



# Montana Department of **LABOR & INDUSTRY**

## Registered Apprenticeship Program Data Report September 15, 2016

Prepared by  
Emily Klungtvedt, Economist  
Barbara Wagner, Chief Economist  
Jake Troyer, Public Information Officer

Registered Apprenticeship Program Staff  
Scott Eychner, Division Administrator  
Pam Watson, Bureau Chief  
Darrell Holzer  
Valerie Piet

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 is just as integral to our worker training systems today as it has been in century's past, but today's apprenticeships have evolved to meet the

needs of our economy. Today's apprentices study in fields like information technology and healthcare, in addition to the traditional apprenticeships for plumbers, carpenters, and electricians. Apprenticeships today also 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 on-the-job and classroom training required to meet the national requirements for an industry-recognized certificate through a curriculum customized to meet the needs of the employer. Once an apprentice has completed a registered apprenticeship program, he or she obtains an industry-recognized credential indicating to employers in all fifty states that the worker is qualified and trained. This credential also provides future employers and customers with a guarantee that the worker is appropriately trained and capable of getting the job done right.

Since 2000, the Montana Registered Apprenticeship program has overseen 7,005 apprenticeships in over 60 occupations involving over 1,016 businesses. 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 an hourly wage while learning hands-on skills alongside a journeyman or mentor. Apprentices that successfully completed the program earn average wages of \$59,600 in 2015, much higher than the statewide average wage of \$40,065.

Over the last five years, the program has graduated an average of 164 apprentices per year, making a large contribution to the training of Montana's successful workforce and producing a graduation cohort roughly the same size as Helena College.<sup>1</sup> This report provides additional information on the apprenticeship program, including data on past participants' demographics, program participation, and employment outcomes, designed to provide insight to policy makers and program administrators looking to improve the success of the program. Some highlights include:

- Apprenticeship training has been gaining popularity in the last five years, responding to the increased demand for trained workers by businesses. There were 583 new apprenticeships in 2015 compared to 266 new in 2010.
- Apprenticeships result in high-paying jobs. Apprentices who successfully completed their training had an average wage of \$59,600 in 2015, nearly \$20,000 higher than the statewide average wage and 65% higher than participants that started a program, but did not finish it.
- Graduates that completed their program in 2014 saw a 20% increase in wages within one year of graduation. Wages during the year after graduation were 117% higher than their wages five years earlier.
  - In comparison, participants who did not complete their apprenticeship training experienced a wage increase of 6% over the year and 61% from five years prior.
- Apprentices help keep skilled workers in Montana. Eighty-nine percent of apprentices that have graduated from the program since 2010 are currently working for a Montana employer.
- The number of sponsors has been increasing by approximately five percent per year in the last three years.

- The programs are largely based in the more populated counties. In fact, 42% of all apprenticeship programs are in the three counties of Lewis & Clark, Gallatin, and Yellowstone County.
- 53 out of Montana's 56 counties have had an apprenticeship since 2000.
- There are 60 different occupations available for apprenticing in Montana, with more occupations being added when employers express interest. Sixteen of the 60 occupations have been started since 2012, including nursing aides.
- The majority of apprentices are in the traditional fields, with 36% of programs for electricians and 22% for plumbing. These two occupations require an apprentice certificate for licensing in Montana.
- Nursing aides is the fastest growing new program. Two apprentices participated in the nursing aide apprentice program in its first year (2015), and there are 26 new apprentices enrolled in 2016.
- Ninety-three percent of apprentices are men. The number of women participating is related to the size of the childcare and nursing aide programs. While nursing aide programs are increasing, the childcare programs have decreased in participation, with no new apprentices in 2015.
- Apprentices are generally between the ages of 25 and 44. In recent years, there has been an increase of those using the program between the ages of 16 and 24.
- Most programs are recommended to be completed in 48 months. On average, apprentices complete the program in 42 months. Over 60% of completed programs are finished within the recommended time.
- The 7,005 apprenticeships have been participated in by 5,990 people, meaning that some individuals participated in more than one program. Of the 5,990 people, 38% completed a program, 23% are currently in a program, and 39% cancelled a program without going on to complete one.
  - Although this completion rate may seem low, it is higher than other educational programs offered in Montana. Roughly 20%-24% of associate degree seekers entering Montana University System Schools successfully graduate within four years.
- Although roughly 70% of the apprentice sponsors have just one or two apprentices, the success of the program is highly reliant on a handful of employers. In 2015, one sponsor hosted 169 apprentices (mostly electricians). There were 12 sponsors that had over 20 apprentices each.

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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 environment that involves both technical instruction and on-the-job practical training from an assigned mentor. In order to be 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 apprentice 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 like plumbers or electricians. In many instances, the participant also has the opportunity to earn a simultaneous post-secondary degree.

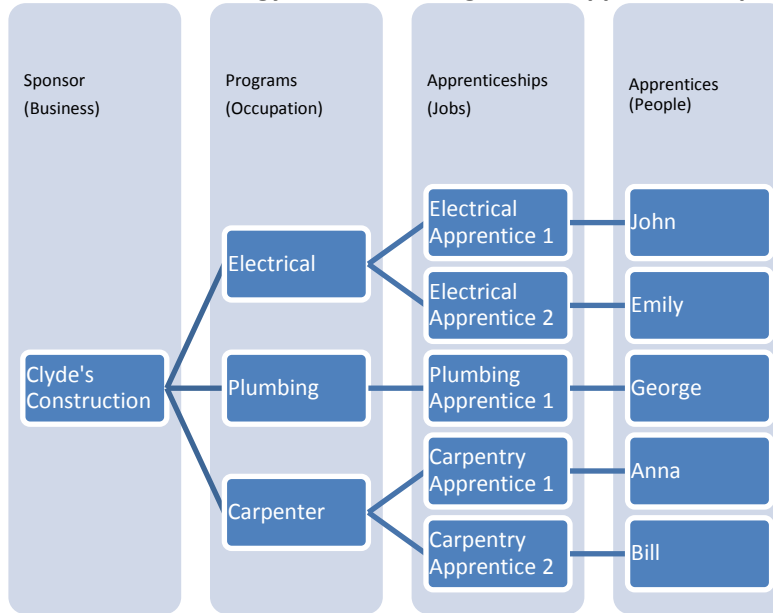
The role of the Montana Department of Labor & Industry is to work with employers to help them set up programs that follow the recommended curriculum, then monitor progress to ensure that the apprentice and business sponsor are meeting program goals. The Montana Department of Labor & Industry can also help businesses find potential workers to fill the apprenticeship position, but the hiring process is completed by the employer. There were about 500 Montana businesses serving as apprenticeship sponsors in 2015.

The U.S. Department of Labor maintains a list of all occupations that can be trained through a registered apprentice program. Montana offers training in roughly 60 of these occupations. The largest occupations trained in Montana are electricians and plumbers, but training programs are diverse and includes non-trade related occupations like nursing aides, daycare providers, radiologic technicians, and computer programming.

Most apprenticeships are expected to be completed in 8,000 hours, or approximately four years. However, 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 for by the apprentice, although sponsors can also meet these needs. Sponsors also pay for the additional time and effort to provide on-the-job guidance, but gain in having a worker that is specifically trained to meet the exact needs of the business.

