



MONTANA REGISTERED
APPRENTICESHIP
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Apprenticeship Works for Montana



Montana Department of
LABOR & INDUSTRY

Apprenticeship Works for Montana

NOVEMBER 14, 2018

STATE OF MONTANA

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Montana Registered Apprenticeship Overview

Apprenticeships are a time-honored tradition of passing on craftsmanship, knowledge, and skills to the next generation in the workplace. This tried-and-true method of on-the-job training has been in Montana for many years and plays an integral part in our worker training systems. While traditional apprenticeable occupations



are a large part of the current program, the apprenticeship program has evolved over the last few years to include a wider range of occupations to meet the training needs of our economy. Today's apprentices study in fields such as information technology and healthcare, in addition to the traditional apprenticeships for plumbers, carpenters, and electricians. Apprenticeships often require college-level classroom learning to keep up with the science, computing, and technologies needed for modern day success.

The Montana Department of Labor & Industry's Registered Apprenticeship program partners with union and non-union employers to establish registered apprenticeship programs in our state. A registered apprenticeship program provides the on-the-job and classroom training required to meet the national requirements for an industry-recognized Montana Registered Apprenticeship certificate through a curriculum customized to meet the needs of the employer. Once an apprentice completes a registered apprenticeship program, he or she obtains an industry-recognized credential indicating to employers in all fifty states that they are qualified and trained.

Since 2000, the Montana Registered Apprenticeship Program has coordinated 8,400 apprenticeships in over 80 different occupations. These 8,400 apprenticeships involved 7,300 individuals and over 1,100 businesses. While the program has been growing in participation and expanding into new occupations, there is still room to grow. The U.S. Department of Labor maintains a list of all occupations that can be trained through a registered apprentice program, which includes over 1,000 jobs listed as apprenticeable under national guidelines. New apprenticeship programs in these occupations may begin when an employer expresses interest and works with the Montana Department of Labor & Industry to set up their program.

The apprenticeship option offers workers a way to earn while they learn, reducing the amount of time the worker must spend out of the labor force while obtaining a certification. The training program typically runs three or four years to completion, depending on the occupation, but apprentices are offered a wage while learning hands-on skills alongside a journeyman or mentor. Apprentices who successfully completed a program earned average wages of \$63,635 in 2017, over \$20,000 more than the statewide average wage of \$42,045. Over the last five years, the program has graduated an average of 154 apprentices per year, making a large contribution to the training of Montana's successful workforce. This report provides information on this important component of Montana's worker training system, including information on past participants' demographics, program participation, and employment outcomes.¹



Highlights include:

- Apprenticeship training has been gaining popularity in the last five years, responding to the increasing demand for trained workers by businesses. There were 687 new apprenticeships in 2017 compared to 324 new apprenticeships in 2012.
- Apprenticeships result in high-paying jobs. Apprentices who successfully completed their training had an average wage of \$63,635 in 2017, over \$20,000 higher than the statewide average wage and 76 percent higher than participants that started a program but did not finish it.
- Apprentices help keep skilled workers in Montana. Eighty-seven percent of apprentices that have graduated from the program since 2012 are currently working for a Montana employer.
- The number of sponsors active in apprenticeship has increased by approximately nine percent per year in the last three years. About 550 sponsors had an active apprentice in 2017.
- The programs are largely based in the more populated counties with 47 percent of all apprenticeship programs in Lewis & Clark, Gallatin, and Yellowstone counties.
- Since 2000, 53 out of Montana's 56 counties have had at least one apprenticeship participant.
- Apprentices were trained in 60 different occupations in 2017. Occupations become available for apprenticing in Montana when employers express interest. Ten new occupations became apprenticeable in 2017.
- The majority of apprentices are in traditional fields, with 36 percent of programs for electricians and 22 percent for plumbing. These two occupations require an apprentice certificate for licensing in Montana.

- Certified Nursing Assistant is the fastest growing new program. The first program began in 2015 with two apprentices. By 2017 there were 120 active apprentices training to be nurse assistants.
- Apprentices are generally between the ages of 16 and 34, suggesting that work-based learning in the form of apprenticeship is becoming a well-known option for young adults to pursue directly after high school.



How Does the Montana Registered Apprenticeship Program Work?

