

# Colorado Talent Pipeline Report

The Talent Pipeline Report explores issues related to the supply and demand of talent in Colorado and strategies for strengthening our talent pipeline.

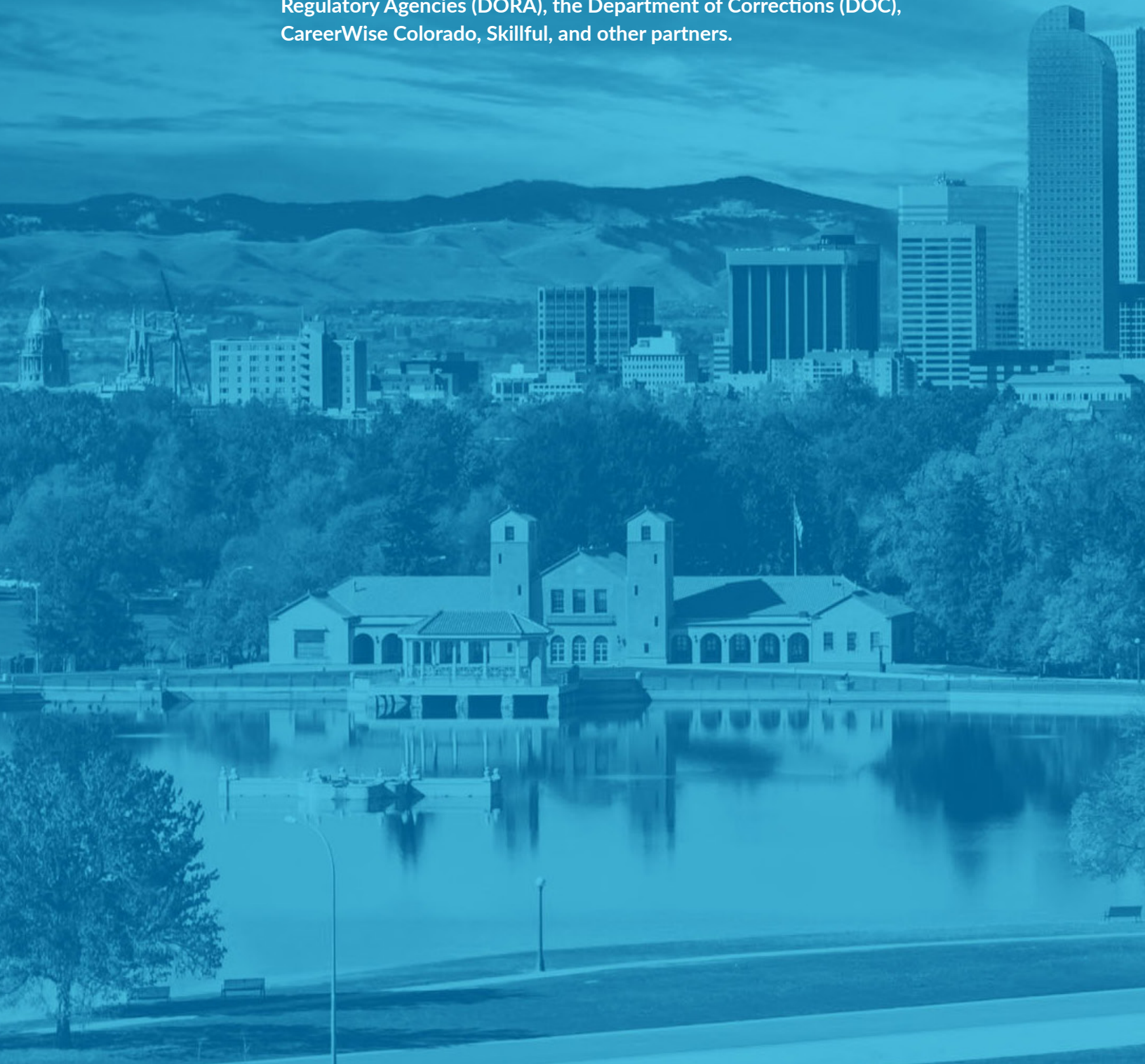
# 2019



Colorado Workforce  
Development Council



In accordance with C.R.S. 24-46.3-103, this Colorado Talent Pipeline Report was prepared by the Colorado Workforce Development Council (CWDC) in partnership with Colorado's Department of Higher Education (CDHE), Department of Education (CDE), Department of Labor and Employment (CDLE), including the CDLE's Labor Standards and Statistics division, and the Office of Economic Development and International Trade (OEDIT). Support was provided by the Office of State Planning and Budgeting (OSPB), the State Demography Office at the Department of Local Affairs (DOLA), the Department of Human Services (DHS), the Department of Regulatory Agencies (DORA), the Department of Corrections (DOC), CareerWise Colorado, Skillful, and other partners.



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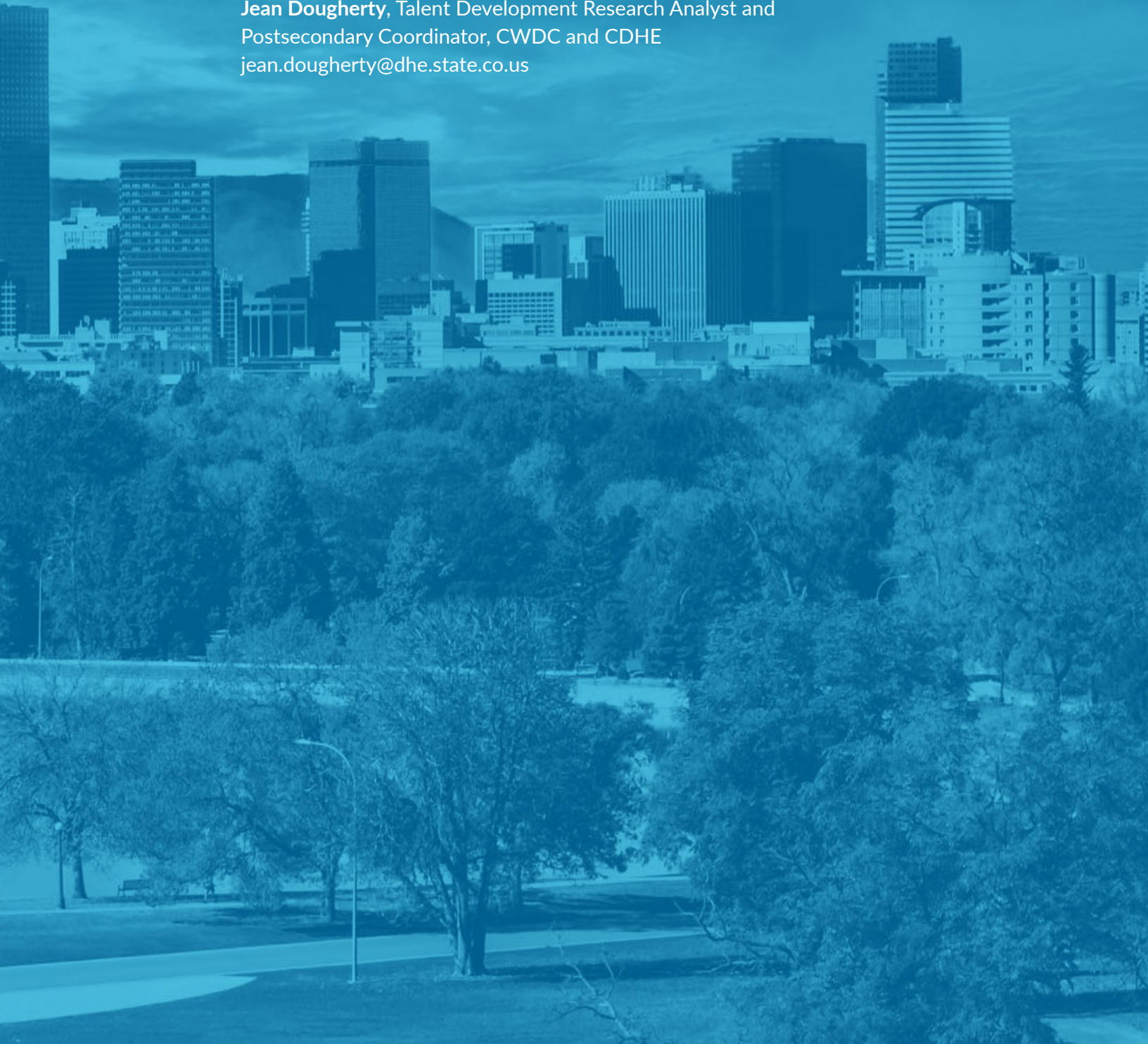
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In 2019 the Colorado economy continues to thrive in the midst of steady job growth and low unemployment. However, questions regarding the timing of the next recession and the transition of our economy to a new future of work have dominated conversations. The future of work encompasses job growth and decline, shifts in the demand for skills, technology or digitalization shifts, labor force shifts, and other implications for our state's workforce and economy.

These questions call for us to fully assess where our talent pipeline currently stands and determine how prepared it is to support an economy that works for everyone, everywhere in Colorado. We are also focused on ensuring that all Coloradans have access to career-connected education and training that will prepare them for the future of work. This report identifies the areas of growing demand and opportunity, key features of the current labor force, and strategies that will allow us to balance the supply and demand equation for talent.

Overall, Colorado is still experiencing a skills gap that must be closed to support future prosperity. The labor force consists of more than 3,000,000 individuals working in 2,789,100 nonfarm payroll jobs. At the end of October 2019, there were more than 115,000 advertised openings. The Demand section of this report identifies the Top Jobs in Colorado, of which 64 percent require a credential beyond high school.

The Supply section confirms that our labor force is not adequately prepared for these Top Jobs, with just 57 percent of Coloradans holding a credential beyond high school. Progress has been made on this issue in recent years, and more work is needed to ensure our talent pipeline is ready to support the demands of a shifting economy and future model of work. The data and recommendations provided in prior Talent Pipeline Reports have led to the Colorado State Legislature passing more than 50 bills to support talent development (see Appendix A).

This sixth iteration of the Talent Pipeline Report continues to analyze relevant labor market data and provide recommendations to enhance the talent pipeline. This year's recommendations include:

- Enhance access to opportunities for quality, lifelong education connected to the future of work.
- Foster an economy that works for everyone.
- Focus resources on enhancing strategies that have already demonstrated results and effectiveness.

On behalf of our state agency partners and governor-appointed members, the Colorado Workforce Development Council is pleased to submit this 2019 Talent Pipeline Report and we are ready to support the current legislature in future policy concepts that will work to close our skills gap and support economic prosperity in every corner of Colorado.



The Colorado Workforce Development Council (CWDC) is a Governor-appointed, public-private partnership with the purpose to advise, oversee, and integrate the work of the Colorado talent development network. The vision of the CWDC is that every Colorado business has access to a skilled workforce and every Coloradan has access to meaningful employment, resulting in statewide economic vitality. To attain this vision, the CWDC's mission is to facilitate the creation and sustainability of an industry-led, competency-based Colorado talent development system that appropriately integrates the work of education, training, economic, and workforce development to meet the needs of businesses, workers, job seekers, and students.

The CWDC Office supports the Council and facilitates collaboration with other state agencies to make recommendations to the Governor on talent development related issues. The CWDC is also the champion of TalentFOUND, which has been adopted as the brand for Colorado's talent development network. The TalentFOUND network refers to all of the public and private entities working together to achieve positive talent development outcomes and includes more than 150 affiliates. The TalentFOUND gateway at [TalentFOUND.org](https://TalentFOUND.org) provides a virtual connection to the variety of programs and services that exist across business, education, workforce, and community organizations in the state.

This is the sixth iteration of the Talent Pipeline Report. It continues to analyze and explain relevant labor market data and provides data-influenced recommendations to enhance the talent pipeline in Colorado.

**01**

**DEMAND**





## COLORADO'S TOP JOBS

Colorado's economy features Top Jobs that cross a variety of industries (see Appendix B) and geographies across Colorado (see Appendix C). This report uses labor market projections from the Colorado Department of Labor and Employment (CDLE) Office of Labor Market Information to identify Top Jobs meeting three criteria:

- Projected high net annual openings (>40)
- Above average growth rate over 10 years (>20.5%)
- A good wage<sup>1</sup>

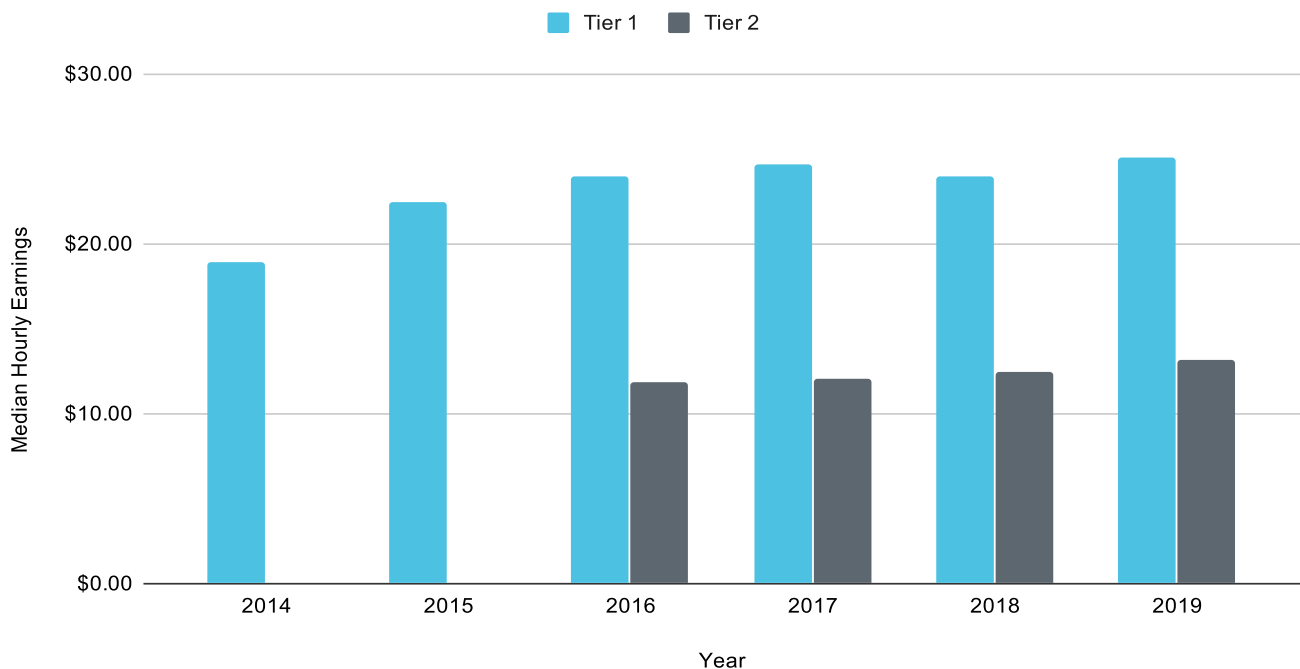
The Top Jobs methodology has changed from 1-year occupational growth to 10-year occupational growth. This change lowers the variance of Top Jobs from year to year by creating a stronger measure of long-term economic growth and offers better insights into future opportunities.