In terms of terminology, sponsors are businesses that are willing to pay and train an apprentice. Programs are the different occupations in 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 July 20, 2016, the Montana Department of Labor & Industry’s apprenticeship program has overseen 7,005 apprenticeships that were participated in by 5,990 individuals. Figure 2 shows the number of apprenticeship positions that were completed, cancelled (includes transfers and suspensions), or are currently in progress.

Roughly 46% of individuals who started an apprenticeship training position during this period did not complete their training. Most of these cancellations occur after the probation period. Like many other permanent employment positions, apprenticeships have a probation period of six months or 25% of the training period, whichever is shorter. Many employers and apprentices find that the job match is not working out well, or that the worker is no longer needed, and end the work partnership.

**Figure 2: Apprenticeship Trainings by Outcome Percentage**

	Apprentice Positions	Outcome Percent
Completed	2,386	34%
Cancelled	3,197	46%
Ongoing	1,422	20%
	<u>7,005</u>	<u>100%</u>

Source: MT DLI Registered Apprenticeship Program (RAP), 2000 to July 2016

Many of the apprenticeship candidates who cancel with one apprenticeship transfer to a different apprenticeship either in a different training program or in the same training program with a different employer. In addition, some apprentices complete more than one program, resulting in 7,005 different apprenticeships participated in by 5,990 individuals. If an apprentice transfers to a different program, it is recorded as a cancellation of the first apprenticeship. Of the individuals with duplicate records:

- 54 completed multiple training programs;
- 17 completed a program and are currently enrolled in another program;
- 363 cancelled a program, but then also successfully completed a training program;
- 189 cancelled a program and are currently enrolled in a different program; and
- 296 individuals cancelled multiple programs but never completed a program and are no longer enrolled in a program.

Figure 3 shows the number of individuals in an apprenticeship by their final result. By individual, roughly 38% 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 39% of apprenticeships are cancelled without the apprentice finding another apprentice training position.

	<b>Apprentice Positions</b>	<b>Outcome Percent</b>
Completed	2,306	38%
Cancelled	2,310	39%
Ongoing	1,374	23%
	<b>5,990</b>	<b>100%</b>

Source: MT DLI Registered Apprentice Program (RAP), 2000 to July 2016

Although the completion rate of 38% may seem low, it is slightly higher than the graduation rates of similar educational programs. Only 20% to 24% 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.<sup>ii</sup>

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. 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 (the most common apprentice age group) having even shorter duration of 2.8 years.<sup>iii</sup>

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 (7,005), or by the number of people who have filled these positions (5,990). 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 Since 2010

The number of new apprenticeships has been steadily growing since 2010 with a small dip in new apprenticeships started in 2012. In 2015, there were 583 new apprenticeship training positions, which is over twice the amount in 2010. Because of this, the total number of apprenticeships has increased from 1,442 in 2010 to 1,709 in 2015. Figure 4 illustrates participation in the registered apprentice program by year since 2010, 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 ongoing. The in-program metric is conceptually similar to enrollment statistics for colleges and universities, including all student served regardless of outcome. Data for 2017 and 2018 is estimated by increasing program participation in 2015 by 5% per year.

**Figure 4: Apprenticeship Program Participation**

Result	2010	2011	2012	2013	2014	2015	2016	5% increase per year	
							(6 months)	2017	2018
In program	1,442	1,402	1,236	1,278	1,458	1,709	1,649	1,884	1,978
Completed	221	232	159	146	121	163	77	180	189
Cancelled	169	258	218	203	211	251	151	277	291
Ongoing	1,053	912	859	929	1,126	1,294	1,421	1,427	1,498
New	266	349	324	419	531	583	355	643	675

Source: DLI apprentice program and UI wage match, 2016. Data through July 20, 2016.



In 2015, there were 1,709 apprentices enrolled in the apprentice program at some point during the year. In comparison to other workforce training institutions in Montana, the enrollment in 2015 was roughly the same size as the enrollment of Helena College or City College.<sup>iv</sup> The apprenticeship program is a sizeable and important component of Montana’s overall workforce training system.

## Business Sponsors and Number of Programs

There are 1,016 businesses that have sponsored an apprentice since 2000. Many businesses host different programs, or fields of study, for apprentices, with a total of 1,170 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 apprentices, the business would be hosting two programs and three apprenticeships. Please see Figure 1 for an illustration of the terminology.

Figure 5 lists the number of programs by year since 2006 and Figure 6 lists the number of sponsors by year since 2006. Over the past three years, there has been over a 5% annual increase in both programs and sponsors. Recent expansion of programs has come 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.<sup>v</sup>

Although there are 1,170 programs, slightly less than half of them are active in a given year. Figure 7 lists the number of active programs since 2010. For example, in 2015, there were 532 programs participated in by 1,709 apprenticeships. The 532 programs in 2015 were sponsored by 502 businesses. Of these businesses:

- 54% of the 502 businesses sponsored just one apprenticeship;
- 20% of the 502 businesses sponsored two apprenticeships;
- 12 businesses sponsored over 20 apprenticeships
- One business sponsored 169 apprenticeships in three different programs. Most of these apprenticeships were electricians.

Year	Total Programs	% Change	New Programs
Before 2006	686		
2006	731	6.56%	45
2007	783	7.11%	52
2008	821	4.85%	38
2009	863	5.12%	42
2010	891	3.24%	28
2011	921	3.37%	30
2012	961	4.34%	40
2013	1,013	5.41%	52
2014	1,071	5.73%	58
2015	1,125	5.04%	54
2016 (6 months)	1,170	4.00%	45

Source: DLI apprentice program and UI wage match, 2016. Data through July 20, 2016.

Year	Total Sponsors	% Change	New Sponsors
Before 2006	569		
2006	606	6.50%	37
2007	655	8.09%	49
2008	689	5.19%	34
2009	730	5.95%	41
2010	758	3.84%	28
2011	783	3.30%	25
2012	822	4.98%	39
2013	873	6.20%	51
2014	927	6.19%	54
2015	976	5.29%	49
2016 (6 months)	1,016	4.10%	40

Source: DLI apprentice program and UI wage match, 2016. Data through July 20, 2016.

<b>Figure 7: Total Number of Apprenticeships and Programs by Year</b>							
	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016 (6 months)</b>
Apprenticeships	1,442	1,402	1,236	1,278	1,458	1,709	1,649
Programs	512	499	463	464	490	532	529

Source: DLI apprentice program and UI wage match, 2016. Data through July 20, 2016

## Sponsors by Industry

The 1,016 sponsors are displayed by their primary industry sector in Figure 8. Of the 851 sponsors where industry could be determined, 651 of them are in construction.

<b>Figure 8: Apprenticeship Sponsors by Industry</b>		
<b>NAICS</b>	<b>NAICS description</b>	<b>Total</b>
11	Agriculture, Forestry, Fishing and Hunting	1
21	Mining, Quarrying, and Oil and Gas Extraction	6
22	Utilities	18
23	Construction	651
31-33	Manufacturing	14
42	Wholesale Trade	4
44-45	Retail Trade	13
48-49	Transportation and Warehousing	1
51	Information	3
52	Finance and Insurance	1
53	Real Estate and Rental and Leasing	2
54	Professional, Scientific, and Technical Services	3
56	Administrative and Support Services	3
61	Educational Services	14
62	Health Care and Social Assistance	66
71	Arts, Entertainment, and Recreation	0
72	Accommodation and Food Services	1
81	Other Services (except Public Administration)	17
92	Public Administration	33
<b>Total</b>		<b>851</b>

Source: DLI apprentice program and UI wage match, 2016. Data includes new apprentices from January 1, 2015 to July 20, 2016.