The Montana Registered Apprenticeship Program partners with union and non-union employers to establish registered apprenticeship programs in our state. A registered apprenticeship has on-the-job and classroom training requirements that allow the apprentice to receive an industry recognized certificate once their training is completed. Many states, including Montana, require a registered apprentice certification for state licensing in trade occupations like plumbers or electricians. In many instances, the participant also has the opportunity to earn a simultaneous post-secondary degree.

The apprenticeship curriculum is customized to meet the needs of the employer. The Montana Department of Labor & Industry's Registered Apprenticeship program is a recognized State Apprenticeship Agency by the U.S. Department of Labor, allowing the Department to monitor the apprenticeship and award the apprentice credentials.

Apprenticeship training requires a commitment from both the workers and the employer to maintain a successful partnership for the full training period (typically three to four years but varies depending on the



occupation). Unlike colleges or educational trainings that will continue to provide training to those who are current on their bills and have adequate performance, 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 in 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.

Participation in Montana’s Registered Apprenticeship Program

Since 2000, the Montana Registered Apprenticeship Program has coordinated over 8,400 apprenticeships participated in by about 7,300 individuals. Although the program has been around for many years it has recently experienced significant growth. In 2017 there were 687 new apprenticeships compared with 324 new in 2012 (shown in **Figure 1**).

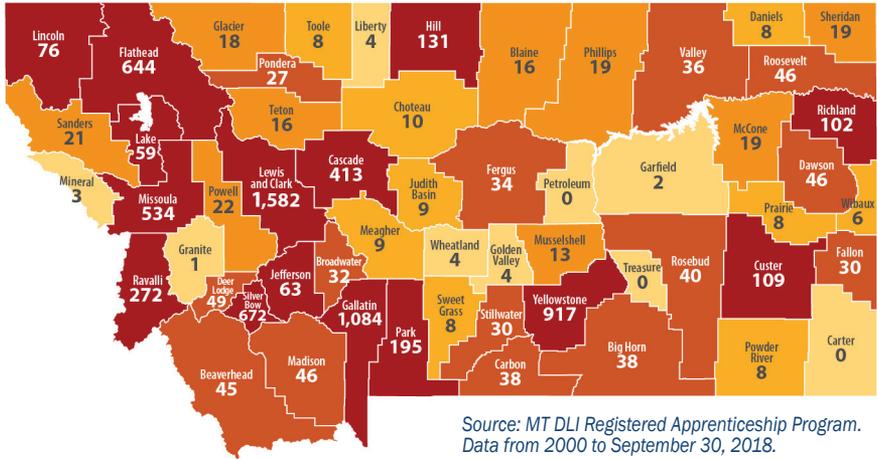
Figure 1: Apprenticeship Program Participation

Result	2012	2013	2014	2015	2016	2017	2018 through Sept. 30th
In Program	1,226	1,275	1,454	1,706	1,896	2,082	2,190
Completed	159	147	126	164	134	197	159
Cancelled	216	208	214	273	276	312	211
Ongoing	851	919	1,114	1,269	1,486	1,573	1,813
New	324	424	536	592	627	687	621

Source: MT DLI Registered Apprenticeship Program. Data from 2012 to September 30, 2018.
 Note: “In Program” counts apprenticeships that were active at some point during the year. “Ongoing” counts active apprenticeships that did not cancel or complete their program in that year.

Apprenticeships exist throughout Montana as shown in **Figure 2**. This map shows the total number of apprenticeships since 2000 by county. The five counties with the most apprenticeships are Lewis and Clark, Gallatin, Yellowstone, Silver Bow, and Flathead. Fifty-three out of the 56 counties have had an apprentice.

Figure 2: Total Apprenticeships since 2000



The number of businesses sponsoring apprenticeships has also grown with the increased popularity of apprenticeship training. While there are over 1,100 businesses that have participated in apprenticeship since 2000 approximately half are active during any given year. **Figure 3** shows the number of active sponsors and the number of new sponsors by year. In 2017, there were 554 sponsors that had an active apprenticeship program, an increase of 13 percent from one year prior. The fast growth is due to the 83 new apprenticeship sponsors in that same year.

