



GROWING THE NUMBERS OF WOMEN IN THE TRADES: BUILDING EQUITY AND INCLUSION THROUGH PRE-APPRENTICESHIP PROGRAMS

Greater access to apprenticeships in the skilled trades can help women achieve economic security and fill predicted skills shortages in construction. The construction trades provide good careers with family sustaining earnings. Employment prospects are favorable, not least because many skilled workers are close to the age where they may want to retire, and the industry needs to train the next generation of workers.

Apprenticeships in the trades offer earn-as-you-learn pathways to industry-recognized credentials.¹ In 2017, the hourly earnings of someone who recently completed an apprenticeship were \$25 for a pipefitter, \$24 for a sheet metal worker, \$23.46 for an electrician, \$22 for a carpenter or plumber, and \$19 for a laborer.² For those covered by union contracts in major metropolitan areas wages are typically substantially higher; for example, the hourly wages for journey-level tradesworkers in the Chicago area range from \$41 to \$51, plus benefits.³ Hourly wage rates in predominantly female fields are significantly lower; for example, a child care development specialist who recently completed an apprenticeship earns, on average, \$9.75 an hour.⁴

While apprenticeships in the trades offer good jobs with benefits, only a small minority of apprentices in the trades are women. Pre-apprenticeship programs can provide women with the foundational skills, supports, networks, and knowledge needed for entering and succeeding in an apprenticeship.⁵ The National Center for Women's Equity in



Apprenticeship and Employment at Chicago Women in the Trades and its partners help women enter the trades, and provide technical assistance to apprenticeship programs, schools, and contractors to create inclusive recruitment channels, gender-informed instruction methods, and welcoming work environments. This brief highlights the recent growth of women working in construction trades, provides detailed data on the composition of the female construction trade workforce by race, ethnicity, union coverage, and earnings, and shows how women-focused pre-apprenticeship programs are contributing to women’s growing numbers in the trades.

A Growing Number of Women are Entering the Trades

The construction trades employ well over a quarter of a million women (276,000), almost as many women as work as dental assistants and substantially more than work as librarians or veterinarians.⁶ Even though women are only a small minority of all workers in the construction trades, their numbers are growing. In 2018, women’s share of workers in construction occupations reached 3.4 percent, the highest level since the beginning of data collection, compared with 2.7 percent just three years’ earlier, in 2015.⁷ Between 2017 and 2018 alone, the number of women working in the trades

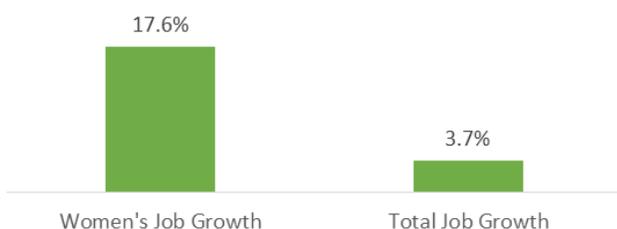


increased by almost 18 percent, a much stronger job growth than of employment in the trades overall (Figure 1).

As can be seen in Table 1, progress for women in construction varies substantially between trades. Women Pipelayers, Plumbers, Pipefitters, and Steamfitters saw the biggest proportional job growth, 70 percent more women work in these trades than did in 2017, and while women are still only a small minority of all workers, their share of this trade rose sharply (from 2.2 to 3.5 percent). At the other end of the spectrum are women Electricians, whose estimated number fell between 2017 and 2018, and whose share of all electricians marginally declined. The top three trades for women are Laborers, Painters, and Carpenters, but while women’s employment as Laborers and Painters grew substantially, by over 20 percent, as did their share of all jobs in those trades, job growth for women carpenters was very small – just 2 percent more than in 2017. Women’s share of all Carpenters did not budge, remaining at just 2.2 percent (Table 1).

