

# Apprenticeships in Montana

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A growing number of Montanans are choosing work-based learning over traditional classroom-based training programs. That's good for their bank accounts and for the state economy.



When starting a new career, workers must decide whether they have the skills required to get a good job, or if they should take time in school to learn new skills. However, reducing the decision to merely “job or school” over-simplifies the options available and overlooks the alternatives of work-based learning and apprenticeships.

In the school-based model, students generally leave the labor force, or work part-time while attending training. The Montana Registered Apprenticeship program gives workers and businesses a mutually advantageous arrangement in which apprentices don't need to exit the workforce to acquire new skills. Eliminating the time a worker spends training outside of the labor force benefits the worker because their wages continue, but it also benefits the Montana economy by allowing workers to continue producing economic output during training. Employers and workers are recognizing the value of the apprenticeship training model, making the Montana Registered Apprenticeship program an important component to Montana's workforce development system.<sup>1</sup>

## What is Registered Apprenticeship?

Registered apprenticeship is a type of work-based learning in which a worker participates in both classroom time and on-the-job training, leading to a nationally recognized credential. Union and non-union employers can sponsor apprenticeship training.

Classroom training is often provided through technical schools or community colleges, allowing the worker to obtain college credit as a part of their apprenticeship training. The industry-recognized credential signals to employers that the worker has been fully trained using approved curricula. In addition, some states require an apprenticeship certificate to be licensed in certain occupations. For example, apprentice certificates are required for plumbers or electricians to become licensed in Montana.

Over 1,000 occupations are listed in the national registered apprentice registry. Montana has had apprenticeships in 60 of these occupations, spanning a wide range of fields from skilled trades (such as carpenters and sheet metal workers) to information technology. New programs are made available when an employer expresses interest and works with the Montana Department of Labor & Industry to set up a program.

Apprenticeship training requires a commitment from both the workers and the employer to maintain a successful partnership for the full training period (typically four years, but varies depending on the occupation). Unlike colleges or training programs that will continue to provide training to those who perform adequately and keep current on their tuition, apprenticeships can be terminated by the employer even with good job performance by the apprentice. For example, employers may choose to terminate high-

performing apprentices due to changes the economic environment or changing company policies. Therefore, it is critical to a successful apprenticeship that employers experience a positive return from the apprentice in terms of productive work hours, worker retention, and a workforce with customized training.

## Growth in Montana's Registered Apprenticeship Program

The Montana Registered Apprenticeship Program has been a part of Montana's workforce training for many years. However, the program is currently showing significant growth and expansion into new occupations. Total participation in apprenticeship has increased 18.5% over the last five years, with 1,709 active apprenticeships in 2015. The number of participants in Montana's apprenticeship program is comparable in size to 2015 enrollment at City College of MSU-Billings (1,641 students) or Helena College (1,921).<sup>2</sup>

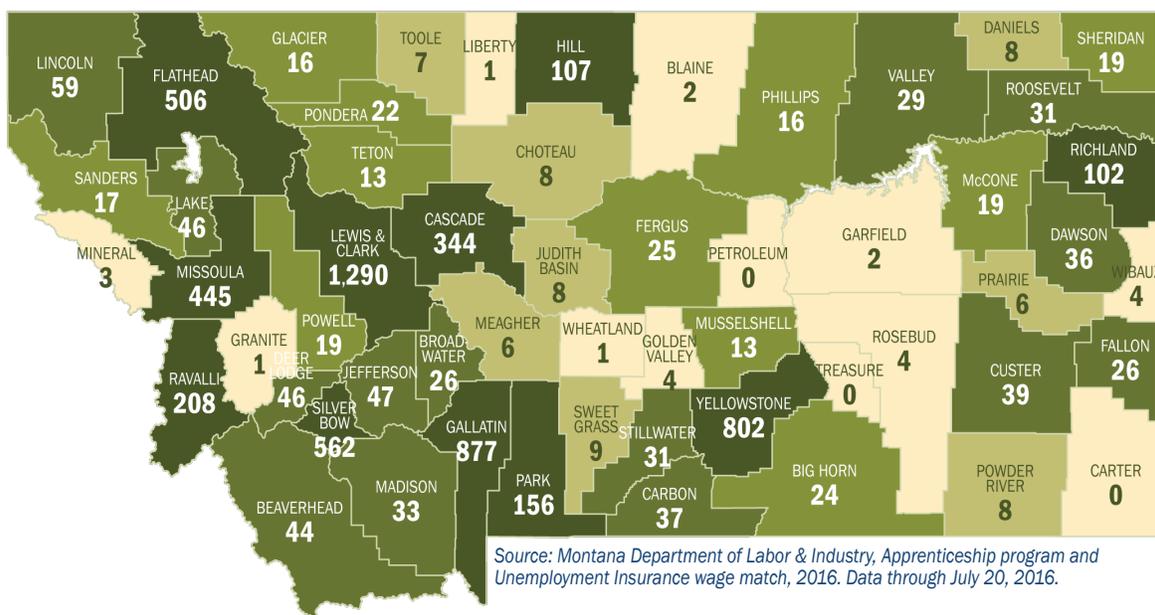
The number of businesses sponsoring apprenticeships has also grown with the increased popularity of apprenticeship training. In the past three years, the number of sponsors has increased by 5% annually.