Figure 3: Number of Apprenticeship Sponsors

Year	Active Sponsors	% Change	New Sponsors	% Change
2012	413		34	
2013	417	1.0%	51	50.0%
2014	430	3.1%	53	3.9%
2015	468	8.8%	55	3.8%
2016	490	4.7%	72	30.9%
2017	554	13.1%	83	15.3%
2018 (through Sept. 30th)	574	--	73	--

Source: MT DLI Registered Apprenticeship Program. Data from 2012 to September 30, 2018

Completion Rates of Apprentices

Figure 4 shows the number of individuals in apprenticeship by their final result. Since 2000, 38 percent of all apprentices have completed a program, 38 percent cancelled a program without ever completing a program, and 24 percent are active apprentices. Excluding active apprentices, just over 50 percent of apprentices successfully complete an apprenticeship program. The other 50 percent cancel their program without finding another apprentice training position. Apprenticeships may be cancelled by either the worker, who may decide to move to a different training program or occupation, or by the employer due to changing economic conditions, different business goals, or poor performance of the employee.

Figure 4: Individuals by Final Result

Final Result	Apprentice Positions	Apprentice Positions	Outcome Percent
Completed	2,477	38.10%	50.40%
Cancelled	2,438	37.50%	49.60%
Ongoing	1,587	24.40%	--
Total	6,502	100%	100%

Source: MT DLI Registered Apprentice Program. Data from 2000 to June 30, 2017

Completion rates of 50 percent are higher than some other types of training programs. Only 20 to 24 percent of first-time, full-time associate degree seekers successfully graduated within four years among those entering the Montana University System schools from 2005 to 2010.² Further, unlike educational institutions that accept all qualified and willing applicants, apprenticeships require both the apprentice and the employer to be willing to continue the training agreement, usually a duration of four years. Data from the Bureau of Labor Statistics shows that the median duration with one employer for U.S. workers is 4.2 years, with workers aged 25 to 34 having even shorter duration of 2.8 years.³

Worker Retention of Apprentices

Montana is currently experiencing a tight labor market and is expecting a worker shortage in the upcoming years as the large baby boomer population retires without enough young workers to replace them. In this economic environment, training and retaining good workers will be a high priority for Montana's businesses. Apprenticeships are one way that Montanans can receive cost-effective training and remain in the state. Among graduates from 2012 and later, 86.7 percent were employed and working for a Montana employer. In comparison, only 60.7 percent of cancelled participants were working for Montana employers in 2017. Apprenticeships help to retain talented workers in our labor force.



PROFILES IN APPRENTICESHIP

Meet Greg Hellyer Colstrip, MT - Colstrip Power Plant

Greg Hellyer, an employee at the Colstrip Power Plant, completed not one, but two registered apprenticeship programs. Growing up in Colstrip, Greg saw many members of his community go to work at the plant, and he saw that as a solid career path. Hellyer began his employment as a utility worker, then transitioned to working with the scrubbers, and eventually, the fuel crew. After years of performing those jobs, he saw the additional options that the apprenticeship program offered. "It's pretty hard to beat learning and getting paid while you learn. No colleges do that."

The two apprenticeship programs that Greg completed are the Boiler Operator and Powerhouse Mechanic. Each program is 5,600 hours and 3 years of training. These two positions are essential to the operations and maintenance of the plant.

Hellyer also recognized that "The apprenticeship gives you tools to become a journeyman. The books and check sheets are important, but just as important is to learn from the people who do the job every day." Greg appreciates the challenges of his new roles at the plant, and the opportunities that completing these two apprenticeships give him.

Montana's Apprenticeable Occupations

Apprentices have trained in over 80 different occupations since 2000, although not all are active in any given year. Apprentices actively trained in one of 60 occupations in 2017, and in one of 67 occupations in 2018 (through September 30).⁴

Despite there being many apprenticeable occupations, electricians and plumbers make up a large share of apprenticeships. Since 2000, over half of all apprentices have trained as either electricians (36 percent of apprenticeships since 2000) or plumbers (22 percent of apprenticeships since 2000). The remaining 42 percent have trained in one of the other available occupations. Part of the reason for the disproportionate share of electricians and plumbers is that an apprentice certificate is required for licensing in Montana. In fact, over one-third of all electricians employed in Montana in 2017 were apprentices being trained through the Registered Apprentice Program, as shown in **Figure 5**.

