fairly evaluate and provide credits toward an apprenticeship to apprentices with prior work or classroom experience.** Credit for prior work or classroom experience seems to help more apprentices complete their programs, but in some instances, the processes for awarding these credits seem unclear or subjective.
- ▶ **Apprenticeship programs and industry leaders should continue to foster a culture in the workplace and industry that does not tolerate abusive hazing or harassment, particularly of women and minorities.** The industry has improved its diversity in recent years, and those in the industry should continue to build on this progress.
- ▶ **Apprenticeship programs should also do more to leverage resources from pre-apprenticeship programs, community colleges and other community resources to help address the various barriers apprentices face.** Many organizations have services such as financial literacy instruction, math tutoring, and emergency supports that may help apprentices succeed.
- ▶ **Apprenticeship programs and industry stakeholders should develop more mentoring projects.** Apprentices have expressed a clear need to receive more mentoring and some pilot projects have demonstrated some early successes. To be effective, however, mentoring programs need resources, ongoing attention and regular evaluation.
- ▶ **Policymakers, investors and industry should work together to create more awareness among young adults, women, and minorities of apprenticeship and construction careers.** Industry stakeholders lament that they have lost their connection to the K-12 education system, and that young adults are unaware of or do not understand the different career options that construction offers. Women and minorities also are underrepresented in construction trades. More needs to be done to increase community outreach and awareness of construction careers, so these populations know about the career opportunities the industry offers.

The promising strategies to improve apprenticeship completion, mentioned earlier, in communities such as Milwaukee and Cincinnati, were developed by local leaders who identified and shared similar concerns about the apprenticeship cancellation rates in their regional labor markets. AspenWSI hopes construction industry stakeholders and their community partners elsewhere also will work to create dialogue around the issue of apprenticeship cancellation and develop strategies to support construction apprentices. Increasing completion rates ultimately will help employers, apprentices, and others ensure that the time, money, and resources they invest in Registered Apprenticeship are used more efficiently and effectively. AspenWSI hopes this report inspires conversations and innovative ideas at national and local levels about what can be done to improve one of our nation's greatest training models and to secure a skilled construction workforce in the years ahead.

Introduction

The United States faces a potential skills crisis in the building trades. The recent economic recession hollowed out the construction labor force, as employment levels in the industry precipitously declined from a peak of 7.7 million in 2007 to 5.6 million in 2012.¹¹ Long-term demographic trends also suggest that the construction workforce has aged substantially, with baby boomers making up more than 40 percent of the workforce.¹² Layoffs and retirements have further weakened the talent pool in the construction sector, potentially undermining the industry's capacity to respond to future demand for building and modernizing the nation's infrastructure, housing stock, and commercial and industrial properties.

The responsibility for replenishing the construction workforce will fall heavily on the nation's Registered Apprenticeship system. Since 1937 when Registered Apprenticeship was first formalized, apprenticeship has been a primary training ground for journey-level carpenters, electricians, plumbers and other skilled craftsmen. Today, Registered Apprenticeship is one of our nation's strongest and most successful training approaches. Registered Apprenticeship programs operated by employers, employer associations and labor-management partnerships offer workers an opportunity to earn a wage working at a job site while learning a skilled trade through on-the-job training (OJT) and related technical (RTI) or classroom instruction. Over the course of apprenticeship programs, which typically last between three and five years in construction, apprentices receive incremental wage increases based on their demonstrated proficiency in an array of job tasks and related academic content. Upon program completion, apprentices receive a portable and nationally recognized certification in their occupation and qualify for journey-level wages.

By delivering training and a credential, Registered Apprenticeship has helped millions of workers get well-paying careers, and helped employers find the workers in construction, as well as other industries. Workers who complete an apprenticeship earn an estimated \$240,037 more during their careers than those who did not participate in an apprenticeship, according to a recent study by Mathematica Policy Research.¹³ The same study found that even apprentices who do not complete their programs seem to benefit from participating. The estimated average earnings gain for all apprentices, including those who cancelled, was \$98,718 during their careers, the study found.

Employers benefit as well. Ninety-seven percent of the 974 apprenticeship sponsors surveyed by the Urban Institute said they would recommend apprenticeship to other employers. Eighty percent cited as the primary benefit an increased ability to meet the demand for skilled workers. Other benefits cited by sponsors included increased worker productivity, improved safety, and better team morale and pride.¹⁴

For all its merits and value, however, the construction apprenticeship system faces some challenges maintaining and turning out a skilled workforce in an efficient and cost-effective manner. It is not uncommon for about half of apprentices in building trades to cancel out of their apprenticeships. In one study, the University of Utah's Cihan Bilgonsoy looked at the completion rates of 12,715 construction apprentices registered in 1989. Six years later, in 1995, 39 percent had cancelled, 47 percent had completed, and 14 percent were still active, Bilgonsoy found.¹⁵ Another study by Bilgonsoy examining completion rates for construction apprentices registered in 1989-1990 and 1995-1997 found that about half of all construction apprentices in each cohort

¹¹ U.S. Department of Labor, Bureau of Labor and Statistics, *Current Employment Statistics*, <http://www.bls.gov/iag/tgs/iag23.htm>, (accessed 20 December 2012).

¹² Laura Welch, "The Aging Worker in the U.S. Construction Industry," Occupational Health and Safety Magazine Online (March 1, 2010), <http://ohsonline.com/articles/2010/03/01/the-aging-worker.aspx> (accessed 10 November 2011).

¹³ Debbie Reed, A. Yung-Hsu Lin, R. Kleinman, A. Mastri, D. Reed, S. Sattar and J. Ziegler, "An Effectiveness Assessment and Cost Benefit Analysis of Registered Apprenticeship in Ten States," Mathematica Policy Research (July 25, 2012), http://wdr.doleta.gov/research/FullText_Documents/ETAOP_2012_10.pdf (accessed 25 July 2012).

¹⁴ Robert Lerman, L. Eyster and K. Chambers, "The Benefits and Challenges of Registered Apprenticeship: The Sponsor's Perspective," The Urban Institute (March 1, 2009), <http://www.urban.org/publications/411907.html> (accessed 10 January 2012).

¹⁵ Cihan Bilgonsoy, "The Hazards of Training: Attrition and Retention in Construction Industry Apprenticeship Programs," *Industrial & Labor Relations Review*, Vol. 57, No. 1, Article 3 (2003), <http://digitalcommons.ilr.cornell.edu/ilrreview/vol57/iss1/3> (accessed 10 December 2011).

cancelled.¹⁶ Studies by others have shown cancellation rates in apprenticeship to be between 40 percent and 60 percent.¹⁷

As with any training program, Registered Apprenticeship serves the important function of “weeding out” individuals who are not a good fit for a construction career. In fact, the probationary period, which is up to one year or 25 percent of the length of the apprenticeship, whichever is less, is designed, in part, so program sponsors can try new apprentices to see if they are a good fit for the work and ready to commit to be an apprentice. At the same time, apprentices can assess whether a career in construction is indeed what they want. As a result, the probationary period, if instituted correctly, offers a way to successfully connect workers who are a good fit for construction with employers who need skilled workers. And, data shows that many cancellations do occur during the first year of apprenticeship, many of which fall within the probationary period.

All cancellations during the probationary period, however, are not necessarily because the apprentice is not a good fit for the industry. In addition, cancellations carry significant monetary and opportunity costs for all involved. Apprentices must invest their time, resources, energy and, sometimes, money in training. Employer sponsors invest significant resources to pay for apprentices’ training in the classroom and on the job site, while also providing wages and benefits. The cost of training, wages and benefits for an apprentice over the course of four to five years can easily approach \$200,000 or more, according to some industry representatives interviewed. Of course, apprentices’ labor is not without value, and their contributions create returns for the employer. And, as apprentices’ skills increase, their ability to do a wider range of work on the job site, as well as be more productive and efficient, provides employers with an increasing return on their investment. But, for apprentices who cancel out of programs, much of the investment in their training is lost.

While the challenge of apprenticeship cancellation does not appear to be new, fresh conversations and efforts to improve completion rates have been sparked by concern over the many people retiring in the construction industry, the loss of construction workers during the recession, the high cost of training apprentices, and low completion rates by women and minorities. This report is offered as a resource to better understand the breadth of the completion and cancellation in apprenticeship, the barriers to completion, and potential strategies for improving success.

From 2011 to 2012, The Aspen Institute Workforce Strategies Initiative (AspenWSI), with the support of the Annie E. Casey Foundation, conducted research looking at the current state of completion and cancellation in construction apprenticeship and what strategies may be needed to improve how apprenticeship works for employers and apprentices. We sought to better understand how apprenticeship completion rates vary across trades, time periods, geography and demographic groups. We also sought to identify the factors or drivers that lead to apprenticeship cancellation and completion and to explore strategies being used to improve apprenticeship completion. This report describes our research findings, with the hope that more efforts and resources will be directed toward

¹⁶ Cihan Bilginsoy, “Registered Apprentices and Apprenticeship Programs in the U.S. Construction Industry between 1989 and 2003: An Examination of the AIMS, RAIS, and California Apprenticeship Agency Databases,” University of Utah, Department of Economics Working Paper Series, Working Paper No. 2005-09 (May 2005), http://economics.utah.edu/publications/2005_09.pdf (accessed 3 January 2012).

¹⁷ For additional research on apprenticeship completion, see:

- Debbie Reed, A. Yung-Hsu Lin, R. Kleinman, A. Mastri, D. Reed, S. Sattar and J. Ziegler, “An Effectiveness Assessment and Cost Benefit Analysis of Registered Apprenticeship in Ten States,” Mathematica Policy Research (July 25, 2012), http://wdr.doleta.gov/research/FullText_Documents/ETAOP_2012_10.pdf (accessed 25 July 2012).
- Keisha Steward and T. O’Brien-Turco, “Changing the Outcome: Closing the Gap to Completion in Greater Cincinnati’s Apprenticeship Programs,” Capstone Project, PAD 793 (December 6, 2010), http://www.competitiveworkforce.com/files/Teri_O_Brien_RAP_Retention_Report_-_Changing_the_Outcome.pdf (accessed 10 December 2011).
- U.S. Government Accountability Office, “Registered Apprenticeship Programs: Labor can Better Use Data to Target Oversight,” Report to Congressional Requesters, GAO-05-886, (August 2005), <http://www.gao.gov/products/GAO-05-886> (accessed 12 January 2012).
- Maura Kelly and L. Wilkinson, “Apprenticeship Needs Assessment in Heavy Highway Construction Workforce,” Portland State University, Department of Sociology, Final Report, no. 3 (August 2012), Interim report available at http://www.skillupwa.org/storage/documents/Portland_State_University_Assessment.pdf (accessed 15 May 2012).

ensuring that the Registered Apprenticeship system in construction develops the skilled-trades workers our country needs in the years and decades ahead.

The report begins with a summary of AspenWSI’s previous research on construction and a description of our research methodology. We then describe trends in apprenticeship registration and completion in the construction trades, using national- and state-level data. Next, the report details the challenges facing construction apprentices and explores why some apprentices succeed and some fail. The report then highlights a few strategies being implemented to increase construction apprentices’ success and apprenticeship completion rates. Finally, we conclude with recommendations for investors, policymakers and workforce development leaders about how to better support the success of construction apprentices.

BOX 1: REGISTERED APPRENTICESHIP OVERVIEW

Registered Apprenticeship is a training system that combines job-related technical instruction (RTI) with structured on-the-job training (OJT). It is often referred to as an “earn and learn” training model because workers earn a wage working at a job site while learning a skilled trade through a combination of OJT and RTI or classroom instruction. Apprenticeship is sponsored by individual businesses or employer associations, some of which partner with labor organizations through collective bargaining. Institutions, such as apprenticeship training centers operated by unions or associations, technical schools and community colleges, provide RTI. Apprenticeship programs in construction typically last between three and five years, but most last about four years or about 8,000 hours of combined OJT and RTI. Upon completing a Registered Apprenticeship program, apprentices receive an industry-issued, portable and nationally-recognized credential that certifies occupational proficiency. In the construction industry, apprentices, upon completion, are known as journey workers.

The U.S. Department of Labor’s Office of Apprenticeship (OA) and State Apprenticeship Agencies (SAAs) oversee Registered Apprenticeship programs. OA and SAAs register apprenticeship programs that meet federal and state standards, issue Certificates of Completion to apprentices, assist in the development of new apprenticeship programs through technical assistance, and help market and monitor programs to ensure that safety and training standards are met. These regulations and program parameters, established under the National Apprenticeship Act, are designed to protect the apprentice.

Program sponsors identify and define the qualifications needed to enter their apprenticeship program. Minimum qualifications in construction often include that the applicant has a high school diploma or GED, is 18 years or older (in some instances, 16 or older), passes a drug screen, is physically able to perform the job duties, and passes an aptitude test demonstrating a level of math and reading skills. Other qualifications may include passing an interview or having previous work experience.¹⁸

¹⁸ U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship, “What is Registered Apprenticeship?” <http://www.doleta.gov/OA/apprenticeship.cfm> (accessed 20 December 2012).

Previous Research Informing this Report

In previous studies, AspenWSI looked at the role pre-apprenticeship programs play in helping low-income individuals, minorities and women connect to careers in the construction industry.¹⁹ We found clear evidence that through pre-apprenticeship programs, many communities help train and connect their constituents to jobs and careers in construction, including placing some into Registered Apprenticeship programs. But, we also found that many pre-apprenticeship programs struggle to provide supports to workers and apprentices after individuals have been placed in jobs. Pre-apprenticeship leaders often cited this lack of ability to provide support as a primary concern, noting that entry into apprenticeship is only half the battle. The other half is helping apprentices succeed in completing their apprenticeship. During this research and conversations with industry stakeholders around the country, we increasingly recognized a need to better understand apprenticeship completion and cancellation rates, the challenges that apprentices face, and the strategies that might help more of them succeed. Our research into pre-apprenticeship, thus, inspired this report's research focus and investigation of strategies that pre-apprenticeship programs and their partners can use to increase apprentices' success.

¹⁹ Reports from AspenWSI's previous research in the construction industry can be found at <http://www.aspenwsi.org/research-resources/industry-specific/construction/>. Reports include *Construction Pre-Apprenticeship Programs: Results from a National Survey* available at <http://www.aspenwsi.org/resource/construction-results-national-survey/>, *Construction Pre-Apprenticeship Programs: Interviews with Field Leaders* available at <http://www.aspenwsi.org/resource/constructioninterviewswithleaders/> and *A Strong Foundation: Key Capacities of Pre-Apprenticeship Programs* available at <http://www.aspenwsi.org/resource/strong-foundation/>.

Research Methodology

This report's foundation is built upon a mix of quantitative and qualitative data highlighting the challenges that apprentices in the construction industry face in completing their programs. The report first highlights findings from quantitative analysis of national- and state-level data on the completion of construction apprentices. National-level data comes from a dataset that the Office of Apprenticeship (OA) within the U.S. Department of Labor Employment and Training Administration provided in response to a Freedom of Information Act (FOIA) request filed by AspenWSI. The national data set, constructed using OA's Registered Apprenticeship Program Sponsors Database (RAPIDS), includes more than 120,000 apprenticeship agreements initiated between 2006 and 2007 by individuals in construction occupations. RAPIDS captures individual record data from 25 Office of Apprenticeship states and eight of the 25 SAA states. For SAA states that manage their data outside of RAPIDS, information is provided in the aggregate to U.S. DOL on a quarterly basis. Because of several limitations on how states report data to OA, the national data set analyzed in this report represents a subset of the entire universe of construction apprenticeship agreements initiated between 2006 and 2007. Data on apprentices who entered their program beyond 2007 was not used for the most part, as few of them have had ample time to complete their apprenticeship, and most remain active in their programs. Prior to 2006, fewer states reported data via RAPIDS and issues with data collection impacted data accuracy, which restricted our ability to look at historical data on apprenticeship from a national perspective. To augment the national data set provided by OA, AspenWSI also worked with state agencies in Massachusetts, Ohio, Washington, and Wisconsin to obtain data on construction apprentices in those states. For more information on the national and state datasets, please see Appendix A. We also conducted a review of literature regarding completion and cancellation rates of apprentices in the building trades to inform our research design and this report. Findings from this literature review are cited throughout the report.

One primary goal of our research was to examine national and state statistics on apprenticeship completion in order to better understand and summarize how apprenticeship completion rates vary across trades, time periods, geography and demographic groups. Given that objective, as well as the variety and limitations of state and national data sources cited, our analysis relies heavily on descriptive statistics. We also used independent t-tests to compare means of various demographic groups in order to evaluate whether statistically significant differences in cancellation rates occur among these groups.

Each data set included a number of duplicate records. Apprentices may enroll in multiple apprenticeship programs simultaneously, or may cancel out of one program and enroll in another. Duplicates remained in our datasets, as we were primarily interested in exploring the completion and cancellation rates of apprenticeship programs, regardless of whether an apprentice had previously or simultaneously enrolled in other programs. Completion and cancellation rates calculated with and without duplicate records did not reveal any large differences. Thus, the primary measure being assessed in most of our analysis is not an individual apprentice or his or her success, but an apprenticeship agreement/contract.

The report draws upon a substantial number of interviews and focus groups conducted with stakeholders from across the country. We conducted numerous focus groups with union and non-union apprentices currently in their apprenticeships and with journey workers who successfully completed apprenticeships. We also conducted a smaller number of interviews with apprentices who cancelled out of their programs. Other conversations were held with apprenticeship training directors, apprenticeship instructors, union and employer association representatives, contractors, staff at the federal Office of Apprenticeship and State Apprenticeship Agencies, and pre-apprenticeship program leaders. We conducted two multi-day site visits to Milwaukee, Wisconsin, and Cincinnati, Ohio. These locations were selected because pre-apprenticeship programs in those communities, along with other construction industry leaders, have been working on strategies to support apprentices in completing their apprenticeships. In addition, we spoke to other stakeholders and experts in St. Louis, Denver, Seattle and Portland, Oregon, regarding the factors driving apprenticeship cancellation. These cities were selected based on information gathered from previous research.

Overview of Completion and Cancellation Rates in Construction Apprenticeship

In this section, we present our analysis of completion rates for construction apprentices nationally, based on OA data, and from datasets from Massachusetts, Ohio, Wisconsin and Washington. We begin, however, with a brief summary of demographic information about the construction apprentices culled from our datasets.

