



Montana Department of **LABOR & INDUSTRY**

Registered Apprenticeship Program Data Report December 17, 2018

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Apprenticeships are a time-honored tradition of passing on craftsmanship, knowledge, and skills to the next generation in the workplace. This method of on-the-job training plays an integral part in our worker training systems. While traditional apprenticeable occupations remain a large part of the program, the registered apprenticeship program has evolved over the last few years to include a wider range of occupations to meet the 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 a demand for continued expansion. 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 will begin when an employer expresses interest and works with the Montana Department of Labor & Industry to set up their program. Starting in 2018, apprenticeship sponsors may be eligible for a state tax credit for hiring an apprentice.

The apprenticeship option offers workers a way to earn while they learn, allowing an individual to remain in the labor force while obtaining a certification. The training program typically runs three or four years to completion, depending on the occupation. 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. 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 County.
- 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 the trades, 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.

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How does the Montana Registered Apprenticeship Program Work?

Registered apprenticeships involve a worker (apprentice) participating in a structured work-based learning program that involves both technical instruction and on-the-job practical training from an assigned mentor. To qualify as a Registered Apprenticeship, the program must meet national standards for curriculum and training under the monitoring of the Montana Department of Labor & Industry. 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 apprenticeship credentials.

After completing a registered apprenticeship, the participant receives a national industry-recognized credential. Many states, including Montana, require a registered apprentice certification for state licensing in trade occupations such as plumbers or electricians. In many instances, the participant may also earn a simultaneous post-secondary degree.

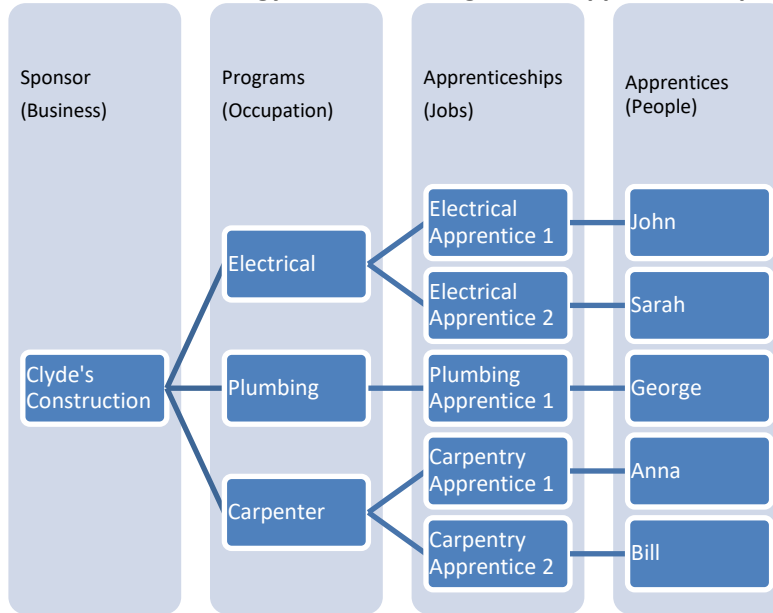
The role of the Montana Department of Labor & Industry is to work with employers to help them set up programs that follow the recommended curriculum, then monitor progress to ensure that the apprentice and business sponsor are meeting program goals. The Montana Department of Labor & Industry can also help businesses find potential workers to fill apprenticeship positions, but the hiring process is completed by the employer. There were approximately 550 Montana businesses serving as apprenticeship sponsors in 2017.

The U.S. Department of Labor maintains a list of all occupations that can be trained through a registered apprentice program. Montana sponsors have offered training in over 80 of these occupations. The largest apprentice groups in Montana are electricians and plumbers, but programs are diverse and include non-trade occupations like nursing aides, daycare providers, radiologic technicians, and computer programmers.

Most apprenticeships are expected to be completed in 8,000 hours, or approximately four years. However, the training for some occupations can be completed in as short as one year. There is a probation period equal to six months, or 25% of the length of the program, whichever is shorter. Apprenticeships can be cancelled by either the employer or the apprentice if the job match is not working. The costs of training, such as tuition payments, books, or supplies, are typically paid by the apprentice, although sponsors can also meet these needs. Sponsors must pay the apprentice a wage, create a mentorship with existing staff to provide on-the-job guidance, and allow additional time for training while completing a job. In exchange, employers gain by having a worker that is specifically trained to meet the exact needs of their business. Starting in the 2018 tax year, sponsors may be eligible for a tax credit for sponsoring an apprentice.

Common terminology includes: sponsors are businesses that are willing to pay and train an apprentice. Programs are the unique business/occupation combination through which an apprentice will be trained. Apprenticeships are the jobs that exist, within which the worker will receive apprentice training. Apprentices are the people that fill the apprenticeships. One apprentice may have participated in more than one apprenticeship. Figure 1 illustrates this terminology.

Figure 1: Illustration of Terminology used in the Registered Apprenticeship Program



Apprenticeship Completion Rates

From January 1, 2000 to September 30, 2018, the Montana Department of Labor & Industry’s apprenticeship program has overseen 8,476 apprenticeships participated in by about 7,300 individuals. Figure 2 shows the number of apprenticeship positions that were completed, cancelled (includes transfers and suspensions), or are currently in progress.

Roughly 42% of apprenticeships are successfully completed, and the remaining 58% apprenticeships are not completed. About 27% are cancelled within their probation period, which is the lesser of six months or 25% of the training period. The other 73% cancel after the probation period possibly because the employers and apprentices find that the job match is not working out well, or that the worker is no longer needed. The average time until cancellation is 17.5 months.

Many of the apprenticeship candidates who cancel with one program transfer to a different program either in a different occupation or in the same occupation with a different employer. If an apprentice transfers to a different program, it is recorded as a cancellation of the first apprenticeship. In addition, some apprentices complete more than one program. These situations are the reason there are more apprenticeships (8,476) than individuals (7,300).

Figure 3 shows the number of individuals in an apprenticeship by their final result. Occasionally, an apprentice will complete a program first, and cancel a second program later. In those instances, their completed apprenticeship is counted as the final result. By individual, roughly 50% of people successfully complete an apprenticeship, although their first apprenticeship position may have been cancelled at either their request or their employer’s request. Roughly 50% of apprenticeships are cancelled without the apprentice finding another apprentice training position.

Figure 2: Apprenticeship Trainings by Outcome

	Apprentice Positions	Percent of Total	Completion Rates
Completed	2,806	33%	42%
Cancelled	3,853	45%	58%
Ongoing	1,817	21%	
	8,476	100%	100%

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

Figure 3: Individual Apprentices by Final Result

	Apprentice Positions	Percent of Total	Completion Rates
Completed	2,477	38.1%	50.4%
Cancelled	2,438	37.5%	49.6%
Ongoing	1,587	24.4%	--
	6,502	100%	100%

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

Completion rates of 50% are higher than some other types of training programs. Among those entering the Montana University system schools from 2005 to 2010, only 20% to 24% of first-time, full-time associate degree seekers successfully graduated within four years.ⁱⁱ Further, apprenticeships require both the apprentice and the employer to be willing to continue the training agreement, usually for 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.ⁱⁱⁱ

As can be seen from Figure 2 and Figure 3, participation in the apprenticeship program can either be calculated as the count of training positions started (8,476), or by the number of people who have filled these positions (7,300). For example, if a person starts an electrician program then transfers to a plumbing program, they are counted in two apprenticeships (one for electrician and one for plumbing), but only once if counting individuals trained. Unless otherwise stated, the remainder of the report will summarize information by apprenticeships, not by individuals.

