THE OFFICE OF THE FUTURE OF WORK

ANNUAL REPORT 2022

COLORADO

Department of
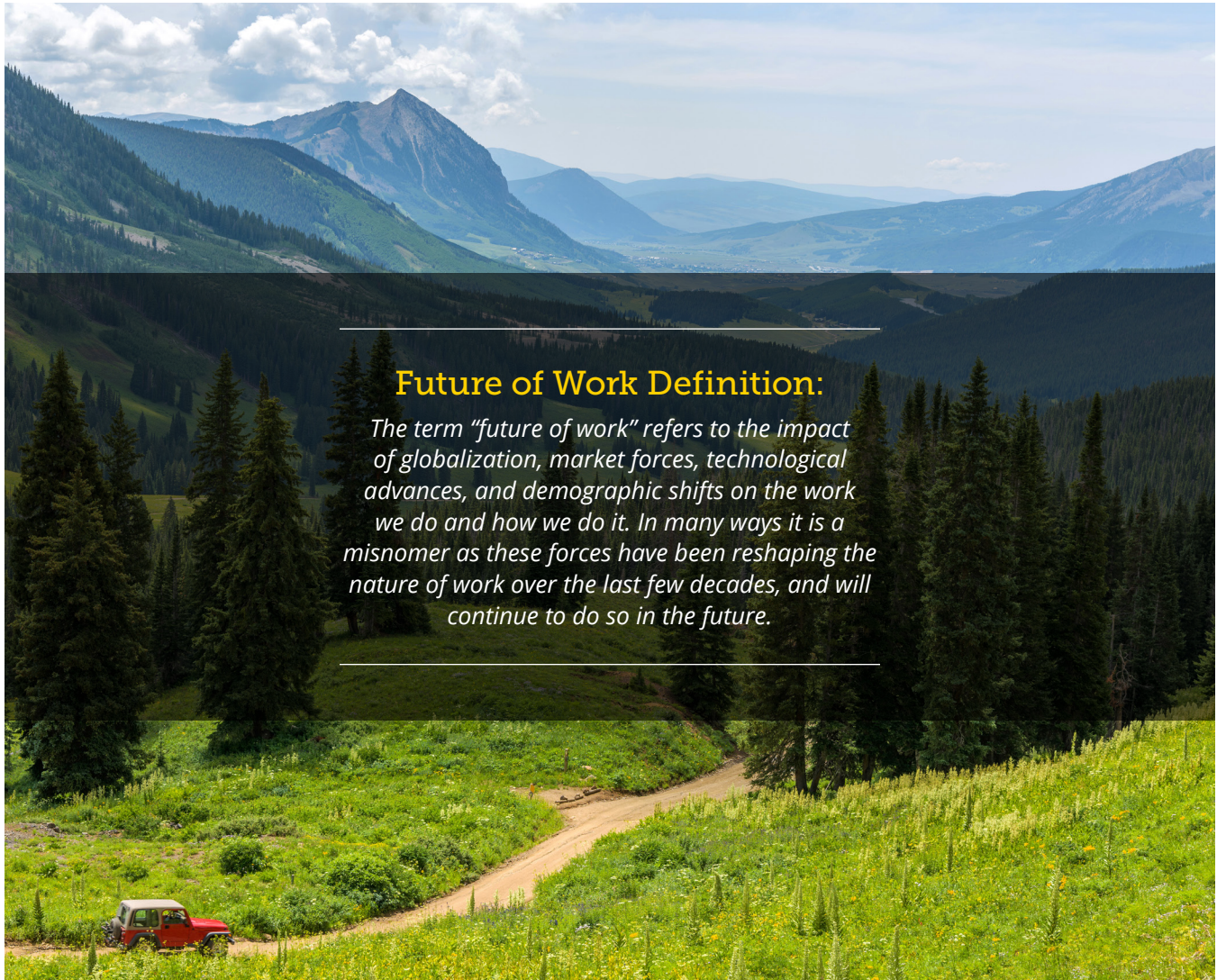Labor and Employment

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EXECUTIVE SUMMARY

Future of Work Definition:

The term "future of work" refers to the impact of globalization, market forces, technological advances, and demographic shifts on the work we do and how we do it. In many ways it is a misnomer as these forces have been reshaping the nature of work over the last few decades, and will continue to do so in the future.