## Work Location of Apprenticeships and Sponsors

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

Lewis and Clark, Gallatin, and Yellowstone Counties are the three counties that have had the most apprenticeships. These three counties combined account for approximately 42% of all apprenticeship locations

since 2000. Figure 9 lists the five counties with the most apprenticeships and the number of apprenticeships that have been completed or are ongoing. The full table including all counties is in Figure 27 in the appendix.

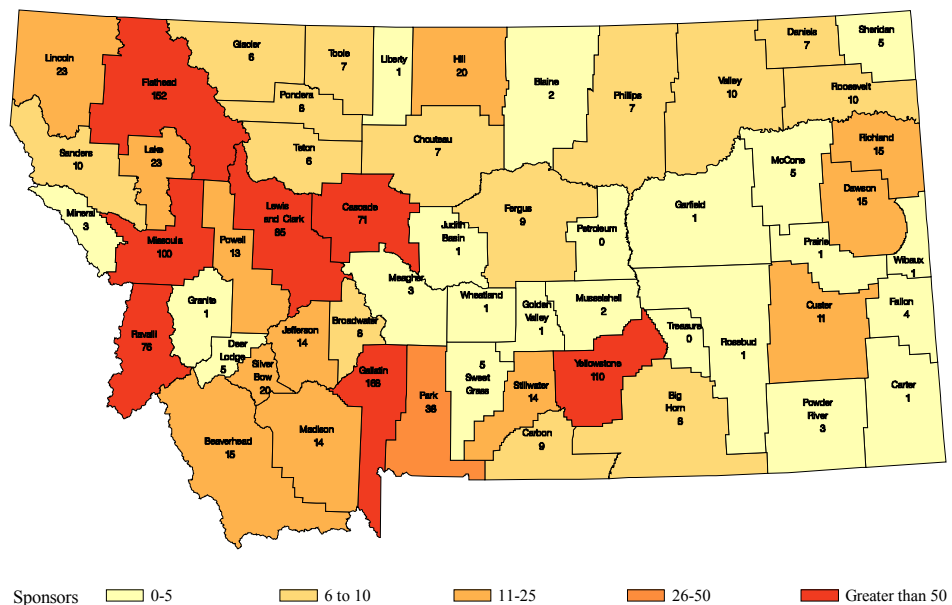
County	Total Programs	Completed/Ongoing
Lewis and Clark	1,290	721
Gallatin	877	463
Yellowstone	802	493
Silver Bow	562	406
Flathead	506	244
<b>Total</b>	<b>4,037</b>	<b>2,327</b>

Source: DLI apprentice program and UI wage match, 2016. Data through July 20, 2016.

As mentioned before, the number of new apprenticeships each year has been increasing. This increase is predominantly in the largest counties. For example, Lewis and Clark County had 42 new apprenticeships in 2010 and 102 new apprenticeships in 2015. Yellowstone County had 45 new apprenticeships in 2010 and 97 new in 2015. Figure 28 in the appendix lists all new apprentices by county for the years 2010 to 2016.

**Figure 10: Number of Apprenticeship Sponsors by County**

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 10 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. However, Silver Bow County only has 20 sponsors, that host over 560 apprenticeships.



Source: DLI apprentice program and UI wage match, 2016. Data through July 20, 2016

### Types of Occupations Trained

Apprentices have trained in 60 different occupations since 2000, with the majority of the training 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 58 occupations; 31 of those occupations have had less than 10 participants over the 16 years of data.

More recently since 2010, apprentices have trained in 50 different occupations. The occupations that have not had an apprentice in the last six years include many construction and housing-related occupations (appraisers, real estate; insulation workers, mechanical; maintenance and repair workers, general; telecommunications line

installers and repairers; and tile and marble setters) that may gain more interest as the construction industry returns. However, pharmacy aides is an occupation that has not had an apprentice in the last six years even though the health care industry is rapidly growing and has high worker demand.

Figure 11 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 10 apprenticeships. The total column represents the total amount of apprenticeships in that occupation since 2000. For example, since 2000, 2,529 apprenticeships were in an electrician program. The full table can be found in Figure 29 in the appendix.

**Figure 11: New Apprenticeship Programs by Occupation**

ONET	Occupation	2010	2011	2012	2013	2014	2015	2016 (6months)	Total Trained since 2000
47211100	Electricians	84	143	134	173	196	243	127	2,529
47215202	Plumbers	54	74	61	106	126	123	98	1,551
47222100	Structural Iron & Steel Workers	5	14	14	19	37	10	7	374
39901100	Child Care Workers	36	20	10	4	1			308
47203101	Construction Carpenters	13	14	5	15	22	24	19	285
47221100	Sheet Metal Workers	12	8	9	20	25	17	19	280
47215201	Pipe Fitters	17	22	27	23	31	24	18	257
47201100	Boilermakers	9	10	6	16	7	21	3	218
49905100	Electrical Power-Line Installers & Repair	8	13	16	6	13	22	9	206
51802102	Stationary Engineers	5	6	8	2	11	7	2	102
47218100	Roofers	1	4	6	7	17	16	7	91
47206100	Construction Laborers		2	1	4	2	7	1	90
47207302	Operating Engineers	5	10	8	4		1		87
47202100	Brickmasons & Blockmasons	1	1	1	1	4	5	4	77
49904100	Industrial Machinery Mechanics	8	4	1	2	10	6		74
33201101	Municipal Fire Fighters	3		6	6	1	2		74
47402100	Elevator Installers and Repairers					1	7	3	45
49902101	Heating and Air Conditioning Mechanics		1	2	3	7	4	4	37
49209800	Security & Fire Alarm Systems Installers			1	1	1			36
49202205	Station Installers & Repairers, Telephone		1						35
31101200	Nursing Aides, Orderlies, & Attendants						2	26	28
47205100	Cement Masons and Concrete Finishers			2			2		19
49902102	Refrigeration Mechanics						3		12
49209500	Electrical and Electronics Repairers, Powerhouse, Substation, and Relay	1					2		12
51302300	Slaughterers & Meat Packers	2		1		1		2	11
51801301	Power Generating Plant Operators, Except Auxiliary Equipment Operators	1							11

Source: DLI apprentice program and UI wage match, 2016. Data through July 20, 2016.

Of the top ten occupations in Figure 11, nearly all of the occupations continue to grow in participation with the exception of childcare workers. Apprenticeships for childcare workers declined to the point that there have been no new apprenticeships since 2014. The increase in childcare occupations, followed by the rapid decline is related to temporary grant funding available for childcare occupations that expired, highlighting the importance of funding to promote and create apprenticeships.

Sixteen new occupations have been added since 2012. The new occupations, year they were added, and number or participants are listed in Figure 12.