Growth in the Apprentice Program

The number of new apprenticeships has been steadily growing in recent years. In 2017, there were 687 new apprenticeship training positions, which is over 300 more than in 2012. Because of this growth, the total number of apprenticeships has increased from 1,226 in 2012 to 2,082 in 2017. Figure 4 illustrates participation in the registered apprentice program by year since 2012, separating out those who start during the year, or who cancel or complete during the year. "In program" is the total amount of apprenticeships including those that started in that year, ended in that year, or are in the middle of their training (ongoing). The in-program metric is conceptually similar to enrollment statistics for colleges and universities, including all student served regardless of outcome.

Figure 4: Apprenticeship Program Participation

Result	2012	2013	2014	2015	2016	2017	2018 (through Sep30)
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 2000 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.

Business Sponsors and Number of Programs

There are over 1,100 businesses that have sponsored an apprentice since 2000. Many businesses provide training in multiple occupations resulting in a total of over 1,200 different programs since 2000. A program is a separate field of study with a specific business. For example, if a business hosts two plumbing apprentices and one electrician apprentice, the business would be hosting two programs and three apprenticeships. See Figure 1 for an illustration of the terminology.

Although there are over 1,100 sponsors registered, slightly less than half of them are active in any given year. Figure 5 lists the number of active and new programs by year since 2012 and Figure 6 lists the number of active and new sponsors by year since 2012. Sponsors and programs have both grown significantly in recent years. This expansion of programs is from the traditional trades occupations, plus some expansion into new fields as a success of the Department’s initiatives to expand work-based learning into non-traditional fields like healthcare and IT.

Figure 5: Active and New Apprenticeship Programs by Year

Year	Active	% Change	New	% Change
2012	440		38	
2013	441	0.2%	56	47.4%
2014	461	4.5%	63	12.5%
2015	514	11.5%	70	11.1%
2016	536	4.3%	82	17.1%
2017	605	12.9%	99	20.7%
2018	623		86	

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

Figure 6: Active and New Apprenticeship Sponsors by Year

Year	Active	% Change	New	% 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	574		73	

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

As seen in Figure 5 and 6, there were 605 programs in 2017 that were sponsored by 554 businesses. Of these businesses:

- 53% of the 554 businesses sponsored just one apprenticeship;
- 19% of the 554 businesses sponsored two apprenticeships;
- 17 businesses sponsored over 20 apprenticeships

Sponsors by Industry

Sponsors are displayed by their primary industry sector in Figure 7. Of the 962 sponsors where industry could be determined, 724 (75%) of them are in construction. The second highest industry concentration is healthcare, an industry targeted for expansion by the Registered Apprenticeship Program in recent years and the largest private employing industry in Montana.

Figure 7: Apprenticeship Sponsors by Industry

NAICS	NAICS description	Total
11	Agriculture, Forestry, Fishing and Hunting	1
21	Mining, Quarrying, and Oil and Gas Extraction	6
22	Utilities	18
23	Construction	724
31-33	Manufacturing	20
42	Wholesale Trade	5
44-45	Retail Trade	16
48-49	Transportation and Warehousing	1
51	Information	4
52	Finance and Insurance	2
53	Real Estate and Rental and Leasing	5
54	Professional, Scientific, and Technical Services	9
56	Administrative and Support Services	6
61	Educational Services	14
62	Health Care and Social Assistance	107
71	Arts, Entertainment, and Recreation	1
72	Accommodation and Food Services	2
81	Other Services (except Public Administration)	21
92	Public Administration	0
Total		962

Source: DLI apprentice program and UI wage match, 2017. Data from 2000 to September 30, 2018.

Work Location of Apprenticeships and Sponsors

The Registered Apprenticeship Program has trained workers in nearly every Montana county, but the majority of apprentices train in the urban counties. Out of the 56 counties in Montana, 53 have had at least one apprenticeship since 2000. The three counties without an apprenticeship program are Carter, Petroleum, and Treasure Counties.

Lewis and Clark, Gallatin, and Yellowstone counties have had the most apprenticeships. These three counties account for approximately 47% of all apprenticeship locations since 2000. Figure 8 lists the five counties with the most apprenticeships and the number of apprenticeships that have been completed. The full table including all counties is in Figure 24 in the appendix.

Figure 8: Top Five Counties with the Most Apprenticeships - January 1, 2000 to Sept. 30, 2018

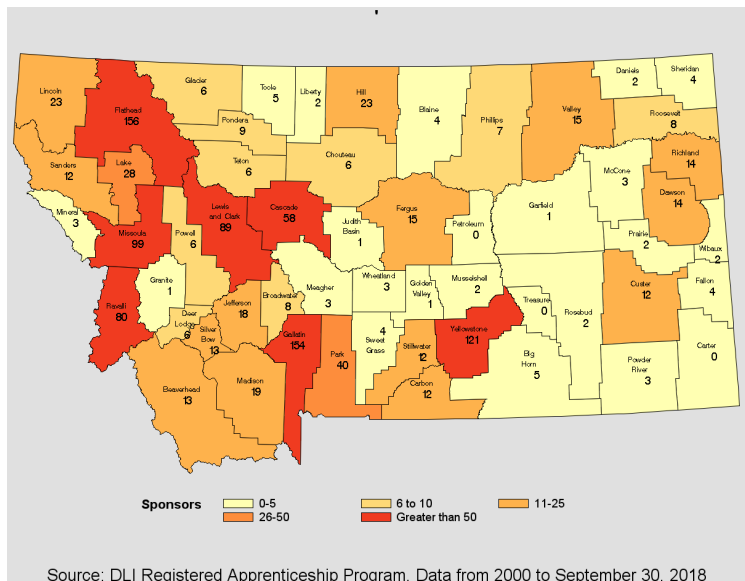
County	Total Apprenticeships	Completed Apprenticeships
Lewis and Clark	1,582	557
Gallatin	1,084	330
Yellowstone	917	353
Silver Bow	672	329
Flathead	644	181
Total	4,899	2,538

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

The number of new apprenticeships each year has been increasing. This increase has been predominantly in the largest counties. For example, Lewis and Clark County had 36 new apprenticeships in 2012 and 95 new apprenticeships in 2017. Gallatin County had 34 new apprenticeships in 2012 and 106 new in 2017. Figure 25 in the appendix lists all new apprentices by county for the years 2016 to 2018.

Apprentices come from 53 Montana counties. Each of these counties must also have a sponsor to host the apprentices, with some sponsors hosting multiple apprentices. Figure 9 illustrates the number of sponsors by county. In general, the counties with the most apprentices also have the most sponsors, reflecting the fact that most sponsors host one or two apprentices.