The jobs in this report are classified into two earning tiers:

- Tier 1 is a median hourly earning living wage benchmark of \$25.06 or above for two adults—one working—and one child
- Tier 2 is a median hourly earning living wage benchmark of \$13.19 or above for an individual

Figure 1 visualizes the changes in the hourly wage for each tier since the first Talent Pipeline Report in 2014. From 2018 to 2019, the living wage in both Tier 1 and 2 has increased. This indicates that in Colorado, occupations require a higher wage than previous years to be classified as a "living wage." Specifically, when controlling for inflation, Tier 1 jobs median hourly earnings increased by 56 cents and Tier 2 increased by 45 cents.

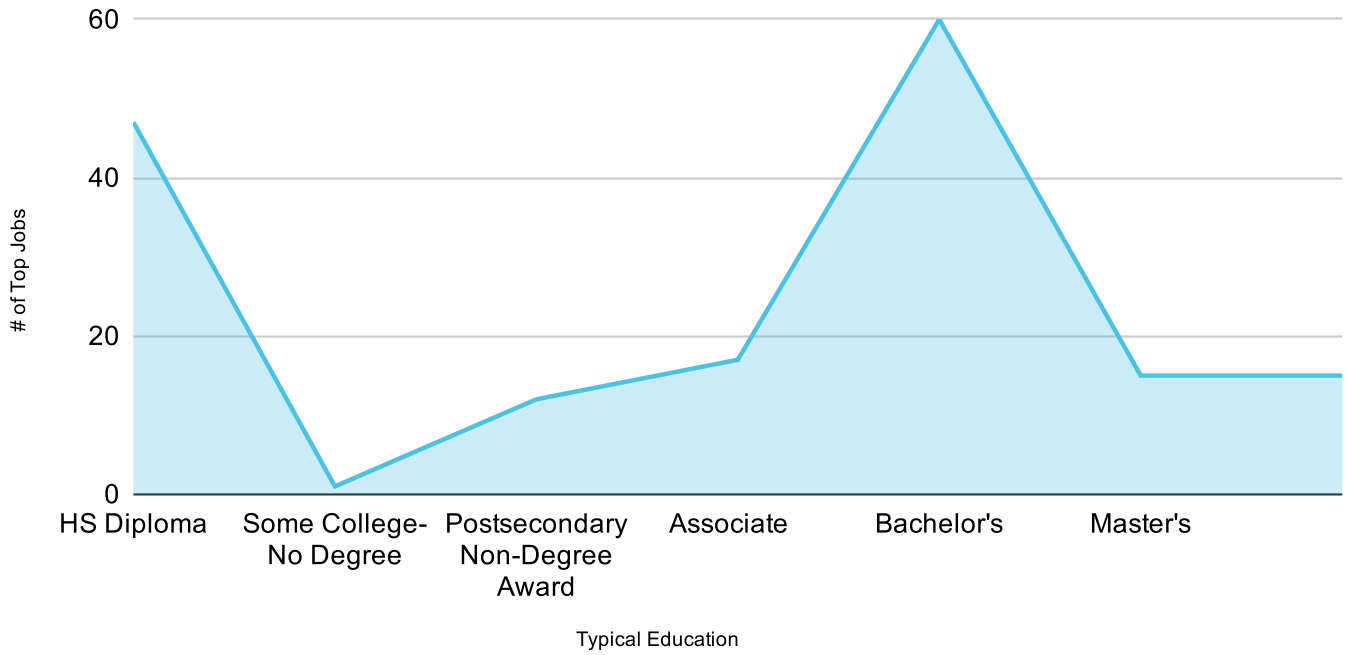
**Figure 1**  
**Living Wage for Colorado Top Jobs**



Source: Colorado Department of Labor and Employment: Office of Labor Market Information<sup>2</sup>

Statewide, there are 108 Top Jobs classified at Tier 1 and 77 Top Jobs classified at Tier 2. Additionally, median hourly earnings are correlated to the level of education or training that individuals have in these occupations. Figure 2 illustrates the number of Top Jobs that fall into each educational attainment category.

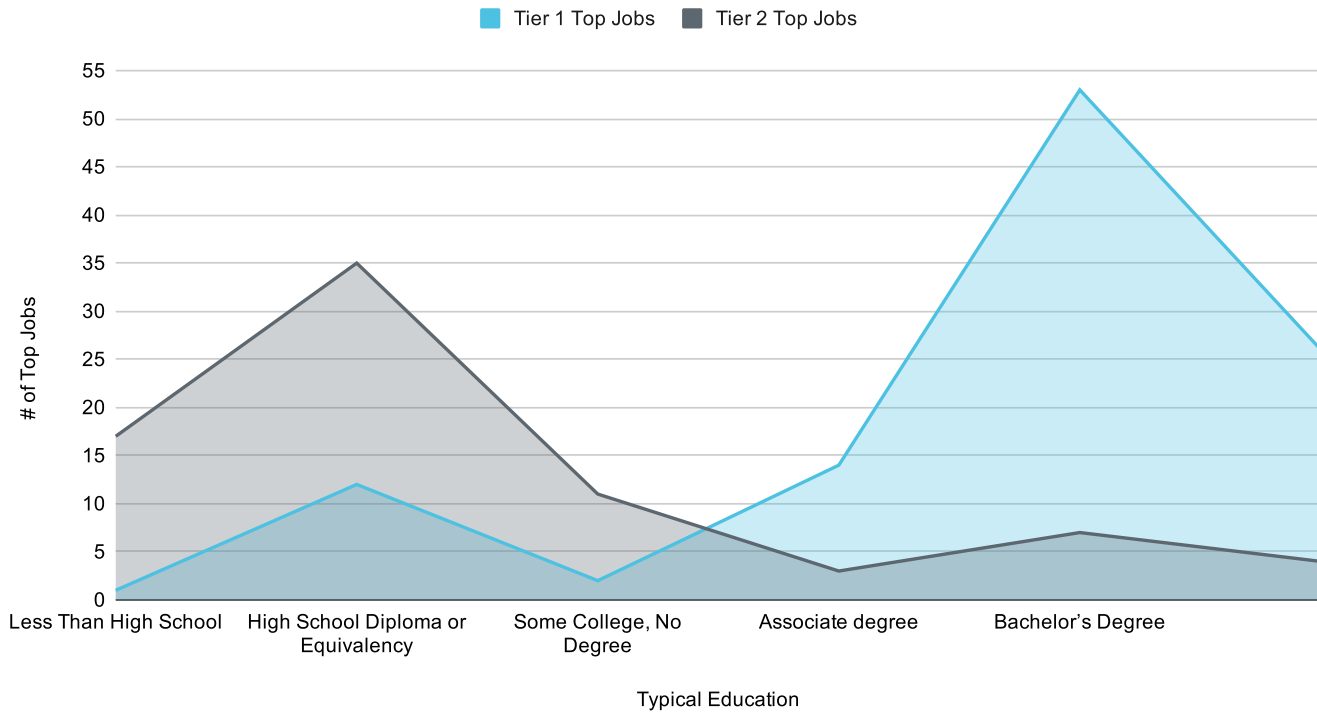
**Figure 2**  
**Top Jobs Typical Education**



Source: Colorado Department of Labor and Employment: Office of Labor Market Information<sup>2</sup>

Tier 1 Top Jobs typically require higher education levels than Tier 2 Top Jobs (see Figure 3), with a majority requiring a bachelor's degree or higher.

**Figure 3**  
**Top Jobs by Tier and Typical Education**



Source: Colorado Department of Labor and Employment: Office of Labor Market Information<sup>2</sup>

## COLORADO'S KEY INDUSTRIES

In 2011, Colorado identified 14 major industries that drive the state's economy. In 2018, the annual average employment in these industries was 2,138,180, meaning that the majority of nonfarm payroll jobs in Colorado are encompassed in the key industries, and these jobs are growing faster than those not included in these industries.

Aerospace	Bioscience
Electronics	Energy & Natural Resources
Defense & Homeland Security	Infrastructure Engineering
Information & Technology	Health & Wellness
Tourism & Outdoor Recreation	Creative Industries
Financial Services	Food & Agriculture
Transportation & Logistics	Advanced Manufacturing

## IN-DEMAND CROSS-INDUSTRY OCCUPATIONS & SKILLS

Table 1 showcases the fastest-growing occupations in Colorado that are projected to grow by greater than or equal to 15 percent over 10 years. These occupations not only have a higher growth rate, but they also have high average annual openings. The average annual openings take into consideration annual exits (i.e., those leaving the labor force), transfers (i.e., those switching occupations), and growth. The high growth and average annual openings indicate that these occupations are "in-demand."

It is important to note that some occupations cannot be categorized into one industry. For example, human resources, marketing, and training and development managers can be found in almost every industry. The same can be said about business and financial operations and information and technology occupations.

**Table 1**

### Colorado's Fastest Growing Occupations

Occupation Group	2018-2028 % Projected Change	2018 Median Hourly Earnings	Average Annual Openings*
Healthcare Practitioners and Technical Occupations	25%	\$34.24	383
Construction and Extraction Occupations	23%	\$22.41	615
Management Occupations	22%	\$56.66	470
Education, Training, and Library Occupations	19%	\$22.21	261
Transportation and Material Moving Occupations	17%	\$17.02	1323
Business and Financial Operations Occupations	17%	\$34.06	1287

\*Average Annual Openings were calculated using only Top Job data

Although many occupations are cross-industry, there are required skills that are common across occupations. Table 2 shows the top 10 essential skills that are found in job postings in Colorado. In contrast to technical skills that are specific measurable abilities, essential skills are more general personal qualities that help facilitate interactions with others. Often these skills are associated with workplace readiness. These nuanced qualities are transportable across industries (i.e., management, customer service), thus making them valuable for all individuals.

Unfortunately, these skills can have a different meaning between people and organizations. It is therefore important for organizations and those charged with filling positions to utilize clear behavioral definitions of what these skills mean in each position, giving job seekers a clear idea of job expectations and requirements and providing organizations and education and training providers with clear training objectives.

**Table 2**  
**Top 10 Essential Skills Across all Occupations**

Skill	Frequency in Job Postings
Management	26%
Customer Service	24%
Sales	22%
Communications	19%
Operations	18%
Leadership	16%
Innovation	15%
Valid Driver's License	9%
Problem Solving	8%
Presentations	8%

Source: EMSI 2019.3 Data<sup>3</sup>

## EMERGING SHIFTS IN DEMAND

### Technological Development and Displacement

The traditional way of work continues to transform with the addition of new technologies, further development of old technologies, and globalization. There are growing concerns about the impact of technological transformation, namely automation and artificial intelligence, and displacement throughout Colorado and the nation. However, automation typically generates employment growth. A recent study from Deloitte found that of the 800,000 new jobs created from 1990 to 2013, 200,000 can be attributed to automation alone.<sup>4</sup>

Technology continues to improve the current workforce by increasing productivity and efficiency. This causes occupations to shift and change job tasks, requiring continuous upskilling or reskilling. Occupations must change to keep up with the new technologies that are becoming available in the present and in the future. Consequently, some occupations may grow and others may shrink over the next decade. Examples of occupations with high automation potential include Packaging and Filling Machine Operators and Tenders (100%), Food Preparation Workers (91%), Payroll and Timekeeping Clerks (87%) and Light Truck or Delivery Services Drivers (78%), all which typically require less than a bachelor's degree.<sup>5</sup> Individuals who have a high school degree or less are more likely to work in occupations that are subject to automation while those with a bachelor's degree are less likely.<sup>6</sup>

Additionally, employment in jobs that require routine cognitive or manual tasks has been either stagnant or in decline since 1985. This trend indicates the importance of ensuring the workforce has adequate information, skills, and qualifications to fill the jobs that are being modified and created due to technology and automation. Strategies to mitigate displacement include job matching, supporting workers transitioning careers, training, and cross-training. Thus, focusing on job skills (i.e., skills-based hiring) will create a clearer and more direct connection between a worker and potential occupations across industries.

### Skills to Thrive In an Evolving Workforce

New technology is causing a shift in how work is being done, creating opportunities for workers to be more productive and efficient. However, this means that workers' knowledge, skills, and abilities need to ensure they are digitally literate, agile, and can keep up with the continuously shifting nature of work.

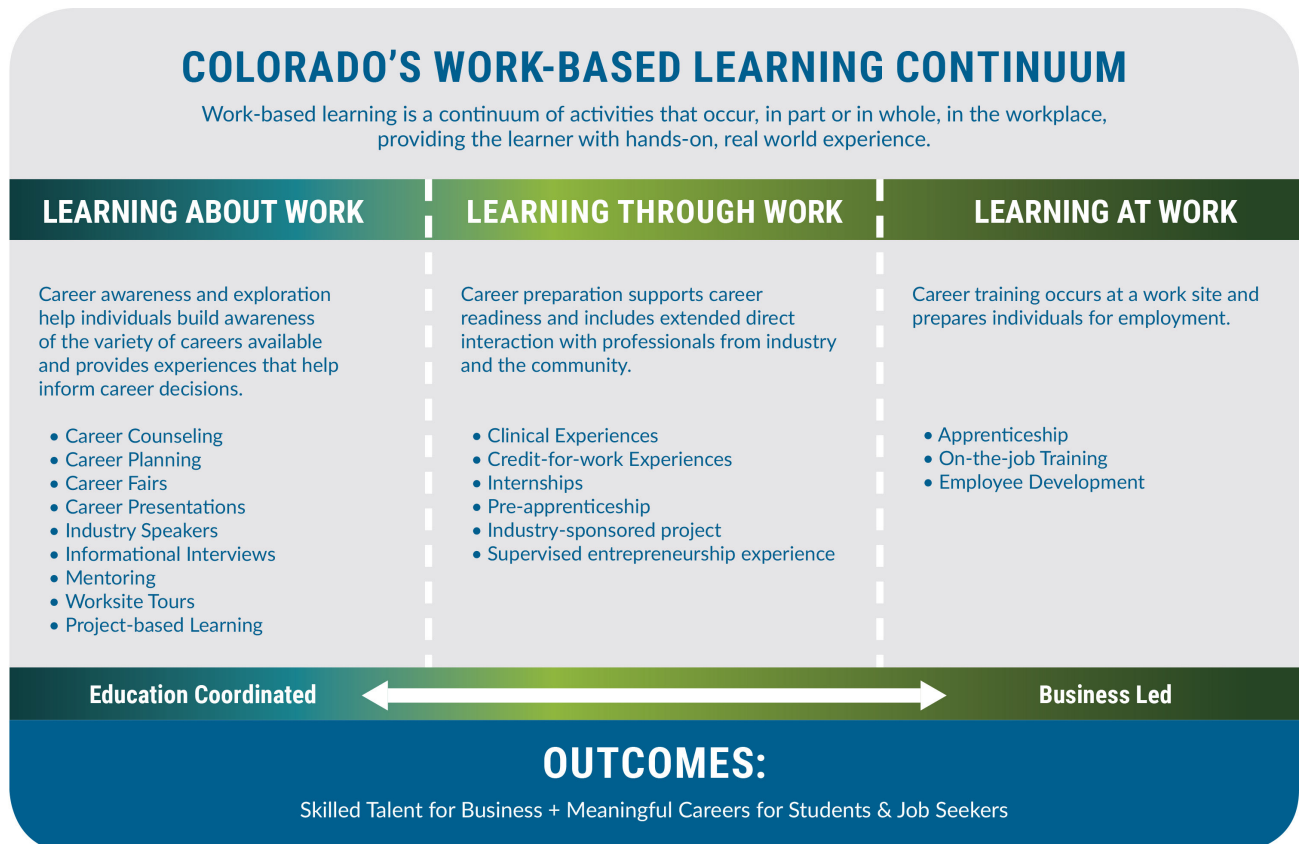
For workers to remain nimble to the changing work environment, education and training should be thought of as a lifelong strategy that employers and employees invest in alike. The current and future nature of work calls for continuous learning and training to keep up with the shifts in demand.<sup>5</sup> Additionally, lifelong learning, training, and professional development opportunities provided by employers, industry associations, and educational institutions will help prepare and train workers with the essential and technical skills for jobs that currently do not exist.