FIGURE 1. WOMEN’S JOB GAINS OUTPACE OVERALL JOB GROWTH IN CONSTRUCTION TRADES BETWEEN 2017 AND 2018

Change in Employment in Construction Trades, 2017 to 2018



Source: Hegewisch (2019)⁸

Table 1	Women's jobs, 2018	Change in women's jobs, 2017 to 2018	Women's Share of Jobs 2018	Women's Share of Jobs 2017
All Construction Trades	276,998	17.6%	3.4%	3.0%
Laborers	78,070	22%	3.7%	3.3%
Painters, Construction & Maintenance	43,704	23%	7.2%	6.6%
Carpenters	30,250	2%	2.2%	2.2%
Pipelayers, Plumbers, Pipefitters, and Steamfitters	22,435	70%	3.5%	2.2%
First-line Supervisors	22,190	16%	3.5%	3.0%
Electricians	21,288	-1%	2.4%	2.5%
Sheet Metal	4,166	15%	2.8%	2.6%

Note: Samples sizes are too small to estimate women's numbers in other trades. Employment totals for all construction tradeswomen exclude workers in extraction and mining occupations, with the exception of First-line Supervisors but are calculated by applying the % women for women in 'construction and extraction' occupations.

Source: Author's calculations based on U.S. Bureau of Labor Current Population Survey, Tables 11 and 18, for 2017 and 2018 <<https://www.bls.gov/cps/tables.htm>>.

Some apprenticeship programs are doing much better than others in improving diversity in their trades. Women's share of apprenticeships, for example, are in the double digits at the sheet metal apprenticeship program of SMART 28 in New York, the electricians IBEW/NECA Local 48 in Portland, and the MA & Northern NE Laborers' J.A.T.C.⁹

The Construction Industry Provides Good Earnings, Without the Need for a Four-Year College Degree

The average women working in construction and extraction occupations¹⁰ earned \$769 for a full-time week in 2016-2018. This was just slightly less than the average earnings for all women (\$788 per week in 2016-2018) even though fewer than two in ten (17

percent) of women in construction have at least a four-year college degree compared with almost four in ten (39 percent) of all women in the total workforce.¹¹ Apprenticeships in construction provide a route to good earnings; apprentices are paid a wage, and benefit from free integrated classroom and on-the-job instruction. By contrast, the average four-year-cost of tuition at a public four-year educational institution is more than \$40,000.¹²

Apprenticeships are particularly common in jobs covered by union contracts; joint labor management programs are the foundation for skilled work in the construction industry. Average earnings for women and men who work for union contractors are substantially higher than for those working in the non-union sector. On average, a woman covered by a union con-



tract earned \$1,134 per week, while non-union women earned \$680 per week (Figure 2). Women covered by a union contract also benefit from greater pay equality than other women in the trades. Union women earn 96.7 cents on the dollar made by the average union man working full-time; non-union women in construction and extraction occupations earn just 87.8 percent of what men make (calculated based on Figure 2).

The Female Construction Trades Workforce is Very Diverse

The construction workforce is considerably more diverse than the general workforce. Latinas are 32 percent of women who work in construction occupations,

compared with just 16 percent in the total female workforce. Slightly over half of all women working in the trades are White (55%), compared with 63 percent of all women in the workforce. Black, and particularly Asian, women are also underrepresented among women construction workers compared with their share of the total female workforce (Figure 3a and 3b). The racial and ethnic composition of the female workforce is similar to that of the male workforce in construction: Latinos are overrepresented compared with their share of all workers, and White, Black and Asian workers are underrepresented.¹⁴

FIGURE 2. WOMEN COVERED BY UNION CONTRACTS EARN 66 PERCENT MORE THAN WOMEN WHO ARE NOT COVERED BY UNIONS

Median Weekly Earnings for Full-time Workers in Construction and Extraction Occupations, by Gender and Union Coverage, 2016-2018



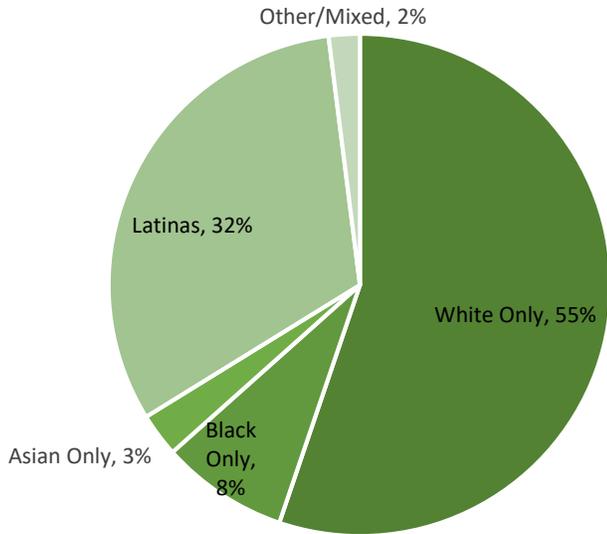
Notes: Based on women and men who worked at least 35 hours per week; includes all working in construction and extraction trades, irrespective of level of skill or qualification. About a fifth of workers are covered by union contracts (see Figure 4).