Figure 9: Number of Apprenticeship Sponsors by County



Types of 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).^{iv}

Most apprenticeship training is in the trades. Thirty-six percent of apprenticeships are electrician programs, and 22% are programs for plumbing. The remaining 42% of the apprenticeships are split between other occupations. Figure 10 lists the number of new apprenticeships per year by occupation, sorted by the total trained since 2000. Data presented is limited to occupations that have had more than 50 apprenticeships. The total column represents the total amount of apprenticeships in that occupation since 2000. For example, since 2000, 3,087 apprenticeships were in an electrician program. The full table can be found in Figure 26 in the appendix.

Figure 10: New Apprenticeships by Occupation

ONET	Occupation	2012	2013	2014	2015	2016	2017	2018 (through Sep 30)	Total Trained since 2000
47-2111.00	ELECTRICIANS	133	171	196	240	253	229	211	3,087
47-2152.02	PLUMBERS	61	107	126	126	166	124	107	1,854
47-2031.01	CARPENTER	5	15	22	30	30	40	70	412
47-2221.00	STRUCTURAL IRON AND STEEL WORKERS	14	19	37	11	17	11	3	399
39-9011.00	CHILD CARE DEVELOPMENT SPECIALIST	10	4	1	0	0	14	15	337
47-2152.01	PIPE FITTERS	27	24	31	24	26	35	30	331
47-2211.00	SHEET METAL WORKERS	9	21	25	17	27	21	14	324
47-2011.00	BOILERMAKER	6	16	7	21	3	15	8	241
49-9051.00	ELECTRICAL POWER-LINE INSTALLERS AND REPAIRERS	16	6	13	24	9	18	8	234
31-1014.00	NURSE ASSISTANT CERTIFIED	0	0	0	2	36	83	42	163
51-8021.00	STATIONARY ENGINEERS & BOILER OPERATORS	8	2	13	7	4	4	6	116
47-2181.00	ROOFERS	6	7	17	17	19	0	0	104
47-2073.00	OPERATING ENGINEERS	8	4	0	1	0	8	0	95
47-2061.00	CONSTRUCTION LABORERS	1	4	2	8	1	2	0	93
47-2021.00	BRICKLAYER/BRICKMASONS & BLOCKMASONS	1	1	4	5	4	3	8	88
49-9021.01	HEATING & AIR CONDITIONING MECHANIC & INSTALLER	2	3	7	4	8	19	25	85
49-9041.00	INDUSTRIAL MACHINERY MECHANICS	1	2	11	6	3	0	0	78
33-2011.01	FIRE FIGHTER	6	6	1	2	0	1	0	75
49-2022.00	TELECOMMUNICATIONS TECHNICIAN	0	0	0	4	3	2	1	63

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

Twenty-six new occupations have been added since 2016. The new occupations, year they were added, and total number of participants are listed in Figure 11.

Figure 11: New Registered Apprenticeship Occupations Added Since 2016

Year Added	ONET	Occupation	Apprenticeships
2016	11-9111.00	MEDICAL AND HEALTH SERVICES 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-TURNER 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

In some occupations, apprentices comprise a significant portion of employment. For example, over one-third of all electricians employed in Montana in 2017 were apprentices being trained through the Registered Apprenticeship Program. Figure 12 shows occupations with 35 or more active apprenticeships in 2017, along with the employment level for the occupation in Montana. Overall, workers currently undergoing apprentice training comprise 3.1% of Montana’s employment in the apprenticeable occupations in 2017, underscoring the importance of the program to meet training needs for some types of jobs.

Figure 12: Number of Active Apprenticeship in 2017

ONET	Occupation	Active Apprenticeships	Total Employment	Apprentices as a % of Employment
47-2111.00	ELECTRICIANS	791	2,170	36.5%
47-2221.00	STRUCTURAL IRON AND STEEL WORKERS	35	130	26.9%
47-2011.00	BOILERMAKER	37	150	24.7%
47-2152.02	PLUMBERS	438	1,890	23.2%
47-2211.00	SHEET METAL WORKERS	83	520	16.0%
49-9051.00	ELECTRICAL POWER-LINE INSTALLERS AND REPAIRERS	43	680	6.3%
47-2152.01	PIPE FITTERS	118	1,890	6.2%
49-9021.01	HEATING & AIR CONDITIONING MECHANIC & INSTALLER	36	950	3.8%
47-2031.01	CARPENTER	93	4,300	2.2%
31-1014.00	NURSE ASSISTANT CERTIFIED	120	6,170	1.9%
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 Apprentice Program. Data from 2000 to September 30, 2018

Apprentices by Industry

Most apprentices are in construction-related occupations, consequently, the majority of apprentices are working in the construction industry. Figure 13 shows the primary work industry that apprentices have worked, including only apprentices that were active in apprenticeship in 2017.

Figure 13: Apprentices by Industry (Active in 2017)

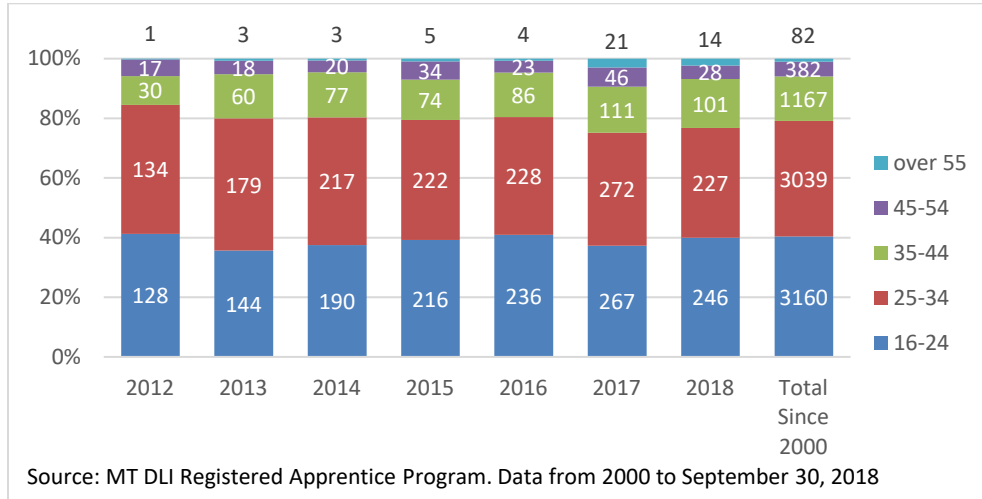
NAICS	NAICS description	Total
22	Utilities	81
23	Construction	1,295
31-33	Manufacturing	50
42, 44, 45	Wholesale and Retail Trade	15
48-49	Transportation and Warehousing	4
54-56	Business Services	33
61, 62	Healthcare and Education	194
51, 81	Other	12
92	Public Administration	38
Total		1,722

Source: DLI apprentice program. Data includes active apprentices in 2017.

Age of Apprentices

Apprentices are generally between the ages of 16 and 34. Figure 14 illustrates new apprentices by age. Total is the all apprentices since 2000.