### Employee Work Expectations

Globally, workers typically favor flexible or remote working opportunities.<sup>7</sup> Alongside flexible and remote work, professional development, learning, and opportunities to advance are important retention factors for the labor force,<sup>8</sup> showing that workers are interested in diverse opportunities and that lifelong learning and upskilling are expected from an organization. This notion highlights the importance of the continued use and adoption of the Work-Based Learning Continuum to ensure individuals have opportunities to apply education and training to relevant, real-world work experiences.

**Work-based learning is a continuum of activities that occur, in part or in whole, in the workplace, providing the learner with hands-on, real-world experience.**

Given the emerging growth industries and skills needed by the future workforce, we must assess how well the current supply of talent aligns with the demands of industry in terms of numbers, skills, and credentials.





# 02

## SUPPLY

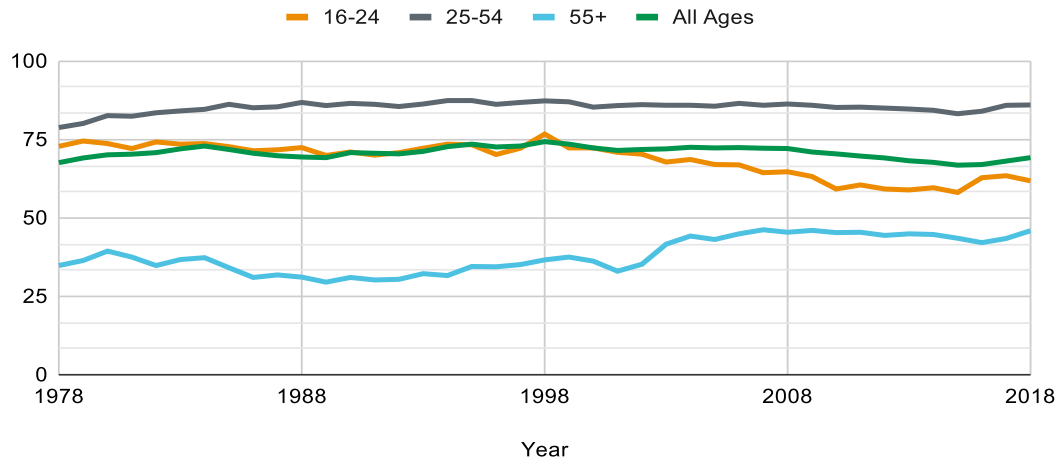
## WORKFORCE BY THE NUMBERS

Colorado has had a strong rebound since the Great Recession with a high labor force participation rate and a low unemployment rate. There has been a small uptick from 68.1 percent to 69.2 percent in the labor force participation for 2018 (see Figure 4), which equates to 3,097,000 Coloradans in the labor force.<sup>9</sup>

Figure 4

Colorado Labor Force Participation Rate for Individuals: 1978-2018

The labor force participation rate is the percent of the civilian noninstitutional population over the age of 16 that is either employed or unemployed (i.e., individuals seeking work but unable to attain employment).



Source: Colorado Department of Labor and Employment: Office of Labor Market Information<sup>2</sup>

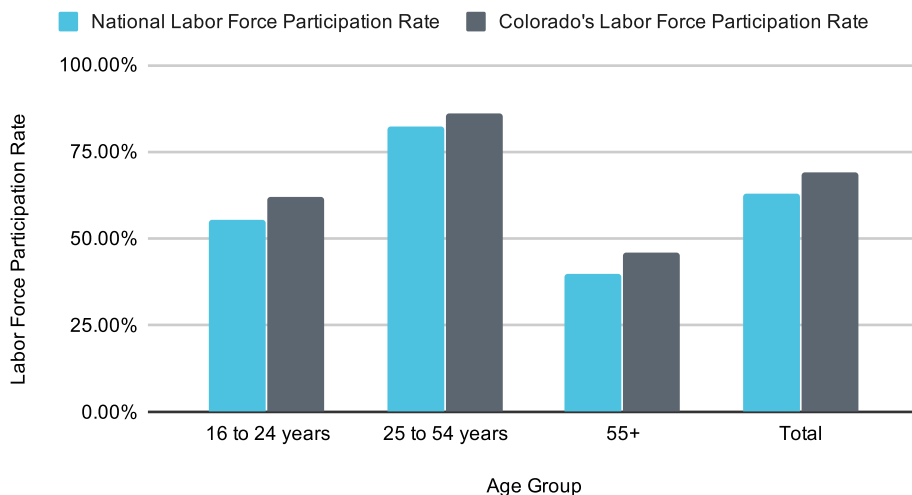
## Current Labor Force

### Age

Unsurprisingly, labor participation is highest between the ages of 25 and 54 at 86 percent (see Figure 5). This is 3.9 percent higher than the national labor force participation rate of 82.1 percent for this group. However, as Figures 4 and 5 illustrate, the labor force participation rate of individuals ages 55+ in 2018 (45.9 percent) is just 0.3 percent away from the historic high of 46.2 percent in 2007.

Figure 5

2018 Colorado and National Labor Force Participation by Age Group

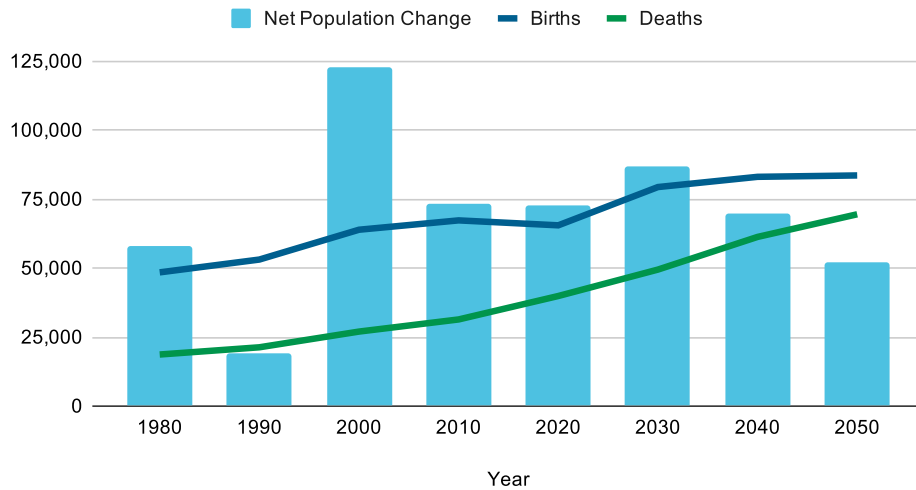


Source: Colorado Department of Labor and Employment: Office of Labor Market Information<sup>2</sup>



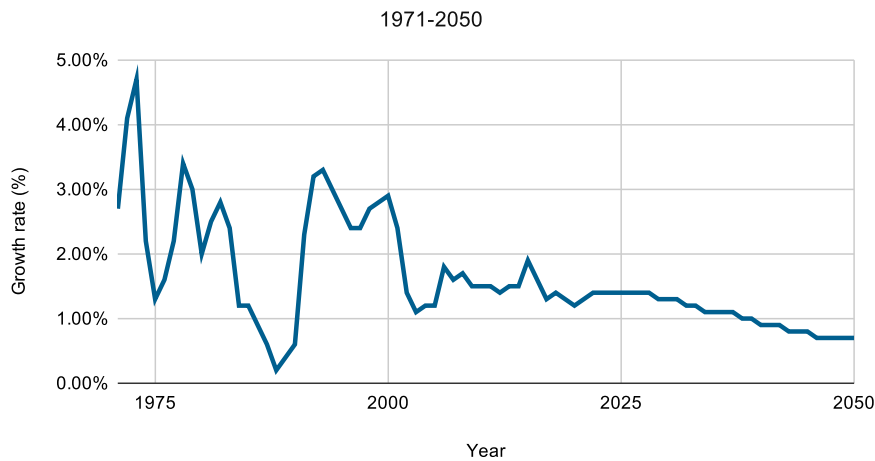
As indicated in the 2018 Talent Pipeline Report, Colorado's population growth is projected to slow (see Figures 6 and 7). Colorado's labor force participation of those 55+ is 5.9 percent higher than the national average of 40 percent. Thus, the labor force age group dynamic is shifting to an older population than historically prevalent in Colorado because people are living and working longer.<sup>10</sup>

**Figure 6**  
**Colorado Net Population Change, Births and Deaths 1980-2050**



Source: State Demography Office at the Department of Local Affairs<sup>11</sup>

**Figure 7**  
**Colorado Growth Rate (Actual and Projected): 1971-2050**



Source: State Demography Office at the Department of Local Affairs<sup>11</sup>

Age is not the only factor to examine regarding labor force participation. Differences between race/ethnicity, gender identity, and credential attainment should be addressed.

### Race/Ethnicity

Table 3 breaks down labor force participation by race and ethnicity. White and Hispanic and/or Latino ethnicity are similar in participation rate (69.4 percent and 69.9 percent respectively), while Black or African Americans have a rate below the average (67.5 percent). Further breaking these groups down by gender identity will tell a more nuanced story of labor participation (see Figure 8).

**Table 3**  
**2018 Colorado Labor Force Participation by Race/Ethnicity**

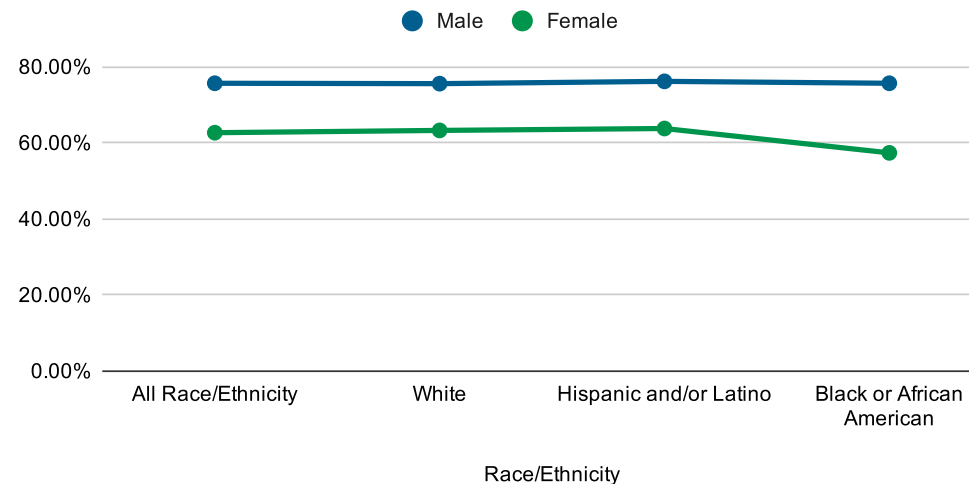
Race/Ethnicity	Labor Force Participation Rate
White	69.4%
Black or African American	67.5%
Hispanic and/or Latino	69.9%
All Races	69.2%

Source: Current Population Survey; U.S. Bureau of Labor Statistics<sup>12</sup>

### Gender Identity, Race/Ethnicity

Figure 8 echoes the norm that those who identify as males have a higher labor participation rate than females, regardless of race or ethnicity. Black females have the lowest labor force participation at 57.4 percent and the widest margin between males and females. This is 2.8 percent lower than the national average; however, the national participation rate for black females is projected to decline to 59.6 percent by 2028. This is incongruent with historical data as black females typically have a higher participation rate than females of other races.<sup>9</sup> Further research is needed to fully understand the causal factors contributing to the decline and demographic disparities in Colorado.

**Figure 8**  
**2018 Colorado Labor Force Participation by Gender Identity and Race/Ethnicity**



Source: Current Population Survey; U.S. Bureau of Labor Statistics<sup>12</sup>

### Credential Attainment & Labor Force Participation

Congruent with historical data, credential attainment has a strong positive correlation with labor force participation. Individuals in Colorado who have a bachelor's degree or higher have the highest participation rate at 76.3 percent. At the other end of the spectrum, those with less than a high school diploma have a participation rate of 55.8 percent, a gap of 20.5 percent. As credential attainment increases, labor participation increases (see Table 4) and unemployment decreases (see Table 5).