The Office of the Future of Work (OFOW) was created by an Executive Order from Governor Jared Polis on September 4, 2019. The OFOW is housed within the Colorado Department of Labor and Employment (CDLE) and serves as the central point of contact for the State's effort to understand, prepare for, and develop effective policy and programmatic solutions to respond to the changing economy and raise awareness about the future of work. Each year, the OFOW submits a report to the Governor with its recommended potential policy initiatives. This is the third annual report from the OFOW which provides an update on the future of work trends and their implications; highlights the key activities of the OFOW throughout 2022; and shares the priorities for the OFOW in 2023.

Future of Work Trends

As we look to understand the key trends shaping work and the workforce, it is important to recognize that the economic shifts we are experiencing will take many years to be fully understood. That being said, there are lessons to be learned from emerging trends, which is what we attempt to illuminate each year as part of this report. Here are key takeaways for the four forces:

» Automation and artificial intelligence are being adopted at faster rates and have contributed to the polarization of the job market over the last four decades in which workers with more education experienced greater access to opportunity and economic success than those with less than a college degree in existing and new occupations. Meanwhile the digital divide poses a threat to economic success for workers across Colorado.

» Global trade has continued to increase despite the war in Ukraine and COVID-19 with e-Commerce playing an outsized role. Freelance and gig work continue to gain acceptance among workers, especially younger generations. Low wage workers continue to lag behind other segments of the workforce in terms of employment.

» Given the labor shortages plaguing the economy, businesses need new strategies to tap into untapped or previously ignored talent pools. One report suggests there are as many as 62 million "hidden" workers with potential to be engaged in the workforce. Government agencies, education institutions, employers, and others can engage these segments of the population to design ecosystems that support their resilience and ensure success in changing jobs.

OFOW Approach and Initiatives

In order to raise awareness and identify policy and program solutions, the OFOW conducts new research and applies existing research to Colorado contexts; holds listening sessions and convenings; builds working groups; participates in and aligns with related efforts across Colorado and the United States; and leads key initiatives and projects related to its areas of exploration. The OFOW has three areas of exploration determined in partnership with thought leaders, state agency partners, and stakeholders:

» Modernizing worker protections and benefits

» Transformation Preparation for individuals, employers, and communities

» Support for historically excluded populations

In 2022, the OFOW gave 24 presentations on the future of work to over 2,100 Coloradans. The OFOW has partnered with, participated in, and supported efforts of 14 state agencies and offices and eight of the divisions and offices within CDLE. The OFOW added 10 new staff members throughout the year and established an organizational infrastructure to sustain its efforts.

OFOW 2023 Projects

In 2023, the OFOW will continue its efforts to raise awareness about the future of work through ongoing publications, convenings, and presentations; will re-engage thought leaders to inform its work; and will establish an ongoing working task force to inform and coordinate the future of work efforts in the state.

The OFOW leads two major initiatives:

» **State Apprenticeship Agency:** The OFOW leads the State Apprenticeship Agency and the apprenticeship expansion in Colorado. With oversight of the SAA and expansion of registered apprenticeships, the OFOW plays a direct role in ensuring more Coloradan workers and businesses have access to high quality apprenticeship programs that create a future-ready talent pipeline. In 2023, the OFOW will continue to increase adoption of registered apprenticeships and will secure recognition for the State Apprenticeship Agency from USDOL.

» **Digital Equity, Literacy, and Inclusion:** The OFOW leads the Digital Equity, Literacy and Inclusion Initiative which includes coordination, research, and policy development to ensure all Coloradans are prepared to participate in the future of work, learning, and daily life. In 2023 this includes the creation of Colorado's Digital Equity State Plan and the launch of a Digital Navigator Corps.

The OFOW also conducts the following projects to inform aligned efforts and create a future-ready Colorado:

» Research on impact of technological advances, economic complexity, and resilient economic development to inform Coloradans and the talent development ecosystem.