Figure 14: New Apprentices by Age



Gender of Apprentices

Men have accounted for ninety percent of total apprenticeships since 2000. Figure 15 lists new apprentices by gender.

Figure 15: New Apprentices by Gender

	2012	2013	2014	2015	2016	2017	2018 (through Sep 30)	Total Since 2000
Women	13	12	14	25	52	131	113	731
Men	303	401	507	545	547	549	503	6,784
Total	316	413	521	570	599	680	616	7,515
% Women	4.1%	2.9%	2.7%	4.4%	8.7%	19.3%	18.3%	9.7%
% Men	95.9%	97.1%	97.3%	95.6%	91.3%	80.7%	81.7%	90.3%

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

In the last few years, the Registered Apprenticeship Program has implemented initiatives to make the program more diverse in terms of gender, race, and types of jobs trained. By encouraging employers to hire a more diverse set of workers and by expanding apprenticeship into occupations with more female workers, there has been success in increasing the share of female apprentices. The certified nurse assistant apprenticeship programs have been particularly popular with 162 apprenticeships – 151 of these apprentices are women. The medical coder apprenticeships, started in 2017, already has had 31 apprenticeships – 30 are women. These apprenticeship expansion efforts have helped increase female apprenticeship so that 19 percent of 2017 apprentices were women. Figure 16 lists the number of female apprenticeships by occupation (limited to the top ten).

Figure 16: New Female Apprenticeships by Occupation

ONET	Occupation	2012	2013	2014	2015	2016	2017	2018 (through Sep 30)	Total Trained since 2000
39-9011.00	CHILD CARE DEVELOPMENT SPECIALIST	9	4	0	0	0	14	15	326
31-1014.00	NURSE ASSISTANT CERTIFIED	0	0	0	2	35	75	39	151
47-2111.00	ELECTRICIANS	1	2	9	11	6	6	9	82
29-2071.00	MEDICAL RECORD AND HEALTH INFORMATION TECHNICIAN/MEDICAL CODERS	0	0	0	0	0	7	23	30
47-2152.02	PLUMBERS	1	0	0	1	2	6	4	27
47-2031.01	CARPENTER	0	2	0	2	3	6	2	21
47-2073.00	OPERATING ENGINEERS	1	0	0	0	0	2	0	16
47-2011.00	BOILERMAKER	0	0	0	1	0	4	0	15
47-2061.00	CONSTRUCTION LABORERS	0	0	0	3	1	0	0	15
51-8021.00	STATIONARY ENGINEERS & BOILER OPERATORS	0	0	2	1	0	0	2	11

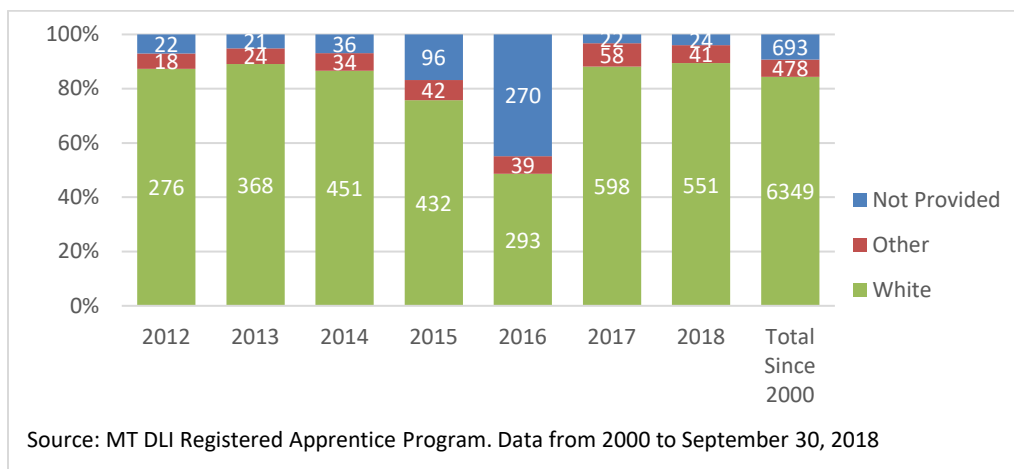
Source: MT DLI Registered Apprentice Program. Data from 2000 to September 30, 2018

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% of Montana’s construction and extraction workers are women.^v 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 program (2.8%), and 27 women in the plumber program (1.8%).

Race of Apprentices

Figure 17 lists new apprenticeships by race. Until 2017, the amount of people signing up in the “all other” category has increased. Total is a sum for all apprenticeships since 2000.

Figure 17: New Apprentices by Race

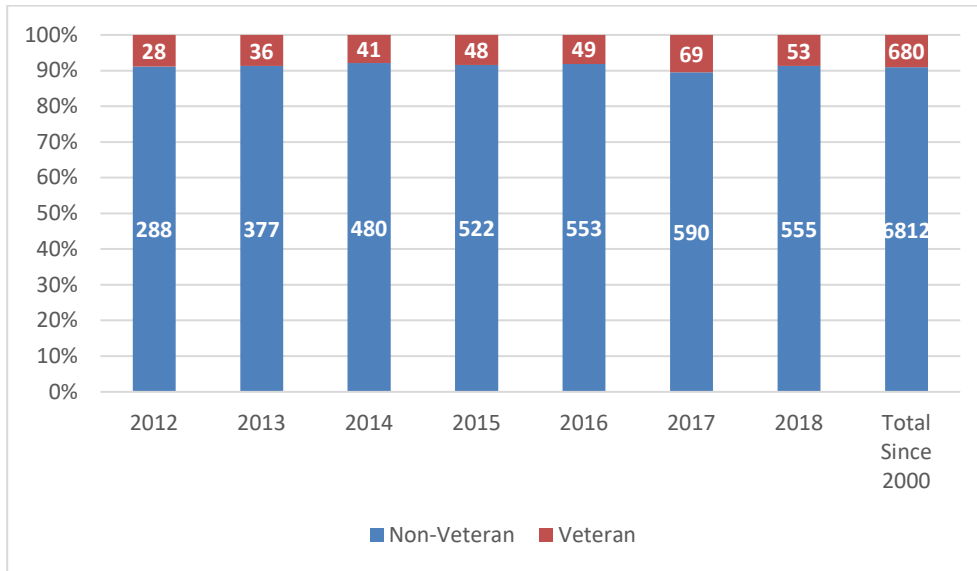


Source: MT DLI Registered Apprentice Program. Data from 2000 to September 30, 2018

Veterans in Apprenticeship

Figure 18 lists new apprenticeships by veteran status. The number of new veterans signing up for apprenticeships has increased from 28 in 2012 to 69 in 2017. 2018 is the first year that sponsors may receive a tax credit for hiring an apprentice. They receive a greater credit if hiring a veteran apprentice.