Summary of Registration and Demographics of Construction Apprentices (For more data on registration and demographics, please see Appendix B)

Today, most U.S. construction apprenticeship programs are affiliated with a labor union, our analysis found. Eighty percent of construction apprentices who registered between 2006 and 2007 in the national dataset participated in a union apprenticeship program. Yet, union density in the industry remains low. Only 13.2 percent of construction workers were union members in 2012.²⁰ Programs exist across a variety of trades, the most common being with electricians, carpenters, plumbers, pipefitters and steamfitters. The length of apprenticeships varies, but most in construction require between three and five years to complete. The median number of hours of training required by construction apprentices in our national data set was 8,000 hours of training, which is approximately four years.

Of the apprenticeship agreements initiated between 2006 and 2007, only two and a half percent of apprenticeship agreements were entered into by women. Over eight percent of apprenticeship agreements initiated between 2006 and 2007 were entered into by African-Americans, and a little more than 27 percent by Hispanics, our national analysis found.

State-level analysis showed geographical differences in the demographic make-up of apprentices. Of the construction apprenticeships in the four states analyzed, Washington had the highest percentage of women (eight percent) and minorities (23 percent).

Finally, the national data set shows that the median age was 26 for individuals entering into apprenticeship agreements initiated between 2006 and 2007 and 19 percent were age 35 or older. Nearly 75 percent had at least a high school diploma and six percent were military veterans.

Overall Completion and Cancellation Data in Construction Apprenticeship from National Dataset

Slightly more than 46 percent of the nearly 121,000 construction apprenticeship agreements started between 2006 and 2007 across the United States were cancelled by May 2012, the month when AspenWSI received the data.²¹ Nearly 36 percent of agreements made during that time were completed and 18 percent were still active.

TABLE 1: SUMMARY TABLE ON CONSTRUCTION APPRENTICESHIP COMPLETION RATES FROM OA NATIONAL DATASET

	Time Period of Registration	Number of Construction Agreements	Completed	Cancelled	Active
National Data Office of Apprenticeship	2006-2007	120,972	35.9%	46.1%	18.0%

²⁰ U.S. Department of Labor, Bureau of Labor and Statistics, “Industries at a Glance,” <http://www.bls.gov/iag/tgs/iag23.htm> (accessed 15 January 2013).

²¹ As noted previously, it important to note that we calculate completion rates differently from the Office of Apprenticeship. Our analysis looked at all apprenticeship agreements, including those that cancelled regardless of when they cancelled. The Office of Apprenticeship calculates completion and cancellation using a methodology that does not include apprenticeship agreements cancelled within a “probationary period” which is up to one year or 25 percent of the length of the apprenticeship, whichever is lesser. For more information, please see http://www.doleta.gov/oa/bul10/Bulletin_2011-07_Completion_Rates.pdf.

State-Level Completion and Cancellation Data for Construction Apprenticeship

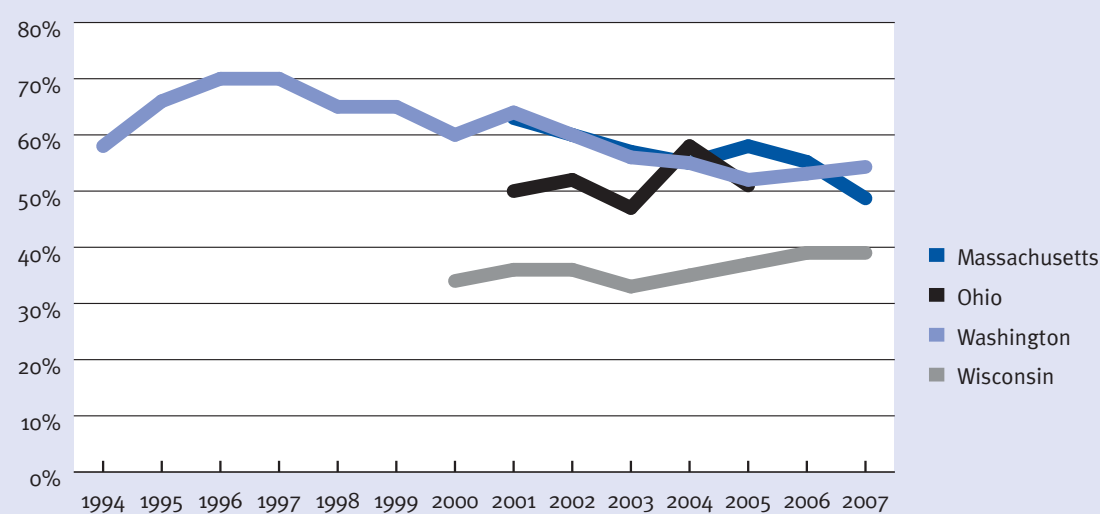
As seen in the table below, our four state datasets, which cover varying timeframes, also showed that it is not uncommon for nearly one in two apprentices in construction to cancel out of their programs. It is important to note the varying registration time periods for the different data studies in the table below. The table below is not meant to draw comparisons across the different states and datasets, but rather to give a full picture of the complete analysis AspenWSI conducted in order to paint a broad picture of apprenticeship completion rates.

TABLE 2: SUMMARY TABLE ON CONSTRUCTION APPRENTICESHIP COMPLETION RATES FROM STATE DATASETS

	Time Period of Registration	Number of Construction Agreements	Completed ²²	Cancelled	Active
Massachusetts	2001-2007	13,366	38.7%	57.1%	4.3%
Ohio	2001-2005	16,850	45.2%	51.7%	3.1%
Washington	1994-2007	45,790	33.9%	60.2%	5.9%
Wisconsin	2000-2007	13,904	58.0%	35.9%	6.1%

Looking at state-level data, we are also found that completion and cancellation rates vary from year to year.²³ The chart below shows cancellation rates based on when apprentices began their apprenticeship. In Washington, which, of the four states studied, provided data covering the longest time period, 70 percent of construction apprentices who began their apprenticeship in 1994 cancelled. This has fallen gradually. Only 54 percent of construction apprentices who began their apprenticeship in Washington in 2007 have cancelled. Of the four states, Wisconsin, the birthplace of apprenticeship in the United States, shows the lowest percentage of cancellations. As seen in the chart, cancellation rates above 50 percent are not uncommon even during years of economic growth and low unemployment.

DIAGRAM 1: PERCENT OF CONSTRUCTION APPRENTICESHIP AGREEMENTS CANCELLED BY YEAR OF REGISTRATION



²² The national data set, Wisconsin and Washington completion rates were from May 2012 and Massachusetts as of August 2012. Ohio's calculations were conducted as of April 2011.

²³ A study by the Government Accountability Office in 2004-2005 found completion rates varied among two cohorts who registered during different time periods. Analysis of 20,670 construction apprentices who enrolled in 1994 found that 59 percent completed, while a study of 47,487 apprentices who registered in 1998 found only 37 percent had completed. (U.S. Government Accountability Office, 2005).

Impact of the Recession on Cancellations and Time to Completion

As noted earlier, employment in construction dropped sharply during the recent recession. Employment levels declined from a peak of 7.7 million in 2007 to 5.5 million in 2012.²⁴ Though our national data set is limited in the time it covers, it is clear that apprentices who registered in some years fared differently from apprentices who registered in other years, especially during the height of the economic recession. Separate analysis of construction apprentices who registered during 2008 and 2009, during the height of the recession, found many of these new apprentices struggled. For example, 55 percent of construction new apprenticeship agreements registered in 2008 and 50 percent of agreements registered in 2009 from our national data set were cancelled by May 2012. These numbers compare to only 44 percent of agreements that were cancelled by apprentices registered in 2006, even though apprentices registered in 2006 had spent two or three years longer in their apprenticeship programs compared to those in 2008 and 2009. Because apprentices rely on OJT opportunities to complete their training hours, an economic recession that includes a lack of work can have a very negative impact. Some apprentices may not be able to find work or enough OJT hours, and may pursue other types of employment.

Other apprentices may take longer than expected to complete programs because they lack ample opportunity to gain OJT hours. Because of the recession, apprentices are taking longer to accumulate training hours and complete their programs, we also heard from apprentices, government officials and industry stakeholders. National- and state-level data show that a sizeable number of apprentices who registered in 2006 and 2007 were still active in their programs in May 2012, indicating these reports may indeed be accurate. Previous research suggests recessions do lengthen the amount of time apprentices spend in their programs.²⁵

Time to Cancellation

Most apprentices who do not complete their programs tend to cancel out within the first year or two of their apprenticeship, according to interviews with various industry stakeholders from around the country. Well over half of construction apprentices registered between 2006 and 2007 who cancelled did so during the first two years. Many cancelled during the probationary period. For example, for apprentices registered between 2006 and 2007 and engaged in a program with 8,000 hours of training, 26.5 percent of those who cancelled left their training during the first 12 months, roughly the length of the probationary period, assuming 2,000 hours of training per year.²⁶ Of these apprentices remaining after the first year of their apprenticeship, 41 percent completed while 40 percent cancelled and 19 percent remained active.

State-level data indicated even higher cancellation rates during the first 12 months of a construction apprenticeship. Of cancelled apprentices in Washington who registered between 1994 and 2007, 60 percent cancelled during the first twelve months. In Wisconsin, almost 40 percent of cancelled apprentices who registered between 2000 and 2007 cancelled during the first year.

In our national analysis, men and women who registered between 2006 and 2007 cancelled during similar time frames. Both men and women cancelled at a median of 21 months into their apprenticeship, and nearly 25 percent of men and women who cancelled did so during the first year. Men and women who registered between 2006 and 2007 and completed their apprenticeship also took similar amounts of time to do so, 41 and 42 months respectively.

African-American and white apprentices who registered in 2006 and 2007 also took similar amounts of time for completion and cancellation, with little difference between the two populations.

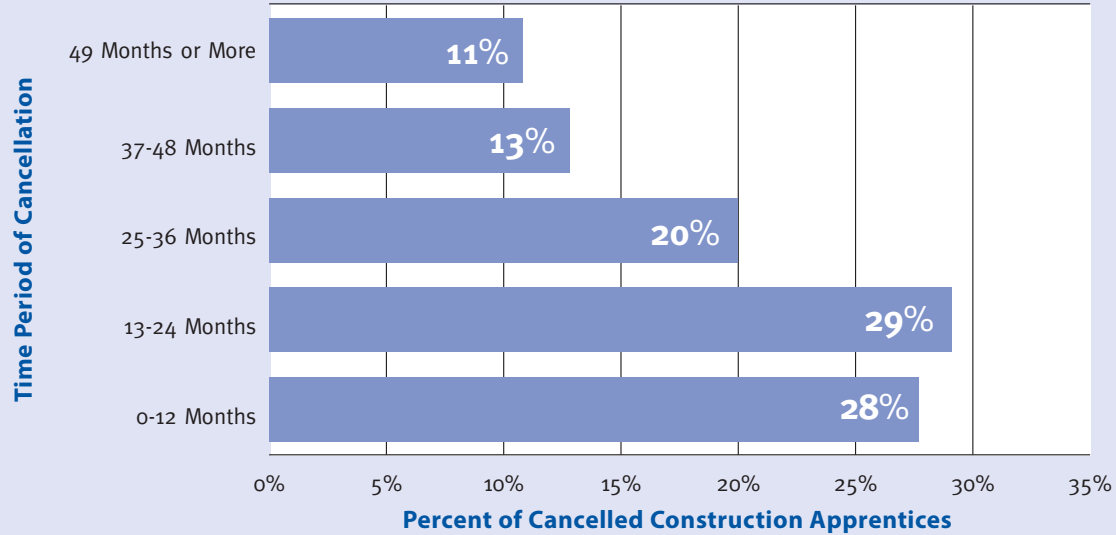
²⁴ (U.S. Department of Labor Bureau of Labor and Statistics, 2012)

²⁵ (Bilgonsoy, 2003)

²⁶ It is important to note that we calculate completion rates differently from the Office of Apprenticeship (OA). Our analysis looked at all apprenticeship agreements including those that cancelled, regardless of when they cancelled. The OA calculates completion and cancellation using a methodology that does not include apprenticeship agreements cancelled within the "probationary period," which is up to one year or 25 percent of the length of the apprenticeship, whichever is less. For more information, please see http://www.doleta.gov/oa/bul10/Bulletin_2011-07_Completion_Rates.pdf.

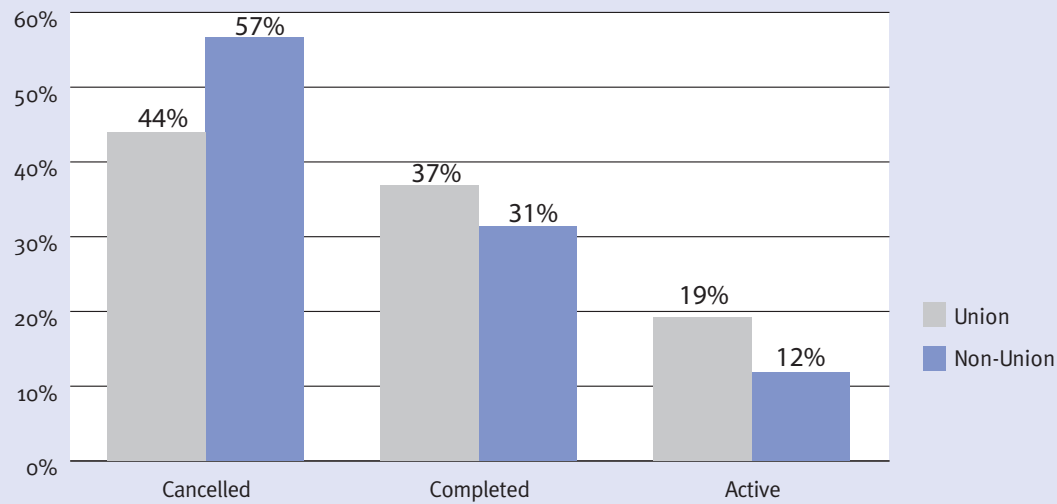
Different trades, however, showed some differences in the average time to cancellation. Cancelled carpenters ended their programs at a median of 19 months into training; electricians and laborers at 22 months; and plumbers, pipefitters and steamfitters at 25 months.

DIAGRAM 2: TIME FROM REGISTRATION TO CANCELLATION FOR CONSTRUCTION APPRENTICES (New Apprentices Federally Registered between 2006 and 2007)



Apprenticeship and Completion of Union and Non-Union Apprenticeship Programs
 Some differences also existed between construction apprentices who registered between 2006 and 2007 based on the training provider. Union apprenticeship training programs saw lower cancellation rates and higher completion rates than programs operated by non-union entities. Fifty-seven percent of apprentices in non-union programs were cancelled by May of 2012, compared to 44 percent in union programs.²⁷

DIAGRAM 3: STATUS OF CONSTRUCTION APPRENTICESHIP AGREEMENTS BY UNION AFFILIATION (New Apprentices Federally Registered between 2006 and 2007)



²⁷ Independent sample t-test revealed a statistically significant difference between union apprentices and non-union apprentices. $t(34.874), 34140, p=.000$

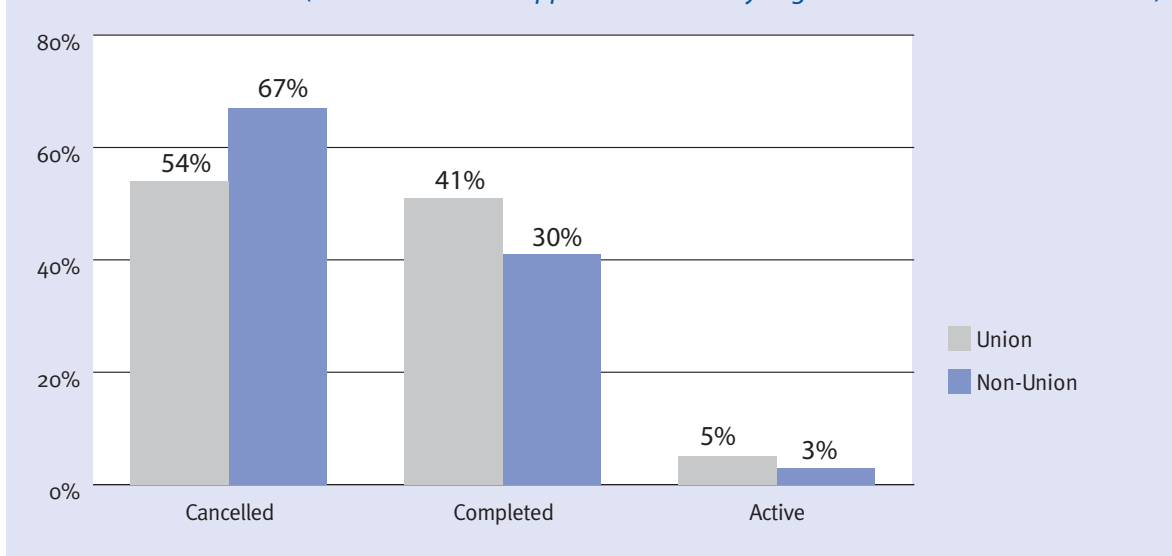
It is important to note, however, that union and non-union apprenticeship programs also differ in the range of occupations in which they are distributed. Nearly 85 percent of non-union apprenticeship programs are concentrated in just a few trades including carpentry, electrical and plumbers, pipefitters and steamfitters. Only 48 percent of union construction apprentices, on the other hand, work in these trades with higher percentages and numbers of union apprentices working in non-mechanical occupations such as laborers and sheet metal workers. The table below compares completion rates for union and non-union apprentices by trade.