<b>Year Added</b>	<b>ONET</b>	<b>Occupation</b>	<b>Participants</b>
2012	49904400	Millwrights	3
2012	51902100	Crushing, Grinding, and Polishing Machine Setters, Operators, and Tenders	1
2013	51302100	Butchers and Meat Cutters	3
2013	17302200	Civil Engineering Technicians	2
2013	51604100	Shoe and Leather Workers and Repairers	1
2014	49209300	Electrical & Electronics Installers & Repairers, Transportation Equipment	9
2014	49909700	Signal and Track Switch Repairers	8
2014	49304300	Rail Car Repairers	6
2014	51401101	Numerical Control Machine Tool Operators and Tenders, Metal and Plastic	1
2015	31101200	Nursing Aides, Orderlies, and Attendants	28
2015	47203103	Carpenter Assemblers and Repairers	6
2015	49901203	Meter Mechanics	2
2015	51412102	Welders and Cutters	1
2015	49302302	Automotive Specialty Technicians	1
2016	29203402	Radiologic Technicians	1
2016	15102100	Computer Programmers	1

Source: DLI apprentice program and UI wage match, 2016. Data through July 20, 2016.

In some occupations, apprentices comprise a significant portion of employment. For example, over 30% of all electricians employed in Montana in 2015 were apprentices being trained through the Registered Apprenticeship Program. Figure 13 shows occupations with 15 or more active apprenticeships in 2015, along with the employment level for the occupation in Montana. Overall, workers currently undergoing apprentice training comprise 4.4% of Montana’s employment in the apprentice-able occupations in 2015, underscoring the importance of the program to meet training needs for some types of jobs.

<b>Occupation</b>	<b>2015 Active Apprenticeships</b>	<b>2015 Total Employment</b>	<b>Apprenticeship as a % of Employment</b>
Electricians	690	2,170	31.80%
Plumbers & Pipefitters	501	2,100	23.90%
Sheet Metal Workers	64	600	10.70%
Structural Iron & Steel Workers	61		
Construction Carpenters	58	4,000	1.50%
Electrical Power-Line Installers & Repairers	56	750	7.50%
Boilermakers	43	130	33.10%
Stationary Engineers	28	210	13.30%

Roofers	25	420	6.00%
Industrial Machinery Mechanics	21	670	3.10%
Construction Laborers	16	4,070	0.40%
Municipal Fire Fighters	15	340	4.40%
<b>Total of Listed Apprenticeships</b>	<b>1,578</b>	<b>15,460</b>	<b>10.20%</b>
<b>Total of All Apprentice-able Occupations</b>	<b>1,709</b>	<b>38,480</b>	<b>4.40%</b>
<b>Total of All Apprentice-able Occupations Excluding Electricians &amp; Plumbers</b>	<b>518</b>	<b>34,210</b>	<b>1.50%</b>
Notes: Listed apprenticeships include occupations with 15 or greater active apprenticeships in 2015. Blank cells indicate that the data is not available.			
Source: MT DLI RAP, 2016. Employment and wage data from the May 2015 Bureau of Labor Statistics Occupation Employment Survey, Montana.			

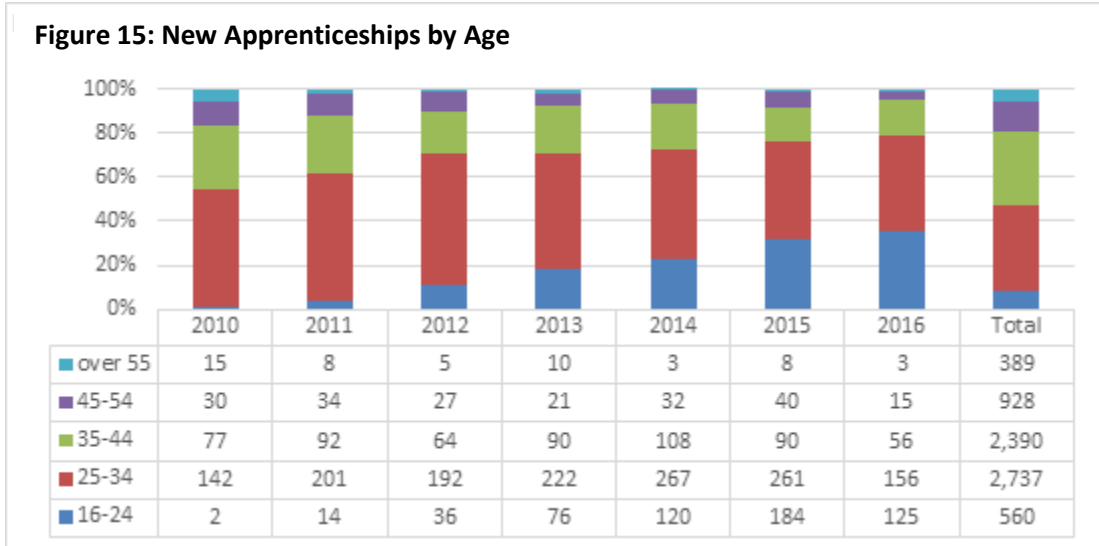
## Apprentices by Industry

With the majority of the apprentices in construction-related occupations, it is no surprise to find the majority of apprentices working in the construction industry. Figure 14 shows the primary work industry that apprentices have worked from 2015Q1 to 2016Q1, including only apprentices starting a program after 2010.

<b>Figure 14: Apprentices by Industry</b>		
<b>NAICS</b>	<b>NAICS description</b>	<b>Total</b>
21	Mining, Quarrying, and Oil and Gas Extraction	39
22	Utilities	166
23	Construction	1,419
31-33	Manufacturing	70
42, 44, 45	Wholesale and Retail Trade	145
48-49	Transportation and Warehousing	22
52-53	Financial Activities	13
54, 56	Business Services	69
61, 62	Healthcare and Education	77
71, 72	Leisure Activities	61
11, 81, 51	Other	39
92	Public Administration	39
<b>Total</b>		<b>2,159</b>
Source: DLI apprentice program and UI wage match, 2016. Data includes new apprentices from January 1, 2015 to July 20, 2016.		

## Age of Apprentices

Apprentices are generally between the ages of 25 and 44. There has been an increase in the use of apprenticeship programs by those between the ages of 16 and 24 in the past few years. Figure 15 lists new apprenticeships by age. Total is the sum of apprenticeships since 2000.



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

## Gender of Apprentices

Apprenticeships are predominantly participated in by men, who account for ninety-three percent of total apprenticeships. Figure 16 lists new apprenticeships by gender.

**Figure 16: New Apprenticeships by Gender**

Gender	2010	2011	2012	2013	2014	2015	2016 (6 months)	Total since 2000
Women	41	26	13	12	13	26	37	510
Men	225	323	311	407	518	557	318	6,492
<b>Total</b>	<b>266</b>	<b>349</b>	<b>324</b>	<b>419</b>	<b>531</b>	<b>583</b>	<b>355</b>	<b>7,002</b>
Percent								
Women	15.4%	7.4%	4.0%	2.9%	2.4%	4.5%	10.4%	7.3%
Percent Men	84.6%	92.6%	96.1%	97.1%	97.6%	95.5%	89.6%	92.7%

Source: DLI apprentice program and UI wage match, 2016. Data through July 20, 2016.

The number of women participating in apprenticeship is related to the size of the childcare and nursing aide programs, although there are some women training in other occupations. The peak year of women involved in apprenticeships was 2002 with 65 women beginning a program, which is also the peak year for the female-dominated childcare program. In 2016 thus far, 27 women started as apprentices in nursing aides, orderlies, and attendants.