» Research on independent contractors and exploration of portable benefits. In 2023, the OFOW will develop a strategic plan for the OFOW's independent contractor and portable benefits work. This plan will guide fundraising, staffing, and the creation of specific deliverables related to the growing independent workforce in Colorado.
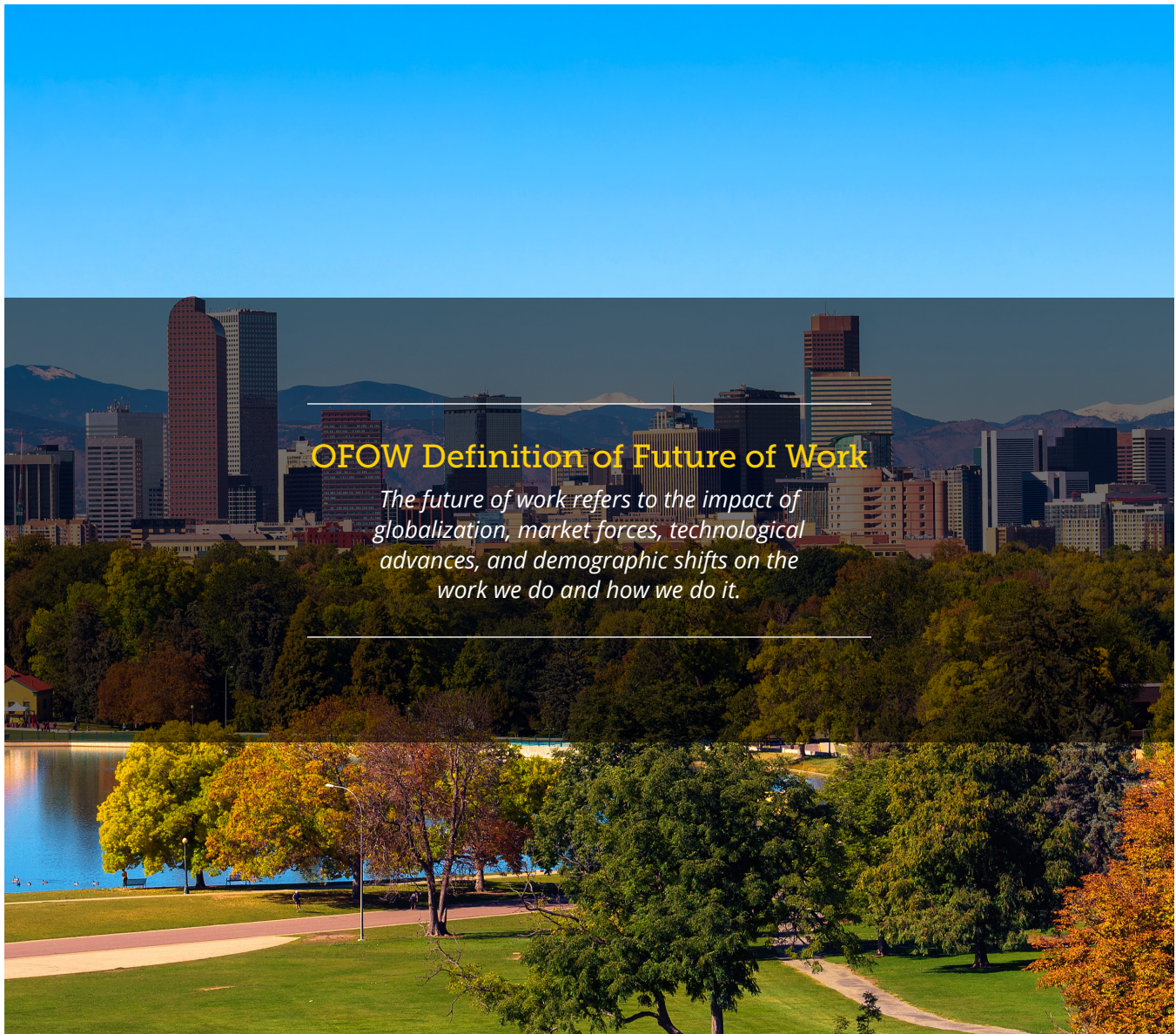
INTRODUCTION

The world of work is changing, propelling some to greater heights while leaving others behind. Globalization, advances in technology, demographic shifts, and other factors leave many wondering whether we, as a society, are ready to face the many challenges tomorrow's economy will bring. That's why the Office of the Future of Work (OFOW) was created by an **Executive Order from Governor Jared Polis** on September 4, 2019. Housed within the Colorado Department of Labor and Employment (CDLE), the OFOW serves as the central point of contact for the State's effort to understand, prepare for, and develop effective policy and programmatic solutions to respond to the changing economy and raise awareness about the future of work. The OFOW, led by the CDLE executive director, must submit a report to the Governor with recommendations for potential policy initiatives at least once per calendar year beginning in 2020. The OFOW's vision is a future where all Coloradan workers have access to meaningful and sustainable employment.