TABLE 3: CONSTRUCTION APPRENTICESHIP COMPLETION RATES OF UNION AND NON-UNION APPRENTICES BY TRADE FROM OA NATIONAL DATASET (*Apprentices Registered 2006-2007*)

Trade	Union or Non-Union	Number of Apprenticeship Agreements	Percent of Construction Apprentices	Completed	Cancelled	Active
Carpentry	Union	21,099	21.8%	28.4%	52.7%	18.9%
	Non-Union	1,469	6.5%	30.4%	61.1%	8.4%
Electrical	Union	12,030	12.4%	47.0%	29.5%	23.5%
	Non-Union	13,012	57.4%	33.3%	56.1%	10.6%
Laborers	Union	7,404	7.7%	38.2%	49.9%	11.9%
	Non-Union	390	1.7%	51.3%	48.7%	0%
Plumbers, Pipefitters and Steamfitters	Union	13,090	13.5%	33.0%	39.7%	27.3%
	Non-Union	4,687	20.7%	28.4%	57.3%	14.3%
Sheet Metal Workers	Union	4,920	5.1%	46.4%	28.0%	25.6%
	Non-Union	773	3.4%	29.6%	55.2%	15.1%

The Massachusetts dataset also allowed us to compare completion rates of union versus non-union apprenticeship programs and confirmed what the national dataset showed. As seen in the chart below, union apprenticeship programs again experienced a lower cancellation rate and a higher completion rate than non-union programs. This suggests that the ongoing relationship that union apprentices have in the industry, through their union membership, and the supports offered to them during periods of unemployment may be beneficial.

DIAGRAM 4: STATUS OF APPRENTICESHIP AGREEMENTS BY UNION AFFILIATION IN MASSACHUSETTS (*New Construction Apprentices Federally Registered between 2001 and 2007*)



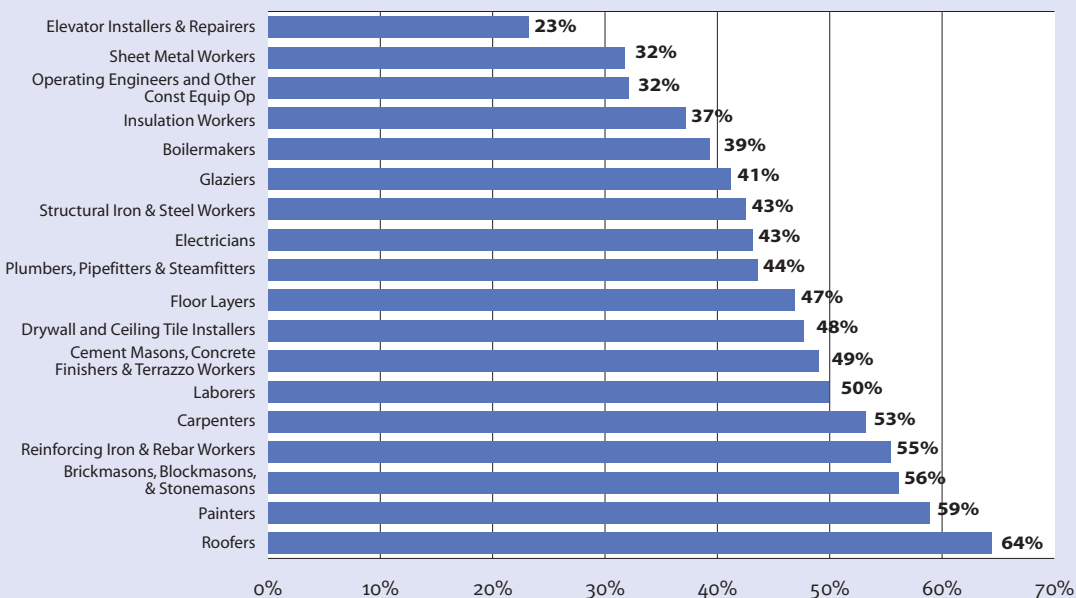
Completion and Cancellation Rates by Occupational Trade

Construction apprentices pursue training and careers in a variety of trades. A U.S. Government Accountability Office study in 2005 found that “among the trades themselves, there were substantial variations in completion rates, often due to the nature of (the) work environment and other constraints, according to federal and state officials. For example, roofing programs, which have low completion rates, face unpredictable weather and seasonal work flows.”²⁸ Our analysis also shows that completion and cancellation rates differed among various trades. The chart below shows the percentage of apprenticeship agreements cancelled, by trade, from our national data set of apprentices registered between 2006 and 2007. Roofers had the highest cancellation rate as 64 percent of the apprenticeship agreements entered into between 2006 and 2007 were cancelled.

State-level analysis also shows varying levels of cancellation among different trades. In Washington state, among apprentices registered between 1994 and 2007, roofers again had the highest cancellation rate at 90 percent, while steamfitters had among the lowest at 30 percent.

DIAGRAM 5: PERCENT OF CONSTRUCTION APPRENTICESHIP AGREEMENTS CANCELLED BY TRADE

(New Apprentices Federally Registered between 2006 and 2007)



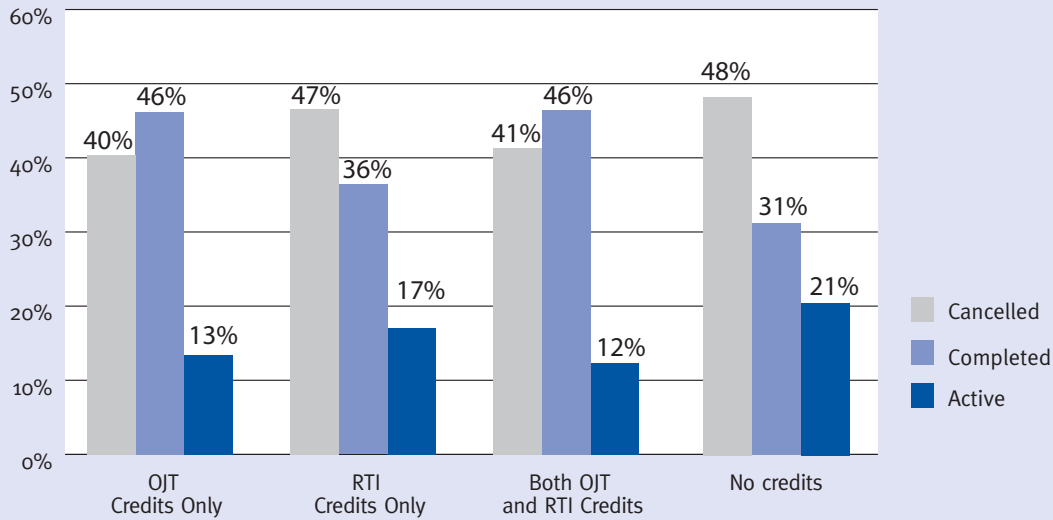
Apprenticeship Completion and Cancellation for Apprentices with OJT or RTI Credits (Advanced Standing)

In some instances, new apprentices are granted advanced standing or credits toward their training based on previous on-the-job training (OJT) or related technical instruction (RTI). Apprentices with credits need to complete fewer training hours in order to complete their programs. Among apprenticeship agreements initiated between 2006 and 2007, 37 percent with credits awarded for either OJT or RTI, or both, have been completed, while 46 percent cancelled. Slightly more than 48 percent of those without OJT or RTI credits cancelled and 31 percent completed.²⁹

²⁸ (U.S. Government Accountability Office, 2005)

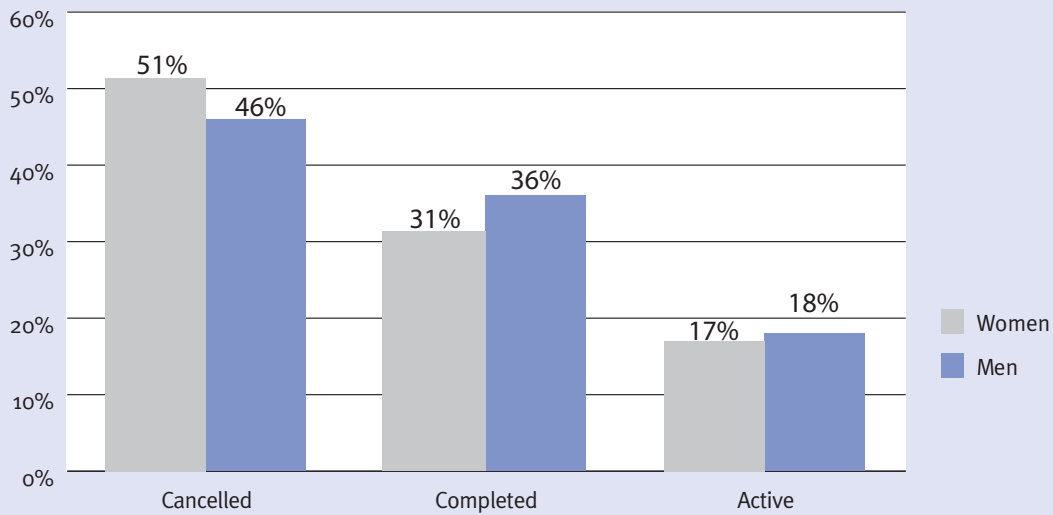
²⁹ Independent sample t-test revealed a statistically significant difference in cancellation between those without credits and those with credits. $t(7.52), 44257, p=.000$

DIAGRAM 6: STATUS OF CONSTRUCTION AGREEMENTS BY APPRENTICE'S RECEIPT OF TRAINING CREDIT (*New Construction Apprentices Federally Registered between 2006 and 2007*)



Completion and Cancellation Rates for Construction Apprentices by Gender
 Previous studies have reported that cancellation rates are higher for women than men. Chihan Bilginsoy's 2005 analysis shows 45 percent of the women construction apprentices registered in 1989 and 1990 cancelled, compared to 37 percent of white men. And, 68 percent of the 2,620 women construction apprentices registered between 1995 and 1997 cancelled, compared to 47 percent of white men.³⁰ Our national data set of over 120,000 apprenticeship agreements, initiated between 2006 and 2007, shows 51 percent of women cancelled versus 46 percent of men.³¹

DIAGRAM 7: PERCENT OF CONSTRUCTION APPRENTICESHIP AGREEMENTS CANCELLED BY GENDER AND YEAR OF REGISTRATION (*New Apprentices Federally Registered between 2006 and 2007*)

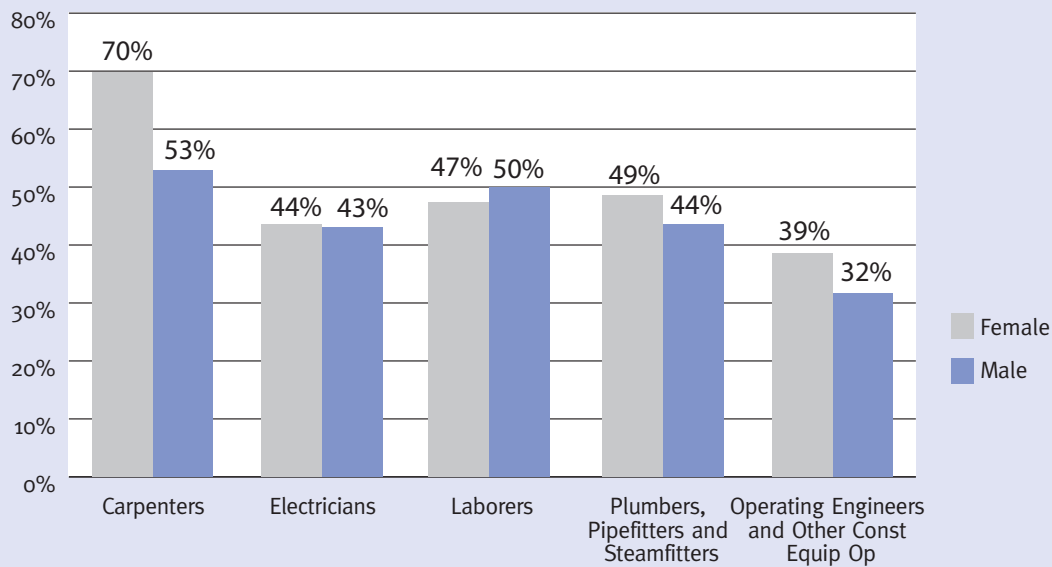


³⁰ (Bilginsoy, 2005)

³¹ Independent sample t-test revealed a statistically significant difference between men's and women's cancellation rates. $t(5.822)=3190, p=.000$

Among particular trades, there also is evidence that men complete at higher rates than women. An ongoing study in Oregon on apprenticeship in the heavy-highway trades has shown that 25 percent of construction apprenticeship agreements initiated by women were completed compared to 40 percent of those initiated by men.³² The chart below shows cancellation rates for men and women apprentices registered in 2006 and 2007 by gender and according to the top five occupations in which women are most represented in the national data set. With the exception of laborers, women cancelled at higher rates than men in all occupations.

DIAGRAM 8: PERCENT OF CONSTRUCTION APPRENTICESHIP AGREEMENTS CANCELLED BY GENDER AND TRADE (*New Apprentices Federally Registered between 2006 and 2007*)



Some state-level data also show that men and women construction apprentices achieve program completion at varying rates. In Ohio, 64 percent of 591 apprenticeship agreements entered into by women between 2001 and 2005, were cancelled compared to 36 percent completed. By comparison, 53 percent of 15,802 apprenticeship agreements by men were cancelled, while 47 percent were completed. Another study in Southwest Ohio in 2010 shows that 55 percent of men construction apprentices registered between 2000 and 2006 cancelled compared to 74 percent of women.³³ The table below shows additional analysis of women and men apprenticeship completion rates in Washington and Wisconsin.

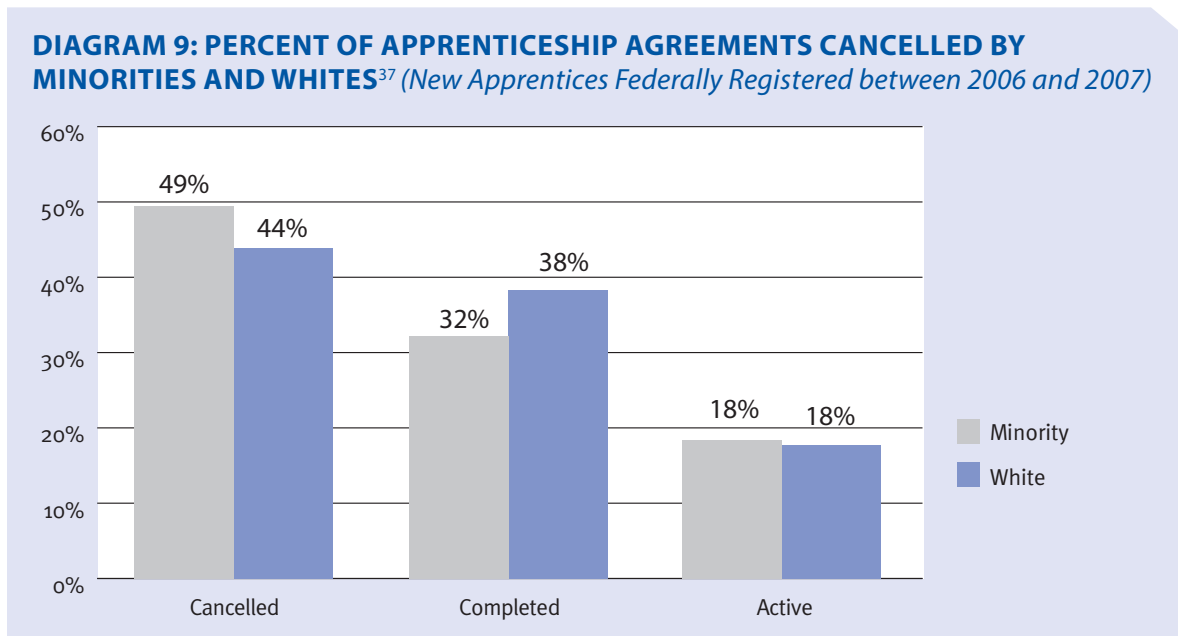
TABLE 4: COMPLETION AND CANCELLATION RATES FOR MEN AND WOMEN FROM STATE DATASETS

State	Time Period of Apprenticeship Registration	Gender	Number of Apprenticeship Agreements	Completed	Cancelled	Active
Washington	1994-2007	Men	42,503	34.4%	59.7%	5.9%
		Women	3,287	26.7%	67.1%	6.1%
Wisconsin	2000-2007	Men	13,587	58.3%	35.6%	6.1%
		Women	317	46.1%	50.2%	3.8%

³² (Kelly and Wilkinson, 2012)

³³ (Steward and O'Brien-Turco, 2010)

Completion and Cancellation Rates for Construction Apprentices by Race
 Studies prior to this analysis have shown that completion and cancellation rates vary among construction apprentices of different races. Bilginsoy’s analysis shows 47 percent of white men, who registered between 1995 and 1997, cancelled. Nearly 70 percent of African-American men and 63 percent of Hispanic men, who registered during the same time period, cancelled. Differences were also present among apprentices by race who registered between 1988 and 1990.³⁴ A Wisconsin study shows 66 percent of non-minorities registered between 1999 and 2004 completed, compared to 48 percent of minority construction apprentices.³⁵ Our analysis also shows differences in completion by apprentices of differing race or ethnicity. As seen in the chart below, 49 percent of apprenticeship agreements entered into between 2006 and 2007 by minorities were cancelled compared to 44 percent of agreements entered into by whites.³⁶



The chart on the next page shows cancellation rates of apprenticeship agreements entered into between 2006 and 2007 by individuals with different racial backgrounds.

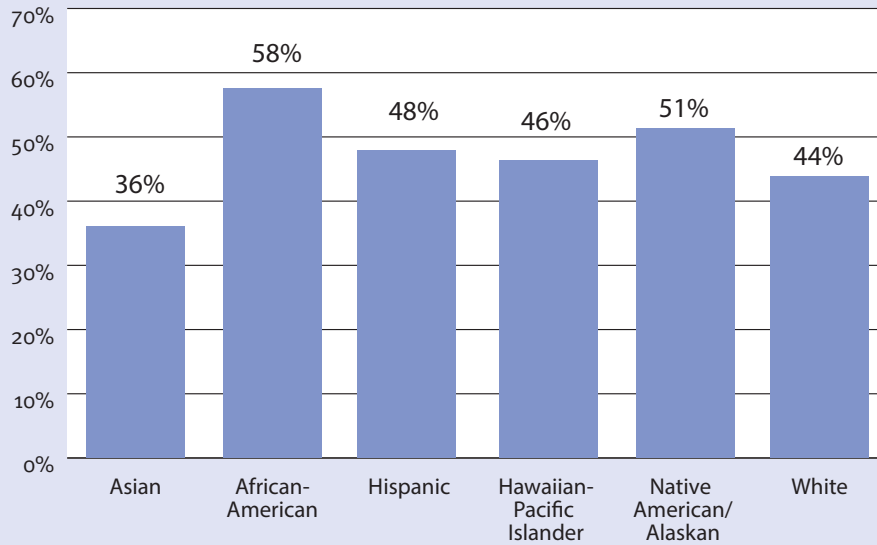
³⁴ (Bilginsoy, 2005)

³⁵ Dean Swenson, Z. Ramirez, J. Martin and T. Steiner, “An Evaluation: Minorities and Women in Construction Trades,” Wisconsin Department of Workforce Development, Report 10-12, (September 2010), <http://legis.wisconsin.gov/lab/reports/10-12full.pdf> (accessed 1 February 2012).