Part of the reason for low enrollment of female apprentices is that the most popular apprenticeship programs are typically male-dominated occupations. According the U.S. Census Bureau, 3.1% of Montana's construction and extraction workers are women.<sup>vi</sup> 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 66 women in the electrician program (2.6%), and 16 women in the plumber program (1.0%). Figure 17 lists the new apprenticeships by occupation participated in by women from 2010 to 2016. Total is the total number of women since 2000.

**Figure 17: Number of Female Apprentices by Occupation**

ONET	Occupation	2010	2011	2012	2013	2014	2015	2016 (6 months)	Total Trained since 2000
39901100	Child Care Workers	35	18	9	4				297
47211100	Electricians		3	1	2	9	12	4	66
31101200	Nursing Aides, Orderlies, & Attendants						2	25	27
47215202	Plumbers	1	1	1			1	1	16
47206100	Construction Laborers		1				2	1	14
47207302	Operating Engineers	2	1	1					14
47203101	Construction Carpenters		1		2		2	3	13
47201100	Boilermakers						1		11
49904100	Industrial Machinery Mechanics		1		1	1	2		9
51802102	Stationary Engineers	1				2	1		9
47222100	Structural Iron and Steel Workers	1					1		8
47215201	Pipe Fitters	1		1				2	7
33201101	Municipal Fire Fighters						1		3
49209800	Security & Fire Alarm Systems Installers					1			2
47221100	Sheet Metal Workers				1				2
51302100	Butchers and Meat Cutters				1				1
49901203	Meter Mechanics						1		1
29203402	Radiologic Technicians							1	1
51604100	Shoe and Leather Workers & Repairers				1				1
<b>Total</b>		<b>41</b>	<b>26</b>	<b>13</b>	<b>12</b>	<b>13</b>	<b>26</b>	<b>37</b>	<b>502</b>

Source: DLI apprentice program and UI wage match, 2016. Data through July 20, 2016.

There are only seven occupations with greater female participation than male participation. Figure 18 lists these seven occupations and the total number of apprenticeships in those occupations.

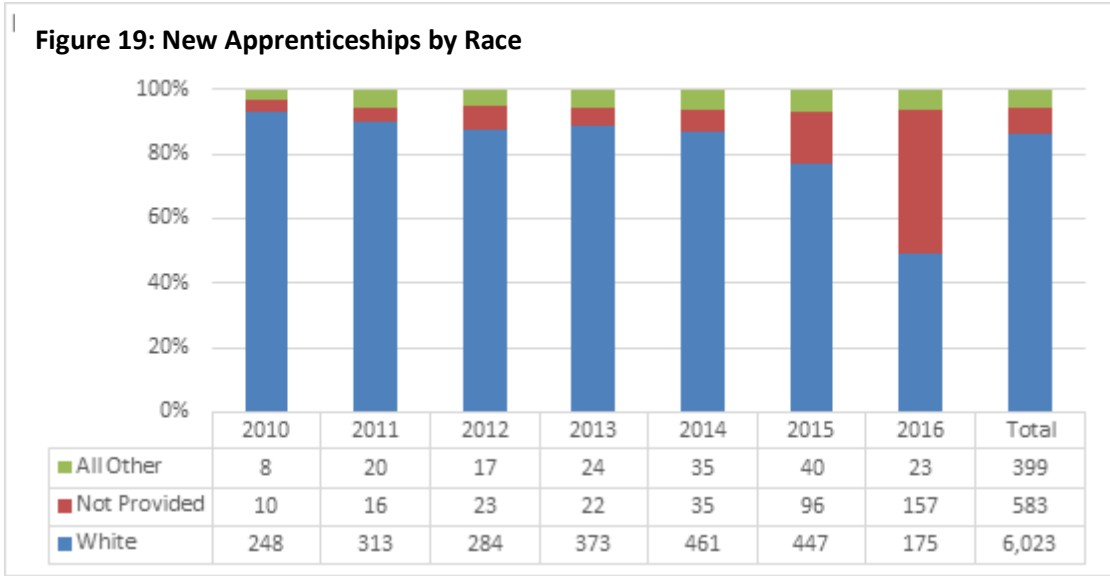
<b>Figure 18: Apprenticeship Occupations with more Women than Men</b>				
ONET	Occupation	Women	Men	
39901100	Child Care Workers	297	10	
31101200	Nursing Aides, Orderlies, and Attendants	27	1	
31909500	Pharmacy Aides	3	0	
49901203	Meter Mechanics	1	1	
49905200	Telecommunications Line Installers and Repairers	1	1	
29203402	Radiologic Technicians	1	0	
51604100	Shoe and Leather Workers and Repairers	1	0	

Source: DLI apprentice program and UI wage match, 2016. Data through July 20, 2016.

### Race of Apprentices

Figure 19 lists new apprenticeships by race. Over the last six years, the amount of people signing up in the “all other” category has increased. Again, total is a sum for all apprenticeships since 2000.

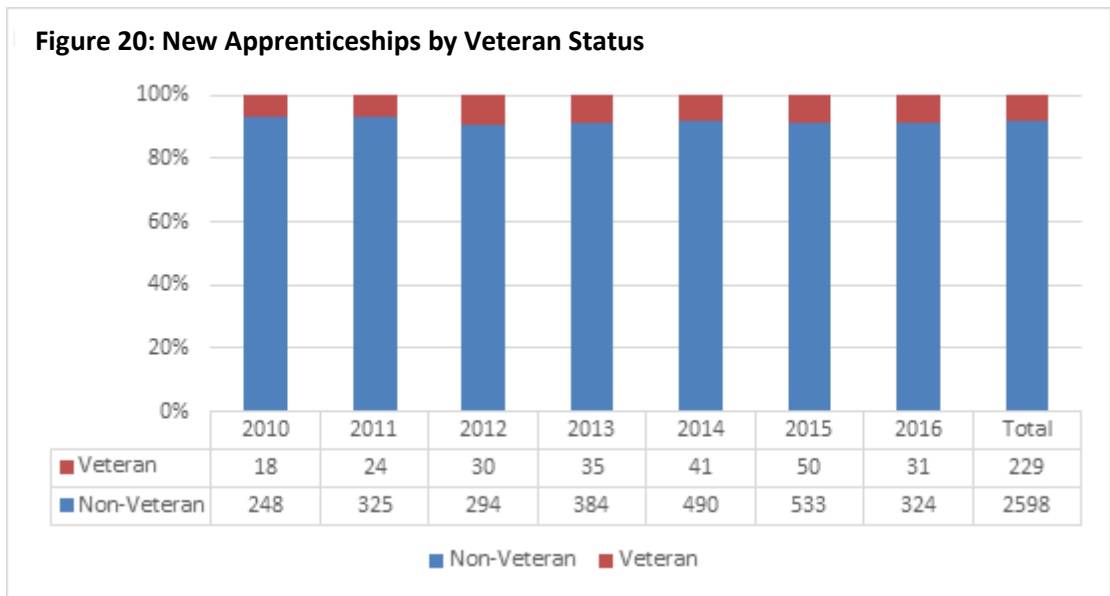




Source: DLI apprentice program and UI wage match, 2016. 2016 is through July 20, 2016. Total is total apprenticeships since 2000.