Source: Authors' micro data analysis of Current Population Survey as provided by Flood et al. (2018).¹³

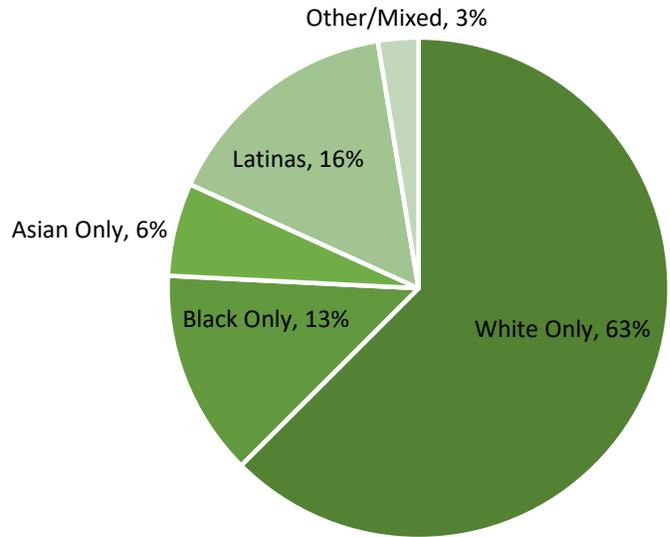
FIGURE 3A AND B. THE CONSTRUCTION WORKFORCE IS MORE DIVERSE THAN THE GENERAL WORKFORCE

The Composition of the Construction and Extraction Trades Workforce, and of the Total Workforce, for Women of the Largest Racial and Ethnic Groups, 2016-2018

Women in the Construction & Extraction Workforce, 2016-2018



Women in the Workforce, 2016-2018



Notes: Whites, Blacks, and Asians are non-Hispanic; Latinas can be of any race.

Source: Authors' micro data analysis of CPS IPUMS 2016-2018, see source for Figure 2.



Union Coverage Differs Sharply by Ethnicity

Construction trades workers are more likely to be covered by union contracts than workers elsewhere in the private sector, and tradeswomen are marginally more likely than tradesmen to be in a union. In 2018, slightly more than one in five women working in construction trades (20.7 percent) were covered by a union contract, and slightly fewer than one in five men (19.2 percent).¹⁵

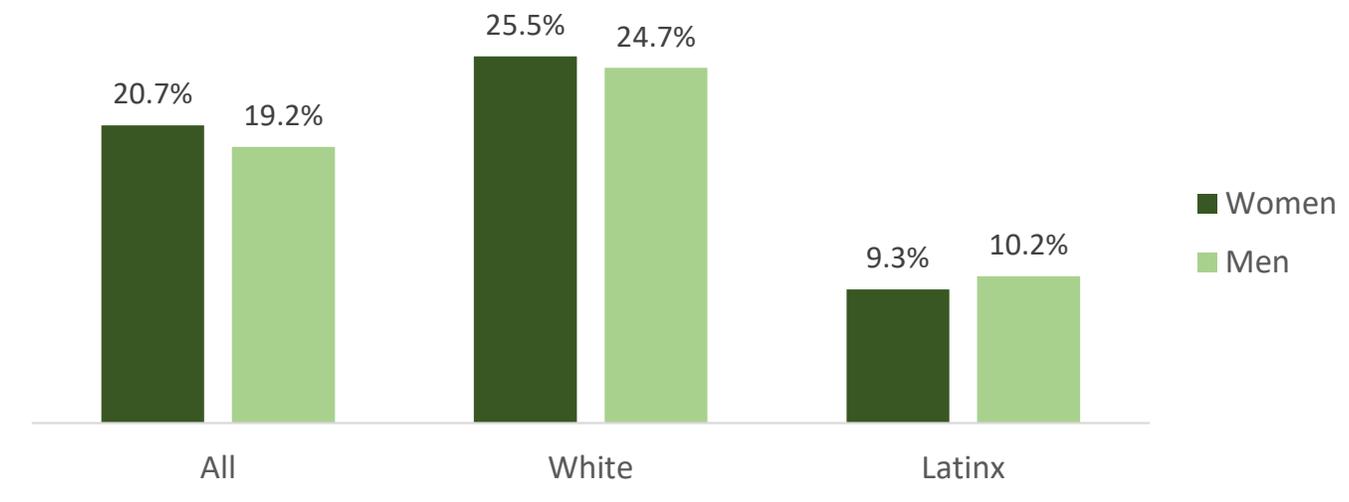
Union coverage, however, varies substantially by race and ethnicity. Union coverage for Latinas working in construction and extraction trades is just 9.3 percent, and 10.2 percent for Latinos, less than half the rate of all workers (Figure 4). Union coverage for White non-Hispanic workers is more than twice as high, 25.5 percent