**Table 4**  
**2018 Colorado Labor Force Participation by Educational Attainment\***

Highest Level of Educational Attainment	Labor Force Participation Rate
Less than a high school diploma	55.8%
High school graduates, no college**	63.5%
Some college or associate degree	70.0%
Bachelor's degree and higher***	76.3%

\*Labor force participation rate by educational attainment of non-institutional population ages 25+

\*\*Includes persons with a high school diploma or equivalent

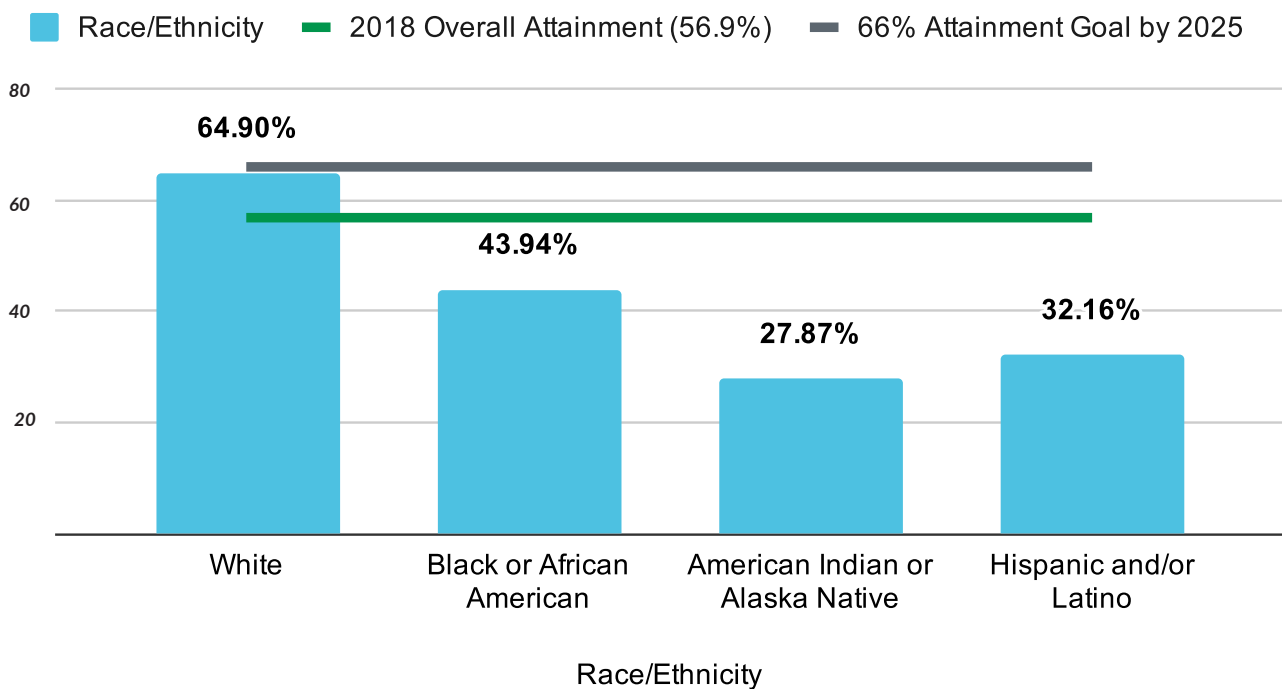
\*\*\*Includes person with bachelor's, master's, professional and doctoral degrees

Source: Current Population Survey; U.S. Bureau of Labor Statistics

In 2017 the Colorado Department of Higher Education (CDHE) and the Colorado Commission on Higher Education updated the State's master plan, Colorado Rises, Advancing Education and Training Development.<sup>13</sup> This plan calls for a goal of 66 percent statewide postsecondary attainment of Coloradans 25-34 years old by 2025. The Colorado Department of Education (CDE) also shares this goal.

Figure 9 shows Colorado's 2018 Postsecondary Credential Attainment broken down by race. The overall postsecondary attainment is 56.9 percent for all Coloradans between 25-34 years old (9.1 percent short of the 66 percent attainment goal). This indicates that 56.9 percent of Coloradans have a certificate, associate degree, bachelor's degree, and/or a professional degree. However, as the figure illustrates, there are attainment gaps between demographic groups. Specifically, Black or African American, American Indian or Alaska Native, and Hispanic and/or Latino groups have a double-digit gap not only between their White counterparts but with the overall average (-12.9 percent, -28.9 percent, and -24.7 percent respectively<sup>14</sup>).

**Figure 9**  
**Colorado's 2018 Postsecondary Credential Attainment**



Source: Colorado Department of Higher Education<sup>14</sup>

## Unemployment

Unemployment is defined as individuals who are not employed but are available to work and have made an active effort to find employment.<sup>12</sup> This is an important definition to keep in mind when looking at unemployment and labor participation information. While Colorado has maintained a very low unemployment rate over the past year, a deeper look at the data reveals that economic prosperity has not been equitable statewide and that individuals with lower levels of educational attainment, as well as minority women, have experienced significantly higher rates of unemployment than the statewide total.

**Table 5**  
**2018 Colorado Unemployment Rate by Educational Attainment\***

Highest Level of Educational Attainment	Unemployment Rate
Less than a high school diploma	3.2%
High school graduates, no college**	3.8%
Some college or associate degree	2.6%
Bachelor's degree and higher***	2.4%

\*Labor force participation rate by educational attainment of non-institutional population ages 25+

\*\*Includes persons with a high school diploma or equivalent

\*\*\*Includes person with bachelor's, master's, professional and doctoral degrees

Source: Current Population Survey; U.S. Bureau of Labor Statistics<sup>12</sup>

## Race/Ethnicity

Table 6 breaks down the unemployment rate by race and ethnicity. Although the overall unemployment rate is relatively low at 3.3 percent (103,000 Coloradans), that is not the case for all demographic groups. Specifically, Black or African Americans have almost double the unemployment rate at 6.6 percent compared to White and Hispanic and/or Latino groups, at 3.2 percent and 3.4 percent respectively. The 6.6 percent unemployment rate is concerning because these are all individuals who are actively searching for employment but cannot find it. If the overall unemployment rate was this high, Colorado would be near recession numbers. This disparity cannot be ignored because as population demographics shift, the overall labor market will become more dependent on minority groups.

Additional factors that may grow the disparity are that Black or African American and Hispanic and/or Latino populations are overrepresented in high-automation risk occupations and underrepresented in low-automation risk occupations; thus these populations have a higher risk of being displaced due to automation (Black or African American: 23.1 percent; Hispanic and/or Latino: 25.5 percent displacement rate by 2030<sup>15</sup>).

**Table 6**  
**2018 Colorado Unemployment Rate by Race and Ethnicity\***

Race/Ethnicity	Unemployment Rate
White	3.2%
Black or African American	6.6%
Hispanic	3.4%
All Races	3.3%

\*Unemployment rate by sex and race of civilian non-institutional population ages 16+

Source: Current Population Survey; U.S. Bureau of Labor Statistics<sup>12</sup>

Unemployment rates for Coloradans 16-19 years old are typically turbulent and less stable from year to year. The unemployment rate for this group in 2018 is 14.5 percent whereas it was 8.9 percent in 2017. Although the rates change from year to year, disparities between groups are still apparent. Specifically, the rate for Black or African American individuals aged 16-19 is more than double the unemployment rate for all races in that age group at 25.9 percent (see Table 7). Further research should be done to understand the factors contributing to the high disparities in the youth unemployment rates in order to develop policies and programs to address those disparities.

**Table 7**  
**2018 Unemployment Rate for Coloradans 16-19 Years Old by Race and Ethnicity**

Race/Ethnicity	Unemployment Rate
White	13.9%
Black or African American	25.9%
Hispanic	12.3%
All Races	14.5%

Source: Current Population Survey; U.S. Bureau of Labor Statistics<sup>12</sup>

#### Gender Identity, Race/Ethnicity

Breaking down the unemployment rate by gender identity and race and ethnicity shows that those who identify as a Black or African American male have the highest unemployment rate among the groups at 7.1 percent, followed by Black or African American females at 5.9 percent. Those with the lowest unemployment rate are the individuals who identify as White females (2.5 percent).

**Table 8**  
**2018 Colorado Unemployment Rate by Gender Identity and Race and Ethnicity\***

Gender Identity, Race/Ethnicity	Unemployment Rate
Male, White	3.8%
Female, White	2.5%
Male, Black or African American	7.1%
Female, Black or African American	5.9 %
Male, Hispanic	3.1 %
Female, Hispanic	3.8 %

\*Unemployment rate by sex and race of civilian non-institutional population ages 16+

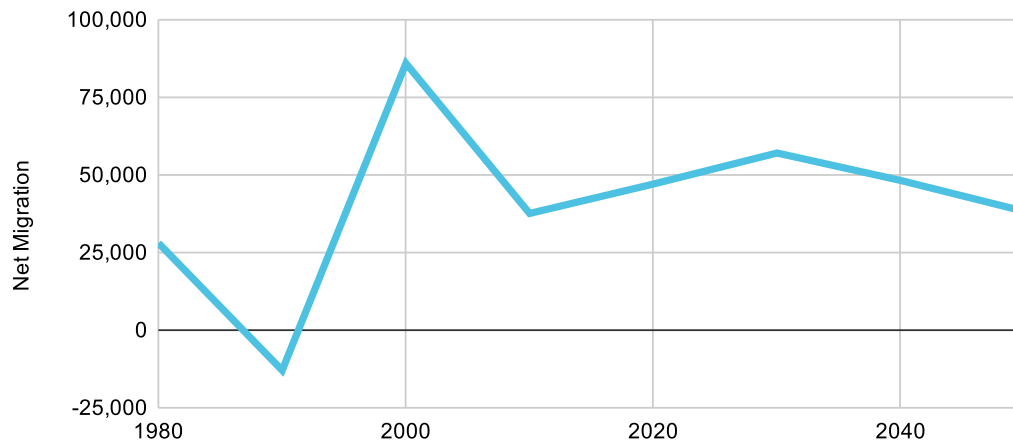
Source: Current Population Survey; U.S. Bureau of Labor Statistics<sup>12</sup>

## MIGRATION AND OCCUPATIONAL LICENSING

Figure 10 illustrates that migration to the state is projected to decline. One of many possible barriers to between-state migration may be occupational licensing.

**Figure 10**

### Net Migration by Year 1980 - 2050



Source: State Demography Office at the Department of Local Affairs<sup>11</sup>

According to the Department of Regulatory Agencies (DORA), in Colorado there are 110 individual occupational licenses (e.g., certified public accountant, barber) and 19 business occupational licenses (e.g., public accounting firm, electrical contractor). A review and comparison of occupational licensure research found that licensing requirements have become more cumbersome and are not consistent between states and occupations.<sup>16</sup>

Additionally, recent research has shown that the migration of an individual between states is 36 percent lower when the individual is in an occupation with state-specific licensing exams compared to those in other occupations.<sup>17</sup> However, there was no indication of reduced interstate migration of individuals in an occupation with national licensing exams. In short, individuals with state-specific licensure are less likely to move between states; although, correlation does not equal causation. More specific research is needed to determine the many factors that are preventing interstate mobility (e.g., moving cost, affordable housing, socioeconomic status, proximity to family).

Arizona recently passed HB 2569, which allows for universal recognition of occupational licenses from out of state that meet delineated Arizona requirements. This legislation could be a model for Colorado to consider as a means to attract more skilled workers to the state. Additionally, Colorado is one of many states that is currently undergoing Sunset Reviews. The Colorado Office of Policy, Research, and Regulatory Reform conducts sunset reviews to question the need for regulation to protect the public. The sunset review will look for the least restrictive regulation—if regulation is deemed necessary—that is congruent with public interest. The purpose of the sunset reviews is to respond to issues raised about regulatory boards, regulatory efficiency, and government transparency.



**03**

**IMPLICATIONS**

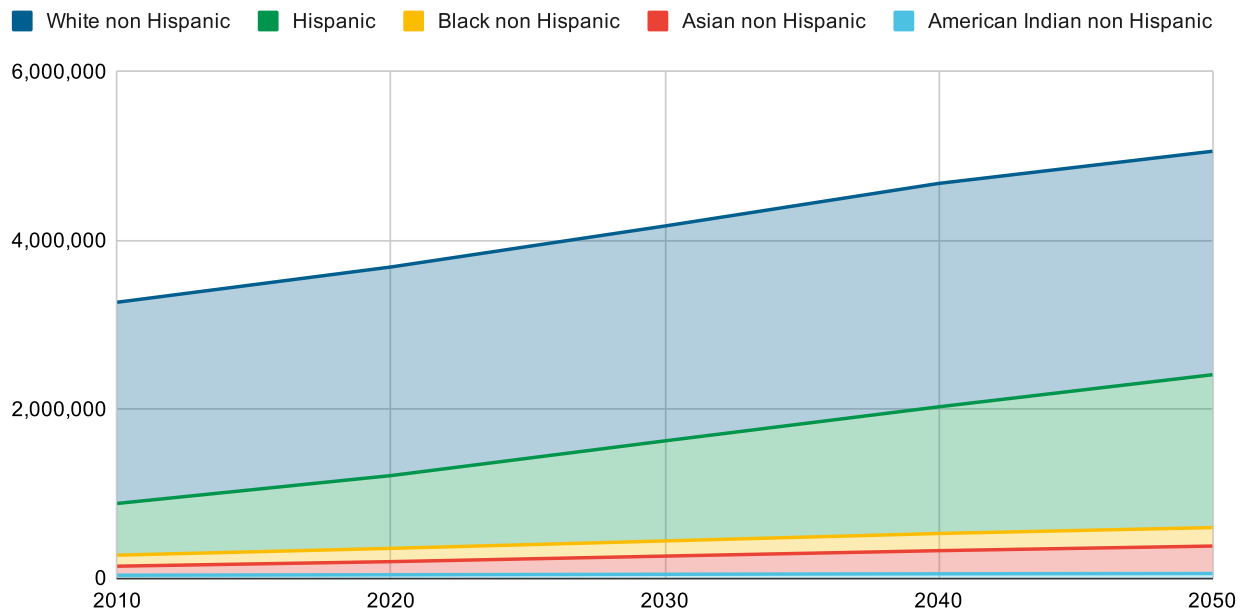
Colorado faces a number of circumstances impacting the supply of and demand for talent. With complicating factors such as an estimated 384,015 annual openings in occupations across the state,<sup>2</sup> the number of jobs in Colorado growing, population growth plateauing, and the nature of work shifting, new ways of collaborating and aligning resources are needed to give Coloradans the knowledge, skills, and abilities to succeed in the workforce and the agility to adapt to changing demands. Further research is needed to fully understand the disparities throughout Colorado, specifically the racial disparities that exist to ensure that the state's overall talent pipeline remains strong as the population changes (see Figure 11). Furthermore, the development and the promotion of reskilling opportunities and intentional efforts to transition workers who are at risk for automation displacement are imperative.<sup>15</sup>

There are steps Colorado can take to build resilient strategies for multiple, and sometimes conflicting, issues such as a low overall unemployment rate, a possible recession, the attainment gap, and automation and displacement risks. As a state there is a need to widen the scope of what education looks like and how credit can be earned. For example, this can be done by giving value to skills gained through high school, apprenticeships and other work-based programs, and military experience.

**Shifting to skills-based training and hiring will lower attainment barriers by providing various alternate credential pathways, aiding in closing the attainment gap, and making the workforce more resilient to automation and displacement risks. Additionally, skills-based hiring allows businesses to be more specific about what they need from prospective employees and improves the likelihood that they will attract and hire employees that meet their needs.**

The strategies discussed in the following section offer approaches that can be scaled throughout the state to close the skills gap and foster economic prosperity. They also illustrate how cross-functional partnerships between workforce, education, and industry are essential and can still be strengthened in Colorado.

**Figure 11**  
**Colorado Population Projection by Race, Age 16-24: 2010 - 2050**



Source: State Demography Office at the Department of Local Affairs<sup>11</sup>

IMPLICATIONS





**04**

**STRATEGIES**

To ensure the effective use of public investments, we must focus resources on enhancing strategies that have already demonstrated results and effectiveness by renewing programs that have produced positive gains for Colorado and expanding and promoting early opportunities for career exploration and education and training (e.g., earning an industry-recognized credential of value in high school). It is crucial that we provide access to opportunities for quality, lifelong education connected to the future of work and that is done through cross-functional, collaborative work. The following strategies exemplify key policies and strategies that are working effectively and would benefit from additional investment.