Figure 18: New Apprentices by Veteran Status



Time to Completion

Most apprenticeships are expected to be completed in 8,000 hours, which translates into approximately four years. Some programs are expected to be done in 6,000 hours (three years) or 4,000 hours (two years). There have been 1,929 completed apprenticeships over the last ten years (since 2008). Of those, 1,168 of them (61%) completed their program within the recommended time. The recommended time used for this analysis was 48 months if the information for program length was not immediately available. Figure 19 lists these statistics for the top 15 occupations.

Figure 19: Number of Completed Apprenticeships within the Program Length

ONET	Occupation	Program Length (Years)	Completed within the Program Length?		
			Yes	No	% Yes
47-2111.00	ELECTRICIANS	4	366	341	51.77%
47-2152.02	PLUMBERS	4	165	223	42.53%
49-9051.00	ELECTRICAL POWER-LINE INSTALLERS AND REPAIRERS	4	88	10	89.80%
39-9011.00	CHILD CARE DEVELOPMENT SPECIALIST	2	69	10	87.34%
51-8021.00	STATIONARY ENGINEERS & BOILER OPERATORS	4	49	5	90.74%
47-2152.01	PIPE FITTERS	4	48	50	48.98%
47-2211.00	SHEET METAL WORKERS	4	47	55	46.08%
47-2221.00	STRUCTURAL IRON AND STEEL WORKERS	4	45	5	90.00%
49-9041.00	INDUSTRIAL MACHINERY MECHANICS	4	45	2	95.74%
33-2011.01	FIRE FIGHTER	4	41	0	100.00%
47-2011.00	BOILERMAKER	4	40	16	71.43%
47-2031.01	CARPENTER	4	31	10	75.61%
47-2073.00	OPERATING ENGINEERS	4	25	0	100.00%
31-1014.00	NURSE ASSISTANT CERTIFIED	1	24	1	96.00%
47-2021.00	BRICKLAYER/BRICKMASONS & BLOCKMASONS	4	21	4	84.00%

Source: MT DLI Registered Apprentice Program. Data from 2008 to September 30, 2018

Looking at data for the past ten years, the average time it takes to complete an apprenticeship is 43 months, just under four years. Figure 20 shows, by occupation, the number of apprenticeships that were completed within these 43 months. Figure 20 also shows the average number of months it takes to complete a program by occupation, starting with the shortest training programs.

Figure 20: Apprenticeship Completion Rates by Occupation

ONET	Occupation	Apprenticeships Completed in Less than 43 Months	Average Completion Time (Months)
31-1014.00	NURSE ASSISTANT CERTIFIED	25	8
51-4011.00	NUMERICAL CONTROL MACHINE TOOL OPERATORS AND TENDERS, METAL AND PLASTIC	1	13
29-2034.02	RADIOLOGIC TECHNICIANS	1	14
39-9011.00	CHILD CARE DEVELOPMENT SPECIALIST	79	18
47-2073.00	OPERATING ENGINEERS	25	22
15-1131.00	COMPUTER PROGRAMMER	1	24
49-2022.00	TELECOMMUNICATIONS TECHNICIAN	4	24
13-2021.02	APPRAISERS, REAL ESTATE	1	25
51-8013.00	POWER GENERATING PLANT OPERATORS, EXCEPT AUXILIARY EQUIPMENT OPERATORS	4	27
49-2098.00	SECURITY AND FIRE ALARM SYSTEMS INSTALLERS	13	32
51-8012.00	POWER DISTRIBUTORS AND DISPATCHERS	4	34
47-2181.00	ROOFERS	4	35
33-2011.01	FIRE FIGHTER	41	36
51-8021.00	STATIONARY ENGINEERS & BOILER OPERATORS	41	36
47-2021.00	BRICKLAYER/BRICKMASONS & BLOCKMASONS	20	37
49-9041.00	INDUSTRIAL MACHINERY MECHANICS	37	38
47-2031.01	CARPENTER	26	38
	POWERHOUSE MECHANIC	8	38
17-3022.00	CIVIL ENGINEERING TECHNICIANS	1	38
49-2095.00	ELECTRICAL AND ELECTRONICS REPAIRERS, POWERHOUSE, SUBSTATION, AND RELAY	3	38
17-3012.02	DRAFTER, ELECTRICAL	1	38
47-2221.00	STRUCTURAL IRON AND STEEL WORKERS	40	38
49-3052.00	MOTORCYCLE MECHANICS	2	40
49-9051.00	ELECTRICAL POWER-LINE INSTALLERS AND REPAIRERS	74	41
47-2132.00	INSULATION WORKER	1	43
51-3023.00	BUTCHER, ALLROUND	1	43
47-2011.00	BOILERMAKER	35	43
47-2152.01	PIPE FITTERS	42	44
47-2051.00	CEMENT MASONS AND CONCRETE FINISHERS	0	44
47-2111.00	ELECTRICIANS	307	45
49-9052.00	TELECOMMUNICATIONS LINE INSTALLERS AND REPAIRERS	1	46
49-2096.00	ELECTRICAL	1	47
47-2211.00	SHEET METAL WORKERS	29	47
49-9021.02	REFRIGERATION MECHANICS	1	50
51-3021.00	BUTCHERS AND MEAT CUTTERS	0	50
47-2152.02	PLUMBERS	142	51
49-9021.01	HEATING & AIR CONDITIONING MECHANIC & INSTALLER	1	51
49-9071.00	INDUSTRIAL MAINTENANCE REPAIRER	1	51
47-2044.00	TILE AND MARBLE SETTERS	0	51
17-3011.01	DRAFTER, HEATING & VENTILATE/PLUMBING	0	52
47-4021.00	ELEVATOR INSTALLERS AND REPAIRERS	0	66
47-2061.00	CONSTRUCTION LABORERS	2	76
49-3021.00	AUTOMOTIVE BODY AND RELATED REPAIRERS	0	80
Total		1,020	43

Source: MT DLI Registered Apprentice Program. Data from 2008 to September 30, 2018

Wages of Apprentices

The wage and employment outcomes of apprentices can be tracked after the completion of their training using information from the mandatory reporting of employment and wages from the Unemployment Insurance program. This data source provides information on the quarterly earnings of individuals from nearly all Montana employers. However, self-employed individuals and employers outside Montana are not included in the data, which may result in underestimates of the number of apprentices working after training. The wage match was completed for 2,477 apprentices who successfully completed their training, plus the 2,438 participants who started an apprenticeship but did not complete it. The non-completers were included in the analysis to provide a group of workers who are similar to the successful apprentices prior to the training, thus allowing us to conclude that the wage gains are due to the apprentice training instead of pre-existing characteristics.

Among graduates from 2012 to 2016, 86.8% were employed and working for a Montana employer, providing an important source of trained workers for our state. Comparing all apprentices who graduated since 2000, 78.0% of apprentices were working for Montana employers. In comparison, only 60.7% of cancelled participants (since 2012) were working for Montana employers in 2017. The percentage of apprentices working in Montana will decrease over time as individuals leave the workforce or move out of state.

Successful apprentices had wages that are roughly 50% higher than the average Montana wage, and 76% higher than those who did not complete their apprentice program. Successful apprentices had average wages of \$63,635 in 2017, \$20,000 higher than the 2017 average wage for all Montana workers of \$42,045. In comparison, workers who did not complete their apprenticeship training had an average wage of \$36,070 in 2017.