for women, and 24.7 percent for men. While there are too few tradeswomen in the Bureau of Labor Statistics Current Population Survey to estimate union coverage for Asian and Black women, coverage for Asian men, at 25.5 percent, and Black men, at 22.7 percent, is also much higher than for Latinx. Latinx are particularly likely to work in the South of the United States, where union coverage is lower, and are also more likely to work in residential construction, again with typically lower union coverage, and earnings.¹⁶

Compared with non-union programs, apprenticeship programs sponsored jointly by unions and employers tend to have higher participation rates from women, and the women who enter these apprenticeships are more likely to or complete and become journeymen;¹⁷ this effect is particularly strong for women of color.¹⁸

FIGURE 4. UNION COVERAGE FOR WHITE CONSTRUCTION WORKERS IS MORE THAN TWICE AS HIGH AS FOR LATINX WORKERS

The Proportion of Workers in Construction and Extraction Occupations Covered by a Union Contract, by Gender, 2016-2018



Notes: Whites are non-Hispanic; Latinx can be of any race. Sample size is too small to calculate union coverage for Black, Asian, or women of other backgrounds; includes all workers who are union members or covered by a union contract.

Source: Authors' micro data analysis of CPS IPUMS 2016-2018, see source for Figure 2.

Pre-Apprenticeship Programs are Improving Women’s Access to Good Apprenticeships

Progress in attracting women to apprenticeships has been particularly high in regions with women-focused pre-apprenticeship programs. With support from federal programs such as the Women in Apprenticeship and Nontraditional Occupations (WANTO) grants program¹⁹ and the Apprenticeship Equity Partnership Initiatives,²⁰ pre-apprenticeship programs have helped to improve both gender and race and ethnic diversity in construction apprenticeships and other nontraditional occupations for women.

- In Chicago, home of Chicago Women in the Trades, the number of women plumber apprentices in Plumbers Local 130 has grown more than ten-fold in three years, to 35, and the number of women members of the Local has grown to 60, in just a few years.²¹

- In northern California, home of Tradeswomen Inc., women’s share of apprenticeships in the ironworkers is three times the national level, around 8 percent.
- In Mississippi, Moore Community House Women in Construction Program has established a successful partnership with shipbuilder and large manufacturing employer Ingalls; its recently established bi-lingual night-time pre-apprenticeship program has created pathways for Latinas into shipbuilding apprenticeships.²²
- In Massachusetts, home of Building Pathways, the Policy Group for Tradeswomen’s Issues, and the North East Center for Tradeswomen Equity, women’s share of apprenticeships has increased from 4.9 percent in 2012 to 8.4 percent in 2019 Q3, and 9.2 percent of all union apprenticeships; the number of women building trades apprentices has more than tripled, to 763. In seven of 28 joint labor management apprenticeship programs (JATCs) women are more than 10 percent of all apprentices.²³



- With the help of Nontraditional Employment for Women (NEW) in New York City, joint union-employer apprenticeship programs have recently been able to achieve the targeted 15 percent share of women in apprenticeship programs.²⁴
- In Oregon, home of Oregon Tradeswomen (OT), women’s share of apprenticeships is twice the national level, and one in four women apprentices are women of color; the Carpenters and Electricians -- the programs with the highest numbers of apprentices -- have been particularly successful in recruiting women to their apprenticeship programs, with a 9.0 percent and 12.2 percent female share, respectively.²⁵
- In Washington, home of ANEW, the oldest continuously running pre-apprenticeship program focused on access to apprenticeships for women and people of color, women work 20% of apprenticeship hours on large public works projects such as Sound Transit. Women’s participation in apprenticeships increase by 23 percent between 2017 and 2018.²⁶
- West Virginia Women Work works with 15 apprenticeship programs in the state and has placed pre-apprenticeship programs for women on the campus of three of them. Jointly with OT, they are helping IUPAT create a national outreach strategy to recruit women veterans and female military spouses to IUPAT apprenticeship programs.