## BUILDING TALENT THROUGH COLLABORATION AT A SHARED TABLE: ALIGNING THE NEEDS OF BUSINESS, ECONOMIC DEVELOPMENT, AND WORKFORCE

Strengthening collaboration across business, education, economic development, and workforce is essential to meeting the needs of a changing economy. Cross-functional collaboration increases the ability to address the complexities facing the talent development ecosystem and allows us to develop and scale successful strategies throughout the state to foster an economy that works for everyone.

## EXPANDING PUBLIC-PRIVATE PARTNERSHIPS

In Colorado, sector partnerships provide a shared table for coordinated strategies aligned with industry demand. These regional, public-private partnerships bring business leaders together within a specific industry to collaborate with public partners in education, economic development, workforce, and community organizations. Colorado is a national leader in advancing the Next Gen Sector Partnerships model. Since 2007, 28 industry-driven regional sector partnerships have been launched with new efforts targeted at the development of partnerships in the energy, education, and retail, hospitality, and food and beverage sectors (see Appendix D for the 2019 Sector Strategies update).

Sector strategies continue to be a pivotal talent development approach to strengthening key industries in Colorado. These partnerships give industry leaders the opportunity to communicate with public partners the necessary knowledge, skills, and abilities for the current and future workforce.

This continued communication between industry and public partners is important when developing *accurate and efficient* education and training programs and hiring practices to build and hire a qualified talent pipeline, as it is unrealistic—and unnecessary—to expect every Coloradan to obtain an associate, bachelor's, and/or graduate degree.

To help advance sector strategies, the Education Consultant role shared between the CWDC and CDE, established by HB 15-1170, aids local school districts in improving postsecondary outcomes of students and developing demand-driven career pathway programs that equip students with the skills needed in the Colorado labor market, aligning education programs with the needs of the labor market. (See Appendix E for the 2018-2019 PWR Coordinator update).

## Energy | 2019-2020 Sector Strategies Development

In alignment with statewide initiatives, energy was identified as a target industry for career pathway systems development. Governor Polis' Bold Goals include positioning Colorado as a leader in the clean energy economy by setting a path to 100 percent renewable energy for the grid by 2040. Reaching Colorado's bold climate change goals will have significant impacts on the workforce. As jobs transition, coal and other extraction energy jobs will become less prevalent while renewable energy jobs will expand to meet these bold goals.

A leading measure of this goal is to increase net new jobs in the renewable energy sector from 2,574 to 3,074. To promote collaboration and industry-led solutions, the CWDC will support communities interested in launching energy sector partnerships. This network of regional energy partnerships will offer a foundation of strong industry leadership, collaboration, and investment to support the development of the energy career pathways to be mapped and developed in 2020 and beyond.

## SKILLS-BASED HIRING

Skills- or competency-based hiring allows industries to be more specific about their hiring needs and cast a wider net for filling jobs. The selection of the right employees is the foundation for employee performance; thus, the hiring process should choose those best qualified for the job.

Removing the degree requirement proxy and actually tapping into the critical skills needed to fulfill the function of the job will grow the candidate pool with qualified individuals

who may have self-selected out of a hiring process. Skills-based hiring bypasses the inferential leap that hiring based on a degree assumes by directly listing what is needed to successfully perform in an occupation. This is not discrediting postsecondary education, rather it boils down the successful, functional components of that education and training to explicitly communicate its value. Additionally, this practice will build education and training programs to teach the necessary skills identified by industry.

## MULTIPLE PATHWAYS TO CAREER SUCCESS

Throughout Colorado significant work is being done to shift and broaden the education and training framework to give all workers the necessary skills to perform in a job in the most economical and efficient way. Strategies to broaden this framework include thinking about higher education as more than just an associate or bachelor's degree. Shorter certifications, apprenticeships, prior learning or work experience, boot camps, and internships represent alternate pathways towards a successful career. Widening the scope of education and training is a strategy that can be used to upskill and reskill workers that may not have nearby access to two or four year institutions.<sup>6</sup>

Education and industry are working to align their efforts to give Coloradans the knowledge, skills, and abilities to be successful and to normalize these pathways. However, these efforts must be regionally tailored to ensure they align with local industry needs. An important part of this work is giving people the right information and tools to make informed career decisions. Career exposure and exploration should be an intentional action starting in the early childhood and K-12 education system and moving throughout one's career. As mentioned before, technology is changing the landscape of work quickly and lifelong learning is necessary to adapt. The following are examples of strategies being used, or that could be used, to widen the spectrum of efficient and economic education and training opportunities.

### Credit for Work

Another important step for Colorado students is the legislative effort to award college credit for prior work experience obtained outside the classroom. In 2019, education committee members introduced HB 19-1252: The Statewide Plan for Awarding College Credit for Work-Related Experience. Although the bill did not pass, the Making Higher Education

Attainable Interim Study Committee has requested a redraft of HB19-1252 to re-energize this important effort at the General Assembly.

This redraft requires the Colorado Commission on Higher Education (CCHE) and the General Education Council, which includes representatives from all Colorado public institutions of higher education, to create a plan to award college credit for prior work experience by 2022. Work experience is defined as "any experience acquired within the past 10 years through paid or unpaid employment, including but not limited to self-employment, an internship, a residency, a pre-apprenticeship program, or an apprenticeship program, that may lead to or result in a business credential, an industry credential, a technical certificate, or a professional license."

This would allow non-traditional, adult students to enter the postsecondary world with academic credit that counts toward their core general education, therefore reducing time to degree and saving them money. It would also allow youth apprentices the opportunity to get college credit for the work they are doing in their apprenticeships with industry. Under this proposal, Colorado's postsecondary institutions must implement their plan through the awarding of credit to students by the 2024 academic school year.

Giving value to experiences outside of a formal educational institution that directly contributes to a successful career would decrease redundancies that cost time, money, boredom, and frustration.<sup>18</sup> Additionally, this would increase the attainment rate for nontraditional students. An example would be to translate military veterans' work experience (e.g., medicine, engineering, computer programming) into academic credit to work toward postsecondary attainment. The Colorado Community College System (CCCS) and other institutions are ahead of the curve and have policies regarding prior learning assessments.

### Stackable Credentials

A stackable credential is a part of a sequence of credentials that will typically be built upon over time to upskill an individual to move forward along a career pathway.<sup>19</sup> These credentials yield opportunities for career mobility, usually leading to higher wages or promotions.<sup>20</sup> Stackable credentials allow individuals—where traditional education may not fit their life circumstances or interests—an alternate career path in an in-demand field.

Additionally, there are middle-skill jobs that require certifications or training beyond high school but not an

associate, bachelor's, or graduate degree. For example, 42 of the 47 Top Jobs that require at least a High School Diploma or equivalent require additional training (e.g., apprenticeship, OJT). Although these credentials are valuable, it is critical that they are aligned with industry needs and are shown to demonstrate the competencies identified by industry, otherwise they would be doing a disservice to students, job seekers, and the workforce.

Colorado is already doing work to align credentialing with identified needs by using industry representatives, sector partnerships, advisory committees, and following Colorado Career and Technical Education (CTE) standards (see the Colorado Career & Technical Education 2019-2024 Strategic Plan). In 2017-2018 CTE had 106,720 enrolled high school students with 1,389 programs across 184 schools and 151 districts, providing **statewide** access to quality career and technical education (see the CTE Fact Sheet for more information).

### Early Credential Attainment

Concurrent enrollment, P-TECH, ASCENT, and similar programs help blend education and industry and help fast track credential attainment for students.

The Concurrent Enrollment Programs Act (C.R.S. §22-35-101 et seq.) defines concurrent enrollment as “the simultaneous enrollment of a qualified student in a local education provider and in one or more postsecondary courses, including academic or career and technical education courses, which may include coursework related to apprenticeship programs or internship programs at an institution of higher education, at no cost to the qualified student.” These courses expand and accelerate the pathways from high school to higher education and help to ease the transition and financial burden of this transition while accelerating credential attainment.

In the 2017-2018 school year, there were 45,787 Colorado high schoolers participating in concurrent enrollment; this number is projected to grow by 10 percent annually. Additionally, 2,758 high school students earned some type of postsecondary credential after participating in concurrent enrollment or ASCENT programs, helping move the needle towards the 66 percent postsecondary attainment goal. Another important note about these concurrent enrollment programs is the increasing enrollment of underrepresented minorities in these programs. Specifically, 25 percent of concurrent enrollment and 40 percent of ASCENT participants identified as Hispanic.

Under SB 19-176: Expanding Concurrent Enrollment Opportunities, CDE is tasked with developing a concurrent enrollment website and managing grant distribution to expand concurrent enrollment opportunities between local education providers (LEPs) and institutions of higher education. In addition, concurrent enrollment is included in Colorado's graduation guidelines, which are adopted at the local school board level. These guidelines are in place to help move the K-12 system into a competency-based framework and to support students in demonstrating postsecondary and workforce readiness (PWR). See Appendix F for the Annual Report on Concurrent Enrollment.

In addition to concurrent enrollment, Pathways in Technology Early College High Schools in Colorado (Colorado P-TECH) provides students with a high school diploma and an industry-recognized credential over six years through a partnership with school districts, community colleges, and local high growth industry employers.

### Career Success Development Program | HB 16-1289

Another opportunity for high school students to gain career competencies is to obtain an industry-recognized credential. The Career Success Development Program provides financial incentives for school districts to promote students in grades 9-12 to complete qualified industry-recognized credentials (e.g., internships, residencies, pre-apprenticeship or apprenticeship, Advanced Placement Courses). Participating districts or charter schools can receive up to \$1,000 for each student who completes one of the qualified programs successfully. (For a list of approved industry-recognized credentials, see Appendix G).

## DEVELOPING CAREER PATHWAYS

HB 15-1274 initiated the development of regional career pathway systems for in-demand industries. Since 2015, seven in-demand industries have been mapped and published on MyColoradoJourney.com

Construction  
Information Technology  
Cybersecurity  
Healthcare  
Business Operations  
Advanced Manufacturing  
Education

Within these industry maps there are 42 different career pathways that have been developed in collaboration with industry and education stakeholders. These pathways expose students and job seekers to careers that are critical within Colorado. Giving Coloradans knowledge such as job demand, growth over 10 years, salary, and skills necessary allows citizens to make smart, feasible, long-term career decisions. The 2018-2019 pathway development focused on the education industry, yielding pathways for early childhood, K-12, and postsecondary education (see Appendix H). Further work is being done on education programs during 2019-2020, and new career pathway systems are being developed for the behavioral health industry.

## WORK-BASED LEARNING

In 2018, the CWDC updated the Work-Based Learning Continuum, and it continues to promote alignment in activities across business and education. Some of the strategies discussed below, such as sector partnerships, career pathways, and skills-based hiring are foundational to our approach in Colorado. Specific programs often support one or more concepts in the continuum, and they are highlighted below in that context

### Learning About Work

#### Early Career Exposure

Coloradans benefit from having early career exposure, exploration, and learning experiences before high school. The WBL continuum and other strategies listed provide a vehicle for career exploration throughout all educational stages, starting at early childhood education. Exposing individuals to different career paths early on allows people to discover what they like—and sometimes, more importantly, do not like—about different occupations. This discovery of interests allows individuals to make informed decisions about their future career pathways.

### Learning Through Work

#### Internships

Internships are a path students may take to learn through work. Internships supplement students' and job seekers' academic knowledge with the practical experience associated with an occupation that is hard to teach in a classroom. Additionally, the employer that provides the internship could extend an offer of employment, essentially creating a win-win for the job seeker and employer; the job seeker

gains academic knowledge and on-the-job training and the employer has a more qualified talent pool to select from.

Successful parts of sustainable internship examples should be analyzed and modeled to bring success to light at a larger scale. Modeling successful components keeps others from struggling to “reinvent the wheel” and allows for continuous improvement of resources and programs throughout the state.

#### Innovative Industries Internships (III) Program | HB 15-1230

CDLE received a state general fund grant to launch the Innovative Industries Internship program in 2016. This internship program's purpose is to incentivize businesses in innovative industries to utilize work-based learning efforts. The program provides extensive technical assistance and employers work directly with the state program coordinator.

The innovative industries include:

- Advanced Manufacturing
- Aerospace
- Bioscience
- Construction
- Electronics
- Energy & Natural Resources
- Engineering
- Information Technology

FY 2018-2019 Program Outcomes:

- 110 businesses were approved with 85 successfully completed internships.
- 88 businesses with under 100 employees and 22 businesses with more than 100 employees participated in the program .
- The average hourly internship wage was \$15.72, a continued increase from previous cycles.
- Of the businesses that participated in the program, 17 represent the rural outlying areas and 93 are based in metropolitan areas.

See Appendix I for the FY 2019 full report. Due to its success, this program has been replicated in the agricultural industry.

In 2009, SB 09-256 was passed requiring all Colorado high school students to have an Individual Career and Academic Plan (ICAP). In the 10 years since the passage of the legislation, schools and districts have taken a variety of approaches to ICAP implementation. The most promising approaches start as early as kindergarten, in an **Individual Career Academic Planning (ICAP) Process** that helps students map their journey toward postsecondary and workforce readiness.

Given that high school graduates and job seekers need a combination of academic skills, **essential skills**, and technical skills to succeed, ICAP is designed to help students develop, articulate, and demonstrate those skills in a way that aligns with the needs of business, industry, and higher education. Schools and districts are taking different approaches to ICAP implementation.

Different locally implemented, high-quality approaches to ICAP give students ownership of a process that helps them plan this journey by exploring their unique talents and aspirations, participating in career and postsecondary options, creating pathways to financial success after high school, and building and curating evidence for powerful demonstrations of learning.

The goal of ICAP is to provide students with the opportunity to **learn about work** at any age. Understanding of self, research, and exposure to a variety of careers form the foundation for career development. With access to the ICAP process, students can participate in: job search activities using online tools; career interest inventories; career cluster maps; career fairs; interviews with professionals in the career field of interest; guest speakers; career costumes; drawing careers in their families/community; essential skills conversations; presentations to peers and community leaders about researched careers; virtual job shadows; worksite tours; entrepreneurship fairs; college visits; and project-based learning curricula offered in their area.

# SPOTLIGHT

When students practice career development, including experiential learning, they:

- Are more motivated to attend school and stay engaged.
- Have access to quality career guidance activities.
- Connect the relevance of education to their future aspirations.
- Understand and demonstrate self-exploration, career exploration, and career planning and management.
- Make secondary and postsecondary course plans to pursue their career and life goals.
- Are connected to their college and career goals.
- Select their pathway more strategically to align with self-defined career, college, and life goals.
- Are aware of and can articulate the cultural expectations they face when in a workplace environment or postsecondary experience.

Although the ICAP process is locally determined and implemented to fit the needs and resources of an area, consistent access to materials is provided in the centralized location of MyColoradoJourney.com. My Colorado Journey is a statewide platform that connects individuals to work, education, and support services to facilitate career exploration and action planning.

**Highlight:** In the Poudre School district, students can sign up to participate in **Career Cab**, “exploring different careers, one job-site at a time.”