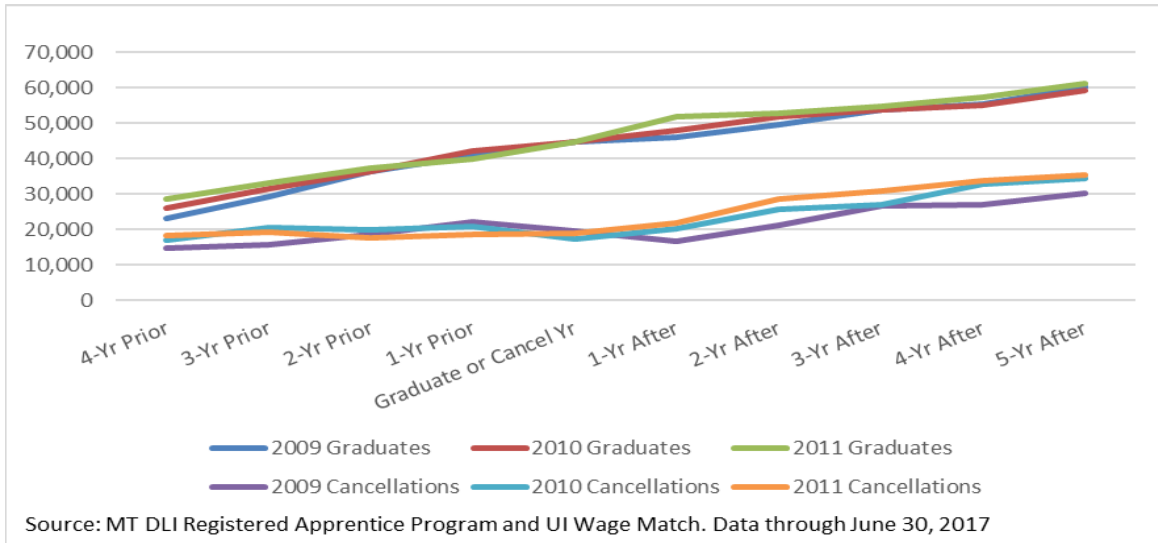
Not only do apprentices see high wages post-graduation, but they also earn wages while earning their certification. This has led some policymakers and economists to argue that apprenticeship offers a solution to rising tuition costs and high student debt loads, thus strengthening the middle class.^{vi} 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 wages earned normally increase while in training as skills progress and continue to increase post-graduation. The wage match shows this increase. Among those who successfully completed their apprenticeship in 2015, wages increased by 11.8% within the first year after graduation. These post-graduation earnings were 86.7% higher than the annual wage earnings five years before graduating (typically before the apprentice started their training).

In comparison, those who did not complete the apprenticeship training, who were likely similar in demographic and economic characteristics as completers when starting the apprenticeship training, had five-year wage gains of only 26.4%. One year after cancellation, those that did not complete training had negative wages growth of -2.2%.

Long-term average wage gains are shown in Figure 21. This graph includes individuals that ended a program between 2009 and 2011 and their average wages from 5-years before graduation or cancellation to 5-years after graduation or cancellation.

Figure 21: Average Wages of Apprentices Before, During, and After Graduation



Many apprenticeships are in occupations that pay high wages, which is one of the reasons for the high wages after graduation. However, Figure 22 illustrates the wages earned by recent graduates from the apprenticeship program by occupation compared to Montana wages at the 25th-percentile wage and the Montana 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 wages include 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. For roughly half of the occupations, the recent apprenticeship graduates were earning wages significantly higher than the statewide average. In 11 of the 12 of the occupations shown, the apprentice graduates were earning wages that were 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.

Figure 22: 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

Source: MT DLI Registered Apprenticeship Program and UI wage match. OES wage data from the May 2017 Bureau of Labor Statistics Occupation Employment Survey, Montana.

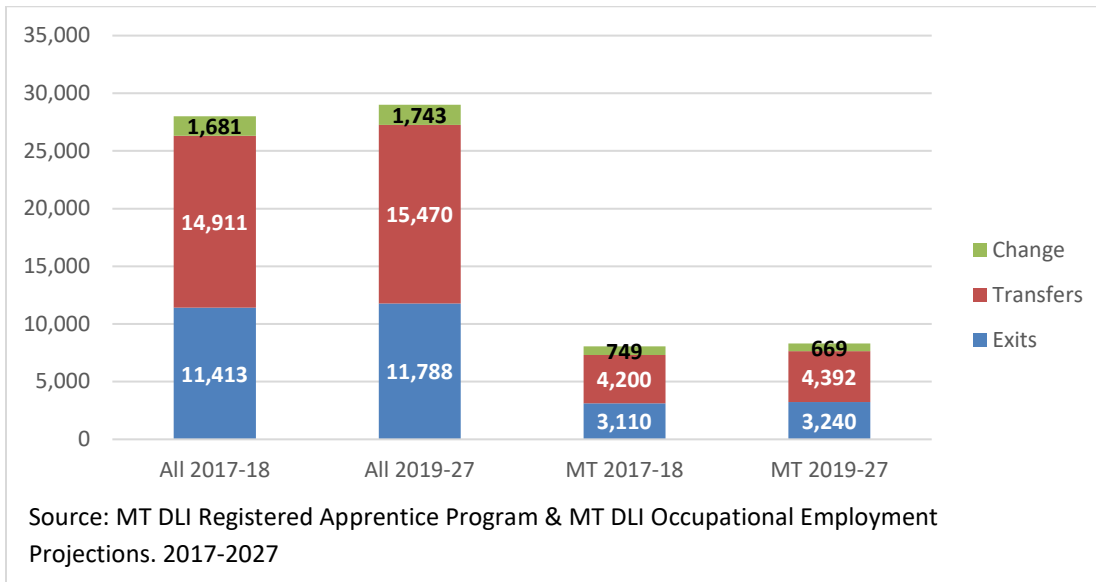
These high wages suggest apprentices are getting a good return on their investment, which is consistent with other research on apprenticeship. One study found that the returns to apprenticeship training exceed the return on investment for other types of training, with the long-term gains or apprenticeship training of about \$266,000 over the worker’s career compared to only \$130,000 for a community college degree.^{vii}

Apprenticeships in the Future - Expected Worker Demand for Apprenticeable Jobs

The Department of Labor & Industry’s forecasts for 2018-2019 and 2020-2027 show that the apprenticeship program has potential to expand because workers are needed in apprenticeable occupations. Looking at the national list of all possible occupations that are apprenticeable, the total workforce 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).^{viii} Apprenticeable occupations represent nearly 47 percent of Montana’s total worker demand.