Figure 5: Number of Active Apprenticeship in 2017

ONET	Occupation Title	Active Apprenticeships	Total Employment	Apprentices as a % of Employment
47-2111.00	Electricians	791	2,170	36.5%
47-2152.02	Plumbers	438	1,890	23.2%
31-1014.00	Nurse Assistant, Certified	120	6,170	1.9%
47-2152.01	Pipe Fitters	118	1,890	6.2%
47-2031.01	Carpenters	93	4,300	2.2%
47-2211.00	Sheet Metal Workers	83	520	16.0%
49-9051.00	Electrical Power-line Installers and Repairers	43	680	6.3%
47-2011.00	Boilermaker	37	150	24.7%
49-9021.01	Heating & Air Conditioning Mechanic & Installer	36	950	3.8%
47-2221.00	Structural Iron & Steel Workers	35	130	26.9%
Total of Listed Apprenticeships		1,884	16,960	11.1%
Total of all Apprenticeable Occupations		2,030	64,820	3.1%

Source: MT DLI Registered Apprenticeship Program. Data from 2000 to September 30, 2018. Employment data from the 2017 Bureau of Labor Statistics Occupation Employment Survey, Montana.

Figure 5 shows occupations with 30 or more active apprenticeships in 2017, along with the employment level in Montana. Apprenticeship is largely used as a means of training for jobs in construction and extraction, with apprentices comprising over 20 percent of the total Montana workforce for electricians, plumbers, boilermakers, and structural iron and steel workers.

Overall, workers currently undergoing apprentice training comprise 3.1 percent of Montana’s employment in the apprenticeable occupations in 2017, underscoring the importance of the program to meet training needs for certain types of jobs. Recently, the Montana Apprenticeship Program diversified the types of training available, expanding the occupations available for apprenticeship training. Twenty-six occupations have been added since 2016. These new programs have modernized apprenticeship to offer a wider selection of occupations, including information technology, many different healthcare occupations, and a variety of other occupations such as master brewers.

Expanding the program into new occupations suggests that the growth of the apprenticeship program is due to both increased interest by new industries as well as general job growth in the last few years. **Figure 6** lists all the new programs and the total number of apprenticeships since 2016.



Figure 6: New Registered Apprenticeship Occupations Added Since 2016

Year Added	ONET	Occupation	Apprenticeships
2016	11-9111.00	Medical & Health Service Managers	5
2016	15-1131.00	Computer Programmer	1
2016	29-2034.02	Radiologic Technicians	1
2016	29-2052.00	Pharmacy Technicians	1
2017	29-2071.00	Medical Record And Health Information Technician/Medical Coders	31
2017	43-3031.00	Accounting Technician	6
2017	31-9094.00	Medical Scribe (Medical Transcriptionist)	5
2017	31-9092.00	Medical Assistant	4
2017	13-1031.00	Insurance Adjusters, Examiners, And Investigators	2
2017	29-2061.00	Licensed Practical And Licensed Vocational Nurses	2
2017	29-2055.00	Surgical Technologists	1
2017	49-2092.00	Power-Transformer Repairer	1
2017	49-3022.00	Glass Installer (Auto Serv)	1
2017	17-3023.03	Electrical Technician	1
2018	41-3041.00	Travel Agent	3
2018	15-1151.00	Computer Support Specialist	3
2018		Master Brewer	3
2018	17-3029.09	Industrial Manufacturing Technician	2
2018	21-1091.00	Community Health Worker	2
2018	11-9081.00	Lodging Manager	2
2018	49-2011.00	Tech Support Engineer	2
2018	15-1142.00	Information Technology Specialist	1
2018	31-9097.00	Phlebotomist	1
2018	29-2053.00	Behavioral Health Aide	1
2018	29-2012.00	Medical Lab Assistant	1
2018	11-3021.00	Information Technology Manager	1

Source: MT DLI Registered Apprentice Program. Data from 2000 to September 30, 2018