³⁶ Independent sample t-test revealed a statistically significant difference between minority and white cancellation rates. $t(18.917)=13268, p=.000$

³⁷ Minority apprentices include all Asian, African-American, Hawaiian-Pacific Islander, Native-American-Alaskan, and Hispanic apprentices.

DIAGRAM 10: PERCENT OF APPRENTICESHIP AGREEMENTS CANCELLED BY RACE³⁸ (New Apprentices Federally Registered between 2006 and 2007)



Our state-level analysis also shows that minority construction apprentices cancelled their apprenticeships at higher rates in Massachusetts, Washington and Wisconsin, as seen in the table below.

TABLE 5: COMPLETION AND CANCELLATION RATES FOR MINORITY AND WHITE APPRENTICES FROM STATE DATASETS

State	Time Period of Apprenticeship Registration	Minority Status	Number of Apprenticeship Agreements	Completed	Cancelled	Active
Massachusetts	2001-2007	Minority	2,274	30.3%	65.7%	4.0%
		White	11,092	40.4%	55.3%	4.3%
Washington	1994-2007	Minority	10,456	25.7%	68.6%	5.7%
		White	34,223	36.6%	57.4%	6.0%
Wisconsin	2000-2007	Minority	1,129	39.7%	55.3%	5.0%
		White	13,231	59.2%	34.6%	6.2%

Apprenticeship Completion and Cancellation by Age Group

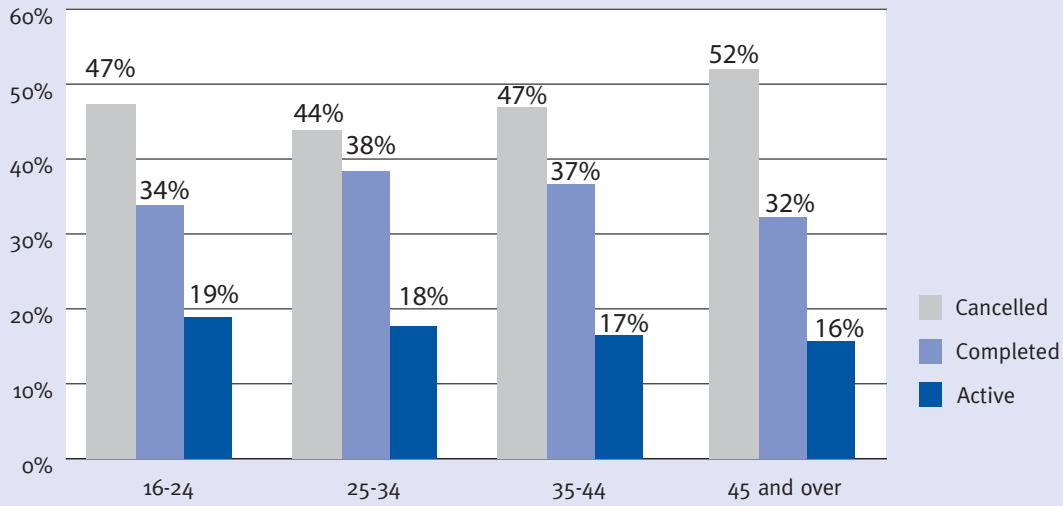
Of construction apprentices registered in 2006 and 2007 in the national dataset, apprentices between the ages of 25-34 had the lowest cancellation rate of all age groups at 44 percent, compared to 47 percent of those ages 16-24, 47 percent of those ages 35-44, and 52 percent of those 45 and over.³⁹ This is especially relevant given that many in the industry consistently argue that apprenticeship recruitment should target younger people, including those straight out of high school. While exposing younger people to careers in construction is important, we should not overlook the ability of working adults to be successful in these careers too.

³⁸ Hispanic includes all Asian, African-American, Hawaiian-Pacific Islander, Native-American-Alaskan, and White apprentices identified as having Hispanic ethnicity.

³⁹ Independent sample t-test revealed a statistically significant difference between those ages 25-34 with all other groups: ages 16-24, $t(10.692)=97110$, $p=.000$; ages 35-44, $t(6.717)$, 30807, $p-.000$; ages 45 and over, $t(11.458)$, 7048, $p=.000$.

DIAGRAM 11: STATUS OF CONSTRUCTION APPRENTICES BY AGE GROUP

(New Apprentices Federally Registered between 2006 and 2007)

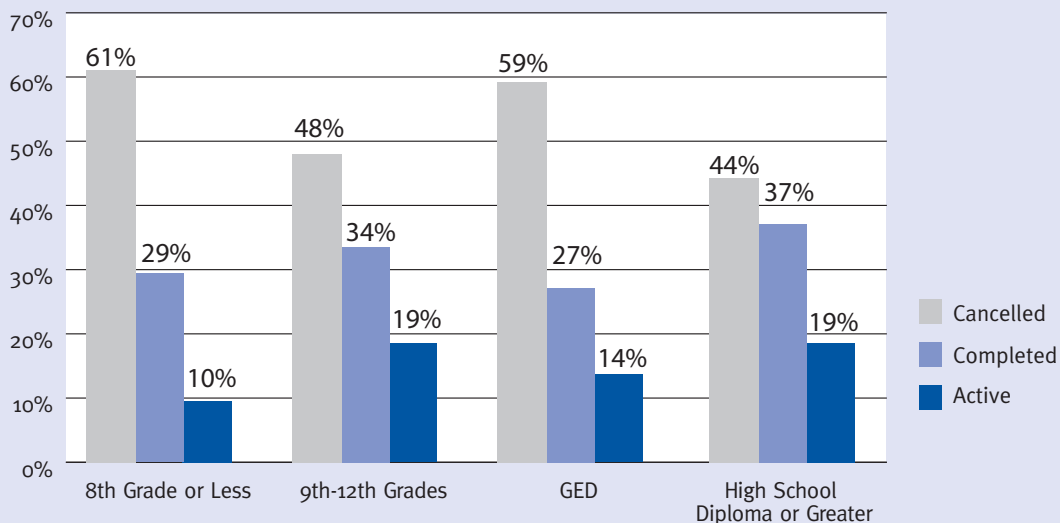


Apprenticeship Completion and Cancellation by Education Level

Apprentices with less education seem to have greater difficulty completing an apprenticeship than those with higher education levels. Those with an 8th grade education or less cancelled at higher rates than all other groups, as seen in the chart below. Overall, slightly more than 44 percent of construction apprentices who registered between 2006 and 2007 with a high school diploma or higher education level cancelled, while 54 percent of those with a GED or less cancelled.⁴⁰

DIAGRAM 12: STATUS OF CONSTRUCTION APPRENTICES BY EDUCATION LEVEL

(New Apprentices Federally Registered between 2006 and 2007)



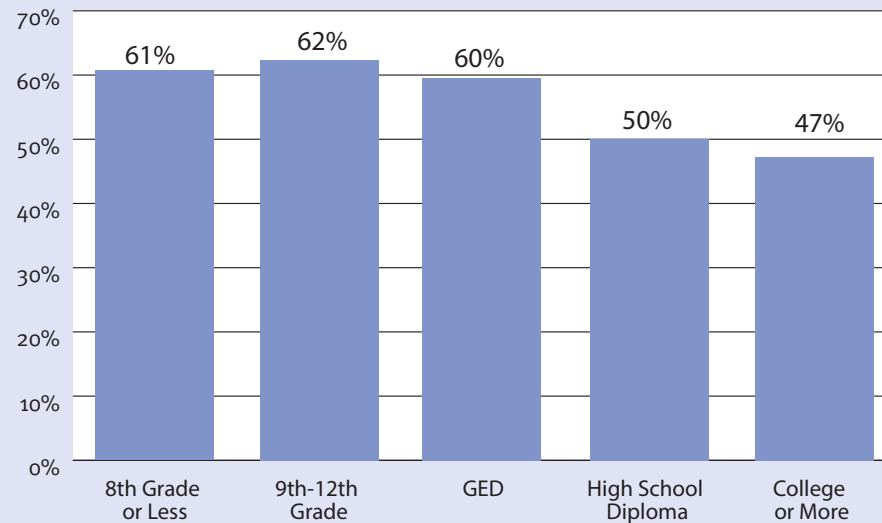
Analysis of Washington state data also suggests that education is a factor in whether apprentices complete their program. Of the 1,633 construction apprenticeship agreements entered into between

⁴⁰ Independent sample t-test revealed a statistically significant difference between those with a high school education and above and those with a GED or less. $t(-28.151), 43531, p=.000$

1994 and 2007 by individuals with a 12th grade education or less, but no GED or high school diploma, 62 percent were cancelled. Only 47 percent of the 2,822 agreements entered into by individuals with some college education were cancelled.

DIAGRAM 13: PERCENT OF CONSTRUCTION APPRENTICESHIP AGREEMENTS CANCELLED BY APPRENTICE'S EDUCATION LEVEL IN WASHINGTON STATE⁴¹

(Newly Registered Apprentices between 1994 and 2007)



Apprenticeship Completion and Cancellation of Military Veterans

Many military veterans who leave service often see construction as a good career opportunity. Our analysis of the OA national dataset found some small, but statistically significant differences in completion and cancellation rates of agreements by military veterans versus non-veterans. From 2006 to 2007, 7,525 apprenticeship agreements were entered into by military veterans. As of May 2012, 49 percent had been cancelled compared to 46 percent of non-veterans.⁴²

Cancellation and Completion Rates of Construction Apprentices Compared to Other Industries

The Registered Apprenticeship system is used by a variety of industries. Nurse assistants, cooks, machinists, and tool and die makers are just a few of the thousands of occupations in which individuals may participate in an apprenticeship as part of their career training. The chart below compares completion and cancellation rates of occupations in various industries for apprentices registered in 2006 and 2007. Completion and cancellation differences are readily apparent among the various occupations, but these occupations also differ in many other aspects. Differences in the length of training, number of classroom hours, physical difficulty of the work, workplace culture, use of the apprenticeship system among employers, and other factors may play a role in the completion and cancellation differences. In construction, in particular, a lot of work is done outside and the industry's cyclical nature means workers are prone to regular lay-offs. Construction workers also often move between employers, because construction projects are typically time-limited and end at some point. In

⁴¹ The results from Washington looking at education levels and cancellation rates are based on analysis of 16,649 apprenticeship agreements between 1994 and 2007. Nearly 64 percent of apprentices, or 29,141 apprentices, who registered during that time did not have an education level provided in the dataset and were not included in the analysis. The following includes the sample sizes for the analysis above 8th grade or less = 122 apprentices; 9th-12th grades = 1,511 apprentices; GED = 3,558 apprentices; High School Diploma = 8,636 apprentices; College or More = 2,822 apprentices.

⁴² Independent sample t-test revealed a statistically significant difference between the cancellation rates of veterans and non-veterans. $t(-4.752)=8565, p=.000$

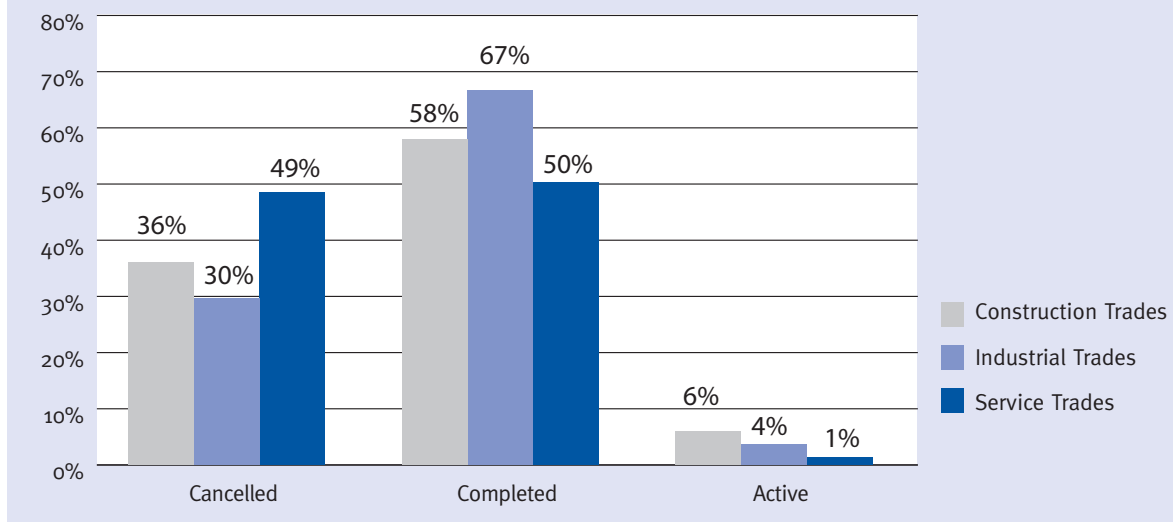
other industries, especially those with a newer apprenticeship model, demand for an apprenticeship credential by industry may be low, which could impact completion.

TABLE 6: SUMMARY TABLE ON COMPLETION AND CANCELLATION RATES OF APPRENTICESHIP AGREEMENTS IN CONSTRUCTION AND NON-CONSTRUCTION OCCUPATIONS AS OF MAY 2012 *(New Apprentices Federally Registered in 2006-2007)*

Occupation	Number of Apprenticeship Agreements	Completed	Cancelled	Active	Median Number of Training Hours Required
Construction Occupations	120,972	35.9%	46.1%	18.0%	8,000
Automobile Mechanics, Technicians and Body Repairers	553	36.0%	38.9%	25.1%	8,000
Cooks	1,090	45.7%	44.9%	9.4%	6,000
Child-care Development Specialists	714	33.0%	47.6%	19.4%	4,000
Firefighters	1,257	61.0%	22.8%	16.2%	4,000
Healthcare Occupations ⁴³	838	37.0%	58.2%	4.7%	2,000
Heating, Air Conditioning, and Refrigeration Mechanics and Installers	2,437	42.2%	40.0%	17.8%	8,000
Millwrights	2,018	37.9%	46.6%	15.5%	8,000
Tool and Die Makers	515	45.2%	34%	20.8%	8,000

The chart below displays data from the Wisconsin Department of Workforce Development for the completion and cancellation rates of apprentices in the service, industrial and construction sectors.

DIAGRAM 14: STATUS OF APPRENTICESHIP AGREEMENTS IN WISCONSIN BY INDUSTRY FOR NEW APPRENTICES REGISTERED BETWEEN 2000 AND 2007



⁴³ Healthcare occupations includes dental assistants, dental laboratory technicians, emergency medical technicians and paramedics, home health aides, licensed vocational and practical nurses, nurse assistants, pharmacy technicians, and others. The occupations with the largest number of apprentices included home health aides (251), nurse assistants (248), pharmacy technicians (106), dental assistants (90), and licensed practical and vocational nurses (71).

Cancellation and Completion Rates of Construction Apprentices Compared to Community Colleges

It is also important to keep community college graduation rates in mind for context and when making comparisons. Many working adults pursue job training and educational advancement in community college programs. Only 22 percent of the full-time students who enrolled in a community college for the first time in the fall semester 2003-2004 earned a certificate or associate's degree at any institution within six years, according to the National Center for Education Statistics.⁴⁴ Data released in 2010 for 33 states by Complete College America, which accounts for all community college students, show that only 13.9 percent of students who enrolled in an associate degree program earned a two-year associate degree within three years. And, only 22.6 percent of students who enrolled in a one-year certificate program earned a certificate within 1.5 years.⁴⁵ Construction apprenticeship completion rates clearly exceed these community college rates. Yet, concern and efforts within the construction industry show that more needs to be done and can be done to improve apprentices' success in the industry.

Summary of Apprenticeship Completion and Cancellation Data

Many construction apprentices struggle to complete their apprenticeships, as seen in this section. While completion and cancellation rates vary by year, longitudinal data from state sources and previous research suggest high rates of cancellation have always been an industry issue. The data also show that various demographic groups such as minorities, those with less than a high school education, and women have higher cancellation rates than whites, those with higher levels of education, and men. While completion and cancellation rates in some industries, such as the service occupations, are sometimes worse than those in construction, other industries, as well as some specific occupations within the construction industry, show higher completion rates, suggesting room for improvement.

The report's next section discusses the unique challenges construction apprentices face, factors that may influence whether they complete or cancel, and strategies that may help more apprentices complete apprenticeships.

⁴⁴ A. W. Radford, L. Berkner, S.C. Wheelless and B. Shepherd, "Persistence and Attainment of 2003-04 Beginning Postsecondary Students: After 6 Years," NCES 2011-151, Washington, D.C.: U.S. Department of Education, National Center for Education Statistics, <http://nces.ed.gov/pubsearch> (accessed February 2, 2013).

⁴⁵ Complete College America, "Time is the Enemy," (September 2011), http://www.completecollege.org/docs/Time_Is_the_Enemy.pdf (accessed 10 May 2013).

Barriers to Apprenticeship Completion in the Construction Industry

It is not uncommon for about half of the apprentices in the construction trades to cancel out of their apprenticeships, as previously documented. Although certain factors (e.g., age, race/ethnicity, education level and occupation) correlate with higher cancellation rates, the primary reasons why building trades apprentices do not complete their programs are less clear. When reporting enrollment figures to government authorities, employers who sponsor apprenticeships can specify a primary reason for an apprentice’s cancellation. But, the sponsors did not cite a reason for the majority of cancellations from 2006 to 2011,⁴⁶ according to an analysis of national OA data regarding the reported reasons for cancellation.