**Figure 1** shows county apprenticeship levels since 2000.

The Montana Registered Apprenticeship Program has also diversified the types of training, expanding the occupations available for apprenticeship training. Of the 60 occupations with apprenticeship programs in Montana, 16 have been added since 2012. These 16 new programs have modernized apprenticeship to offer a wider selection of occupations, including information technology, radiologic technicians, and nursing aides, in addition to the traditional occupations like plumbers, carpenters, and electricians. Expanding the program into new occupations suggests that the growth of the apprenticeship program is due to both increased interest by new industries and general job growth in the past few years. **Figure 2** lists all the new programs and the total number of apprenticeships since 2012.

As the variety of occupations and fields offering apprenticeships expands, the number of apprentices will continue to grow. Although apprenticeship is not for everyone, this expansion of occupations allows more and more people to choose apprenticeship. In fact, the Montana Department of Labor & Industry forecasts that over 44% of the total worker demand over the next ten years will be in occupations where apprenticeship is one of the possible training methods.

**FIGURE 1**  
**Total Apprenticeships since 2000**



**FIGURE 2**  
**New Registered Apprenticeship Occupations Added Since 2012**

Year Added	Occupation	Total Participants
2012	Millwrights	3
2012	Crushing, Grinding, & Polishing Machine Setters, Operators, & Tenders	1
2013	Butchers and Meat Cutters	3
2013	Civil Engineering Technicians	2
2013	Shoe and Leather Workers and Repairers	1
2014	Electrical & Electronics Installers & Repairers, Transportation Equipment	9
2014	Signal and Track Switch Repairers	8
2014	Rail Car Repairers	6
2014	Numerical Control Machine Tool Operators & Tenders, Metal & Plastic	1
2015	Nursing Aides, Orderlies, and Attendants	28
2015	Carpenter Assemblers and Repairers	6
2015	Meter Mechanics	2
2015	Welders and Cutters	1
2015	Automotive Specialty Technicians	1
2016	Radiologic Technicians	1
2016	Computer Programmers	1

Source: Montana Department of Labor & Industry, Apprenticeship program and Unemployment Insurance wage match, 2016. Data through July 20, 2016.

The growth of apprenticeship is good for Montana’s economy because it offers a partial solution to Montana’s expected worker shortage. Montana is expected to experience tight labor markets in the next ten years because of the large baby boomer population retiring without enough younger workers to replace them. In such economic conditions, every worker hour becomes more valuable to the economy, and time spent out of the labor market to obtain education and training becomes costly for both workers and employers.

### Montana’s Apprenticeable Occupations

Electricians and plumbers make up the majority of Montana’s apprenticeships. Since 2000, over half of all apprentices have trained as either electricians (36%) or plumbers (22%). These occupations make up a disproportionate share because Montana requires

plumbers and electricians to hold an apprenticeship certificate to be licensed. Nearly one-third of all electricians employed in Montana in 2015 were apprentices currently training through the Registered Apprentice Program.

Figure 3 shows occupations with 15 or more active apprenticeships in 2015, along with the employment level for the occupation in Montana. Apprenticeship is largely used as a means of training for the construction industry, with apprentices comprising over 20% of the total Montana workforce for electricians, plumbers, and boilermakers. However, non-construction occupations are also showing moderate levels of participation. There were 15 municipal fire fighters in apprenticeships in 2015, while nursing aides have nearly 30 active apprenticeships that started in 2016.