Wages Earned by Apprentices



Apprentices have the opportunity to earn wages while earning their certification, which has led some policy makers and economists to argue that apprenticeship offers a solution to rising tuition costs and high student debt loads, thus strengthening the middle class.⁵ The average wage for Montanans currently in registered apprenticeship training in 2017 was about \$39,290, 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 continue to support their families while receiving training, or 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 training exceed the return on investment for other types of training. The long-term gains of apprenticeship training of about \$266,000 over the worker's career compared to only \$130,000 for a community college degree.⁶ Much of the differences in the return to education are related to the post-graduation wage, since apprentices

generally face similar tuition costs to community college students. After graduation, Montana apprentices who successfully completed their training earned wages of \$63,635 in 2017, \$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 7 illustrates the wages earned by recent graduates from the apprentice program by occupation compared to Montana wages at the 25th-percentile wage and at the state average wages. The 25th percentile is provided to represent the expected entry-level wages for workers just starting out in their careers, while the average wage includes all workers, including those with extensive training and experience. The table compares the 2017 wages earned for apprentices who graduated in 2014, 2015, or 2016 to the expected wages for all occupations.

Figure 7: Average Wages of Recent Apprenticeship Graduates Compared with Occupational Entry-Level and Average Wages

Occupation	Apprentices	Graduated Apprentice Average Wage	Entry Level Wage (25th Percentile)	State Average Wage
Electrical Power-Line Installers and Repairers	31	\$111,127	\$70,700	\$80,670
Industrial Machinery Mechanics	8	\$89,646	\$43,680	\$54,880
Municipal Fire Fighters	5	\$83,096	\$38,710	\$48,790
Pipe Fitters	27	\$81,327	\$52,400	\$63,860
Electricians	127	\$58,888	\$49,460	\$60,400
Plumbers	105	\$57,989	\$52,400	\$63,860
Construction Laborers	3	\$54,006	\$30,560	\$37,430
Sheet Metal Workers	9	\$53,757	\$38,120	\$52,370
Boilermakers	13	\$51,312	\$54,730	\$64,040
Structural Iron and Steel Workers	8	\$45,458	\$34,700	\$48,620
Construction Carpenters	7	\$40,208	\$34,440	\$43,900
Child Care Workers	4	\$34,576	\$18,930	\$22,360

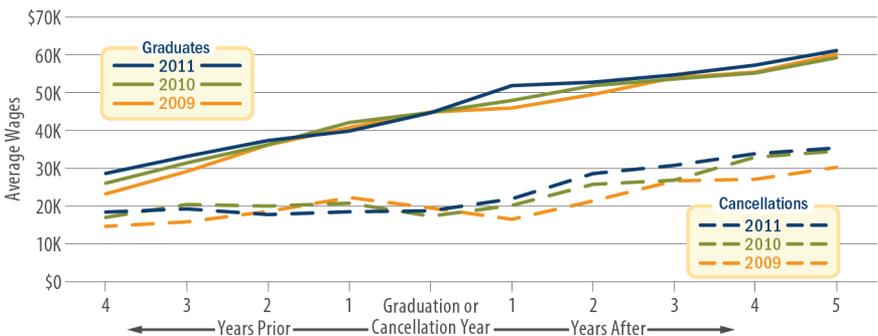
*Note: Occupations with fewer than three graduates are not shown.
 Source: MT DLI Registered Apprenticeship Program and UI wage match, 2017. OES wage data from the May 2017 Bureau of Labor Statistics Occupation Employment Survey, Montana*

For roughly half of the occupations, the recent apprenticeship graduates were earning significantly higher wages than the statewide average. In 11 out of the 12 occupations shown, the apprentice graduates were earning wages above the entry-level occupational wage. Given that apprentices are just starting out in their chosen careers, apprenticeship appears to give workers a leg up over other workers, bringing them to average or above average wages even though they are recent graduates and just starting out in their careers.

Wage benefits are also apparent when comparing the wages of the graduates of apprenticeship to wages of those that did not complete their 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. While graduates earned an average 2017 wage of \$63,635, non-completers earned \$36,070, a 76% difference.

Figure 8 examines this wage difference further by showing long-term average wages of graduates compared with those that cancelled and never completed a program. This table includes apprentices that completed or cancelled their program between 2009 and 2011 and their wages from 5-years before graduation or cancellation to 5-years after graduation or cancellation. Individuals that completed apprentices have higher long-term average wage gains.