Since 2016, the women-focused programs associated with the National Center for Women’s Equality in Employment and Apprenticeships at Chicago Women in the Trades have directly helped over 800 women to enter apprenticeships, and have paved the way for women to enter the trades indirectly by supporting over 500 recruitment and outreach events, and over 200 trainings on creating more equitable, inclusive, and welcoming work environments.

ENDNOTES

1. See U.S. Department of Labor. 2019. “Your One-Stop Source for All Things Apprenticeship.” <https://www.apprenticeship.gov/?utm_source=dol_gov_apprenticeship&utm_medium=text&utm_campaign=apprenticeship_homepage> and North America’s Building Trades Unions (NABTU). 2019. “Enhance your Skills. Advance your Life.” <<https://nabtu.org/apprenticeship-and-training/>> (accessed October 2019).
2. Angela Hanks, Annie McGrew, and Daniella Zessoules. 2018. “The Apprenticeship Wage and Participation Gap.” Briefing Paper, July. Center for American Progress: Washington, DC <<https://www.americanprogress.org/issues/economy/reports/2018/07/11/453321/apprenticeship-wage-participation-gap/>> (accessed October 2019).
3. See Construction Industry Corporation (2019) “2019 Wage Benefit Update.” <<http://cisco.org/wp-content/pdf/2019%20Wage%20Guide%20Expanded.pdf>> (accessed October 2019).
4. Hanks, McGrew, and Zessoules, as above.
5. U.S. Department of Labor. n.d. “Pre-apprenticeship: Pathways for Women into High-Wage Careers.” U.S. Department of Labor Employment and Training Agency <https://www.doleta.gov/oa/preapp/pdf/pre_apprenticeship_guideforwomen.pdf>(accessed October 2019).
6. U.S. Bureau of Labor Statistics. 2019. Current Population Survey Table 11. Employed Person by Detailed Occupation <<https://www.bls.gov/cps/cpsaat11.pdf>> (accessed October 2019).
7. Ariane Hegewisch. 2019. “Women Gain Jobs in Construction Trades but Remain Underrepresented in the Field.” *IWPR Fact Sheet #C47* Institute for Women’s Policy Research <<https://iwpr.org/publications/women-jobs-construction-underrepresented/>> (accessed October 2019).
8. Hegewisch (2019), see note above.