...Students jump on the “Career Cab,” a white PSD mini-bus, to visit businesses and professions they are interested in pursuing either after high school or college. Worksite tours have included visiting the Fort Collins Fire Department, City Services, and a cosmetology business and training program.

Cassie Poncelow, high school counselor, says that “students not only learn about the jobs but also what they need to do to help land a position. On most of our trips, we have partnered with a training program that will talk with students about the education and training that they need to work in the field.”

The Upper Arkansas Area Technology Sector Partnership is growing based on two focus areas: talent development and attraction and business development and attraction.

**Talent Development & Attraction:** The partnership connected with K-12 and community college partners to develop internship programs for students. The program is growing and work is being done to develop a program manual to ensure each internship is teaching a similar curriculum. Additionally, the partnership developed relocation flash drives for each county to help in efforts to attract location-neutral professionals to the area.

**Business Development & Attraction:** A similar approach was used for business attraction efforts. Within the partnership, there is one company that is currently completing time with the HAX Accelerator in China and another is building a government/defense contracting business for service desk support. The partnership's story has been shared in Forbes Magazine, the school district has won awards in STEM education, and the internship program manager is nominated as a finalist for the Colorado Technology Association APEX Award for his work.

## COLORADO'S WORK-BASED LEARNING CONTINUUM

Work-based learning is a continuum of activities that occur, in part or in whole, in the workplace, providing the learner with hands-on, real world experience.

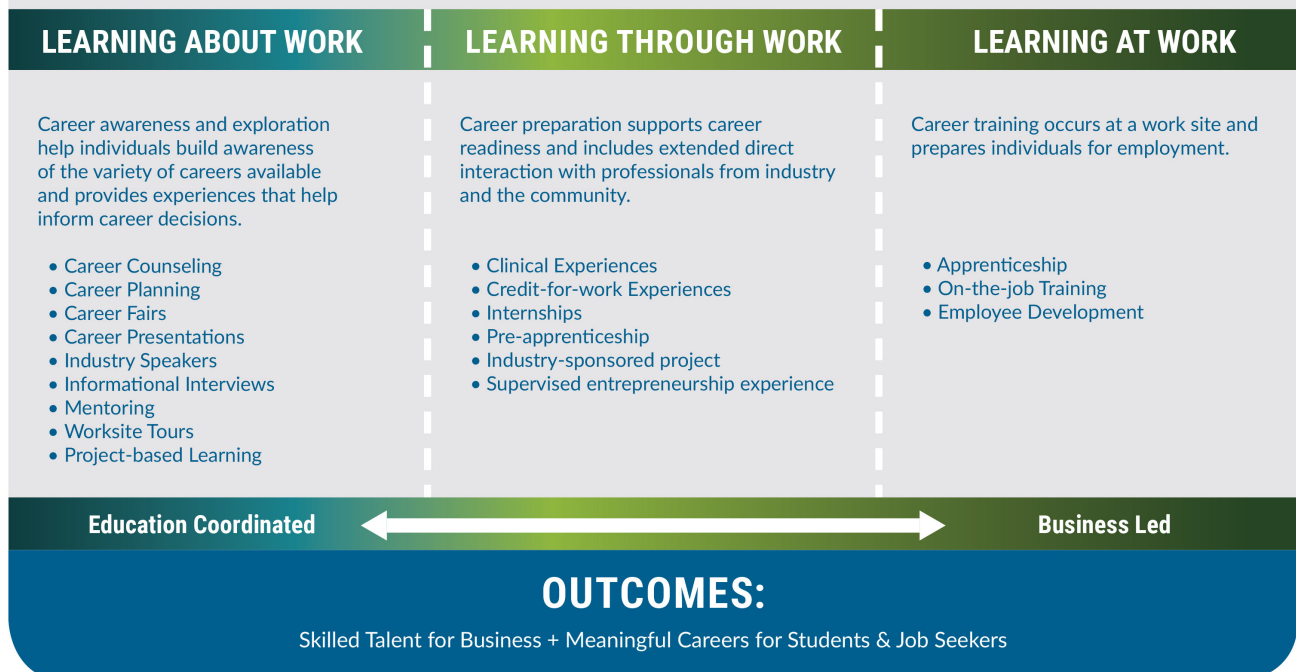




Photo credit: nicklucey.com

### Co-Locating the Regional TalentFOUND Network at Sturm Collaboration Campus

Collaboration across the TalentFOUND network was the impetus for the Sturm Collaboration Campus at Arapahoe Community College (ACC), which opened to over 650 students in August. The campus is located in Castle Rock, a region where unemployment continues to hover around two percent, making it difficult for south metro Denver employers to find the qualified workers they need. Led by ACC, the campus and its partners along with Colorado State University, Douglas County School District, A/D WORKS!, the Town of Castle Rock, Castle Rock Economic Development Council, and local industry will set the stage for shaping industry-education collaboration in the region by aligning applied learning and workforce training with educational offerings in cybersecurity, secure software development, business, accounting, entrepreneurship, and healthcare.

Sturm Collaboration Campus will provide students career and academic support on the front end through campus navigators and will have a goal of connecting students with paid work-based learning experiences.

### Changing the Talent Development Landscape

The development of the Sturm Collaboration Campus at ACC is intended to change the educational landscape for south metro Denver students and the surrounding community. ACC and its regional partnership have utilized the following four pillars when developing the programs and operations of the campus:

1. **Partnerships** are the crux of the Sturm Collaboration Campus. The institution has approached work-based learning across the learner continuum as a collaboration of K-12, community college, 4-year colleges/universities, workforce centers, community partners, and industry. By leveraging each other's strengths, the Sturm Collaboration Campus will co-create job shadows, internships, pre-apprenticeships, and apprenticeships in a centralized and seamless manner.
2. **Innovation** at the Sturm Collaboration Campus is defined as industry first. Business partners are taking the lead, informing educational partners of their needs and how campus programs and operations can best support those needs—this offers a detour from the traditional relationship between education and industry. ACC is collaborating with Skillful Colorado on an innovative project to calibrate competencies in the curriculum with the competencies in the most up to date job postings that the degrees should qualify students for.
3. **Pathways:** Students complete their selected pathway criteria through a hybrid of in-person labs, face-to-face classes, and online coursework that is aligned with industry. To remain relevant and address Colorado's current workforce skills gap, pathways will evolve as industry needs change over time.
4. **Sustainability** is necessary for the viability of the program. To transform into a thriving, autonomous region, the unification of education, industry, and community agencies must be sustainable for future generations. Therefore, the partners formed an industry-led Talent Pipeline Douglas County group whose goal is to ensure continuous improvement and evolution of the Sturm Collaboration Campus.

ACC partnered with the Sturm family on an up to \$10 million gift through their Family Foundation. The largest private gift to a community college in Colorado's history is being utilized for campus operations/staffing, technology upgrades, and has matching opportunities through scholarships, a program innovation fund, and a Phase 2 investment. The town of Castle Rock also provided a \$3 million infrastructure investment into the campus.



## Learning At Work

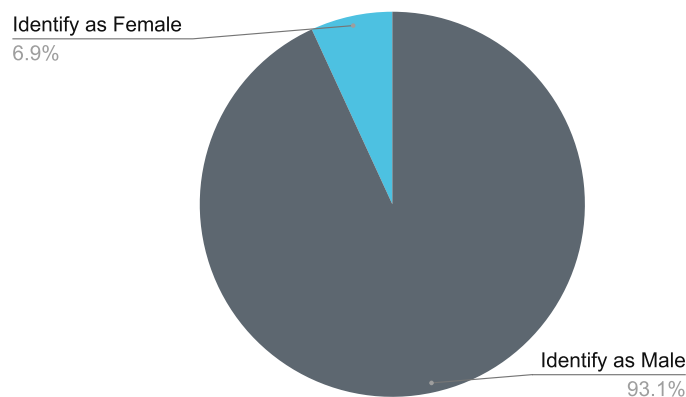
The last component in the WBL continuum is learning at work. Career training that occurs at work that prepares individuals for employment includes apprenticeships, on-the-job training (OJT), and employee upskilling or reskilling. Learning at work is increasingly becoming more common across industries. With work itself shifting rapidly, the workforce must embrace lifelong learning to adapt with the changes.

### Apprenticeships

Apprenticeships are a premier example of learning at work. The 2018 Talent Pipeline Report identified that apprenticeships are a proven strategy to close the skills gaps throughout the state. Furthermore, they are shown to develop highly skilled and highly productive employees, decrease turnover, increase workplace safety, and diversify the workforce. Apprenticeships are supported through the USDOL Registered Apprentice System and Colorado Department of Labor and Employment, the Workforce Innovation and Opportunity Act (WIOA; discussed below), and initiatives like CareerWise Colorado that are creating modern youth apprenticeships.

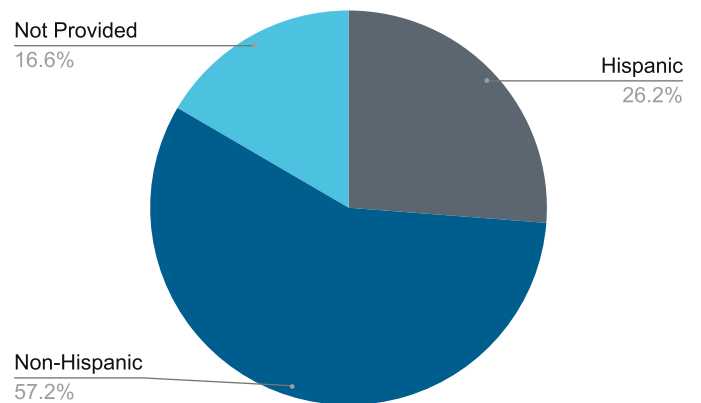
In Colorado as of July 2019, there were 6,826 total USDOL Registered Apprentices. The demographics of apprenticeships are diversifying since the last report, and there are continuing efforts to increase numbers for underrepresented minorities and females (see Figures 12, 13, and 14). Additional demographics include 855 military veterans and 52 individuals living with a disability.

**Figure 12**  
2018 USDOL Registered Apprenticeship Participation by Gender Identity



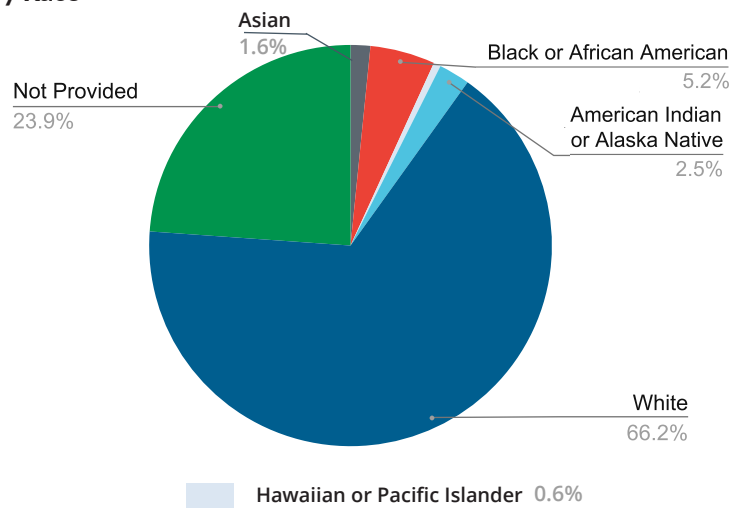
Source: Colorado Department of Labor and Employment<sup>21</sup>

**Figure 13**  
2018 USDOL Registered Apprenticeship Participation by Ethnicity



Source: Colorado Department of Labor and Employment<sup>21</sup>

**Figure 14**  
2018 USDOL Registered Apprenticeship Participation by Race



Source: Colorado Department of Labor and Employment<sup>21</sup>

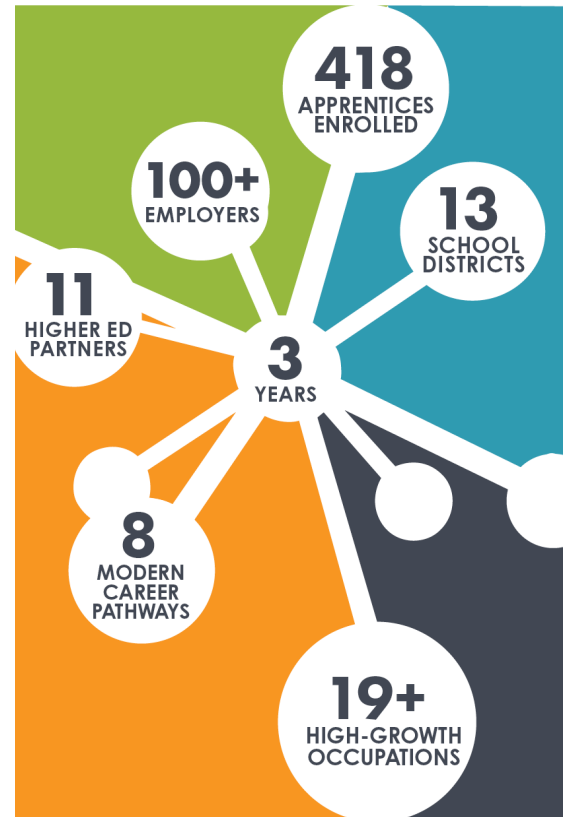
### Industry Infrastructure Grant | HB 1288

In 2018-2019, the final year of the Industry Infrastructure Grant (HB 1288), CareerWise Colorado has continued to lead the development of robust frameworks for youth apprenticeship, which can then be applied across the spectrum of work-based learning to ensure broad access, high-quality, and equitable outcomes in a variety of industries and business contexts across Colorado. The work that CareerWise has completed to identify, refine, and launch tools, processes, and new types of relationships between industry, education, and the workforce of tomorrow has gained attention from around the country, and is now being replicated not only in Colorado, but in other national communities as diverse as New York City and Elkhart County, Indiana.

Though the work is continually evolving, CareerWise is committed to gathering, analyzing, and reacting to feedback from partners and constituents in order to move toward a codified, best practice model for competency-based training in the workplace that is linked to and complementary of classroom-based education, both at the K-12 and postsecondary level. See Appendix J for the full annual report.

In summary, apprenticeships allow for pathways to achieve career growth, empowerment of diverse populations to financial independence, removal of barriers to entry for the technology industry, exposure to careers that seem out of reach, and the transformation of lives, communities, and populations through workplace learning.

### CAREERWISE BY THE NUMBERS



**“The development of apprenticeship programs is important to attracting and growing talent to meet our workforce demands. Some of the most difficult to fill roles in our industry are projected to grow up to 37 percent between 2018 and 2028. Creating and scaling programs to meet this demand are critical to meeting the needs of the individuals in the communities we serve. Through partnerships with innovative educational institutions, Centura Health is committed to creating and supporting lifelong learning experiences that close the workforce gap.”**

- Abbey Clothier, Manager of Talent Partnerships,  
Centura Health

Tectonic's apprenticeship program is registered by the United States Department of Labor and is built on a platform of diversity, critical thinking, and core foundational engineering skills. The Tectonic apprenticeship is a 12-month paid apprenticeship, comprising classroom learning and real-world client application development. Tectonic's apprentices learn basic coding literacy, fundamentals, and essential skills and develop career-readiness, preparing them to become immediate contributors to the corporate software development community. The demand for skilled software developers will continue to grow as the Bureau of Labor Statistics projects a 30.7 percent employment growth for software developers between 2016 and 2026.