This third annual report provides an update on the future of work trends explored in its 2020 and 2021 reports as Colorado continues its recovery from the economic impact of COVID-19 and other global disruptions. It then provides an update on the OFOW activities and an overview of the policy and programmatic priorities in the next year. As we look to understand the key trends shaping work and the workforce, it is important to recognize that the implications of the economic shifts we are experiencing today will take many years to be fully understood. Attempts to predict the future are futile, and can blind us to new opportunities. As economist David Autor states, "forecasting the 'consequences' of technological change treats the future as a fate to be divined rather than an expedition to be undertaken."[1] However, there are lessons to be learned from emerging trends, which is what we attempt to illuminate each year as part of this report to inform the state's work ahead and result in a skilled and resilient Colorado workforce.

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1   Autor, D. (2022). The labor market impacts of technological change: From unbridled enthusiasm to qualified optimism to vast uncertainty. An Inclusive Future? Technology, New Dynamics, And Policy Challenges. Global Economy and Development at Brookings. Retrieved at www.brookings.edu/wp-content/uploads/2022/05/Inclusive-future_Technology-new-dynamics-policy-challenges.pdf

FORCES SHAPING THE FUTURE OF WORK

OFOW Definition of Future of Work

The future of work refers to the impact of globalization, market forces, technological advances, and demographic shifts on the work we do and how we do it.

The work of the OFOW is to understand the impact of globalization, market forces, technological advances and demographic shifts, and identify policy and program solutions that mitigate their negative impact. In this year's report we'll provide a reminder of the key themes related to each force and provide an update on new research and insights related to each.

Technological Advances

While there are numerous technologies shaping the future of work, the OFOW focuses primarily on automation, artificial intelligence, and digitalization. Automation is the use of technology to reduce the level of human activity needed to complete a particular task by replacing or augmenting labor.[2] Artificial intelligence refers to computer systems that are able to perform tasks that normally require human intelligence such as visual perception and speech recognition, allowing for non-human decision making, process management, and analysis.[3] Digitalization is the use of technologies to change or update business operational processes in order to optimize a variety of communication, management, design, and logistical tasks.[4]
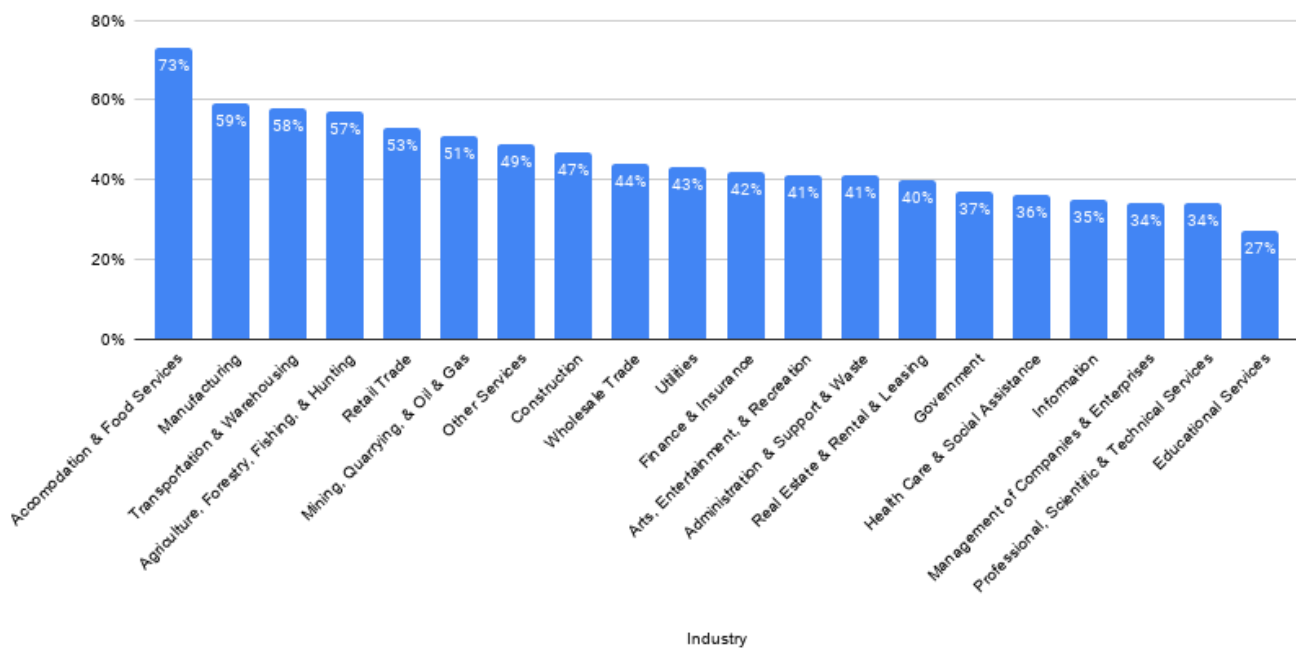
2   Muro, M., Maxim, R., & Whiton, J. (2019). Automation and artificial intelligence: How machines are affecting people and places. Brookings Institution. Retrieved at brookings.edu/research/automation-and-artificial-intelligence-how-machines-affect-people-and-places