### Veterans in Apprenticeship

Figure 20 lists new apprenticeships by veteran status. The number of new veterans being signed up for apprenticeships has increased from 18 new in 2010 to 50 new in 2015.



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

### Time to Completion

Most apprenticeships are expected to be completed in 8,000 hours, which is 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 2,005 completed apprenticeships in the last 10 years. Of those, 1,231 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 21 lists these statistics for the top 20 occupations.

<b>Figure 21: Number of Apprenticeships that Complete within their Program Length</b>				
<b>Program</b>	<b>Program Length (Months)</b>	<b>Completed Within the Program Length?</b>		
		<b>Yes</b>	<b>No</b>	<b>% Yes</b>
Electricians	48	375	383	49%
Plumbers	48	180	252	42%
Electrical Power-Line Installers and Repairers	48	99	11	90%
Sheet Metal Workers	48	47	54	47%
Child Care Workers	48	87	3	97%
Pipe Fitters	48	38	35	52%
Boilermakers	48	50	15	77%
Structural Iron and Steel Workers	48	57	7	89%
Municipal Fire Fighters	48	59	0	100%
Stationary Engineers	48	41	5	89%
Industrial Machinery Mechanics	48	41	3	93%
Construction Carpenters	48	29	11	73%
Operating Engineers	48	29	0	100%
Brickmasons and Blockmasons	48	22	2	92%
Security and Fire Alarm Systems Installers	48	20	0	100%
Construction Laborers	48	7	4	64%
Station Installers and Repairers, Telephone	48	3	8	27%
Central Office and PBX Installers and Repairers	48	7	2	78%
Elevator Installers and Repairers	48	4	5	44%
Electrical and Electronics Repairers, Powerhouse, Substation, and Relay	48	7	0	100%

Source: DLI apprentice program and UI wage match, 2016. Data through July 20, 2016. Not all of the program lengths are accurate – 48 months was assumed for analysis when program lengths were not immediately available

Looking at data for the past ten years, the average time it takes to complete an apprenticeship is 42 months, just under four years. Figure 22 shows, by occupation, the number of apprenticeships that were completed within these 42 months. Figure 22 also shows the average number of months it takes to complete a program by occupation, starting with the shortest training programs.

**Figure 22: Apprenticeship Completion Rates by Type of Program**

<b>Program</b>	<b>Apprenticeships Completed in Less Than 42 Months</b>	<b>Average Completion Time (Months)</b>
Numerical Control Machine Tool Operators and Tenders, Metal and	1	12
Child Care Workers	85	21
Cement Masons and Concrete Finishers	3	22
Appraisers, Real Estate	1	24
Operating Engineers	29	24
Telecommunications Line Installers and Repairers	1	24
Power Generating Plant Operators, Except Auxiliary Equipment	4	27
Security and Fire Alarm Systems Installers	17	31
Central Office and PBX Installers and Repairers	5	34
Brickmasons and Blockmasons	21	35
Municipal Fire Fighters	59	36
Stationary Engineers	33	36
Motorcycle Mechanics	3	37
Structural Iron and Steel Workers	51	37
Civil Engineering Technicians	1	38
Construction Carpenters	24	38
Industrial Machinery Mechanics	33	38
Roofers	4	38
Electrical Power-Line Installers and Repairers	75	39
Boilermakers	44	40
Electrical and Electronics Repairers, Powerhouse, Substation, and Relay	4	41
Refrigeration Mechanics	4	41
Pipe Fitters	34	42
Slaughterers and Meat Packers	2	42
Insulation Workers, Mechanical	0	43
Electricians	331	44
Sheet Metal Workers	32	45
Construction Laborers	7	47
Maintenance and Repair Workers, General	2	47
Tile and Marble Setters	0	47
Automotive Master Mechanics	0	48
Power Distributors and Dispatchers	2	48
Elevator Installers and Repairers	4	49
Plumbers	147	51
Station Installers and Repairers, Telephone	2	51
Bus and Truck Mechanics and Diesel Engine Specialists	0	54
Heating and Air Conditioning Mechanics	0	65
Automotive Body and Related Repairers	0	72
<b>Total</b>	<b>1,065</b>	<b>42.4</b>

Source: DLI apprentice program and UI wage match, 2016. Data through July 20, 2016.

## 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 2,395 apprentices who successfully completed their training, plus the 3,143 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 2010 and later, 86.7% were employed and working for a Montana employer, providing an important source of trained workers for our state. Comparing all apprentices that graduated since 2000, 79.9% of apprentices were working for Montana employers. In comparison, only 64.8% of cancelled participants were working for Montana employers in 2015. The percentage of apprentices working in Montana will decrease over time as workers die, leave the workforce, or move out of state.

Successful apprentices also had wages that are roughly 50% higher than the average Montana wage, and 65% higher than those who did not complete their apprentice program. Successful apprentices had average wages of \$59,600 in 2015, nearly \$20,000 higher than the 2015 average wage for all Montana workers of \$40,065. In comparison, workers that did not complete their apprenticeship training had an average wage of \$36,049 in 2015.

Not only do apprentices see high wages post-graduation, but they also earn wages while earning their certification. This 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.<sup>vii</sup> The average wage for Montanans currently 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 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 2014, wages increased by 20% within one year of graduation. These post-graduation earnings were 117% higher than the annual wage earnings five years earlier (before the apprentice started their training).

In comparison, those that 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 61%. One year after cancellation, those that did complete training had wage gains of 6.4%.

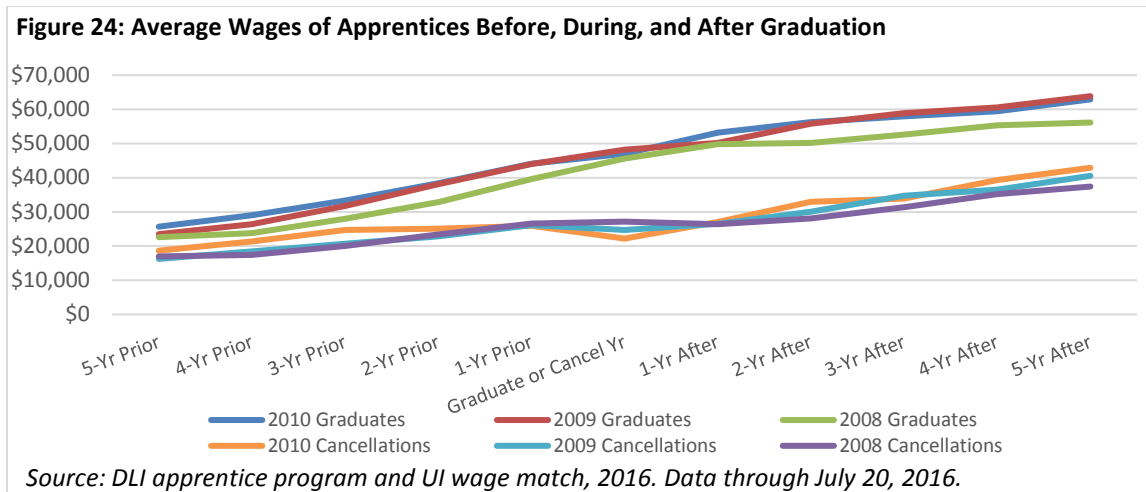
The increase in wage earnings due to the successful completion of apprenticeship training is demonstrated across all years of data. Figure 23 shows the 1-year and 5-year increases in wages for the 2012 through 2014 graduation years. In 2013, participants that completed their program increased wages 15% within one year of graduation and 86% from five years prior to graduation, compared to 13% and 34% among those with a cancelled program. In 2012, wage gains for graduates were 7.9% one year after graduation, and 72.4% from the period before the training, compared to 2.7% and 30.7% for non-completers, respectively.