**FIGURE 3**  
**Active Apprenticeships in 2015**

Occupation	Active Apprenticeships	Total Employment	Apprenticeship as a % of Employment
Electricians	690	2,170	31.8%
Plumbers & Pipefitters	501	2,100	23.9%
Sheet Metal Workers	64	600	10.7%
Structural Iron & Steel Workers	61	Not Available	Not Available
Construction Carpenters	58	4,000	1.5%
Electrical Power-Line Installers & Repairers	56	750	7.5%
Boilermakers	43	130	33.1%
Stationary Engineers	28	210	13.3%
Roofers	25	420	6.0%
Industrial Machinery Mechanics	21	670	3.1%
Construction Laborers	16	4,070	0.4%
Municipal Fire Fighters	15	340	4.4%
Total of Listed Apprenticeships	1,578	15,460	10.2%
Total of All Apprenticeable Occupations	1,709	38,480	4.4%
Total of All Apprenticeable Occupations Excluding Electricians & Plumbers	518	34,210	1.5%

Source: Montana Department of Labor & Industry RAP, 2016. Employment and wage data from the Bureau of Labor Statistics Occupational Employment Survey, May 2015.

Overall, workers currently undergoing apprentice training comprise 4.4% of Montana’s employment in the apprenticeable occupations in 2015, underscoring the importance of the program to meet training needs for some types of jobs.

## Wages Earned by Apprentices

Apprentices have the opportunity to earn wages while earning their certification, which has led some policy-makers and economists to suggest that apprenticeship might offer a solution to rising tuition costs and high student debt loads, thus strengthening the middle class.<sup>3</sup> The average wage for Montanans in registered apprenticeship training in 2015 was about \$37,740, which is higher than the typical income potential of a college student working around a class schedule. The higher income earned during training years may allow apprentices to support their families while receiving training, or to rely less on student loans, placing them in a better financial position for the rest of their careers.

High wages continue after graduation and apprentices typically see a high return on their investment. One study found that the returns-to-apprenticeship exceed the return on investment for other types of training, with the long-term gains of apprenticeship amounting to about \$266,000 over the worker’s career, compared to only \$130,000 for a community college degree.<sup>4</sup>

Much of the difference in the return-to-education is related to the post-graduation wage, since apprentices generally face similar tuition costs to community college students. After graduation, Montana apprentices earned wages of \$59,600 in 2015, nearly \$20,000 higher than the statewide average wage. However, the wage premium for apprentices depends on the occupation. In some occupations, apprentices tend to earn higher than the average occupational wage in Montana, and in other occupations, apprentices earn lower wages.

**Figure 4** compares the wages of recently graduated apprentices to 25th-percentile wages and statewide average wages for select occupations. The 25th percentile represents the expected entry-level wages for workers just starting out in their careers, while the average wage represents all workers, including those with extensive training and experience. The table compares the 2015 wages earned for apprentices who graduated in 2012, 2013, or 2014 to the expected wages for all occupations with three or more graduates.

### FIGURE 4 2015 Wage Comparison

FOR APPRENTICESHIP GRADUATES, ENTRY-LEVEL WORKERS, AND STATE AVERAGE WAGES

Occupation	# of Apprentices	Graduated Apprentice Average Wage	25th Percentile Wage	State Average Wage
Stationary Engineers	12	\$110,834	\$36,720	\$56,130
Electrical and Electronics Repair	4	\$100,542	\$50,280	\$60,080
Electrical Power-Line Installers	17	\$93,952	\$68,670	\$77,680
Industrial Machinery Mechanics	11	\$87,262	\$39,950	\$55,250
Pipe Fitters	18	\$81,736	\$45,090	\$57,030
Municipal Fire Fighters	3	\$73,828	\$41,040	\$47,050
Plumbers	72	\$56,146	\$45,090	\$57,030
Electricians	145	\$55,781	\$50,780	\$60,690
Sheet Metal Workers	25	\$53,253	\$39,770	\$50,830
Operating Engineers	6	\$46,375	\$40,110	\$47,140
Boilermakers	16	\$45,719	\$55,180	\$66,260
Security and Fire Alarm Systems	3	\$42,064	\$33,960	\$42,800
Structural Iron and Steel Workers	9	\$41,114	\$51,330	\$53,080
Child Care Workers	19	\$26,415	\$17,940	\$20,490
Construction Carpenters	4	\$24,880	\$33,010	\$42,480

Source: Montana Department of Labor & Industry, RAP and Unemployment Insurance wage match, 2016. Occupational Employment Statistics (OES) wage data from the May 2015 Bureau of Labor Statistics Occupation Employment Survey, Montana.

For roughly half of the occupations, the recently graduated apprentices earned significantly higher wages than the statewide average. In 12 out of the 15 occupations shown, the apprentice graduates earned more than the entry-level occupational wage. In all but four occupations, the apprentice graduates earned wages roughly equal to or above the statewide average. Given that apprentices are just starting out in their chosen careers, apprenticeship appears to give workers a leg up over other entry-level workers.