Researchers in recent years have sought to identify the main causes of cancellation by surveying or interviewing a variety of apprenticeship stakeholders.⁴⁷ Identifying or rank ordering the most common and significant causes of cancellation has been difficult. Moreover, different parties tend to cite different reasons. Cancelled apprentices commonly attribute their departures to job insecurities, as well as inadequate supervision and training.⁴⁸ By contrast, employers, training coordinators and even current apprentices tend to point to cancelled apprentices’ poor performance, personal issues and lack of commitment.⁴⁹ Regardless, most stakeholders that AspenWSI interviewed concurred that more cancellations result from the direct action of an apprentice, who voluntarily decides to quit, rather than from an employer or training committee forcing the cancellation. In Wisconsin, 55 percent of cancelled apprentices surveyed in 2010 said they quit voluntarily.⁵⁰

Interviews and focus groups conducted by AspenWSI revealed highly diverse reasons why apprentices cancel and a range of challenges they face. AspenWSI, however, found broad consensus among different stakeholder groups in identifying four overarching challenges to completion: financial security, difficult work environments, school and academic struggles, and life challenges. The perspectives and first-hand accounts of current and former apprentices, as well as of employers, training coordinators, classroom instructors, and other community and industry takeholders are interwoven in this section.

BOX 2: SUMMARY OF CHALLENGES FOR CONSTRUCTION APPRENTICES

Overarching Challenge	Description
Financial Security	Apprentices may experience a number of economic hardships during training. The industry’s cyclical nature means lay-offs are frequent, and apprentices often experience a lack of work. Some apprentices earn low wages the first few years, and this, plus poor saving habits and other money management skills or financial literacy, can cause difficulty maintaining financial security.
Workplace Environment	Apprentices face a work environment full of challenges. A lot of construction work is physically tiring, dirty and occurs outside in tough weather. Apprentices may enter construction work without fully understanding the job’s nature and demands. They may not know what the proper behavior, attitudes and actions are on the job site, which can lead to misconduct. Apprentices may work on a job where the OJT provided by a journey worker is limited or poor, leaving them without sufficient opportunity to develop their skills. Initiation also may go too far into hazing of apprentices. Women and minorities, in particular, may face abusive remarks or actions. <i>(continued on next page)</i>

⁴⁶ For instance, in 2011, sponsors simply cited “cancellation” as the reason why 77 percent of apprentices cancelled; the next most common responses were “voluntary quit,” representing just 5 percent of cancellations; “program cancelled by registration agency” and “discharged/released” each at 4 percent; and “left for other employment” and “unsatisfactory performance” each at 2 percent of responses.

⁴⁷ For additional research on the reasons behind apprenticeship cancellation, see (Steward and O’Brien-Turco, 2010), (Lerman et al. 2009), (Kelly and Wilkinson, 2012), (Reed et al. 2012), and (Wisconsin Apprenticeship Advisory Council, 2010).

⁴⁸ (Steward and O’Brien-Turco, 2010), (Kelly and Wilkinson, 2012), and (Wisconsin Apprenticeship Advisory Council, 2010).

⁴⁹ (Steward and O’Brien-Turco, 2010), (Lerman et al. 2009).

⁵⁰ (Wisconsin Apprenticeship Advisory Council, 2010).

School and Academic Skills	Being a successful apprentice means being a good student in the classroom and, for many trades, having good math skills. Apprentices may have limited basic math and reading skills and need additional remediation or academic supports to succeed. They may lack test-taking strategies or study skills. The demands of working during the day and going to a school classroom at night may cause scheduling difficulties, if not exhaustion. Classroom instructors may lack knowledge of adult education or teaching experience and, therefore, instruction may not be up to par.
Personal and Life Issues	For all apprentices, “life happens” during their apprenticeship. They may struggle to balance family, work, and school responsibilities and schedules. Many apprentices have children, so arranging and paying for child care can be challenging. Working in construction often requires a great deal of travel, so having money for a car, fuel and car repair is a necessity. For some, substance abuse or issues with mental health can wreak havoc on their chances of succeeding in an apprenticeship.

FINANCIAL SECURITY

Economic hardships are inherently a part of working in the construction sector and, more acutely, for apprentices moving up through the ranks. AspenWSI interviewed current and former apprentices during site visits in Cincinnati and Milwaukee who discussed the financial burdens of being laid off and earning low starting wages. Many apprentices persevere, but for some, financial hurdles proved insurmountable, particularly during the recent recession. Some apprentices lack financial literacy skills and make matters worse by not planning financially for likely hardships.

Frequent Lay-Offs

The nature of the construction industry requires many employees to regularly switch jobs and work for different employers. In 2011, 72 percent of construction workers in the private sector left their jobs at some point, nearly double the 37 percent of all workers who left their jobs in the United States that year.⁵¹ Of the construction workers who left jobs, 17 percent voluntarily quit, 52 percent were involuntarily laid-off or dismissed by their employer, and three percent left for another reason (such as death or retirement). At the same time that 72 percent of construction workers left their jobs, the industry experienced a 74 percent hire rate, revealing that many in the construction industry workforce are regularly moving to different employers.

Construction apprentices are told that temporary lay-offs are part of the natural ebb and flow of construction projects. Yet, this does not always ease the shock of a layoff. “They tell you from the beginning to expect to be unemployed. But, no matter how many times you hear it, it’s still scary when it happens to you for the first time,” said a female carpentry apprentice in Portland, Oregon. Some apprentices interviewed said that once they got used to being laid-off and rehired, they viewed a week or two off of work as an opportunity to rest or catch up on school assignments. But, many apprentices told AspenWSI that they were not always sure they would return to work after being laid-off, especially given the construction industry’s recent ups and downs.

Frequent and lengthy bouts of being out of work took an irreparable toll on many apprentices. When AspenWSI visited Milwaukee in the winter of 2012, apprentices painted a grim picture of unemployment. One apprentice described a regular pattern of layoffs — three weeks on, three weeks off, and so on. He seemed resigned to this, noting that at least he worked some of the time. In St. Louis and Milwaukee, program officials and apprentices said that most apprentices have cancelled in the past few years due to a lack of work. In Cincinnati, layoffs also caused turmoil during the Great Recession, when construction projects dried up, according to union officials interviewed there.

The Milwaukee visit shed light on a difficult predicament facing apprentices, especially those trying to support families: whether to be idle during a layoff, collecting unemployment checks, or to get another type of job, giving up their construction career ambitions. “My challenge is a lack of work, to the point that you got a choice: you can sit on layoff or you can go get a job elsewhere, non-union, and take care of your family,” remarked a Milwaukee apprentice. “A hundred times

⁵¹ U.S. Department of Labor, Bureau of Labor and Statistics, “Job Openings and Labor Turnover – January 2012,” http://www.bls.gov/news.release/archives/jolts_03132012.html (accessed 8 March 2013).

out of a hundred, a man will go and take care of his family before he sits there and takes this government check that is like 10 times less than the amount of money he can make if he was working.”

Repeated layoffs also impede progress in completing apprenticeship programs. A Milwaukee laborer noted that in the last 18 months of his apprenticeship, he accumulated six months of work experience with three different companies. Apprentices in this situation accrue required OJT hours more slowly, lengthening the time of their apprenticeship and making it harder to attain a journey license and the accompanying pay raise. Although the Milwaukee laborer ultimately persevered and became a journeyman, other apprentices find the often prolonged time required to complete an apprenticeship is an insurmountable obstacle. According to researchers in Portland, insufficient OJT hours is a leading cause of cancellation, particularly among non-traditional populations. Their study shows that women and minorities tend to accrue work hours more slowly than white men, which may help explain their higher cancellation rates.⁵²

Low Wages

Even when apprentices have steady work, they report having difficulty making ends meet on apprenticeship wages. In Cincinnati, apprentices reported earning just over \$9 an hour during their first year. Several apprentices noted that they could make more working other jobs in the short-term. “The first year was rough because I was making very little money,” said a third-year carpentry non-union apprentice in Cincinnati. “I could have made more money under the table than I could working 40 hours a week or more.”

Low wages create particularly severe hardship for apprentices with child-care expenses. In Wisconsin, an apprentice reported paying about \$1,300 a month for child care. An African-American electrical apprentice in Cincinnati also said he was struggling to provide for his family and six children.

Because of Registered Apprenticeship’s progressive wage structure, apprentices in the later years of their program reported becoming more financially stable with each bump in earnings. Nonetheless, some said that their apprenticeship was longer than needed. Some said their previous construction work experience was not valued enough and should have enabled them to start at a higher wage and further along in the program. In Cincinnati, a bricklayer apprentice, who had previously worked in construction, but not through an apprenticeship program, shared his reaction after the apprenticeship program would admit him only as a second-year apprentice. “I had six and a half years of experience with the same company. I had passion and I was good. And, they wanted me to settle for \$13.50. I haven’t made under \$14.00 an hour since I was 18 years old. That was a huge, huge blow,” he said.

Limited Financial Literacy and Planning

An apprentice’s limited understanding of financial literacy and planning can aggravate the economic hardship caused by layoffs or low wages. AspenWSI learned that after some apprentices were accepted into a program, they purchased big-ticket items, like a new truck or house, without giving much thought to how they would make payments, when or if work slowed down. Even smaller-scale expenses can add up to major financial woe. A union electrician told AspenWSI that during the first year of her apprenticeship she lived paycheck to paycheck, spending any extra cash on socializing and on purchasing unneeded tools. But, after being laid off, she realized the need to save money.

Layoffs and low starting wages, complicated by poor saving habits and other money management skills, can make an apprentice’s life difficult. In the next section, we discuss the unique challenges posed by the construction workplace.

WORKPLACE ENVIRONMENT

AspenWSI heard numerous accounts of how hard a construction apprentice’s life can be, particularly at work. Apprentices said they work at dangerous and dirty job sites and may be repeatedly assigned laborious and menial tasks. Their superiors may in some instances subject incoming apprentices

⁵² (Kelly and Wilkinson, 2012)

to ribbing or hazing while offering little time or talent to teach the trade. Not surprisingly, some apprentices enter the field unaware of these difficulties and ill-equipped to handle job assignments. Others lack the conviction and work ethic to persevere through such hardship. Employers and apprenticeship providers told AspenWSI that arduous work conditions, coupled with rigorous academics, play an important role in weeding out uncommitted and poor-performing apprentices, producing some necessary attrition. Yet, as apprentices' experiences and perspectives document below, when severe work situations are aggravated by other financial, school and life challenges, even the most determined and skilled apprentices end up at the brink of cancellation.

The Nature of Construction Work

When asked to describe their average workday, apprentices reported some of the same experiences. The day starts early and can run well into the evening, depending upon class schedules, project deadlines and commuting distance. In most trades, the work is dirty, physically exhausting, carries plenty of health and safety risks, and continues during all sorts of weather. As the "low man on the totem pole," apprentices said, they typically do a lot of grunt work such as fetching tools, unloading materials or cleaning job sites. And, they may be assigned the same sort of menial task for several consecutive days.

Apprentices also commonly reported that they had trouble making it through long, hard and often monotonous days. Apprentices noted that several colleagues cancelled as a result of the nature of the work, echoing other research findings. Asked why apprentices cancel, a Milwaukee apprentice replied, "Some didn't know what they were getting into."

Apprentices and program officials shared stories of cancelled apprentices who were afraid of heights, who couldn't handle the daily pressures of risky work conditions, who were physically unfit and easily exhausted from hard labor, and who did not expect to work in inclement weather, get dirty or do menial tasks.

A common theme emerging from the research literature and from AspenWSI's site visits is that many apprentices enter their programs mistaken about the work conditions they will encounter. Most apprentices interviewed in Cincinnati in 2010 by other researchers for another study said they entered their program not clearly aware of what their job would entail.⁵³ Moreover, researchers in Oregon found that a common reason apprentices cancelled was because they were a poor fit for the work.⁵⁴

While some apprentices told AspenWSI that prior to their apprenticeship, they previously worked or had been schooled in the building trades, other apprentices acknowledged that they knew very little about the building trades. They told stories about how they were sent to fetch tools and struggled mightily to identify the right ones. "I just didn't know a lot of the stuff that they would ask me to go get," said a non-union electrical apprentice in Cincinnati.

Program officials and employers also said that some apprentices do not take workplace rules seriously, and they were astonished to witness some apprentices text messaging on the job. They commonly cited apprentices' tardiness and absences. And, they reported that the newest generation of apprentices do not respond well to hard-nosed discipline, perhaps because they are unaccustomed to being yelled at. Meanwhile, apprentices told AspenWSI that their expectations of how they would be treated and supported on the job did not match their experiences in the workplace. These workplace realities are covered in the report's next two sections.

Limited Skills Development and On-the-Job Training

Across the board, apprentices interviewed in Cincinnati and Milwaukee expressed frustration with the overabundance of grunt work and the limited exposure to their craft's assortment of skills and work. Apprentices said the lack of skill-building opportunities provided contributed to performance issues and hampered their career development, causing some to give up and drop out. A Milwaukee plumbing apprentice pointed to the importance of quality OJT in achieving success in a craft. "The plumbing apprenticeship program's standard of excellence is very high, and I vouch for it. But, the

⁵³ (Steward and O'Brien-Turco, 2010)

⁵⁴ (Kelly and Wilkinson, 2012)

instructors can only take you so far,” he said. “You can get as much training in the books as you want and know the plumbing code, the electrical code. But, if every day you go to work, nobody gives a damn about you, you will be lost. It’s all about the on-the-job training you get.”

Much of the blame for not adequately training apprentices was directed at journey workers. Many apprentices asserted that supervising journey workers do not follow through with their training responsibilities, due to time restraints, competition for available work, or poor interpersonal and supervisory skills. Some criticism also was aimed at management for not prioritizing OJT or ensuring its quality.

In Cincinnati, some union-based training coordinators explained that shrinking profit margins on construction bids forced contractors to hire fewer workers for projects and to demand greater productivity. Consequently, they said, apprentices are now more likely to be assigned manual or menial tasks rather than shadowing and working alongside journey workers. Moreover, because of tighter project deadlines, journey workers are compelled to focus on completing skilled tasks on the job site rather than training apprentices. “There’s a lot of journeymen that don’t care and they’re like ‘You’re slowing me down’ or ‘I got deadlines to meet,’” said a Milwaukee apprentice. “Especially with the economy and job bids being tight, if you screw up one thing, then they’re losing money on the job, and they’ll blame the kid or the apprentice.”

Taken to the extreme, some employers reportedly do not offer OJT opportunities for incoming apprentices, as a matter of policy. A union-based employer in Cincinnati asserted that other area contractors have developed a bad reputation for not training apprentices in their early years and, instead, using apprentices as a source of cheap labor to move materials or dig ditches. This employer said that apprentices who face these work circumstances can contact their training committee, which, under collective bargaining rights, can reassign the apprentice to another job site.

Still, some apprentices may be afraid to protest or be labeled a “whiner.” Even when apprentices stridently requested training, some reported they faced resistance from journey workers. Apprentices surmised that some journey workers balk at overt training requests because they have already concluded that an apprentice was not cut out for the job. An electrical apprentice in Milwaukee relayed a story about a struggling peer who quit out of frustration after never receiving training. “He didn’t quite get the book work, but he probably would have if he had done the physical work in the field,” the apprentice said. “But, every single day, for literally a year, he pushed the broom and was told to organize the same toolbox over and over again, even if it had not been messed up. Every time he asked a question, they barked back, ‘Don’t ask, that’s not what you are doing.’ So, he got really frustrated and quit.”

Several people interviewed by AspenWSI also reported that some journey workers are reluctant to provide training for apprentices if they view the apprentices as future competitors for jobs. “Instead of a foreman or a journeyman taking you under their wing, they see you as competition once you become a journeyman,” said a Cincinnati union carpentry apprentice. The apprentice added, “They don’t want to help you. As an apprentice, if you do the job that needs to be done better or faster than they do, they will run you right under the bus to get you out of there.”

Even when journey workers do offer apprentices some tricks of the trade, they can be ineffective teachers. “A lot of times . . . it’s been, ‘Okay, I need you to do this. This is how you do it.’ And, then they are gone and I’m doing it and I’m all by myself,” one apprentice said. “And, come to find out, it’s wrong and I’m like, ‘I really wish somebody had been standing here with me, guiding me through this more.’” Another interviewee, a union electrical apprentice, reported that she was never offered adequate time to practice a new skill on the job. “I have a chance to learn something and then I get a couple of days of it and then it’s like, ‘Okay, now we need you to go do this,’” she said. She also described struggling with how to strike the right balance between asking to learn something new and being a “good employee” who does her assigned tasks, no matter how repetitive or menial.

Even with the best training conditions, many contractors specialize in particular segments of construction, making it unlikely an apprentice will learn all aspects of a trade through one employer. This is a particular problem for apprentices, many non-union, who spend their entire apprenticeship with one employer. In Cincinnati, a non-union electrical apprentice reported that he learned in class

that journey-level electrician work includes significant aspects that neither he nor anyone else at his company does. He did not know how he would learn them on the job site, where electricians are specially hired to handle more specialized tasks. “I just pull cables at my job,” he said. “But, as an electrician, you’ve got to do pipe bending. I don’t know how I am going to learn it, aside from class. My employer subcontracts with electricians. I sort of get to work alongside them, once in a while. But really, the electricians are just there to do their thing, and you got something else that you got to do.”

In contrast, union apprentices tend to rotate between different contractors, increasing the likelihood that they will be exposed to different job tasks and be trained by different journey workers. Generally, union apprenticeship program officials reassign apprentices upon completion of a particular job, but may initiate job rotations earlier if apprentices are not receiving adequate on-the-job training. Beyond insufficient training, apprentices also may encounter an uncomfortable, unfriendly and occasionally hostile work environment, as discussed next.

Inhospitable Workplaces

Apprentices, journey workers and apprenticeship program providers all told AspenWSI that “ribbing” or friendly teasing is an everyday occurrence at the job site. At best, this is good-natured and promotes camaraderie on the job site. Many noted, however, that this can become abusive name-calling that crosses the line into overt abuse or hazing. Unsurprisingly, going to this kind of job site can be unpleasant or even a game-changer for apprentices unaccustomed to an inhospitable and hostile work environment. “Some people quit because they couldn’t deal with hazing,” reported one journey-level laborer in Milwaukee. Seasoned apprentices, journey workers and others contended that apprentices who figure out whether and how to push back can survive hazing. They acknowledged, however, that some apprentices get beaten down, become isolated and eventually cancel.