3   West, Darrell (2018). What is Artificial Intelligence? Brookings Institution. Retrieved at www.brookings.edu/research/what-is-artificial-intelligence

4   Muro, M., Liu, S., & Kulkarni, S. (2017). Digitalization and the American Workforce. Brookings Institution. Retrieved at www.brookings.edu/wp-content/uploads/2017/11/mpp_2017nov15_digitalization_full_report.pdf

AUTOMATION AND ARTIFICIAL INTELLIGENCE (AI) 2022 UPDATE

Over the last year, new research has emerged that adds nuance to the discussion of which occupations face the most potential for displacement due to automation. The main research the OFOW has pulled from previously identified which industries were most at risk based on the number of tasks within each occupation that automation was able to perform (see Figure 1).[5] With this analysis, we can see that Accommodation and Food Services, Manufacturing, and Transportation and Warehousing could potentially see the most disruption due to automation displacing the routine, non-cognitive tasks that make up a large part of these roles. On the far right of Figure 1 we see that Education Services, Professional Scientific, and Technical Services, and Management of Companies face the least threat of displacement primarily because these occupations are made up of more cognitive, non-routine tasks.

**Figure 1. Automation potential by industry (% of sector)[6]**

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5   Muro, M., Maxim, R., & Whiton, J. (2019). Automation and artificial intelligence: How machines are affecting people and places. Brookings Institution. Retrieved at **brookings.edu/research/automation-and-artificial-intelligence-how-machines-affect-people-and-places**

6   Id.

New research shows that while automation is unlikely to displace occupations that depend on more cognitive, non-routine, abstract skills such as leading teams, emotional intelligence, and critical thinking, it can augment labor and therefore make workers in occupations on the right and of the graph more productive.[7] The catch is that when automation is used in this way, it ends up displacing middle-skill workers who then most often move towards lower-wage jobs on the left end of this spectrum.[8]

At the same time, there is a large section of the labor market that is made up of jobs that automation cannot replace nor augment, but that are not high-quality jobs; though they are often in critical industries such as personal services, production, and hospitality.[9] These dynamics have contributed to the polarization of the labor market, as shown in Figure 2 in which workers without a college degree were more likely to be in jobs that saw employment levels decline and were forced to then compete for lower-wage jobs in critical industries as employment opportunities grew.

Figure 2. Percent changes in occupational employment shares among working-age adults, United States, 1970–2016[10]