Year	Graduates	1-year	5-year	Cancellations	1-year	5-year
2012	159	7.9%	72.4%	216	2.7%	30.7%
2013	146	14.6%	85.8%	190	12.9%	34.2%

2014	122	20.2%	116.9%	193	6.4%	60.7%
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Source: DLI apprentice program and UI wage match, 2016. Data through July 20, 2016.

Long-term average wage gains are shown in Figure 24. This graph includes individuals that ended a program between 2008 and 2010 and their average wages from 5-years before graduation or cancellation to 5-years after graduation or cancellation.



Many apprenticeships are in occupations that pay high wages, which is one of the reasons for the high wages after graduation. However, Figure 25 illustrates the wages earned by recent graduates from the apprentice program by occupation compared to Montana wages at the 25<sup>th</sup>-percentile wage and the Montana average wages. The 25<sup>th</sup>-percentile is provided to represent the expected entry-level wages for workers just starting out in their careers, while the average wages is 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. For roughly half of the occupations, the recent apprenticeship graduates were earning wages significantly higher than the statewide average. In 12 out of the 15 occupations shown, the apprentice graduates were earning wages that were above the entry-level occupational wage. In all but four occupations, the recent graduates were earning wages roughly equal to or above the average 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 25: Average Wages of Recent Apprenticeship Graduates Compared with Occupational Entry-Level and Average Wages**

Occupation	N	Graduated Apprentice 2015 Average Wage	2015 25th Percentile Wage	2015 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: MT DLI RAP and UI wage match, 2016. OES wage data from the May 2015 Bureau of Labor Statistics Occupation Employment Survey, Montana.

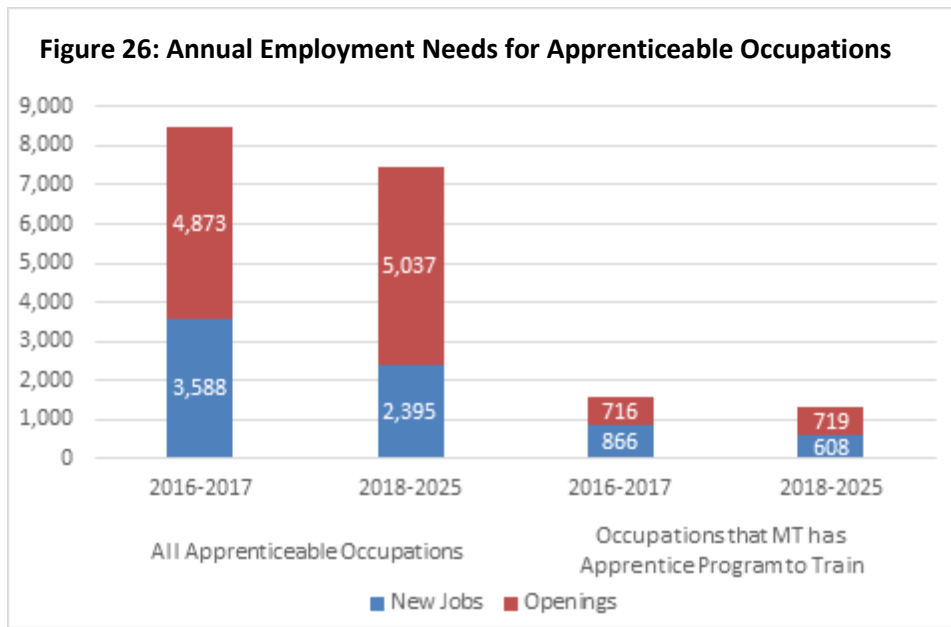
These high wages suggest apprentices are getting a good return on their investment, which is consistent with other research on apprenticeship. One study found that the returns to apprenticeship training exceed the return on investment for other types of training, with the long-term gains or apprenticeship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

### **Apprenticeships in the future - Expected Worker Demand for Apprenticeable Jobs**

The Department of Labor & Industry's forecasts for 2016-2017 and 2018-2025 show that the apprenticeship program has potential to expand. Looking at the national list of all possible occupations that are apprenticeable, the total demand for apprentices are 8,460 for the next two years with 3,588 of those jobs coming from growth and the rest coming from openings. Apprenticeable occupations represent nearly 44% of our total worker demand.

However, Montana does not offer programs in all of those occupations. Including only occupations for which Montana has a program, there is demand for 1,582 new apprentices annually for the next two years, representing 8% of total worker demand.

Figure 26 illustrates the forecasted worker demand for all apprenticeable jobs and the forecasted worker demand for occupations that Montana has an apprentice program to train.



Source: Montana Department of Labor & Industry 2015 Employment Forecasts

## Appendix: Data Tables

**Figure 27: Apprentices by County - January 1, 2000 to July 20, 2016**

County	Total Programs	Completed/Ongoing
Beaverhead	44	18
Big Horn	24	19
Blaine	2	1
Broadwater	26	14
Carbon	37	22
<b>Cascade</b>	<b>344</b>	<b>150</b>
Chouteau	8	6
Custer	39	16
Daniels	8	5
Dawson	36	15
Deer Lodge	46	23
Fallon	26	16

Fergus	25	15
<b>Flathead</b>	<b>506</b>	<b>244</b>
<b>Gallatin</b>	<b>877</b>	<b>463</b>
Garfield	2	1
Glacier	16	3
Golden Valley	4	0
Granite	1	1
<b>Hill</b>	<b>107</b>	<b>60</b>
Jefferson	47	24
Judith Basin	8	3
Lake	46	20
<b>Lewis and Clark</b>	<b>1290</b>	<b>721</b>
Liberty	1	1
Lincoln	59	30
Madison	33	18
McCone	19	14
Meagher	6	2
Mineral	3	1
<b>Missoula</b>	<b>445</b>	<b>267</b>
Musselshell	11	7
<b>Park</b>	<b>156</b>	<b>74</b>
Phillips	16	9
Pondera	22	10
Powder River	8	4
Powell	19	9
Prairie	6	3
<b>Ravalli</b>	<b>208</b>	<b>85</b>
Richland	102	43
Roosevelt	31	21
Rosebud	4	0
Sanders	17	7
Sheridan	19	12
<b>Silver Bow</b>	<b>562</b>	<b>406</b>
Stillwater	31	14
Sweet Grass	9	6
Teton	13	5
Toole	7	4
Valley	29	14
Wheatland	1	0
Wibaux	4	4
<b>Yellowstone</b>	<b>802</b>	<b>493</b>
<b>Total</b>	<b>6,212</b>	<b>3,423</b>

Source: DLI apprentice program and UI wage match, 2016. Data through July 20, 2016.