When presented with fresh faces, veteran workers often try to figure what makes them tick, how to push their buttons, and how to break them in or, worse, break them down, some interviewees explained. Current and former apprentices reported being greeted with belittling nicknames and varying forms of hazing. As a consequence, one Milwaukee apprentice said he felt “demoralized as a rookie” and not a “viable part of the team.” A Cincinnati union apprentice reported that, “as soon as you walk in the door, ... if you look younger than everyone else, they will say, ‘Hey cub, get over here.’ I haven’t heard my first name in four years.”

Apprentices reported that some veteran workers enjoy poking fun at apprentices who were not yet familiar with the nicknames used for tools and other workplace terminology. Sometimes, apprentices say, this was done in good fun. Other times, they claim, journey workers mistreated apprentices by either stealing their tools or blaming their own errors on apprentices. A union apprentice in Milwaukee recalled having tools stolen on the job. “I brought a brand new 30-foot tape measure and within an hour it was gone. Somebody took it to use and never gave it back,” she said. “I also had a brand new voltage tick tracer and put it in the game box the first day on the job. The next day it was gone.”

Apprentices who look or act different are more likely to be the targeted of hazing, some interviewees reported. AspenWSI heard several accounts of abusive remarks or hostile acts directed at African-Americans and women. While some female and minority apprentices in focus groups said they had not experienced racism or sexism, others reported that they had. Some female apprentices and journey workers reported experiencing pointed name-calling. One female apprentice in Milwaukee reported being told, “You’re a girl and need to be at home making babies.” Contrary to some claims that sexual harassment and unfair treatment of female apprentices is uncommon nowadays, three other recent studies report that the vast majority of women interviewed experienced workplace harassment, ranging from patronizing remarks about their ability to do construction work to lewd remarks, unwelcomed sexual advances and inappropriate touching.⁵⁵ In one survey of apprentices in the heavy highway trades in Oregon, 24 percent of minority men and 30 percent of minority women reported experiencing discrimination at work because of their race/ethnicity. This survey also revealed that nearly 40 percent of non-Hispanic white women and 50 percent of minority women

⁵⁵ (Kelly and Wilkinson, 2012), (Reed et al. 2012) and Karen Morgan, “Apprenticeship Focus Group Report: Women and Minorities in Construction Apprenticeship,” Wisconsin Bureau of Apprenticeship Standards, Department of Workforce Development and Department of Workforce Services (November 2006).

reported experiencing discrimination on a job site due to their gender.⁵⁶ Similarly, two of the studies found instances of racial slurs and hazing directed at African-American men in apprenticeship programs.⁵⁷

Noting a misconception that the workplace welcomes apprentices, researchers suggest this misconception is based, in part, on the fact that few victimized apprentices file discrimination complaints.⁵⁸ Indeed, in Wisconsin, no women or minorities filed discrimination complaints in 2008 or 2009. Some attribute this to apprentices' fear of retribution or retaliation from employers and co-workers.⁵⁹

In Milwaukee, however, some apprentices report that offensive remarks got so out of hand that many journey workers were required to attend a diversity training workshop. "There have been so many comments made and so many harassing remarks that they have been forced to take that class," reported one female apprentice. During AspenWSI's site visits, female and African-American apprentices also reported feeling isolated, overtly scrutinized and overlooked at work. "It's definitely a good ole boy system," said an African-American male apprentice, who is one of a few minorities in his trade. "At my first interview, they asked who I knew. Then I would hear it in the field every day, 'How did you get in? Who did you know?'" Another African-American journey worker in Milwaukee lamented, "Being a minority is a problem. It is a good old boys' system. It's all family; it's all cousins, nephews, uncles and brothers."

Apprentices in Milwaukee and Cincinnati said hazing and isolation also may be experienced by people, regardless of race and gender, who do not have relatives in the trades. "The first question asked of me coming in as a pre-apprentice was, 'So where did your dad work or where did your brother work?'" recalled a white male apprentice in Milwaukee. "And I'm just, like, 'My dad worked at an American car company. He was a mechanic.' 'Well, how did you get in, who do you know? I mean, is your brother a pipefitter? Your uncle?' 'No.' And, right then there is like a wall. It's just like 'Okay, you're here. We will deal with you, but you know, you weren't in the family.' I was the first one and that wasn't really looked upon well."

Whether female or male, minority or white, apprentices reported having to figure out how to handle disparaging remarks and hazing or, they say, they would have given up a long time ago. "I used to get exhausted at being disrespected until I learned how to deal with it," said an apprentice in Cincinnati.

Minority and female journey workers in Cincinnati and Milwaukee also told AspenWSI that they have learned over time when and how to ignore or respond to others' unwelcome behavior, whether by responding with good-natured return-razzing, direct confrontation or filing formal complaints. Discerning people's motivation for acting inhospitably, whether it is well-intended or not, whether it stems from ignorance or hatred, is key. "You have to let things like this roll off," said an African-American journey-level electrician. "If you don't have a sense of humor, you won't make it. You have to find ways to fit in and bond with others. Negative and aggressive responses will only egg some on."

SCHOOL AND ACADEMIC SKILLS

School poses another major obstacle to apprenticeship completion. During interviews, AspenWSI heard from training coordinators, instructors and apprentices alike about challenges that apprentices face in the classroom related to basic skills deficiencies, returning to school after a long absence, mastering technical content, and balancing school with a full-time job. In this section, these challenges are briefly described.

Unprepared for Apprenticeship Classroom Training

Math skills are often a critical skill set that apprentices need in order to succeed and become journey workers. "It's sink or swim for electricians, based on math proficiency. You need algebra to bond a pipe," said a journey-level electrician in Cincinnati. Math is routinely cited as a major stumbling

⁵⁶ (Kelly and Wilkinson, 2012)

⁵⁷ (Kelly and Wilkinson, 2012) and (Morgan, 2006)

⁵⁸ (Reed et al. 2012)

⁵⁹ (Swenson et al. 2010)

block for apprentices. For several trades, apprentices who fail too many math tests are dropped from programs. Apprenticeship program officials contend that more apprentices with weak math skills are entering programs than in years past. Instructors report that apprentices often lack a basic understanding of how to read a measuring tape or how to calculate fractions and decimals. And, they struggle with more advanced math, like algebra, geometry and trigonometry, which have practical applications in the workplace. “Academic challenges are getting more prevalent with new apprentices. Forty to 50 percent fail the basic math test,” said a union training coordinator in Milwaukee.

Some apprentices fresh out of high school said during site visit interviews that they never mastered the math concepts required for the trades. Others who had been out of school for several years reported struggling to relearn material or readjust to life as a student. Some mentioned copious amounts of homework, while others said it was a struggle to sit in a classroom again. “It had been, like, probably 10 years since I had been in school,” remarked an electrical apprentice in Cincinnati. “All of this math was basically brand new to me. I had to ask so many questions. So, that was pretty tough, just trying to catch on and catch up.” A journey-level carpenter in Milwaukee recalled, “Going into the trade after not being in school for many years, that proved to be very difficult for me. I found myself studying twice as hard as my peers, my classmates or my coworkers.”

Inadequate Classroom Instruction

Apprentices attributed some of their school struggles to poor teaching by journey workers hired as course instructors. Some apprentices said that some instructors read straight from the textbook, while others never taught the material that appeared on tests. “I had the same teacher for the three years, and he didn’t really teach you anything,” said a carpentry apprentice in Cincinnati. “We had to teach ourselves. And, what I had to learn did not really apply to what I do at work.” Training committee members also acknowledged difficulty finding qualified journey workers to teach courses who both understand the content and know how to teach.

Missing Classroom Hours to Work

Absenteeism is grounds for expulsion from an apprenticeship, but some apprentices commonly attributed their absenteeism to conflicts with work schedules. Apprentices in Cincinnati said some apprentices were frequently tardy to school because they worked 45 minutes away from the classroom training facility. In some instances, apprentices spoke of skipping class in order to work another shift, causing them to fall behind in their classroom training hours. One apprentice in Milwaukee reported that the need to work and earn money trumped the requirement to attend classroom training. “We had a rule that you weren’t supposed to do a second or third shift during the school year,” the apprentice said. “But, with the economy the way it is, you really don’t have a choice. So, you have to take whatever work you can get, and if you got to skip a day of school, you have to skip a day.” This sentiment was echoed by a carpentry apprentice in Cincinnati who said, “Every three months, we are supposed to take a week off work to go to school. A few times recently, I’ve been working 16-hour days building scaffolding on a major job site. I am making \$1,500 to \$2,000 dollars a week. And, they are like, ‘You need to come to class’ and I’m like, ‘No way.’ I am not about to miss a week of this money. I am going to work. So, now I am about to be a fifth-year apprentice, because I have missed a few classes.”

Attending school also can be challenging for apprentices with family responsibilities and commitments, as the next section discusses.

PERSONAL AND LIFE CHALLENGES

Struggles to deal with life’s challenges are a big reason why apprentices cancel out of programs, according to many stakeholders interviewed. Echoing past research, several apprentices told AspenWSI about issues with cars breaking down, child care and substance abuse.⁶⁰ These were just a few of the life challenges we heard about during site visits.

⁶⁰ See (Steward and O’Brien–Turco 2010), (Kelly and Wilkinson, 2012) and (Reed et al. 2012)

Juggling Family, Work and School Responsibilities

Balancing school, work and family responsibilities can be difficult, many apprentices reported. A plumbing apprentice in Milwaukee cited “the commitment” as the top challenge he faced in his apprenticeship. “You go to school all semester long, all night long, 6:00 to 9:00,” he said. “You work all day and you don’t get home until 10:00 at night. You don’t see your family. You don’t see your children. And, it’s not easy.” Another apprentice in Milwaukee echoed this concern. “When you are working 40 hours a week and overtime half the time, you don’t have time to do homework and spend time with your family,” she said.

An electrical apprentice in Cincinnati spoke of the strain on his marriage and relationship with his kids caused by being in an apprenticeship. “By the time I come home from school, it is time for everybody to go to bed. . . . That is really hard on my wife,” he says. Another apprentice in Cincinnati spoke of the exhaustion of going to school and work at the same time. “The biggest thing right now is the schedule of classes. I’m not getting home until late and I am so tired,” he said. “And, I still have to get up, and I still got to go do a full day’s work, and I’m like ‘How am I going to survive this?’”

Child-care Issues

Several apprentices told AspenWSI that they had a hard time arranging child care around work and school schedules. In particular, apprentices said, early morning start times and evening classes do not match most child-care centers’ hours. In Milwaukee, an electrical apprentice said she was fortunate to find a home-based provider who could watch her children from 6:00 a.m. to 4:30 p.m. She still found it costly to pay for the 10 hours plus of child care she needs per day, which used up a sizeable part of her and her husband’s paychecks. She reported that since she and her husband started working in the trades, they have lost government assistance to help cover child-care costs.

Others face the stress of cobbling together child care, whether during work hours, for evening classes or on weekends, so they could focus on schoolwork. In Cincinnati, a single parent of four children told AspenWSI that she quit her apprenticeship program during the first year because she grew weary of constantly having to find a family member or friend to watch her children while she attended class. She said asking her family and friends so often for help had strained her relationships, and sometimes she had to leave her children in less than ideal circumstances. On weekends, when she wasn’t working or at school, the last thing she wanted to do was look for a sitter so she could do her homework, she said. As a result, her grades suffered.

Family commitments also create tensions at work. Several apprentices mentioned having to leave work due to a family emergency, such as a sick child. In Cincinnati, an electrical apprentice said she worried constantly about how taking time off from work to care for her daughter would affect her job security. “It seems like every other week, there is something for my daughter to take care of that I need to take some time off work to help her with, and I worry a lot about how that is going to affect me getting work assignments if things get slow. Are they going to overlook me for some guy because I’m a single parent and they know I need to take off an hour sometimes to help my kid?”

Some apprentices experienced or witnessed bosses being unsupportive with workers who needed to leave work early to care for their children. While these apprentices did not drop out, they knew others who did as a result of this treatment. Other recent studies describe apprentices facing similar challenges, most notably an apprentice who said she was fired for excessive absenteeism when her three children were sick with strep throat.⁶¹ One apprentice in Milwaukee told AspenWSI that apprentices, “get sick of getting harassed about it. If you are the only one taking care of the kids, you got to leave work all the time. The school calls, you got to go. Family does come first even though the job is just as important. Apprentices get really irritated with the bosses giving them a hard time about leaving.” Another factor sometimes making apprenticeship difficult is the need for reliable transportation, as discussed next.

⁶¹ (Reed et al. 2012)

Transportation Issues

Several apprentices discussed the trials and tribulations of getting to and from work. In Cincinnati, two apprentices interviewed mentioned that their cars had broken down. One left the interview with AspenWSI early to pick up his car at the mechanic. Another apprentice spoke of recently buying a car that “turned out to be a lemon.” Others noted the high cost of the gas they need to commute to and from the job site and school. In Milwaukee, pre-apprenticeship program leaders described how one apprentice, with only one car in his household, brought his wife and children to work each day, in case his wife needed the car suddenly. A study by researchers in Oregon noted that an apprentice they interviewed cancelled because he could not afford to keep his car in the working order necessary to drive the long distance to his job site.⁶² During previous research in Maryland, AspenWSI found that an apprentice’s success can be negatively affected by having to pay for driver’s education and for a driver’s license.

Substance abuse

A few apprentices divulged personal struggles with issues, such as substance abuse, that can cost them their jobs. Several employers told AspenWSI that they conduct random drug tests and automatically fire apprentices who test positive for illicit drug use. Employers noted that if an apprentice admits to having a drug problem prior to testing, they are obligated by law to refer the apprentice to treatment. If an apprentice does not go to treatment, employers say their only option is to fire the apprentice.

Mental health

During site visits, AspenWSI heard stories of apprentices who suffered from poor mental health. In one instance, the apprentice’s poor mental health seemed to be a primary reason why the apprentice cancelled out of an apprenticeship.

Summary of Barriers to Completion

As interviews with many stakeholders indicate, there is no one reason why apprentices cancel. For some apprentices, everyday life gets in the way or the industry is not a good fit. Some quit because they need to earn higher wages or remain steadily employed, or the working conditions are too difficult, or life as an apprentice is too demanding. For some, a lack of sufficient training, an unfriendly workplace, and a lack of overall support is challenging. In the next section, we discuss some factors that stakeholders identified as contributing to an apprentice’s success.

⁶² (Kelly and Wilkinson, 2012)

Drivers of Success in Construction Apprenticeship

During site visits to Milwaukee and Cincinnati, as well as other research, Aspen asked apprentices, journey workers, employers and program officials what it takes for apprentices to overcome obstacles, learn the trade, and successfully complete an apprenticeship. Interview subjects broadly agreed that program completion is more likely when apprentices have a personal commitment to a construction career, strong determination, a firm work ethic, and a willingness to learn; a supportive workplace that prioritizes skills and career development; and a support network that eases the burdens and obstacles of apprenticeships.

PERSONAL COMMITMENT TO A CAREER IN CONSTRUCTION

Faced with the considerable length of an apprenticeship, apprentices said they had to remain focused on the long-term benefits of obtaining a journey-level license. They knew that, in the short run, they could earn as much or more in other jobs and face far fewer hardships. But, they stuck in there, knowing that far greater financial rewards and a more satisfying career awaited them upon program completion. “Lots of opportunities come up for other jobs and stuff where they say ‘You can make this amount of money.’ But, I know that in the long run this, right here, is going to be better for me,” said an electrical apprentice in Cincinnati. Some apprentices, and others interviewed, reported that some apprentices who cancelled had viewed their apprenticeship only as a way to earn an immediate paycheck, which doomed their apprenticeships to failure. “They don’t go into it knowing that ‘Okay, I’ve got to go to work and school for the next five years,’” said an apprentice in Cincinnati. “It’s like ‘Oh, this is a job. What? I’ve got school, too?’ They are not actually in it for the career. They are more into it as ‘I needed to find a job I quickly.’”

STRONG DETERMINATION, WORK ETHIC, AND DESIRE TO LEARN

In no uncertain terms, interview subjects attributed much of apprentices’ success or failure to their level of dedication and ability. “Ultimately it comes down to the individual. How bad do they want it?” said a Cincinnati employer. Drawing parallels to professional degree programs, such as medical and law school, instructors told AspenWSI that the rigors of the classroom and the job site are designed to weed out apprentices who are unsuited and uncommitted to a career in the industry. They said that cancellations should be expected because some apprentices do not have what it takes and the process is used to identify them. For their part, apprentices told AspenWSI that they advanced in their apprenticeship by working hard, tirelessly advocating for themselves, and maintaining a belief that they could overcome any obstacle. They said not all apprentices have such dedication. Reflecting on the trials of apprenticeship, a journey worker in Milwaukee said, “If you decide this is what you want, then most of us feel like ... no hurdles can stop us from getting it because ‘I’m going to get to my destination, my goal, what I set out to do.’”

Apprentices also spoke of their work ethic in both the classroom and on the job site. First and foremost, apprentices said, they had to gain journey workers’ respect. So, without complaint, apprentices took on and took care of menial tasks. And, if they were assigned more difficult tasks, apprentices recognized the need to do them correctly. “To succeed you have to be there on time and when you get there, you have got to work fast and hard,” explained a carpentry apprentice in Cincinnati. Only after proving their worth, apprentices noted, did journey workers take greater interest in teaching them. “But once they see, ‘Hey, this kid has got a spark’ or ‘That kid is bright’ the journeymen are going to grab you and teach you stuff,” said an apprentice in Milwaukee. And often, apprentices said, their hard work and determination were welcomed by supportive instructors. “You may not be the smartest person in class. You may not be able to get it all the time,” said an electrical apprentice in Cincinnati. “But, as long as you show instructors that you are willing to do the work, to get stuff done, they will help you as much as they can. They’ll stay after class. They’ll make arrangements to come in, whatever you need.”

Women and minorities face a particularly uphill struggle to prove they are fit and able for their trade.

They said they succeeded in winning over skeptical journey workers by insisting on being trained and demonstrating their abilities. “I would work very hard, I would be there on time, and I would listen,” said an African-American apprentice in Milwaukee. “The razzing goes away if you can hold your own. As I learned, I worked super hard. I told the guys on the job site once, ‘I thought you guys would give me more trouble.’ They said, ‘No, because you listen and you work hard. We run the other ones off.’”