The Tectonic apprenticeship is a pioneering apprenticeship model for the technology industry. The goal is to provide an unparalleled opportunity to people with diverse backgrounds, women, and veterans who are looking to gain an education and the associated skills to begin a career in technology. By removing the barriers normally associated with gaining a career in technology, Tectonic finds the best and brightest talent regardless of education, background, or socioeconomic status. Tectonic is closing the talent gap and reversing the

stigma of what a developer "should" look like. Apprentices are paid a livable wage throughout their 2,000 hour apprenticeship program and there is no cost to the apprentice to join the apprenticeship.

Apprenticeships have set the foundation for the past, current, and future growth of Tectonic and its clients. Instrumental to the growth of the Apprenticeship program was the support provided by the Colorado Department of Labor and Employment, the local county workforce offices, the TEC-P, and WORK Act grants. The candidate referrals, funds, and expertise provided by these agencies was key to the development, maturation, and growth of the program. Tectonic also benefited through participation in the Tech Talent Denver and Tech Talent Boulder technology sector partnerships. Tectonic also shared the power of apprenticeship to the industry partners who participate in these partnerships.

Former Tectonic apprentices are now working for a wide range of Colorado and national companies including Zayo, Misty Robotics, IHS Markit, and Pivotal.

## RESPONSIVENESS TO THE CHANGING NATURE TO WORK

Demand driven career pathway programs integrate opportunities for work-based learning and are critical to providing students and job seekers with relevant industry-aligned training. In addition to these relevant real-world experiences, more is needed to keep pace with the needs of the changing economy.

### Office of the Future of Work

On September 4, 2019, Governor Polis signed an Executive Order establishing the Office of the Future of Work, designed to serve as a central point for the state's efforts to respond to Colorado's rapidly changing economy and workforce needs. The Office, housed within CDLE and working across state agencies, is charged with researching, analyzing, and developing recommendations on ways Colorado communities can modernize worker protections and build a skilled and resilient workforce. Specifically, the Office will explore the following work areas:

#### Modernize worker benefits and protections:

Worker protections and the social safety net need to be modernized in order to support the people most vulnerable

to the changing economy and to ensure everyone has access to opportunity as Colorado's economy evolves. This area of exploration includes modernizing our benefits delivery systems to better serve Coloradans, supporting workers' voices, and exploring a portable benefits system. This area also includes ensuring that people working in jobs that require a high level of human interaction and care (e.g., those working in early childhood education, home health care, and other direct care positions) are receiving a living wage.

#### Ensure individuals, employers, and communities have a digital transformation plan:

To help Colorado workers, employers, and communities prepare for the future of work, the Office will create awareness and action plans to address the challenges the changing nature of work brings and equip people with tools and strategies to effectively manage the transformation. For individuals, the Office will raise awareness of My Colorado Journey and promote access to career advising services. For employers, the Office will explore ways to support small and medium businesses in executing their own digital transformation. For communities, the Office will work to ensure that local communities are proactive in responding to the changing economy and support their efforts to diversify their industries and build the skills of their workforce.

**Align inter-agency government programs, resources, and support to best serve target populations** with a particular focus on New Americans, people with disabilities, underrepresented minorities (e.g., Black or African American, LatinX), mid-career professionals, justice-involved, and mature workers. As the digital transformation of work continues, the Office will keep a focus on those individuals who have been displaced, left behind, or underserved in the current economy.

The work of the Office will be done in partnership with the CWDC and other state agencies, boards and commissions, business and industry leaders, local government representatives, community-based organizations and service providers, and learners and workers themselves. In addition to state agency partners, CDLE is bringing together thought leaders including the Aspen Institute, Deloitte, McKinsey Global Institute, Brookings Institute, the Markle Foundation, and others to tackle these challenges. The Office will develop ongoing working groups and host regional and statewide summits to achieve its mandate. This work culminates in a roadmap delivered to Governor Polis in the second half of 2020 that will include policy and program recommendations with implications for the 2021 legislative session and state programs.

## The On-demand Workforce

To further understand the implications for the future of work, CDLE Workforce Development Programs partnered with the National Governors Association, the American Institute for Research, and Colorado State University to conduct focus groups for the on-demand workforce in three locations in Colorado in November 2019: Denver Metro, Pueblo, and Grand Junction. Two groups were held at each location, one for gig workers (e.g., freelancers, independent contractors, project-based workers) and one for 1099 employers. The focus groups' purpose was to establish a common process for other states to emulate through the NGA's On-Demand Workforce Consortium and create a nationally valid set of qualitative information about gig workers. Continuing to build resources for different types of workers showcases the different paths an individual can take and how.

## LIFELONG LEARNING AND CAREER SUCCESS

With technology evolving the way work is being done, upskilling, reskilling, and on-the-job training (OJT) are integral components of responding to that evolution. Investing in the education, development, and training of employees is an

adaptive way to create a resilient workforce and is good for organizational return on investment and employee retention. As technology causes a shift in the way work is being completed, there is a need for employees to be upskilled in their current industry or reskilled in a different or emerging industry after being displaced during a downturn to use these new technologies accurately and efficiently.

An example that is prevalent today is the reskilling of extraction and mining workers to transition to renewable or green energy occupations. Green occupations are expected to grow by 17 percent over the next 10 years.<sup>3</sup> The workers have the critical skills (e.g., mechanics, engineering) necessary to succeed in these jobs, and OJT will facilitate the transition between industries.

Another strategy to aid in upskilling and reskilling would be to offer expedited, flexible courses to allow for an individual to continue working while learning or re-enter the workforce at a quicker pace.<sup>6</sup> These strategies are especially helpful for the 55+ population in the labor force. As the workforce continues to age because people are working longer, upskilling, reskilling, and OJT are pivotal in ensuring the employability of these workers to protect them from being left behind or disadvantaged.

## EQUITY: ELEVATE RESOURCES AND REDUCE BARRIERS

As an increasing number of education and training providers develop more programming that is relevant and aligned with the needs of business, it is imperative that resources are identified and barriers mitigated that ensure equitable access and success within this programming is attainable for all Coloradans. Additionally, there is a need to identify opportunities to facilitate support for Coloradans throughout their entire career. This includes raising awareness of the variety of careers and training opportunities available, making behavioral health an area of focus, addressing early childhood education needs, and increasing services to support the pursuit of education or training programs for individuals.

### Awareness

#### Career Advising Framework

Access to quality career advisors is a strategy that can be used to address the skills and attainment gap in Colorado. Many Coloradans have difficulty navigating the education, training, and employment system and are unsure of what steps to take to pursue in-demand, well-paying jobs.

Funding from the FY20 state budget creates the opportunity

to address this challenge by training career advisors and counselors throughout Colorado using a statewide framework. This statewide framework was developed by system partners in K-12 education, postsecondary education, workforce development, adult basic education, and human services with the purpose of training 5,000 individuals throughout Colorado on a shared approach to career advising. The framework defines what quality career advising means and provides an overview for professionals in the field on how to engage in career advising with an individual in a one-on-one setting. The framework includes action steps, expectations, and primary competencies of a career advisor. Some expectations include:

- Data-informed
- Inclusive, respecting the cultural values of participants
- Competency-based
- Equitable
- Customer-centered

#### Skilled Worker Outreach, Recruitment, and Key Training (WORK) Act

The WORK Act is a public-private collaboration with the purpose to increase awareness, enrollment, and completion of training programs to expand the skilled workforce. Eight grantees were awarded \$3,182,610.79 for the performance period of October 2019 through May 31, 2021. Grantees use the funds to support outreach and recruitment efforts for the training programs.

WORK Act outcomes since inception in 2015:

- Awarded more than \$11 million
- Awarded 30 grants to a diverse group of organizations among 15 key industries
- 12,000+ enrolled in training programs (apprenticeships, pre-apprenticeships, internships, boot-camps)
- 4,000+ training completers employed, including 1,000+ in registered apprenticeships

The WORK Act facilitated:

- **Industry partnership and sustainability:** Grantees strengthened existing partnerships and engaged them to provide additional support, such as an improved training space.
- **Programs expanding to new communities:** Grantees expanded their successful programs to additional locations and exposed new Colorado

communities and diverse populations to the greater opportunities.

- **Curriculum enhancement:** Grantees responded to industry needs by enhancing curriculum and expanding emphasis on soft skills such as conflict resolution.
- **Leveraging marketing funds for sustainability:** Efforts produced high-quality marketing materials, including functional, attractive websites and program branding. These marketing efforts elevated programs and gained credibility in the community. Two grantees chose to partner to leverage marketing funds, increasing the sustainability of their outreach efforts.
- **Grantee and State Employment:** 100+ recruiters/navigators/administrators employed by grantees, including program graduates now working for the organization.

See Appendix K for the annual WORK Act report.

#### Education and Equity

Education is a common resource that is not without barriers. As mentioned previously, raising the postsecondary attainment rate to 66 percent is a statewide goal. However, momentum must begin to build earlier than high school in order to attain that goal. One step that has been taken to reduce barriers to educational attainment is to provide state funding for full-day kindergarten throughout Colorado through HB 19-1262. This bill helps reduce potential financial barriers associated with full-day kindergarten.

Increasing educational attainment is one strategy in filling the equity gap throughout Colorado and the nation. However, equity is a systemic issue that feeds up from early in life. However, research indicates that equity gaps can appear among children as early as 4.5 years of age, which can reverberate throughout an individual's life with the possibility of increasing the chances of adverse impact when looking for work.<sup>22</sup> Adverse impact is the differences between demographically different individuals or groups regarding the outcome of some selection procedure or process.<sup>23</sup> Adverse impact is just one of many consequences for not providing an equitable playing field for all Coloradans. It is critical that Colorado continues working to break down barriers to ensure children are provided with equal opportunities to quality education and support early on to work to prevent systemic consequences.

## Behavioral Health Resources

During the 2019-2020 FY, behavioral health pathways will be an industry of focus for CWDC's career pathways team. Building out career pathways in behavioral health helps create more exposure and clarity to the industry. Additionally, it starts the conversation of how behavioral health fits into the workforce on both the supply and demand side. The National Institute of Mental Health reported that one in five (46.6 million) people in the United States 18 years or older reported a mental illness in 2017. This is not an issue that only affects adults. It was found that in children 3-17 years old in 2016:

- 7.1 percent had anxiety problems
- 7.4 percent had behavioral problems
- 3.2 percent had depression<sup>24</sup>

What does this mean for the workforce? Research indicates that poor mental health can result in adverse workplace consequences (e.g., unemployment, absences, decreased performance<sup>25</sup>). Mental illness is life impairing and access to behavioral health resources is life-changing. These support resources are significant at all stages of life.

Throughout K-12 and postsecondary education, resources are made available for students. However, there is a need for increased resources and support for mental illness prevention to meet the demand for behavioral and mental health services throughout schools and districts. The American School Counselor Association recommends that there be a 250:1 student to school counselor ratio. In Colorado in 2016-2017, the ratio of students to school counselors was 365:1.<sup>26</sup> Additionally, the National Association of School Psychologists recommends that there be a 1:700 school psychologist to student ratio.<sup>27</sup> In Colorado in 2016-2017, the ratio of school psychologists to students was 1:956.<sup>14</sup> Mental illness left untreated affects daily life and could become pervasive throughout childhood and adulthood leading to not only workplace problems but lifelong problems.

## Services to Support the Pursuit of Education or Training Programs

Giving people the resources to achieve their own success is necessary when thinking about how to upskill and educate Coloradans. Everyone has unique challenges to overcome to achieve success. These challenges include but are not limited to childcare, transportation, illness or injury, and surprise expenses. Services that provide behavioral health resources, childcare, financial assistance, and reduce educational barriers help Coloradans navigate through the maze of life barriers.

## Workforce Innovation Opportunity Act (WIOA): Title I Programs

The federal Workforce Innovation Opportunity Act (WIOA) funds programs that provide employment services, education, and training to re-enter the workforce. These programs focus on employment and reemployment services for youth and adults who have not been in the labor force, are unemployed, underemployed, special populations, veterans, incumbent workers, and those in the gig economy. These programs are delivered through county- and state-run workforce centers as well as other locations.

Collectively, these programs deliver robust services for individuals most in need of support to obtain training, complete their high school equivalency degree, or discover how a disability and work can co-exist. Appendix L is the full annual report for activities under WIOA during PY 2018, and the snapshot on page 39 highlights the results of services delivered under Titles I and III of the Act.

## Financial Assistance

The financial burden of tuition and textbooks are significant hurdles for most individuals seeking to pursue education and training after high school. According to CDHE's recent ROI report, in addition to tuition, students pay around \$6,000 for books and other expenses. However, if the student completes the postsecondary credential, their lifetime earnings are higher than those who do not (see *Colorado Rises: Maximizing Value for Students and our State*). One strategy to reduce student costs is Open Educational Resources (see page 40).

## The Employment Support Job Retention Services Program

The Employee Support Job Retention Services program (HB 19-1107) creates a grant program within CDLE to contract with local nonprofits and other entities to provide emergency support services to Coloradans seeking job training or preparation. Known as the "flat tire fund," this emergency support can be used for last-minute childcare (or to fix a flat tire) if something unexpected arises during a critical point in the training or hiring process. Such programs provide small dollar amounts to families but can make a huge difference for those working toward economic mobility.