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 23 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 23: Annual Employment Needs for Apprenticeable Occupations



Appendix: Data Tables

Figure 24: Apprenticeships by County - January 1, 2000 to September 30, 2018

FIPS	County	Total Apprenticeships	FIPS	County	Total Apprenticeships
49	LEWIS AND CLARK	1,582	95	STILLWATER	30
31	GALLATIN	1,084	73	PONDERA	27
111	YELLOWSTONE	917	77	POWELL	22
93	SILVER BOW	672	89	SANDERS	21
29	FLATHEAD	644	55	MCCONE	19
63	MISSOULA	534	71	PHILLIPS	19
13	CASCADE	413	91	SHERIDAN	19
81	RAVALLI	272	35	GLACIER	18
67	PARK	195	5	BLAINE	16
41	HILL	131	99	TETON	16
17	CUSTER	109	65	MUSSELSHELL	13
83	RICHLAND	102	15	CHOUTEAU	10
53	LINCOLN	76	45	JUDITH BASIN	9
43	JEFFERSON	63	59	MEAGHER	9
47	LAKE	59	19	DANIELS	8
23	DEER LODGE	49	75	POWDER RIVER	8
21	DAWSON	46	79	PRAIRIE	8
57	MADISON	46	97	SWEET GRASS	8
85	ROOSEVELT	46	101	TOOLE	8
1	BEAVERHEAD	45	109	WIBAUX	6
87	ROSEBUD	40	37	GOLDEN VALLEY	4
3	BIG HORN	38	51	LIBERTY	4
9	CARBON	38	107	WHEATLAND	4
105	VALLEY	36	61	MINERAL	3
27	FERGUS	34	33	GARFIELD	2
7	BROADWATER	32	39	GRANITE	1
25	FALLON	30			

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

Figure 25: New Apprenticeships by County

County	2016	2017	2018 (through Sep 30)	Total Trained since 2000	County	2016	2017	2018 (through Sep 30)	Total Trained since 2000
LEWIS AND CLARK	114	95	141	1,590	PONDERA	1	3	3	29
GALLATIN	101	106	67	1,086	POWELL	2	1	3	25
YELLOWSTONE	84	51	56	942	MCCONE	0	2	0	21
SILVER BOW	52	60	33	676	PHILLIPS	0	3	1	20
FLATHEAD	36	42	70	640	SANDERS	1	3	0	20
MISSOULA	44	40	41	547	SHERIDAN	0	0	0	19
CASCADE	25	35	34	419	GLACIER	0	0	2	18
RAVALLI	27	31	18	267	BLAINE	0	7	7	16
PARK	27	15	19	202	ROSEBUD	0	6	6	16
HILL	2	16	6	131	TETON	2	1	1	16
CUSTER	2	39	33	111	MUSSELSHELL	1	1	1	13
RICHLAND	1	3	4	111	CHOUTEAU	0	0	2	10
LINCOLN	7	6	6	76	JUDITH BASIN	1	0	1	9
JEFFERSON	4	8	8	65	MEAGHER	0	1	2	9
LAKE	5	8	3	59	SWEET GRASS	0	0	0	9
DEER LODGE	0	4	0	50	DANIELS	0	0	0	8
DAWSON	3	1	9	48	POWDER RIVER	2	0	0	8
BEAVERHEAD	1	1	1	46	PRAIRIE	0	1	1	8
BIG HORN	9	13	5	44	TOOLE	1	0	0	8
MADISON	5	7	3	44	WIBAUX	0	1	1	6
ROOSEVELT	11	11	0	43	GOLDEN VALLEY	0	0	0	4
VALLEY	3	9	3	43	LIBERTY	0	3	0	4
CARBON	3	4	0	41	WHEATLAND	0	1	2	4
STILLWATER	1	2	3	37	MINERAL	0	0	0	3
BROADWATER	2	1	3	32	GARFIELD	0	0	0	2
FERGUS	2	1	5	32	GRANITE	1	0	0	1
FALLON	0	4	0	30					

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

Figure 26: New Apprenticeships by Occupation

ONET	Occupation	2012	2013	2014	2015	2016	2017	2018 (through Sep 30)	Total Trained since 2000
47-2111.00	ELECTRICIANS	133	171	196	240	253	229	211	3,087
47-2152.02	PLUMBERS	61	107	126	126	166	124	107	1,854
47-2031.01	CARPENTER	5	15	22	30	30	40	70	412
47-2221.00	STRUCTURAL IRON AND STEEL WORKERS	14	19	37	11	17	11	3	399
39-9011.00	CHILD CARE DEVELOPMENT SPECIALIST	10	4	1	0	0	14	15	337
47-2152.01	PIPE FITTERS	27	24	31	24	26	35	30	331
47-2211.00	SHEET METAL WORKERS	9	21	25	17	27	21	14	324
47-2011.00	BOILERMAKER	6	16	7	21	3	15	8	241
49-9051.00	ELECTRICAL POWER-LINE INSTALLERS AND REPAIRERS	16	6	13	24	9	18	8	234
31-1014.00	NURSE ASSISTANT CERTIFIED	0	0	0	2	36	83	42	163
51-8021.00	STATIONARY ENGINEERS & BOILER OPERATORS	8	2	13	7	4	4	6	116
47-2181.00	ROOFERS	6	7	17	17	19	0	0	104
47-2073.00	OPERATING ENGINEERS	8	4	0	1	0	8	0	95
47-2061.00	CONSTRUCTION LABORERS	1	4	2	8	1	2	0	93
47-2021.00	BRICKLAYER/BRICKMASONS & BLOCKMASONS	1	1	4	5	4	3	8	88
49-9021.01	HEATING & AIR CONDITIONING MECHANIC & INSTALLER	2	3	7	4	8	19	25	85
49-9041.00	INDUSTRIAL MACHINERY MECHANICS	1	2	11	6	3	0	0	78
33-2011.01	FIRE FIGHTER	6	6	1	2	0	1	0	75
49-2022.00	TELECOMMUNICATIONS TECHNICIAN	0	0	0	4	3	2	1	63
47-4021.00	ELEVATOR INSTALLERS AND REPAIRERS	0	1	3	7	4	0	0	49
49-2098.00	SECURITY AND FIRE ALARM SYSTEMS INSTALLERS	1	1	1	0	0	0	0	36
29-2071.00	MEDICAL RECORD AND HEALTH INFORMATION TECHNICIAN/MEDICAL CODERS	0	0	0	0	0	7	24	31
47-2051.00	CEMENT MASONS AND CONCRETE FINISHERS	2	0	0	2	0	0	0	19
49-9021.02	REFRIGERATION MECHANICS	0	0	0	3	0	2	1	15
49-2095.00	ELECTRICAL AND ELECTRONICS REPAIRERS, POWERHOUSE, SUBSTATION, AND RELAY	0	0	0	2	0	1	1	14
49-3021.00	AUTOMOTIVE BODY AND RELATED REPAIRERS	0	0	0	1	0	7	0	13
51-3023.00	BUTCHER, ALLROUND	1	0	1	0	3	0	1	13
51-8012.00	POWER DISTRIBUTORS AND DISPATCHERS	0	0	0	3	1	1	0	12