Despite their hard work, women and minorities told AspenWSI that their success often hinged on figuring out how to handle being razzed or hazed. They had to learn how to distinguish between relatively harmless teasing and outright harassment. While some said they were able to fit in by teasing co-workers who teased them, others developed “a tough skin” and ignored razzing or took an offending co-worker aside to explain that the razzing was insulting. No interview subjects reported filing formal complaints. “Some of the stuff you deal with in some of these companies, you got to take it with a grain of salt,” said a female apprentice in Milwaukee. “You just keep pressing on because of the bigger goal.”

A SUPPORTIVE WORKPLACE THAT PRIORITIZES SKILLS AND CAREER DEVELOPMENT

Even the most driven apprentice can run into insurmountable obstacles at work and in school, as shown in the previous section. During site visits, several apprentices and journey workers interviewed described ways that employers and other journey workers contributed to a workplace culture that supports career development and does not tolerate discrimination.

In some instances, apprentices described an environment where the boss set the tone by taking a personal interest in apprentices. In Cincinnati, a couple of union contractors said they take care to assign apprentices to journey workers whom they know are good trainers. A male journey worker in Cincinnati said his boss memorized the names of all the apprentices on the job site. That level of personal connection made apprentices feel welcomed and supported. In Milwaukee, a female journey worker told AspenWSI that a recent boss had taken the rare step of actively tamping down hazing and hostility. “The owner of my company had high moral standards,” she said. “He told me right away when he hired me that ‘You know, these guys are rough and tough. If they give you a hard time or they go too far, just let me know.’”

In Cincinnati, the union electrical program has taken initial steps to gauge the quality of on-the-job training. Apprenticeship program staff calls journey workers three times during an apprentice’s first-year probationary period to ask about the apprentice’s performance. The journey worker must score their assigned apprentices on a number of items, using a 1 to 10 scale. If time permits, program staff reaches out to apprentices, praising them for good work or helping them address work-related difficulties.

Despite offering numerous accounts of hazing and hostility, several apprentices identified some journey workers who have fulfilled their training responsibilities or offered informal mentoring and counsel. Apprentices credited these supportive journey workers with helping them succeed. “They are just easier to ask,” for help or advice, said a carpentry apprentice in Cincinnati. “They won’t give you any negative feedback. They are just right on it to teach you.” An apprentice in Milwaukee described a supportive journey worker telling him, “Alright, you sit here and watch me do this for five hours, and then we’re going to flip the script. You’re going to do it, and if you have a question, please ask me.”

Apprentices also noted the importance of high-quality training facilities and opportunities for hands-on learning. Several union programs in Cincinnati recently opened impressive facilities offering traditional classes and expanded hands-on training labs designed to better equip apprentices with work-related skills. This kind of training facility made a difference, reported a bricklayer apprentice who re-enrolled in the program after dropping out earlier. “Before, we were in a garage with one guy trying to teach all of us,” he told AspenWSI. “Now we’re in a big facility with two full-time teachers, which has helped a lot. You’ve got classroom time and then you’ve got your hands-on. And, they teach you the actual science behind what you are doing.” Apprentices said receiving hands-on training at school helped their learning process and better prepared them for work. A carpentry apprentice praised the experience of building playground equipment in class. “I learn from doing it,” he said. Without this, he added, “I could study a book and pass all the tests but not remember any of it, because I didn’t touch it.”

A SUPPORT NETWORK TO EASE THE BURDENS AND OBSTACLES OF APPRENTICESHIPS

Apprentices face numerous financial, academic, work and family challenges, as described earlier. The importance of a support network to help apprentices overcome these difficulties was made clear in Milwaukee and Cincinnati. During interviews there, apprentices cited support from mentors, employers, family members, friends, instructors and pre-apprenticeship programs as instrumental to their success.

From first-year apprentices to seasoned journey workers recalling their early days in the trade, several interview subjects said they “learned the ropes” through a journey worker’s mentorship. For apprentices with no personal connections to the trades, in particular women and minorities, a mentor helped them overcome a sense of isolation and figure out how to succeed. Recalling her days as a new apprentice, an African-American carpenter in Cincinnati said she was fortunate that a journey worker took her to task when she did not come to work or slacked off on the job. Several interviewees found mentors who were journey workers nearing retirement and motivated by a sense of responsibility to preserve their trade. “You got a guy that is two months from being out the door or a year from being out the door, he wants to share that knowledge,” said a Milwaukee journey worker, recalling a mentor journey worker he had as an apprentice. “He wants to make sure that the trade goes on.” Apprentices also spoke of instructors willing to stay after class to help them.

In other instances, apprentices cited spouses, family members or friends as a great source of support. Having someone to watch a sick child, from whom to borrow a car from, or to provide encouragement seemed important to apprentices. Many noted that to have a real impact, a support network and links to helpful resources must be more intentional and well-structured. In the next section, we discuss promising strategies to help apprentices find supportive networks and resources that increase their chance of success.

Efforts to Support Apprenticeship Completion

During our research, we found several efforts around the country that support apprentices' success.

PRE-APPRENTICESHIP PROGRAMS

As discussed in AspenWSI's previous research, pre-apprenticeship programs are a promising strategy to help prepare and connect people, especially those who are low-income, minority and female, to careers in construction. Many pre-apprenticeship programs offer math and basic skills remediation, hands-on experience, apprenticeship test preparation, financial literacy training, support services and case management, among other services designed to specifically address many of the apprenticeship challenges discussed in this report. Sometimes these services offer enough to help workers enter an apprenticeship and succeed. Pre-apprenticeship program leaders, however, reported that they struggled to provide the long-term supports many apprentices need after beginning an apprenticeship.

RETENTION COUNSELORS

In Cincinnati, union and non-union apprenticeship providers have teamed up with a community-based organization, Partners for a Competitive Workforce (PCW), to reduce high cancellation rates of first- and second-year apprentices. During a two-year pilot program begun in fall 2011, PCW funded the hiring of a "retention counselor," who provides a cohort of apprentices with supplemental counseling, tutoring and other assistance. The program was offered to 57 construction apprentices entering the IBEW-NECA joint electrical program or three building trades programs offered by the Ohio Valley ABC. Although it is too early to assess the program's effect on apprenticeship completion, over 80 percent of apprentices remained in their apprenticeship programs approximately 20 months after their admission, according to the most recent data available for the pilot, which ends in fall 2013.

PCW created and funded the retention effort after studying the scope, causes and costs of cancellation. After analyzing data requested from the Ohio State Apprenticeship Council, PCW determined that over the past decade, about half of the men and nearly three-quarters of the women in building trades apprenticeships had dropped out, the equivalent of about 500 cancellations per year at an estimated cost of \$7 million. Additional research, undertaken by a team of graduate students, concluded that Cincinnati area apprentices cancel out primarily due to layoffs, untenable time commitments, the physical demands of the work, and illness.

Equipped with these findings, PCW convened industry, apprenticeship and pre-apprenticeship stakeholders to identify and implement successful strategies to improve retention. PCW's initial

OTHER EFFORTS BY APPRENTICESHIP TRAINING COMMITTEES, UNIONS AND ASSOCIATIONS TO SUPPORT APPRENTICESHIP SUCCESS

Carpenters' District Council of Greater St. Louis and Vicinity

- ▶ Provides a free 30-minute monthly session with a lawyer for apprentices experiencing legal problems.
- ▶ Partners with a local community college, so apprentices can receive additional instruction through the college's remedial math courses.

International Brotherhood of Electrical Workers, Local 212, and the National Electrical Contractors Association in Cincinnati

- ▶ Apprentices are enrolled in a math refresher "boot camp" during the summer before their first semester of related technical instruction.

Bricklayers and Allied Craftworkers, Local 18, Cincinnati

- ▶ Related technical or classroom instruction is provided in week-long sessions when apprentices are not working, instead of requiring apprentices to work during the day and take classes at night.

Associated Builders and Contractors, Inc., Ohio Valley Chapter

- ▶ All related technical and classroom instruction for apprentices has been moved online. Apprentices participate in a day-long, hands-on lab one Saturday per month.

Other

- ▶ Many joint apprenticeship training committees have begun "train the trainer" efforts. As apprentices near the end of their apprenticeship and become journey workers, they participate in workshops addressing how best to relate to and train apprentices on the job site.

effort provided seed money to Easter Seals to hire the retention counselor. PCW hoped to replicate the success of an earlier job coaching program it established with local health care providers that helped cut turnover of frontline health care workers in half.

Easter Seals hired a retention counselor who had worked in both the construction industry and social services. Officials told AspenWSI it was critical to find a counselor who is resourceful, can develop a good rapport with apprentices, and understands both the industry and social services. Equally important, they added, is that Easter Seals and PCW are known and considered reputable by apprenticeship programs and employers.

Apprentices attend group and one-on-one sessions with the retention counselor and stay in contact through telephone and email. The counselor mitigates obstacles faced by apprentices and helps them remain in their programs. Initially, the pilot program officials assumed the counselor would focus on child-care and transportation barriers. These issues did arise, but others, such as poor performance and attendance in school, led the counselor to focus on outreach to struggling or absent apprentices. The counselor, for example, organized and conducted math tutoring sessions to help academically unprepared apprentices. The extra math support has been credited with helping retain four apprentices who, otherwise, would have failed required tests. The counselor also convened several peer group meetings, addressing topics such as scheduling, employer expectations, hazing on the job site, how to make suggestions to employers, the Top 10 ways to get fired, the generation gap between younger and older workers, and the construction career ladder. Six months into the program, nearly two-thirds of the 57 apprentices had attended at least one meeting, where gas cards also were provided to help apprentices with transportation costs.

Project officials, apprenticeship program staff and apprentices, alike, said the biggest benefit of the retention counselor is that apprentices have someone to listen to their problems and encourage them to continue their studies and career ambitions. The counselor acts as a “sounding board” on issues that apprentices would rather not discuss with program staff or their employer. The counselor also tries to boost the confidence of apprentices who are not sure they can complete their programs. In one case, the counselor helped one union electrical apprentice remain in her apprenticeship, despite her family issues, homelessness and high car payments. The apprentice said she had the aptitude to do the job and to pass school tests, but had low self-esteem. “Having somebody, not a part of the program, that I could go to when I needed help was really beneficial when I had a couple concerns,” she recalled. “He was able to get me some resources, and he just listened. I am not entirely sure I would have gotten through, but his help really made a difference.” Other apprentices also found the retention counselor valuable. “When I first started, I was having trouble with math,” said another electrical apprentice. “He sat with me and went over some things. And, he would just check up on me and ask how things were going.”

As of June 2013, about 20 months after the pilot’s start, 46 of the original 57 apprentices, or 81 percent, were still active in their apprenticeship program. Janice Urbanik, who leads PCW’s construction sector work, was cautiously optimistic that this high retention rate would hold, because research suggests that a significant share of cancellations occur at an apprenticeship’s 18- to 24-month mark. If the high retention level persists, Urbanik said, she hopes employers involved in apprenticeship programs will start helping to pay for the counselor. During the second year of the pilot program, which concludes in fall 2013, project staff hope the retention counselor will make greater strides in engaging employers to support apprentices’ success.

MENTORING EFFORTS

Apprentices and other stakeholders mentioned, during many of our interviews, that mentoring might help improve completion rates. Some said the informal mentoring that once occurred on the job site has disappeared, that the sense of community in the trades is declining, and that more may be needed to replace what has been lost. Apprentices also saw value in more formalized mentoring. When asked what would help improve apprentices’ success, a Milwaukee apprentice said that, if an apprentice “had a problem, whether it be serious or not,” having a mentor available, even for a brief period, “would help a lot.” And, she said, people “would know where to go, who to talk to, how to

fix it or how to do whatever it is they don't know how to do." To address this need, the Wisconsin Regional Training Partnership and BIG STEP (WRTP/BIG STEP) have been working with their industry partners, a local group of minority construction trades workers, and the Wisconsin State Department of Workforce Development (WDWD) to develop mentoring programs.

These mentoring programs have a dual approach, working both "internally" and "externally," according to WRTP/BIG STEP. Internally, WRTP/BIG STEP works with unions to develop customized mentoring programs for their apprentices. For example, WRTP/BIG STEP received an initial WDWD grant to work with the National Electrical Contractors Association and the local International Brotherhood of Electrical Workers (IBEW) to develop and pilot a mentoring program for electrical apprentices. The program's goal is to have numerous mentors, who are journey workers, spread across several job sites in the Milwaukee area, so that "every apprentice has a friend," according to Rhandi Berth, WRTP/BIG STEP Vice President. Mentors are trained with a curriculum initially used in the manufacturing industry. It was customized for the construction industry with the help of a retention counselor with the United Auto Workers. Mentor training includes communications, such as how to establish rapport and "break the ice" with apprentices. Mentors also learn how to be a referral resource, so they become "the point person for support and the facilitator or connector to internal or external supports," according to Berth.

Apprentices in IBEW's mentoring program can select the mentor they want. Otherwise, IBEW works to pair apprentices with mentors who live near them so apprentice and mentor have something in common. That proximity also opens the possibility of carpooling and eases the logistics of face-to-face meetings. The first three meetings are face-to-face and mentors give mentees their phone numbers. Mentors have six-month and 12-month reviews of their activities and performance. As of February 2012, IBEW had 21 active mentors. According to IBEW representatives, a recent survey revealed that 30 percent of the program's apprentices had met with their mentors during the past month and some pairs met every other week. IBEW is working with WRTP/BIG STEP to continue improving this effort. In addition, WRTP/BIG STEP is working with the labor-management committee of seven construction trades to examine the issue of cancellation in apprenticeship and serve as a resource for developing other mentoring programs for unions "when they are ready and committed," said Earl Buford, Executive Director of WRTP/BIG STEP. "It helps a lot when these efforts are homegrown within the industry, with a training committee (that) helps set up the training and process for mentoring."

"External mentoring," according to WRTP/BIG STEP, involves linking apprentices with mentors who may be outside of apprentices' employment network, working in different trades, on different job sites, or in different parts of the area. The Skilled Trades Apprentice Mentoring Project (STAMP), also funded by WDWD, links minority and women apprentices to journey workers in the trades. Stakeholders collaborating on STAMP include The Associated General Contractors of Greater Milwaukee, the Milwaukee Building and Construction Trades Council, WRTP/BIG STEP, the Skilled Trades Collaborative, NECA of Greater Milwaukee, Electrical Joint Apprenticeship Training Committee (JATC), Electrician's Local 494, Plumbing Mechanical & Sheet Metal Contractors Alliance, Plumbers JATC, Plumber's Local 75, Laborers JATC, Construction Craft Laborers' Local 113, Southeast Wisconsin Carpentry Training Center, and Women in Trades, a local group of women journey workers.

At the time of AspenWSI's visit in February 2012, the external mentoring efforts were still being designed and tested. The proposed strategy was to reach out and provide mentoring to women and minority apprentices in Milwaukee. WRTP/BIG STEP planned to utilize the willingness, expertise and networks of the Skilled Trades Collaborative, a local group of minority construction journey workers, as well as Women in Trades. "We also hope to leverage public sector support systems and resources to connect apprentices in trouble with work supports needed to prevent job termination or layoff, such as child care, transportation, housing, etc.," Berth noted. These supportive services are not typically offered to employed people. IBEW is helping develop these efforts. Mentors are trained in a manner similar to the mentoring program initiated by the electricians. Mentors and

mentees will set and agree on the goals of their relationship and fill out evaluations of the program at 30-, 90- and 180-day intervals after the relationship begins.

During previous research, AspenWSI observed other mentoring efforts. Most notably, Oregon Tradeswomen Inc. helps female apprentices find female mentors and provides regular networking opportunities and social activities for women in construction, helping build and foster a community of women in the trades.

APPRENTICESHIP ACADEMY

A group of Seattle area stakeholders recently launched the Apprenticeship Academy to help apprentices identify and achieve long-term goals. In addition to creating networking opportunities for apprentices with construction industry leaders, the academy provides apprentices with mentors who assist them on a project of their choosing, which they then present to the Washington State Apprenticeship Training Council. The academy was developed by representatives from apprenticeship training committees, unions, pre-apprenticeship programs, contractors, associations and community colleges. It is managed by Apprenticeship and Nontraditional Employment for Women (ANEW), a nonprofit group in Washington state.

The Apprenticeship Academy meets four times over the course of five months, providing training in communication, conflict resolution and leadership, among other skills. It offers opportunities for apprentices to play a role in community projects as well as guidance on how to support equitable workplaces on their job sites. Apprentices receive training in how to identify, navigate and access educational, community and professional resources that support their success. Participants are referred to the academy by their employer or apprenticeship program. As of early 2013, 14 apprentices selected by apprenticeship program directors had participated in the academy and all remained active in their apprenticeship. They also formed an alliance, which is a subcommittee of the Washington State Apprenticeship and Training Council, and are involved in catalyzing policy and practice changes to support apprentice success. ANEW plans to annually recruit and train a cohort of apprentices for the Apprenticeship Academy.⁶³

DEPARTMENT OF TRANSPORTATION FUNDING FOR PRE-APPRENTICESHIP PROGRAMS AND SUPPORT SERVICES

A state Department of Transportation (DOT) is allowed to use one-half of one percent of the annual funding they receive in federal surface transportation and bridge dollars on training programs and support services for under-represented and disadvantaged populations. While many state DOTs do not leverage these resources to provide additional training or supports, some do. The Oregon legislature passed a law requiring the Oregon DOT to use one-half of one percent (or up to \$1.5 million) of these federal dollars received every two years to increase diversity in the highway construction workforce and prepare people interested in entering the highway construction workforce.⁶⁴

From July 2009 through September 2012, these resources were used to provide fuel and transportation assistance to 274 apprentices in the highway trades, child-care supports to 171 apprentices, and job site mentoring and retention services to 1,033 apprentices. The funds also were used to provide orientation sessions on working in the highway trades, pre-apprenticeship programs, career counseling and remediation services.⁶⁵

The effectiveness of these early-stage efforts is still being evaluated, according to Steve Simms, Director of the Apprenticeship and Training Division at Oregon's Bureau of Labor and Industries. Early evidence suggests the supports may be helping. Among apprentices receiving

⁶³ To learn more about the Apprenticeship Academy, visit <http://anewaop.org/>.

⁶⁴ Maryland also recently passed a law making this funding available to support diversity in construction.