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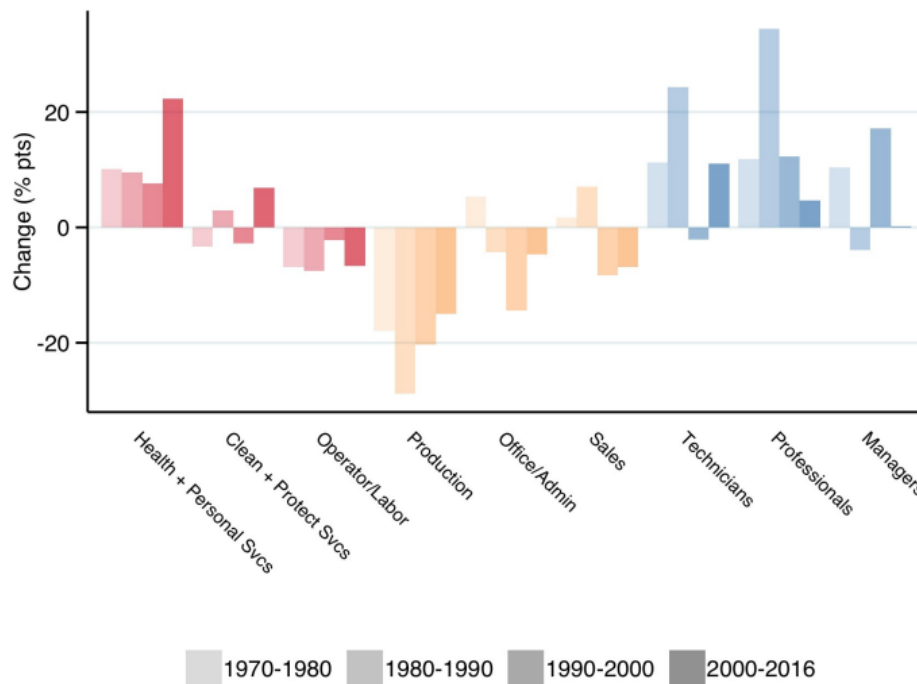
7   Autor, D. (2022). The labor market impacts of technological change: From unbridled enthusiasm to qualified optimism to vast uncertainty. An Inclusive Future? Technology, New Dynamics, And Policy Challenges. Global Economy and Development at Brookings. Retrieved at www.brookings.edu/wp-content/uploads/2022/05/Inclusive-future_Technology-new-dynamics-policy-challenges.pdf

8   Id.

9   Id.

10 Id.

In addition to disruption due to automation, we see that new jobs have entered the labor market which have the potential to provide opportunities to those in occupations disrupted by automation.[11] However, new work creation mirrors and drives continued polarization as the new jobs available for non-college workers drove towards lower-wage jobs, while new work for college educated workers appeared in more managerial sectors (see Figure 3). These shifts in new work can be explained by how automation technology is applied: if it augments labor, it spurs economic growth; if it automates labor, it drives down employment. Both of these phenomena are then exacerbated by global shocks that affect supply and demand.

Figure 3. More than 60 percent of jobs done in the United States in 2018 had not yet been "invented" in 1940[12]