Figure 8: Average Wages of Apprentices Before, During, & After Graduation



Source: MT DLI Registered Apprentice Program and UI Wage Match, 2017. Data through June 30, 2017.

Age and Gender of Apprentices

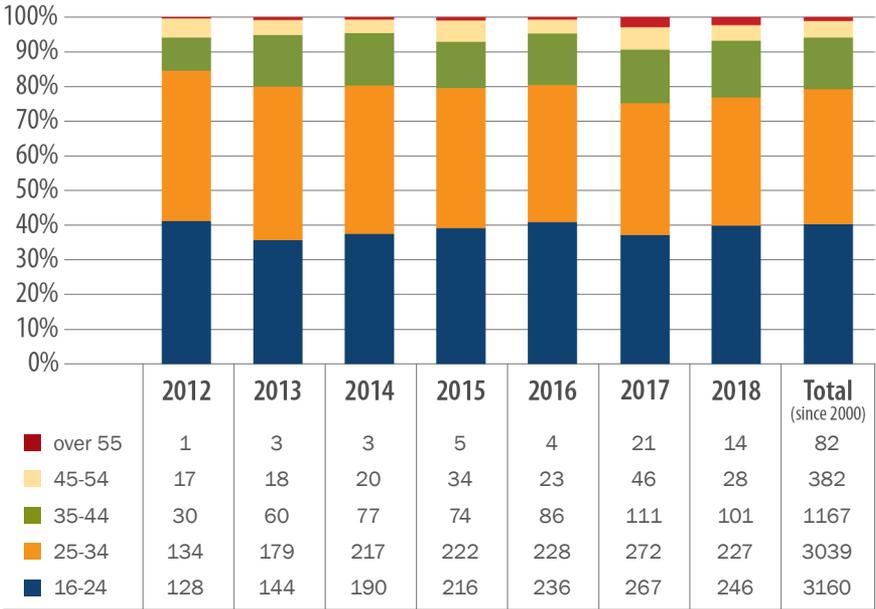


Apprentices are typically younger, male workers. Ninety percent of apprentices over the past 18 years are men. Part of the reason for low enrollment of female apprentices is that the most popular apprenticeship programs are typically male-dominated occupations. According to the U.S. Census Bureau, 4.3 percent of Montana's construction and extraction workers are women.⁷ The construction programs tend to be the most popular apprenticeships, with plumbing and electricians at the top of the list. Since 2000, there have been 73 women in the electrician apprenticeship program (2.8 percent of participants), and 27 women (1.8 percent) in the plumbing program.

The traditionally low rate of female participation has driven the idea that there is opportunity for apprenticeship expansion directed towards women. New apprenticeship programs, especially in the healthcare field, have helped more women get involved in apprenticeship. The certified nurse assistant apprenticeship programs have been particularly popular with 162 total apprentices since the first program began in 2015. 151 of these apprentices are women. Medical coder apprenticeships, which started in 2017, already has had 31 apprentices – 30 are women. These apprenticeship expansion efforts have helped increase female apprenticeship so that 19 percent of 2017 apprentices were women.

Apprentices are generally between the ages of 16 and 34, as shown in **Figure 9**. The large number of apprentices between 16 and 24 signals that work-based learning in the form of apprenticeship is becoming a well-known option for young adults to pursue directly after high school.

Figure 9: New Apprentices by Age



Source: MT DLI Registered Apprentice Program. Data from 2000 to September 30, 2018.