⁶⁵ Oregon Department of Transportation, "Report on the Use of Federal Funds to Increase Diversity and Prepare Those Entering the Highway Construction Workforce," (ORS 184.866), http://www.oregon.gov/ODOT/CS/CIVILRIGHTS/reports/113012_Diversity_in_Hwy_Constr.pdf (accessed 13 December 2012).

supportive services between March 1, 2011, and August 31, 2012, 88 percent of the female and minority apprentices were still active on August 31, 2012, compared with 84 percent of white male apprentices, said Simms. Overall trends for minorities and women are improving as well. About 76 percent of all women and minorities, including those who did and did not receive support services, who were apprentices between March 1, 2011, and August 31, 2012, in the five major highway trades, including carpenters, cement masons, ironworkers, laborers and operating engineers, either remained active or completed their programs during this period, compared with 80 percent of the white men apprentices. These numbers, said Simms, “close the traditional gap that we have seen in retention rates for women and minorities.”

Recommendations

Below, we draw on our research to provide recommendations to various audiences about roles or actions they may take to improve apprenticeship completion rates in construction.

FOR POLICYMAKERS AND INVESTORS

Use infrastructure investments to put construction workers back to work. Investing in infrastructure would contribute significantly to rebuilding our roads, bridges and public spaces, such as schools, while also strengthening our construction workforce. This is especially true at a time when so many construction apprentices and journey workers still struggle to find continuous employment and when our nation needs serious infrastructure improvements. The recent recession took a heavy toll on the construction industry and caused many lost opportunities for apprentices to gain OJT hours and work experience. To complete their programs, apprentices rely heavily upon employment opportunities to gain their OJT hours. Many of these opportunities are spurred by investments in building new highways, bridges, water and electrical systems, schools, hospitals, and more. Apprenticeship utilization requirements, which guarantee that apprentices work a certain percentage of the total construction labor hours on a construction project, can help more apprentices access opportunities created by these investments and should be encouraged. Including a requirement for all contractors to participate in state or federally-registered apprenticeship programs on publicly funded projects would also help ensure these new projects are helping to increase demand for construction apprentices. Making these investments now could not come at a better time for our nation and for the construction sector.

Support better data collection and management. Policymakers need to invest more resources in supporting better data collection on apprentice outcomes in order to shed light on why apprentices cancel, and the different preparation, support and training strategies that lead to the best outcomes. The experience of construction apprentices varies greatly and we need a stronger understanding of which apprentices succeed and fail, and why. The Office of Apprenticeship has made great strides in improving data collection and management, as have many state apprenticeship agencies. Yet, more needs to be done. Improving collection of data that better quantifies reasons for cancellation, in particular, may further identify the most common barriers to completion. As the apprenticeship grows in construction and other industries, we will need a stronger understanding of what is effective. Directing more resources to the Office of Apprenticeship to expand its ability to collect and analyze quality data is, as a result, critical to the success of our Registered Apprenticeship system.

Improve apprenticeship programs' access to public resources. Apprenticeship programs receive little, if any, government support to help pay for the cost of training apprentices. As such, apprenticeship programs' resources are not sufficient to address all of the barriers to completing an apprenticeship. Apprentices struggle with the costs of child care, transportation, housing and more, as this report describes. Oregon is among several states that have leveraged DOT funding to provide support services to apprentices, as noted above. Some officials with whom we spoke, however, said these funds are not always easily accessible, and sometimes, legislation is required to access and use the funds for training and support services. We encourage state DOTs to work more closely with industry stakeholders and others involved in building a skilled and diverse construction workforce to find ways that DOT resources can be used to improve apprenticeship programs. Policymakers should also work to ease access to Workforce Investment Act funds and other public resources to support apprentices in training.⁶⁶ Making support services such child care or transportation assistance available to apprentices through WIA would help address some of the barriers apprentices face in completing their programs. Also, as the industry tries to recruit the next generation of skilled workers, public investments in marketing and promoting construction careers would help programs reach and recruit high-caliber candidates for apprenticeship slots.

⁶⁶ For ideas about how to build collaboration among the workforce system and Registered Apprenticeship programs, please see a memorandum from Jane Oates, Assistant Secretary of Labor titled, "Training and Employment Notice No. 44-11," available at http://wdr.doleta.gov/directives/corr_doc.cfm?docn=4843.

Provide longer-term supports to apprentices via pre-apprenticeship programs. Providing pre-apprenticeship programs with the resources to provide longer-term supports to the apprentices that they place would help more minorities and women finish their apprenticeships. Many pre-apprenticeship programs excel at helping low-income adults, particularly women and minorities, prepare for and enter construction apprenticeships. Resource limitations, however, often mean that the services, supports and intensive services are not available to apprentices as they encounter the challenges of apprenticeship.

Support and evaluate more mentoring and retention efforts. Piloting or supporting more efforts, such as mentoring and the use of retention counselors, as well as evaluating their effectiveness, seems the next step in identifying specific approaches to increase apprenticeship completion. Formalized mentoring programs such as those in Milwaukee and the use of retention counselors in Cincinnati offer promising approaches to help apprentices adjust to the rigors and difficulties of apprenticeship and the construction industry.

FOR PRE-APPRENTICESHIP PROGRAMS

Leverage alumni and industry networks to build mentoring and networking opportunities. Pre-apprenticeship programs should leverage alumni from their programs or their other industry contacts to ensure that each participant they place in an apprenticeship has a mentor from the start. Mentors are clearly a necessity in the construction industry. A mentor can provide the support and encouragement that a struggling apprentice needs to persevere. But, some apprentices struggle to find a mentor. Providing regular and informal networking opportunities, as Oregon Tradeswomen Inc. does, also would help new apprentices build the professional and support network they need to succeed.

Track and support the apprentices throughout their first year of apprenticeship. As pre-apprenticeship programs graduate one class of participants and enroll another, resources may need to be invested to make sure graduates succeed, even if this means using some resources earmarked for enrolling new participants. Most construction apprentices drop out during the first year. Pre-apprenticeship programs may find it challenging, given their scarce resources, to spend another year tracking and engaging a participant. Yet, setting up processes for regular check-in calls, emails or in-person meetings can be done efficiently. Sometimes, all an apprentice needs is a word of encouragement or a gas card to get through the next week. In addition, because a valid driver's license is needed to enter and succeed in most registered construction apprenticeship programs, all pre-apprenticeship training providers should incorporate driver education and licensure opportunities in their program designs.

FOR APPRENTICESHIP PROGRAMS AND INDUSTRY LEADERS

Improve supports for the development of math skills. Increasing supports in apprenticeship programs such as additional tutoring, “math boot camps,” or access to community college resources — as many apprenticeship programs already do — is worthy of investment. Math skills are essential to success in many of the trades, but many apprentices lack math skills or are out of practice, because they have been out of school for a while. Increasing math support to these apprentices could help more of them stay in their programs and succeed.

Minimize conflicts around school, work and family schedules. Apprenticeship programs should try to design better training schedules, so they better accommodate apprentices' work schedules and family commitments. Today's apprentices often have families and even those who do not, may find it difficult to manage an apprenticeship's intensive work and school schedule. Faced with more adult learners on campus, community colleges have started to offer more classroom training options at night, on weekends and online, and apprenticeship programs would be wise to consider how they can implement more flexible options.

Increase oversight of OJT and job rotations. More should be done to ensure that apprentices get the on-the-job training they need. Apprenticeship programs should work closely with employers to institute procedures and safeguards ensuring that apprentices are assigned to journey workers who have

the time and interest to train apprentices. Regular check-ins with apprentices and their assigned journey workers sometimes happen on paper, but rarely in person where a better assessment and conversation would occur, according to site visit interviews. Apprentices also often lack a comfortable process for evaluating their OJT or for filing a complaint when OJT is substandard. Apprentices told AspenWSI that they need to rotate employers and jobs during their apprenticeship. While most programs are designed to include these rotations, this does not always happen. Regular rotation helps workers build better all-around skills by exposing workers to different employers and types of work. It also gives some workers the opportunity to rotate out of a work environment where they are being treated poorly.

Provide credits for previous experience and instruction. Apprenticeship programs should create clear and defined assessments for use in evaluating an apprentice's prior experiences and awarding credits fairly. Apprentices who receive credit for previous on-the-job experience or classroom instruction tend to complete their apprenticeships faster. And, those who do not receive credit cancel in higher percentages than those who do. We heard of apprenticeship programs that award credits, but their process sometimes seemed unclear or subjective. Developing some clear standards and processes to award credits objectively should be considered if not already being done.

Support a culture that does not tolerate abusive behavior and hazing. Industry leadership, at all levels, must speak out more against abusive behavior directed toward apprentices, especially minorities and women, and implement policies discouraging it in any form. In recent years, the construction industry has made remarkable progress in creating a more diverse workforce. But, in some instances, minorities and women, in particular, have been met with hostility, including hazing, as a response to an apprentice's race or gender. While some forms of abusive behavior may be viewed as harmless, they are not — and have no place in any industry.

Leverage the resources of your community partners. In an era of shrinking resources, collaboration with pre-apprenticeship programs, nonprofit and human services organizations, and community colleges can greatly support workers' success by providing assistance with child care, housing, transportation, financial literacy instruction and basic skills development. Members of today's construction workforce are often older, have children, and may not have attended school for some time, according to many of AspenWSI's interviews. Pre-apprenticeship programs have resources to conduct outreach, screening and assessment before someone becomes an apprentice, and sometimes provide support services to apprentices. In some instances, as was done in Cincinnati, a community organization or set of organizations may be able to contribute resources toward hiring retention counselors.

Consider implementing a mentoring program. Set up a strong program by seeking outside guidance and expertise from others who have done it. To be effective, these programs need resources, ongoing attention and regular evaluation. Many apprentices spoke of the value of having a mentor. But, many industry long-timers said that the informal mentoring that once occurred on the job site no longer does. Setting up formal mentoring programs would be useful. But, while designing and implementing mentoring efforts may seem straightforward, many mentoring programs fail if they aren't developed well.

Increase community outreach and awareness of construction careers. Building stronger relationships with K-12 schools, as well as community and technical colleges, in order to promote and market construction careers to young people, minorities and women, would help build a stronger pipeline of construction apprentices. Leveraging community resources and networks to help with this outreach also is wise. Construction careers are no longer seen as a good opportunity by young people or by teachers and counselors in the K-12 system, many people told AspenWSI. And, minorities and women are also often unaware of the good jobs this industry can provide. Industry leaders, with government assistance, must do a better job of selling construction careers to individuals for whom the industry is a good fit.

Conclusion

Now and in the future, the United States needs a skilled and diverse construction workforce in order to build a competitive and equitable economy. For the construction industry, apprenticeship programs are a tried and true method of developing highly-skilled workers. Like any method, however, this one needs updating. Today, by many estimates, one out of every two construction apprentices drops out of their apprenticeship program. Some attrition is inevitable and necessary. Yet, losing so many apprentices hurts not only these once-aspiring construction workers and current construction workers, but also employers and, potentially, our nation's economy. Some improvements in completion are necessary, especially when the construction industry is grappling with both short- and long-term workforce challenges due to two other harsh realities — many construction workers are approaching retirement and many workers left the industry during the recession that began in 2008. In recent years, many community colleges and universities — which are the primary training ground for our nation's workers — also have seen an increasing number of their students fail to complete their programs. Seeking to address this and to better serve a new generation of students with different needs, some community colleges and universities are re-evaluating and re-envisioning their student services, instruction, curricula and collaborations with other types of institutions. Faced with similar challenges, construction apprenticeship programs should do the same, under the leadership of the stakeholders who regulate, operate or support the programs. Solutions to address apprenticeship cancellation are being developed in some communities such as Cincinnati and Milwaukee. Elsewhere in the country, construction industry stakeholders and their community partners also need to act — to begin a dialogue and to work together to ensure that the current generation of apprentices, and those who follow, have a better chance of becoming skilled journey workers. Apprenticeship is one of our nation's most successful training approaches and one of our greatest assets. Strengthening it will only serve to make our workforce, our businesses and our economy stronger.

APPENDIX A: NOTES ON FEDERAL AND STATE DATA SOURCES USED IN THIS REPORT

National Data

The Office of Apprenticeship in the Employment and Training Administration at the Department of Labor in Washington, D.C., provided AspenWSI with a dataset in May 2012 constructed from their Registered Apprenticeship Program Sponsors Database (RAPIDS) including 581,446 federally registered apprentices from 1999 to May of 2012. Though apprentices from all 50 states are represented in the database, disclosure requirements and data set limitations meant all construction registered apprentices in the U.S. are not included in the analysis. Twenty-five states' apprenticeship systems are regulated and governed by State Apprenticeship Agencies who report their data in aggregate to the Federal Office of Apprenticeship. Though the Office of Apprenticeship has some records of apprentices in these states, due to the presence of federal staff in these states, these records do not include all apprentices, thus, limiting our analysis to a subset of construction apprentices. Our analysis also focuses on apprentices registered from 2006 to 2007. Prior to 2006, fewer states reported data via RAPIDS and issues with data collection impacted data accuracy. The analysis we use in discussing national apprenticeship completion and cancellation comes from a sample of 120,972 apprentices who were identified as being in the construction industry through O*Net codes. Our analysis looked at all construction apprentices registered between 2006 and 2007 regardless of when the apprentices cancelled and regardless of whether an apprentice had registered in more than one apprenticeship. The analysis includes 2,167 records of duplicate apprentices or those who enrolled in more than one apprenticeship program.

Ohio Data

The Ohio State Apprenticeship Council (OSAC) provided AspenWSI with data the Council obtained on April 1, 2011, from national Registered Apprenticeship information system (RAPIDS) through the U.S. Department of Labor Office of Apprenticeship. The data includes analysis of 31,288 records of construction apprentices, identified by O*Net code, registered from January 1, 2001, through December 31, 2010. OSAC could not feasibly determine how many duplicate records of various kinds are in the selected data set. OSAC provided AspenWSI with previously analyzed data, not a dataset of individualized records. Analysis on completion and cancellation rates was done only for apprentices registered between 2001 and 2005.

Massachusetts Data

The Massachusetts Department of Labor Standards, Division of Apprentice Standards, provided AspenWSI with data on 18,738 records of apprentices registered between January 1, 2001, and December 31, 2007. After removing apprentices from other industries based on occupational title, 13,336 records of construction apprentices remained. Data were received by AspenWSI in August 2012. An unknown number of apprentices with duplicate records, including those who enrolled simultaneously in multiple programs or who dropped in one program to re-enroll in another, also exist in this data set.

Washington Data

In April 2012, AspenWSI obtained a dataset from Apprenticeship Section at the Washington State Department of Labor and Industries. The data includes 69,339 records of apprentices registered between 1994 and 2012. Analysis for this report focused on 45,790 records of construction apprentices, identified through by O*Net Code, registered from 1994 through 2007. A total of 2,696 duplicate records were identified and left in the dataset for the analysis AspenWSI conducted.

Wisconsin Data

AspenWSI obtained data from the State of Wisconsin Department of Workforce Development (DWD) in May 2012. DWD houses and updates data on apprentices registered in the state on their website at http://dwd.wisconsin.gov/apprenticeship/statistics_data.html. AspenWSI's analysis focused on 13,904 records of construction apprentices registered between 2000 and 2007. An unknown number of duplicate records exists within this data.

APPENDIX B: REGISTRATION AND DEMOGRAPHIC INFORMATION OF CONSTRUCTION APPRENTICES

Appendix B is available at <http://www.aspenwsi.org/resource/construction-stat-appendix>.

APPENDIX C: STATISTICAL APPENDIX

Appendix C is available at <http://www.aspenwsi.org/resource/construction-stat-appendix>.

ASPENWSI'S RESEARCH INTO PRE-APPRENTICESHIP PROGRAMS

Construction Pre-Apprenticeship Programs: Results from a National Survey

This publication shares findings from a WSI-conducted survey of pre-apprenticeship programs in the construction trades. Based on responses from 260 programs nationwide, the report presents information about program size, services offered, populations served, funding sources, and successes and challenges in placing trainees in apprenticeships or jobs. Funded by the Annie E. Casey Foundation, the impetus for the project was a desire to explore the capacity of the workforce system to prepare individuals — particularly low-income and minority jobseekers — for jobs in the construction industry. It is hoped that the report will contribute to discussions about the need for investment in skills training and about ways to ensure that apprenticeships and construction-related jobs are open to more low-income, minority and women candidates. Available at <http://www.aspenwsi.org/resource/construction-results-national-survey/>.

Construction Pre-Apprenticeship Programs: Interviews with Field Leaders

This publication shares research from interviews with leaders from 25 promising and innovative pre-apprenticeship programs from across the country. The interviews revealed factors that impact how programs are designed and how they might better be utilized as part of a broader workforce development strategy for the construction sector. The publication reviews program leaders' perspectives on factors influencing the design of their programs, opportunities and challenges associated with financing the work, the merits of incorporating green elements into curricula, and other issues. WSI also makes several recommendations designed to promote workforce development policies that better support and assist these programs as they seek to develop a strong pipeline of employees for the construction industry. Funded by the Annie E. Casey Foundation, the report is part of a project investigating how pre-apprenticeship programs are used to train low-income and disadvantaged adults for careers in construction. Available at <http://www.aspenwsi.org/resource/constructioninterviewswithleaders/>.

A Strong Foundation: Key Capacities of Construction Pre-Apprenticeship Programs

This publication shares research from site visits conducted to construction pre-apprenticeship programs in Baltimore, Hartford, Milwaukee and Portland (Ore.). Findings from the site visits, which included interviews and focus groups with pre-apprenticeship program staff, public officials, philanthropic leaders, construction industry leaders and employers, and pre-apprenticeship participants, showed programs in these cities to be of high value to workers, employers and other stakeholders in their regional construction labor market. The publication reviews how programs target a variety of education and employment outcomes for workers and use industry networks and staff expertise in order to meet a wide range of worker and employer needs in the construction industry. WSI also makes several recommendations about how pre-apprenticeship programs could be better supported to help their participants achieve outcomes that are aligned with participants' interests and needs, as well as the realities of the labor market. This research was supported by the Annie E. Casey Foundation as part of a project investigating how pre-apprenticeship programs are used to train low-income and disadvantaged adults for careers in construction. Available at <http://www.aspenwsi.org/resource/strong-foundation/>.



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