County	2010	2011	2012	2013	2014	2015	2016
Beaverhead	1	3	4	3	1	6	1
Big Horn	1	1	1		1		7
Blaine			1				
Broadwater		1	2		2	4	
Carbon	1		3	2	1		3
Cascade	11	17	11	15	24	16	19
Chouteau	1			2	1		
Custer	2	4	3	3	6	5	2
Daniels				1			



Dawson	1		3	2	2		1
Deer Lodge	1	1		1			
Fallon	3	2	5	1	1	1	
Fergus		2		4	2	2	1
Flathead	13	23	24	26	22	42	14
Gallatin	34	41	34	71	79	76	67
Garfield				1		1	
Glacier		1			2		
Granite							1
Hill	6	6	4	2	2	8	1
Jefferson	4	2	4	3	4	4	2
Judith Basin		1	1			1	1
Lake	1			2	3	1	3
Lewis and Clark	42	81	36	77	88	12	52
Liberty						1	
Lincoln	6	6	5	3	5	2	2
Madison		2	1	1	2	2	4
McCone		3	1	2		2	
Meagher		1		2	1	1	
Mineral		1					
Missoula	19	19	17	26	48	47	24
Musselshell				1	1	1	1
Park	6	1	7	8	8	11	16
Phillips	1	2		1	1	1	
Pondera	1	1	1	2	2	3	
Powder River	2	2	1				2
Powell	2		2	1	1	1	
Prairie	1	1					
Ravalli	9	6	4	8	12	17	17
Richland	3	9	12	7	9	8	
Roosevelt	1	1	2	5	4		1
Sanders	1	1			4	1	1
Sheridan		2	2	2	2		
Silver Bow	16	22	28	24	34	54	34
Stillwater	2		2	4	4	7	
Sweet Grass	1	1			1		
Teton	1			1	1	1	1
Toole		2				1	
Valley		2	2	2	4	5	1
Wibaux			1			1	
Yellowstone	45	45	71	61	77	97	52
<b>Total</b>	<b>239</b>	<b>316</b>	<b>295</b>	<b>377</b>	<b>462</b>	<b>533</b>	<b>340</b>

Source: DLI apprentice program and UI wage match, 2016. Data through July 20, 2016.

**Figure 29: New Apprenticeship Programs by Occupation**

ONET	Occupation	2010	2011	2012	2013	2014	2015	2016 (six months)	Total Trained since 2000
47211100	Electricians	84	143	134	173	196	243	127	2,529
47215202	Plumbers	54	74	61	106	126	123	98	1,551
47222100	Structural Iron and Steel Workers	5	14	14	19	37	10	7	374
39901100	Child Care Workers	36	20	10	4	1	0	0	308
47203101	Construction Carpenters	13	14	5	15	22	24	19	285
47221100	Sheet Metal Workers	12	8	9	20	25	17	19	280
47215201	Pipe Fitters	17	22	27	23	31	24	18	257
47201100	Boilermakers	9	10	6	16	7	21	3	218
49905100	Electrical Power-Line Installers and Repairers	8	13	16	6	13	22	9	206
51802102	Stationary Engineers	5	6	8	2	11	7	2	102
47218100	Roofers	1	4	6	7	17	16	7	91
47206100	Construction Laborers	0	2	1	4	2	7	1	90
47207302	Operating Engineers	5	10	8	4	0	1	0	87
47202100	Brickmasons and Blockmasons	1	1	1	1	4	5	4	77
49904100	Industrial Machinery Mechanics	8	4	1	2	10	6	0	74
33201101	Municipal Fire Fighters	3	0	6	6	1	2	0	74
47402100	Elevator Installers and Repairers	0	0	0	0	1	7	3	45
49902101	Heating and Air Conditioning Mechanics	0	1	2	3	7	4	4	37
49209800	Security and Fire Alarm Systems Installers	0	0	1	1	1	0	0	36
49202205	Station Installers and Repairers, Telephone	0	1	0	0	0	0	0	35
31101200	Nursing Aides, Orderlies, and Attendants	0	0	0	0	0	2	26	28
47205100	Cement Masons and Concrete Finishers	0	0	2	0	0	2	0	19
49902102	Refrigeration Mechanics	0	0	0	0	0	3	0	12
49209500	Electrical & Electr. Repairers, Powerhouse, Substation, Relay	1	0	0	0	0	2	0	12
51302300	Slaughterers and Meat Packers	2	0	1	0	1	0	2	11
51801301	Power Gen Plant Operators, Except Auxiliary Equipment Op.	1	0	0	0	0	0	0	11
51801200	Power Distributors and Dispatchers	0	0	0	0	0	3	0	10
49209300	Electrical & Electr. Installers & Repairers, Transp. Equi.	0	0	0	0	6	3	0	9
47214100	Painters, Construction and Maintenance	0	0	0	0	0	1	0	9
49909700	Signal and Track Switch Repairers	0	0	0	0	3	5	0	8
51404100	Machinists	0	0	0	0	3	3	0	8
47203103	Carpenter Assemblers and Repairers	0	0	0	0	0	6	0	6
49304300	Rail Car Repairers	0	0	0	0	2	4	0	6
49202203	Communication Equip. Mechanics, Installers, & Repairers	0	0	0	0	0	3	3	6
49302100	Automotive Body and Related Repairers	1	0	0	0	0	1	0	6
49305200	Motorcycle Mechanics	0	1	0	0	0	1	0	6
49303100	Bus and Truck Mechanics and Diesel Engine Specialists	0	0	0	0	1	0	1	6
49304200	Mobile Heavy Equipment Mechanics, Except Engines	0	1	1	3	0	0	0	5
51302100	Butchers and Meat Cutters	0	0	0	2	1	0	0	3
49904400	Millwrights	0	0	3	0	0	0	0	3
49901203	Meter Mechanics	0	0	0	0	0	2	0	2
17302200	Civil Engineering Technicians	0	0	0	1	0	1	0	2
49209400	Electrical & Electr. Repairers, Commercial & Industrial Equip.	0	0	0	0	1	0	0	2
49302302	Automotive Specialty Technicians	0	0	0	0	0	1	0	1

51412102	Welders and Cutters	0	0	0	0	0	1	0	1
15102100	Computer Programmers	0	0	0	0	0	0	1	1
29203402	Radiologic Technicians	0	0	0	0	0	0	1	1
51902100	Crushing, Grinding, & Polishing Machine Setters, Operators	0	0	1	0	0	0	0	1
51401101	Numerical Control Machine Tool Operators, Metal & Plastic	0	0	0	0	1	0	0	1
51604100	Shoe and Leather Workers and Repairers	0	0	0	1	0	0	0	1

Source: DLI apprentice program and UI wage match, 2016. Data through July 20, 2016.

<sup>i</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>ii</sup> 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>

<sup>iii</sup> Bureau of Labor Statistics Employee Tenure data, available at [www.bls.gov](http://www.bls.gov).

<sup>iv</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>v</sup> The sponsor data shows that there are 67 occupations. However, the apprenticeship data lists only 60 that have been used. The seven occupations that are listed for sponsors but have not been used in an apprenticeship are: farm equipment mechanics; electronic home entertainment equipment installers and repairers; electronics engineering technicians; production, planning, and expediting clerks; bakers, manufacturing; electrical and electronic inspectors and testers; and tree trimmers and pruners.

<sup>vi</sup> 2015 American Community Survey 1-Year Estimates, U.S. Census Bureau

<sup>vii</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>viii</sup> Ibid.