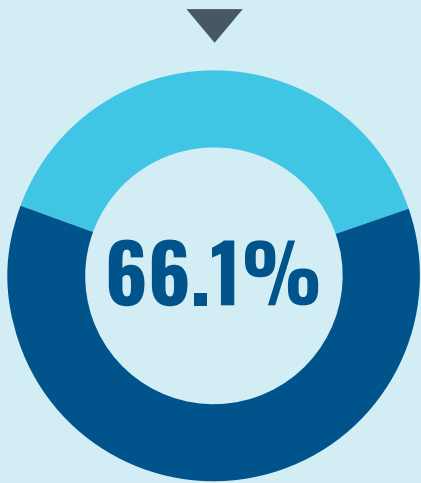
All of these programs are providing resources for individuals to overcome barriers that would otherwise prevent them from moving forward with work, education, and training. Thus, they are indirectly helping strengthen the talent pipeline and increase postsecondary attainment. Specifically, continuous adoption of the 2Gen approach will help address needs in the workforce and workers' families. The 2Gen approach works to fulfill the needs of and create opportunities for the adult and children within the family, acknowledging that each family has unique circumstances.<sup>28</sup>

# IN COLORADO



**191,796**

JOB SEEKERS  
UTILIZED THE PUBLIC  
WORKFORCE SYSTEM  
IN PY2018



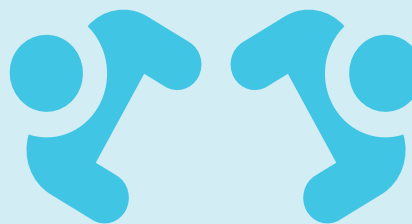
OF JOB SEEKERS WERE  
SUCCESSFULLY EMPLOYED

with **66.4%** successfully  
retaining employment one  
year later

**11,479**

**BUSINESSES**  
WERE SERVED BY THE  
PUBLIC WORKFORCE SYSTEM

**376,058** JOBS POSTED



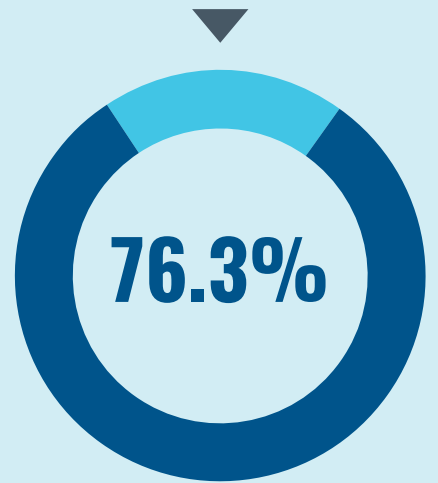
**63,111**

job seekers received in-person  
services through our statewide  
network of workforce centers,  
such as resume assistance and  
interview skills



**6,953**

INDIVIDUALS WERE  
ENROLLED IN MORE  
EXTENSIVE TRAINING  
**PROGRAMS**



OF THOSE INDIVIDUALS WERE  
SUCCESSFULLY EMPLOYED

with **75.7%** successfully  
retaining employment one  
year later

Containing costs for students in higher education is paramount to the Colorado Department of Higher Education (CDHE) and the State of Colorado. Since 2018, CDHE has been working to assist public higher education institutions in lowering learning material costs by developing and expanding the use of Open Educational Resources (OER) in tandem with the Colorado OER Council, pursuant to HB 18-1331.

Over the last half-century, textbook and other educational resource prices have increased at an unparalleled rate compared to all consumer goods, contributing to the rising cost of college. In the last decade, the average cost of college textbooks has risen four times faster than the rate of inflation. National organizations, the state of Colorado, and Colorado institutions of higher education estimate that college students should budget anywhere from \$900 to \$1,800 for books and course materials in the 2018-19 academic year.

Colorado's OER initiative was established to address these rising costs and encourage innovative practices in higher education. In the first year of the OER Grant Program, institutional grantees are projecting savings of more than \$3.4 million to the students of Colorado at their respective institutions. This figure represents more than six times the return on the State's initial investment into this initiative.

Open educational resources, practices, and philosophy have inspired educators to innovate by reinvigorating curricula, starting free textbook campaigns, and more. This is a direct result of two key factors for institutional capacity: 1) State-supported OER grant funding and training opportunities and 2) the willingness of expert educators from all disciplines to continue to innovate their educational practices for the learning and financial benefit of the students.

## RURAL STRATEGIES: EXPAND UPON, SCALE, AND DEVELOP OPPORTUNITIES

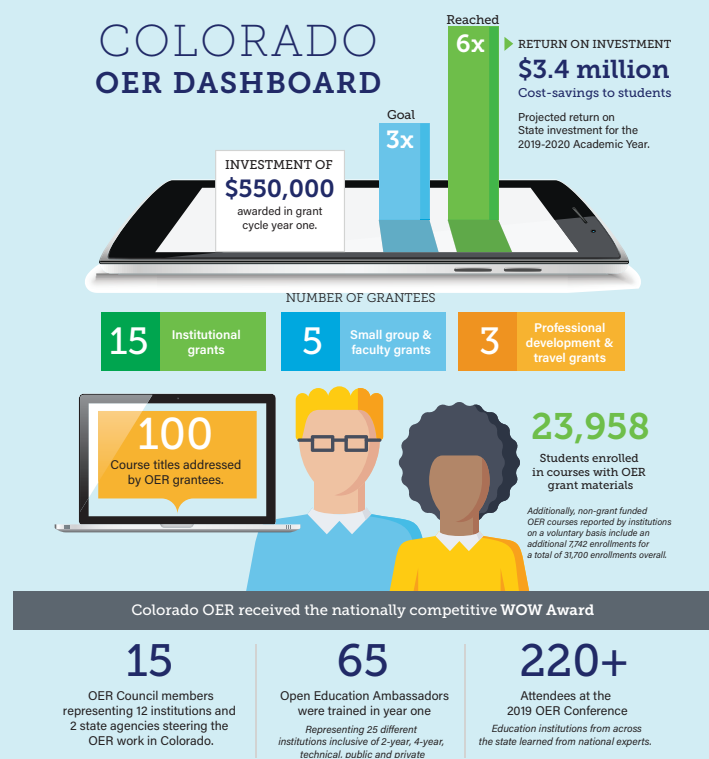
The strategies above are intended to be scalable and functional statewide. However, to ensure workers in rural Colorado have an equal playing field for economic success, supplemental strategies must be adopted. Rural communities face special circumstances compared to the front range and metro areas, such as transportation and broadband access.

Transportation is not equally available in rural areas and this poses a problem for students, job seekers, and community members to access jobs, education, and healthcare. For example, a student in an area where there is public transportation available has easier access to concurrent

# SPOTLIGHT

Acknowledging the progress so far, the OER Council recommends the following considerations for continued momentum: building structure, building culture, and building evidence around the impact of open educational resources and practices. Current indications from this work at the statewide level demonstrate the current state of the open education movement in Colorado is radiant, and the potential for the future is just as bright.

See Appendix M for the full OER report.



enrollment opportunities than those without public transportation who would have to drive significant distances. Expanding transportation resources and infrastructure in addition to increasing access to services (e.g., broadband) is pivotal for creating equitable opportunities for Coloradans.

Considerable work is being done by the Colorado Department of Local Affairs' broadband program using grants to support local governments' efforts to develop infrastructure that would provide broadband access throughout the state. Broadband would allow for remote work, business and community growth, and distance learning opportunities in areas where the cost of living is lower.

These two services are steps the state can take, in addition to the statewide strategies, to provide rural communities with opportunities for economic prosperity.





05

RECOMMENDATIONS

## REVIEW OF 2018 RECOMMENDATIONS

In the 2018 Talent Pipeline Report there were three priority areas highlighted and several strategies recommended. These recommendations aligned with the Education Leadership Council report released in December 2018. Those priorities were:

1. Further develop infrastructure that supports all pathways to a meaningful career.
2. Eliminate attainment gaps along the education and career pipeline.
3. Strengthen collaboration and alignment at the state and local implementation levels to improve efficiency.

During the 2019 legislative session, several pieces of legislation were passed and signed into law that supported the 2018 priorities. In addition to legislation, state agencies continued working over the past year with local and national partners to enhance the outcomes we are seeking for the talent pipeline in Colorado. Specific results are outlined connected to each priority.

### **Priority 1. Further develop infrastructure that supports all pathways to a meaningful career.**

Five bills were passed that enhance the infrastructure for meaningful career pathways. These include:

HB19-1187: Increase Student Aid Application Completion Rates provides dedicated resources to CDE to support students in completing the FAFSA;

HB19-1236: Workforce Diploma Pilot Program allows qualified providers to award a high school diploma to adult learners;

HB19-1294: Transfer Apprenticeship Credit to College Credit requires a working group to be formed to develop recommendations on the awarding of college credit for construction industry registered apprenticeship programs;

SB19-171: Apprenticeships and Vocational Technical Training requires CDLE to develop and publish an apprenticeship program directory; and

SB19-216: High School Innovative Learning Pilot allows high schools to receive full funding for students who attend classes part-time and participate in an innovative learning experience outside of the classroom part-time, which has the potential to promote the growth of apprenticeships for high school students.

### **Priority 2. Eliminate attainment gaps along the education and career pipeline.**

Four bills were passed that will help eliminate attainment gaps for Coloradans in the education and career pipeline. These include:

19-1025: Limits on Job Applicant Criminal History Inquiries creates more opportunities for a person who has had involvement with the justice system to be evaluated for jobs based on their skills and experience, rather than on their criminal history;

19-1107: Employment Support Job Retention Services Program provides financial resources to individuals in need who may otherwise be forced to drop out of training programs;

19-176: Expanding Concurrent Enrollment Opportunities and SB19-189: Sunset Concurrent Enrollment Advisory Board work together to ensure that all students in Colorado have continued and expanded access to complete college-level courses while in high school at no cost to the student.

### **Priority 3. Strengthen collaboration and alignment at the state and local implementation levels to improve efficiency.**

Although there was not any legislative action taken in the 2019 session to improve alignment, the Polis Administration has established cross-agency workgroups at the cabinet level to focus on working together on shared challenges towards the same outcomes. The CWDC has continued to align efforts of state and local partners through its regular convenings and steering committees, and multiple agencies have partnered together on work with the National Governors Association in policy academies.

## 2019 RECOMMENDATIONS

Based on the work that has been executed to date by the TalentFOUND Network and the data presented in this report, the following actions can be taken in order to strengthen Colorado's talent pipeline and to support future economic growth.

**Priority: Enhance access to opportunities for quality, lifelong education connected to the future of work.**

**Strategy 1:** Support the front-end of Colorado's talent pipeline by expanding access to high-quality early childhood education so that all children enter kindergarten prepared to thrive.

**Strategy 2:** Support efforts to make postsecondary education and training more accessible and affordable while containing costs. Income sharing agreements have demonstrated some success for populations who are not able to access available and sufficient federal and state financial aid. Creating a policy framework or piloting a program could deliver new resources to individuals in need of financial support. (See the income sharing agreement report available at [coworkforcecouncil.org](http://coworkforcecouncil.org)).

**Strategy 3:** Develop new mechanisms for upskilling and reskilling workers who are in occupations at high-risk for automation or market changes, and supporting populations who are overrepresented in these high-risk areas in coordination with the Office of Just Transition as applicable. Solutions should include earn and learn models that allow individuals to obtain training without sacrificing income, or receive training for new roles prior to the loss of a current job.

**Priority: Foster an economy that works for everyone.**

**Strategy 1:** Recognize work experience and skills with academic credit to expedite credentialing and reduce costs for individuals.

**Strategy 2:** Reduce the barriers to occupational licensure that prevent skilled workers from participating in their chosen profession.

**Strategy 3:** Create options for employers to support the high-cost services that impact the availability and retention of talent in Colorado, such as housing and childcare. (See recommendations from the CWDC task force on affordable housing available at [coworkforcecouncil.org](http://coworkforcecouncil.org)).

**Strategy 4:** Encourage employers and those charged with filling positions to utilize clear behavioral definitions of what "essential skills" are needed and what they mean in each position, giving job seekers a clear idea of job expectations and requirements, and the organizations and education and training providers clear training objectives.

**Priority: Focus resources on enhancing strategies that have already demonstrated results and effectiveness.**

**Strategy 1:** Renew programs that have produced positive gains for Colorado including the Innovative Industries Internship Program, the Employment First Advisory Partnership, and the WORK Act.

**Strategy 2:** Further enhance and promote opportunities for concurrent enrollment aligned to a student's program of study and the ability to earn industry-recognized credentials of value in high school.

# 06

## CONCLUSION

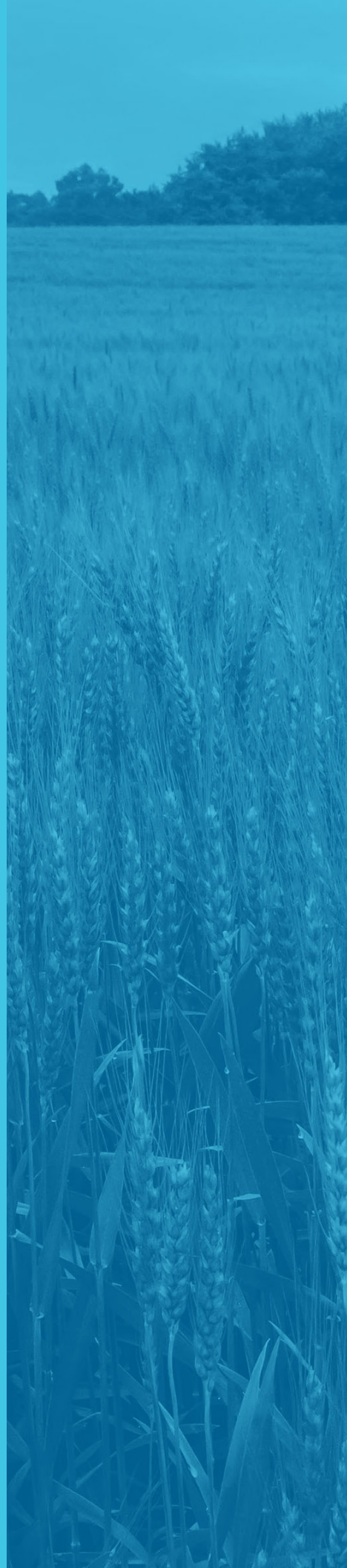




Through diligent work within public-private partnerships, strategy has been developed and policy has been implemented that is positively influencing the talent pipeline in Colorado. The strategies outlined above are meeting the unique needs of Coloradans and working toward balancing talent supply and demand. As Colorado looks to the future, the programs demonstrating success need to continue to be scaled and modeled to further drive progress without duplicating efforts. Strengthening the Colorado talent pipeline will ensure our state's economy has the talent it needs to thrive and will open doors of opportunity for all Coloradans to actively participate in, and benefit from, that economy.

07

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**08**

**APPENDICES**

Appendix A: Talent Pipeline Policy Success

Appendix B: Colorado Top Jobs

Appendix C: Colorado Top Jobs by Region

Appendix D: 2019 Sector Strategies Update

Appendix E: HB 15-1170 PWR Coordinator Update

Appendix F: Annual Report on Concurrent Enrollment: 2017-2018 Academic Year

Appendix G: Career Development Incentive Program (CDIP) List of Approved Programs – HB 16-1289/HB 18-1266

Appendix H: Education Industry Career Pathways FY19 – HB 15-1274

Appendix I: Innovative Industries Internship Program Annual Report: FY 2018-2019

Appendix J: HB 1288 Industry Infrastructure Grant CareerWise Annual Report: 2018-2019

Appendix K: WORK Act Annual Report: FY 2018-2019

Appendix L: PY18 WIOA Annual Report

Appendix M: Colorado Rises: Transforming Educational Practices through Open Educational Resources

**To view the 2019 appendices, visit [colorado.gov/cwdc/colorado-talent-pipeline-report](https://colorado.gov/cwdc/colorado-talent-pipeline-report)**



Colorado Workforce  
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Department of  
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**COLORADO**  
Department of  
Labor and Employment



**COLORADO**  
Department of Education



**COLORADO**  
Office of Economic Development  
& International Trade

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**2019 Colorado Talent Pipeline Report**  
Produced by the Colorado Workforce Development Council