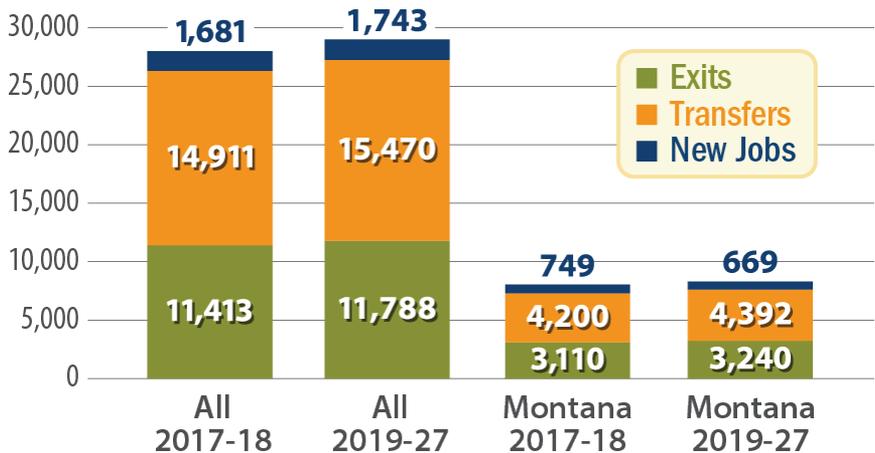


Expected Worker Demand for Apprenticeable Jobs

The Montana Department of Labor & Industry’s forecasts for 2017-2018 and 2019-2027 emphasize that the apprenticeship program has the potential to continue expanding. Looking at the national list of all possible occupations that are apprenticeable, the total demand for apprentices is 28,000 for the next two years with 1,680 of those jobs coming from growth and the rest coming from job openings (exits or transfers).⁸ Apprenticeable occupations represent nearly 47 percent of Montana’s total worker demand.

As mentioned, Montana apprentices have trained in over 80 occupations, compared with over 1,000 that are on the national list of apprenticeable occupations. If the projections only include occupations for which Montana has had a program, there is demand for 8,060 new apprentices annually for the next two years, representing 14% percent of total worker demand. **Figure 10** illustrates the forecasted worker demand for all apprenticeable jobs and the forecasted worker demand for occupations that Montana has an apprentice program to train.

Figure 10: Annual Employment Needs for Apprenticeable Occupations



Source: MT DLI Registered Apprentice Program and Montana’s 2017-2027 Occupational Employment Projections.

PROFILES IN APPRENTICESHIP



Meet Erin Bartel Wolf Point, MT - Faith Lutheran Home

Erin Bartel was born and raised in Wolf Point, Montana. After graduating from high school, she wanted to stay close to her family, and took a custodial job at Faith Lutheran Home.

Erin had nearly resigned herself to low-wage labor positions when she heard that her employer was starting to explore the Montana Registered Apprenticeship Program. Erin was eager for hands-on training and career advancement, and she jumped at the opportunity to be Faith Lutheran's first Licensed Practical Nurse apprentice. Within a year, she was working directly with patients.

Joann Hibel, the Vice President of Senior Care, immediately saw Erin's potential and decided to include her in Faith Lutheran's succession planning. When Joann retires, Erin will have the skills and knowledge to fill her position. Erin will receive her registered LPN certificate in the spring of 2019. She plans to continue to use apprenticeship as a pathway to become a registered nurse, allowing her to remain in her community and serve her neighbors.



Joann Hibel, Vice President of
Senior Care, Faith Lutheran Home

Conclusion

Montana's Registered Apprenticeship Program has offered training to many Montanans over the past several years. The program has grown both in participation size and into new occupations, suggesting that the increase in interest is due to both participation by new industries as well as general job growth. With the fast growth of apprenticeships and expansion into new occupations, apprenticeship has earned its place as one of Montana's important workforce training systems and has the potential to continue to grow to further meet the needs of Montana's economy.

Endnotes

- 1 *All apprenticeship data is from the Montana Department of Labor & Industry's Registered Apprenticeship Program as of October 11, 2018. Apprenticeship wages are calculated from the unemployment insurance wage match.*
- 2 *Office of the Commissioner of Higher Education, Graduation Rates, System Level for the MUS total. <http://mus.edu/CCM/CCA%20Outcome%20Metric%202%20-%20Grad%20Rates,%20ASSOCIATES.pdf>*
- 3 *Bureau of Labor Statistics Employee Tenure data, available at www.bls.gov.*
- 4 *Occupations are counted based on ONET codes.*
- 5 *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.*
- 6 *Ibid*
- 7 *2017 American Community Survey 1-Year Estimates, U.S. Census Bureau.*
- 8 *Montana's Department of Labor and Industry Occupational Employment Projections. Exits are individuals that leave the workforce (possibly to retire, attend school, or care for family) and transfers are people that leave their current occupation for an occupation in a different field.*



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