Wage benefits are also apparent when comparing apprentice graduates to workers who started, but did not complete an apprenticeship program. Prior to starting the apprenticeship program, non-completers and graduates are likely similar in their demographic and educational backgrounds. The completion of the apprenticeship program results in graduates obtaining higher wage levels than their cohort that found other employment.

**Figure 5** shows the average wages of apprentice graduates and of those who canceled and never completed a program from 2008 to 2010. This chart includes wages from 5-years before graduation or cancellation to 5-years after graduation or cancellation.

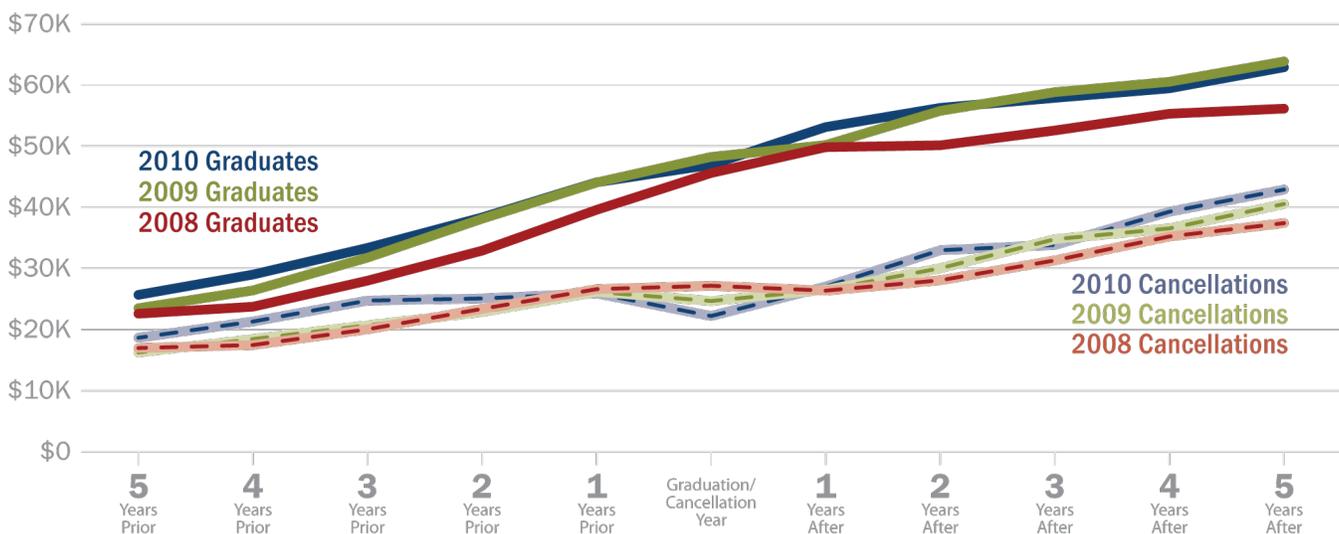
## Age and Gender of Apprentices

Apprentices are typically younger, male workers. Ninety-three percent of apprentices are men. This low rate of female participation suggests there is opportunity for apprenticeship expansion directed towards women.

The low enrollment of female apprentices can be largely attributed to the most popular programs being in traditionally male-dominated occupations. According to the U.S. Census Bureau, only 3.1% of Montana's construction and extraction workers are women.<sup>5</sup> Construction programs tend to be the most popular apprenticeships, with plumbers and electricians at the top of the list. Since 2000, there have been 66 women in the electrician apprenticeship program (2.6% of participants), and 16 women (1.0%) in the plumbing program. However, the Montana Registered Apprenticeship program recently added a nursing aide program, which is traditionally a female-dominated field. Twenty-seven of the 28 new nursing aide apprentices are women.