49-9071.00	INDUSTRIAL MAINTENANCE REPAIRER	0	0	0	0	0	0	0	11
51-8013.00	POWER GENERATING PLANT OPERATORS, EXCEPT AUXILIARY EQUIPMENT OPERATORS	0	0	0	0	0	0	0	11
51-3021.00	BUTCHERS AND MEAT CUTTERS	0	3	1	0	3	1	2	10
47-2141.00	PAINTER, INDUST COATING AND LINING APP SPECIALIST	0	0	0	1	0	0	0	9
49-2093.00	ELECTRICAL AND ELECTRONICS INSTALLERS AND REPAIRERS, TRANSPORTATION EQUIPMENT	0	0	6	3	0	0	0	9
17-3011.01	DRAFTER, HEATING & VENTILATE/PLUMBING	0	0	0	0	0	5	3	8
47-2044.00	TILE AND MARBLE SETTERS	0	0	0	0	0	0	0	8
49-2096.00	ELECTRICAL	0	0	0	0	0	5	3	8
49-3023.02	AUTOMOTIVE SPECIALTY TECHNICIANS	0	0	0	1	0	5	2	8
49-9097.00	SIGNAL AND TRACK SWITCH REPAIRERS	0	0	3	5	0	0	0	8
51-4041.00	MACHINISTS	0	0	3	3	0	0	0	8
49-9052.00	TELECOMMUNICATIONS LINE INSTALLERS AND REPAIRERS	0	0	0	0	0	3	2	7
43-3031.00	ACCOUNTING TECHNICIAN	0	0	0	0	0	2	4	6
49-3031.00	BUS AND TRUCK MECHANICS AND DIESEL ENGINE SPECIALISTS	0	0	1	0	1	0	0	6
49-3043.00	RAIL CAR REPAIRERS	0	0	2	4	0	0	0	6
49-3052.00	MOTORCYCLE MECHANICS	0	0	0	1	0	0	0	6
11-9111.00	MEDICAL AND HEALTH SERVICES MANAGERS	0	0	0	0	2	2	1	5
31-9094.00	MEDICAL SCRIBE (MEDICAL TRANSCRIPTIONIST)	0	0	0	0	0	5	0	5
49-3042.00	MOBILE HEAVY EQUIPMENT MECHANICS, EXCEPT ENGINES	1	3	0	0	0	0	0	5
51-9061.00	ELECTRIC METER TESTER	0	1	0	2	0	1	0	5
53-5011.00	ABLE SEAMEN	1	1	0	1	1	0	0	5
31-9092.00	MEDICAL ASSISTANT	0	0	0	0	0	1	3	4
15-1151.00	COMPUTER SUPPORT SPECIALIST	0	0	0	0	0	0	3	3
31-9095.00	PHARMACY AIDES	0	0	0	0	0	0	0	3
41-3041.00	TRAVEL AGENT	0	0	0	0	0	0	3	3
47-2132.00	INSULATION WORKER	0	0	0	0	0	1	0	3
49-3023.01	AUTOMOTIVE MASTER MECHANICS	0	0	0	0	0	0	0	3
49-9044.00	MILLWRIGHTS	3	0	0	0	0	0	0	3
51-6041.00	SHOE AND LEATHER WORKERS AND REPAIRERS	0	1	0	0	0	0	2	3
	MASTER BREWER	0	0	0	0	0	0	3	3

11-9081.00	LODGING MANAGER	0	0	0	0	0	0	2	2
13-2021.02	APPRAISERS, REAL ESTATE	0	0	0	0	0	0	0	2
17-3022.00	CIVIL ENGINEERING TECHNICIANS	0	1	0	1	0	0	0	2
17-3029.09	INDUSTRIAL MANUFACTURING TECHNICIAN	0	0	0	0	0	0	2	2
21-1091.00	COMMUNITY HEALTH WORKER	0	0	0	0	0	0	2	2
29-2061.00	LICENSED PRACTICAL AND LICENSED VOCATIONAL NURSES	0	0	0	0	0	1	1	2
49-2011.00	TECH SUPPORT ENGINEER	0	0	0	0	0	0	2	2
49-2094.00	ELECTRICAL AND ELECTRONICS REPAIRERS, COMMERCIAL AND INDUSTRIAL EQUIPMENT	0	0	1	0	0	0	0	2
49-9012.00	METER MECHANICS	0	0	0	2	0	0	0	2
49-9031.00	ELECTRIC HOME APPLIANCE AND POWER TOOL REPAIRERS	0	0	0	0	0	0	0	2
	POWERHOUSE MECHANIC	0	0	0	0	0	2	0	2
11-3021.00	INFORMATION TECHNOLOGY MANAGER	0	0	0	0	0	0	1	1
13-1031.00	INSURANCE ADJUSTERS, EXAMINERS, AND INVESTIGATORS	0	0	0	0	0	1	0	1
15-1131.00	COMPUTER PROGRAMMER	0	0	0	0	1	0	0	1
15-1142.00	INFORMATION TECHNOLOGY SPECIALIST	0	0	0	0	0	0	1	1
17-3023.03	ELECTRICAL TECHNICIAN	0	0	0	0	0	1	0	1
29-2012.00	MEDICAL LAB ASSISTANT	0	0	0	0	0	0	1	1
29-2034.02	RADIOLOGIC TECHNICIANS	0	0	0	0	1	0	0	1
29-2052.00	PHARMACY TECHNICIANS	0	0	0	0	1	0	0	1
29-2053.00	BEHAVIORAL HEALTH AIDE	0	0	0	0	0	0	1	1
29-2055.00	SURGICAL TECHNOLOGISTS	0	0	0	0	0	1	0	1
31-9097.00	PHLEBOTOMIST	0	0	0	0	0	0	1	1
41-2022.00	PARTS SALESPERSONS	0	0	0	0	0	0	0	1
49-2092.00	POWER-TRANSFORMER REPAIRER	0	0	0	0	0	1	0	1
49-3022.00	GLASS INSTALLER (AUTO SERV)	0	0	0	0	0	1	0	1
51-4011.00	NUMERICAL CONTROL MACHINE TOOL OPERATORS AND TENDERS, METAL AND PLASTIC	0	0	1	0	0	0	0	1
51-4121.06	WELDERS AND CUTTERS	0	0	0	1	0	0	0	1
51-9021.00	CRUSHING, GRINDING, AND POLISHING MACHINE SETTERS, OPERATORS, AND TENDERS	1	0	0	0	0	0	0	1
51-9199.00	ELECTRONICS UTILITY WORKER	0	0	0	0	0	1	0	1
	AUTOMOTIVE TECHNICIAN SPECIALIST	0	0	0	0	0	0	1	1

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

ⁱ 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.

ⁱⁱ Office of the Commissioner of Higher Education, Graduation Rates, System Level for the MUS total.

<http://mus.edu/CCM/CCA%20Outcome%20Metric%20-%20Grad%20Rates,%20ASSOCIATES.pdf>

ⁱⁱⁱ Bureau of Labor Statistics Employee Tenure data, available at www.bls.gov.

^{iv} Occupation counts are based on ONET codes.

^v 2017 American Community Survey 1-Year Estimates, U.S. Census Bureau

^{vi} 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.

^{vii} Ibid.

^{viii} 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.