9. See Ariane Hegewisch. 2017. "Forging Gender Equity in the Sheet Metal Workers Local 28: The Importance of Leadership, Goals and Regular Review." The National Center at Chicago Women in the Trades <<http://womensequitycenter.org/best-practices/>>; Connie Ashbrook. 2017. "Wire a Light: A Workshop Designed to Increase Apprenticeship Diversity." <<http://womensequitycenter.org/best-practices/>>; for Massachusetts PGTI: "The Policy Group on Tradeswomen's Issues. 2019. Providing Research and Technical Assistance to Union Construction Partners on Recruiting and Retaining Tradeswomen." <<https://policygroupontradeswomen.org/about-pgti/about/>> (accessed October 2019).
10. Women working in construction trades were combined with women working in extraction trades for purposes of microdata analysis of earnings; separate analysis is not available.
11. Median weekly earnings for full-time (35 hours or more) workers ages 16 and older, for workers in construction & extraction occupations, and all workers; to obtain a large enough sample, we combined data for three years for microdata analysis of IPUMS CPS 2016-2018. Data are for all women and men working in construction & extraction trades; the data set does not differentiate between apprentices, journeyworkers, or vocational training and qualifications of workers.
12. See College Board. 2019. "Trends in Higher Education: 2018-19 Tuition and Fees at Public Four-Year Institutions by State and Five-Year Percentage Change in In-State Tuition and Fees." <<https://trends.collegeboard.org/college-pricing/figures-tables/2018-19-state-tuition-and-fees-public-four-year-institutions-state-and-five-year-percentage>> (accessed October 2019); fees are for in-state students.
13. Current Population Survey data for microdata analysis obtained from Sarah Flood, Miriam King, Renae Rodgers, Steven Ruggles, and J. Robert Warren. 2018. "Integrated Public Use Microdata Series, Current Population Survey: Version 6.0 [dataset]." Minneapolis: IPUMS. <<https://doi.org/10.18128/D030.V6.0>> (accessed October 2019).
14. U.S. Bureau of Labor Statistics. 2019. "Table 11. Employed persons by detailed occupation, sex, race, and Hispanic or Latino ethnicity." Current Population Survey Household Data Annual Averages. U.S. Department of Labor. <<https://www.bls.gov/cps/tables.htm>> (accessed October 2019).
15. See Figure 4 for sources; for annual data on union membership by broad occupation (not by gender) see U.S. Bureau of Labor. 2019. "Union Membership (Annual) News Release"; Economic News Release, January 18 <<https://www.bls.gov/news.release/union2.htm>> (accessed October 2019).
16. The Center for Construction Research and Training. 2018. *The Construction Chartbook: The U.S. Construction Industry and its Workers*. Sixth edition, eChart Book 2018. Silver Spring, MD: CPWR. <https://www.cpw.com/sites/default/files/publications/The_6th_Edition_Construction_eChart_Book.pdf>.
17. U.S. Government Accountability Office (GAO). 2005. *Registered Apprenticeship Programs: Labor Can Better Use Data to Target Oversight* <<https://www.gao.gov/products/GAO-05-886>> (accessed October 2019).
18. See Günseli Berik and Cihan Bilginsoy. 2006. "Still a Wedge in the Door: Women Training for the Construction Trades in the USA." *International Journal of Manpower* 27(4): 321-341; the article is based on data from registered apprenticeship programs from 31 states from 1995-2003 and includes analysis for White, Black and Hispanic women.
19. U.S. Department of Labor Women's Bureau. 2019. "WANTO Grant Program." <<https://www.dol.gov/wb/media/wantogrants.htm>> (accessed October 2019).
20. U.S. Department of Labor Employment and Training Agency. 2016. "Solicitation DOL-ETA-16-R-00103 to coordinate with the government to promote diversity a inclusion of under-represented populations that allow them to successfully prepare for, enter, and complete Registered Apprenticeship programs."; July 27th
21. See "Women-Only Pre-Apprenticeship Programs: Meeting Skills Needs and Creating Pathways to Good Jobs for Women." <http://womensequitycenter.org/wp-content/uploads/2017/10/Women-Only-Pre-Apprenticeship-Programs_low-res.pdf> and Jess Kozik. 2019. "Women's Work: An Interview with Journeywoman Plumber Cristina Barillas." *Working Women* 6(1), January <<https://myemail.constantcontact.com/WWHP-Newsletter-January-2019.html?oid=1114943010201&aid=xoGJbDzEia8>> (accessed October 2019).

22. See for example <https://docs.wixstatic.com/ugd/f285ef_f26b-20067d744649aa4518d50d3bb61d.pdf>; according to Moore Community House Women in Construction program staff, completion and placement rates for the bi-lingual program were around 90 percent. See also “Strategies for Meeting the Demand for Advanced Manufacturing and Ship Building Workers: Women Only Pre-Apprenticeship Programs in Mississippi and West Virginia” <http://womensequitycenter.org/wp-content/uploads/2017/10/Strategies-for-Meeting-the-Demand_Best-Practice_Low-Res.pdf> (accessed October 2019).
23. PGTI: The Policy Group on Tradeswomen’s Issues. 2019. At note 8 above; see also “Massachusetts Supply and Demand Strategy: A Successful Model for Increasing Gender Diversity in the Trades.” <<http://womensequitycenter.org/best-practices/>> (accessed November 2019).
24. Wall Street Journal. 2019. “Yes They Can! Program Boosts Number of Women Construction Workers.” Anne Kadet, February 12 <<https://www.wsj.com/articles/yes-they-can-program-boosts-number-of-women-construction-workers-11549983600>> (accessed October 2019).
25. See Oregon Tradeswomen <<http://www.tradeswomen.net/>>; also “Wire a Light: A Workshop Designed to Increase Apprentice Diversity.” <<http://womensequitycenter.org/best-practices/>>. Data analysis based on Bureau of Labor and Industry Oregon, Portland Metropolitan Statistical Area Apprentices, Construction Only, January 2019; provided by Connie Ashbrook, independent consultant.
26. Data provided by director of ANEW, based on Washington state apprenticeship statistics.

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