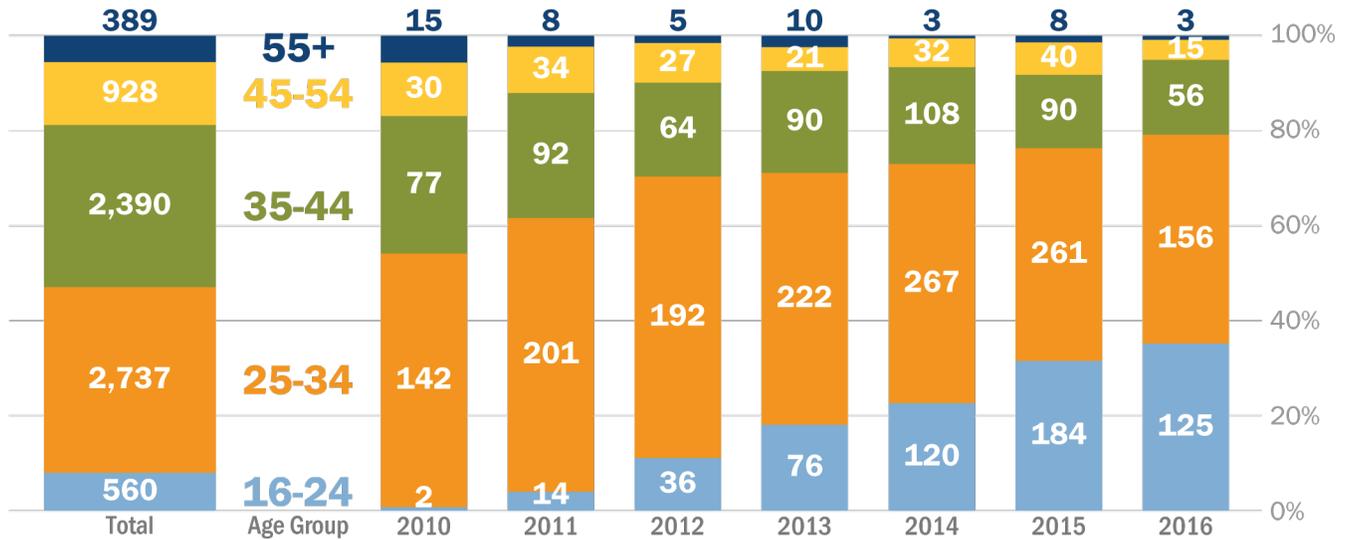
Apprentices are generally between the ages of 25 and 44, as shown in **Figure 6**. In recent years, there has been an increase of 16 to 24-year-olds using the program,

**FIGURE 5**  
**Average Wages of Apprentices Before, During, and After Graduation**



Source: Montana Department of Labor & Industry, Apprenticeship program and Unemployment Insurance wage match, 2016. Data through July 20, 2016.

**FIGURE 6**  
**New Apprenticeships by Age**



Source: DLI apprentice program and UI wage match, 2016. 2016 is through July 20, 2016. Total is total apprenticeships since 2000.

signaling that work-based learning in the form of apprenticeship is becoming an increasingly well-known option for students to pursue directly after high school.

## Conclusion

Montana’s Registered Apprenticeship Program has become an important tool for career development. This form of work-based learning helps minimize time between jobs and keeps individuals in the labor force while they are learning and growing their skills. The program is still driven largely by the construction industry, particularly electricians and plumbers, but the recent push for apprenticeship in other fields has expanded the program to other in-demand fields.

Employment projections suggest that apprenticeship will continue to be an important part of our workforce training system in future years as well. Just like other forms of training and career advancement, apprenticeship is not right for everyone. But with an increasing variety of programs available, more and more Montanans will choose the apprenticeship option.

Employers are encouraged to work with the Department of Labor & Industry to learn if apprenticeship would be useful for their business model. High schools can continue to work with their students to provide well-rounded information on all future career options, including work-based learning. All individuals who are transitioning to new careers can discover if apprenticeship is an appropriate pathway for their career development.

## Works Cited

- <sup>1</sup> All apprenticeship data is from the Montana Department of Labor & Industry Apprenticeship Program as of July 20, 2016. Apprenticeship wages are calculated from the unemployment insurance wage match.
- <sup>2</sup> Office of the Commissioner of Higher Education, Enrollment Statistics available at [http://mus.edu/CCM/CCA%20Context%20Metric%201%20-%20Enrollment%20\(A%20undup\)%202015.pdf](http://mus.edu/CCM/CCA%20Context%20Metric%201%20-%20Enrollment%20(A%20undup)%202015.pdf). The 2014-2015 enrollment for Helena College was 1,921 and for City College was 1,641.
- <sup>3</sup> Lerman, Robert. 2012. “Can the United States Expand Apprenticeship? Lessons from Experience” American University and the Urban Institute. Available at [www.american.edu/cas/economics/research/upload/2012-18.pdf](http://www.american.edu/cas/economics/research/upload/2012-18.pdf).
- <sup>4</sup> Ibid.
- <sup>5</sup> 2015 American Community Survey 1-Year Estimates, U.S. Census Bureau.