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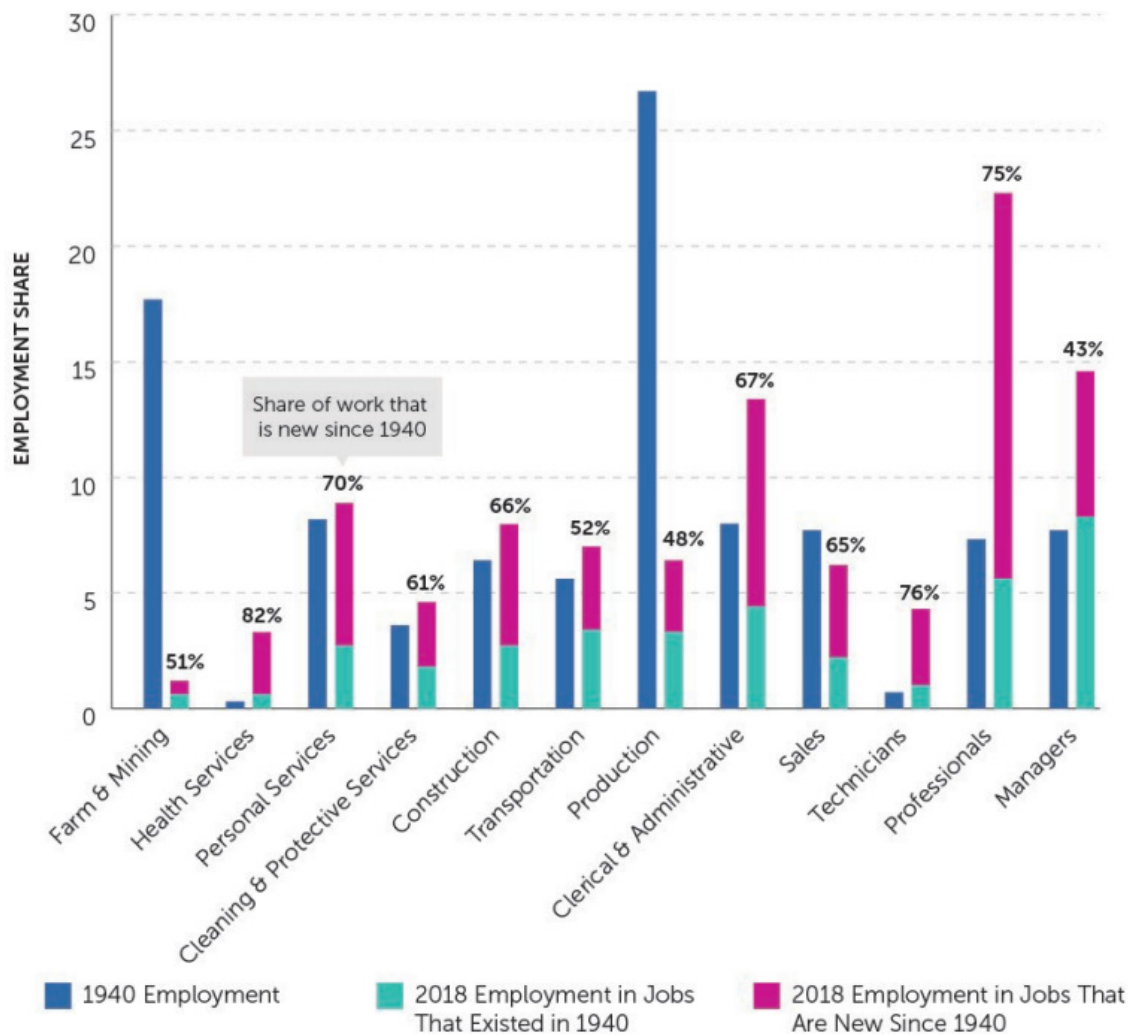
11 Id.

12 Id.

AI presents a new challenge as it relates to predicting impact on occupations because so much about what AI is capable of doing is yet to be categorized. What we do know is that adoption of AI is increasing. McKinsey's 2022 survey of over 1,800 employers representing the full range of regions, industries, company sizes, functional specialties, and tenure found that 50 percent of all respondents report AI adoption in at least one function.[13] While this is a six percent decrease from the previous year, it is an overall increase from the previous five years that McKinsey has been conducting this survey, indicating a general trend upwards.[14] Investment in AI has also increased over the last five years.[15] Companies reported challenges in hiring for AI-related roles, with companies turning to reskilling and upskilling in order to build the talent they need. Research shows that AI is already playing a role in shaping job vacancies for non-AI jobs. In businesses that were hiring for AI-related roles, job vacancy postings show that even in non-AI jobs, there was still a shift to more technological skills.[16]

Figure 4. AI-related roles that are being hired most frequently.[17]

AI-related roles that respondents' organizations hired, past year, % of respondents[1]

Role	%
Software engineers	39
Data engineers	35
AI data scientists	33
Machine learning engineers	30
Data architects	28
AI product owners/managers	22
Design specialists	22
Data visualization specialists	21
Translators	8
None of the above	14

[1]Only asked of respondents whose organizations have adopted AI in at least one function. For respondents at AI high performers, n = 51. For all other respondents, n = 413.

13 QuantumBlack AI by McKinsey (2022). The state of AI in 2022—and a half decade in review. Retrieved at www.mckinsey.com/~/media/mckinsey/business%20functions/quantumblack/our%20insights/the%20state%20of%20ai%20in%202022%20and%20a%20half%20decade%20in%20review/the-state-of-ai-in-2022-and-a-half-decade-in-review.pdf?shouldIndex=false

14 Id.

15 Id.

16 Autor, D. (2022). The labor market impacts of technological change: From unbridled enthusiasm to qualified optimism to vast uncertainty. An Inclusive Future? Technology, New Dynamics, And Policy Challenges. Global Economy and Development at Brookings. Retrieved at www.brookings.edu/wp-content/uploads/2022/05/Inclusive-future_Technology-new-dynamics-policy-challenges.pdf
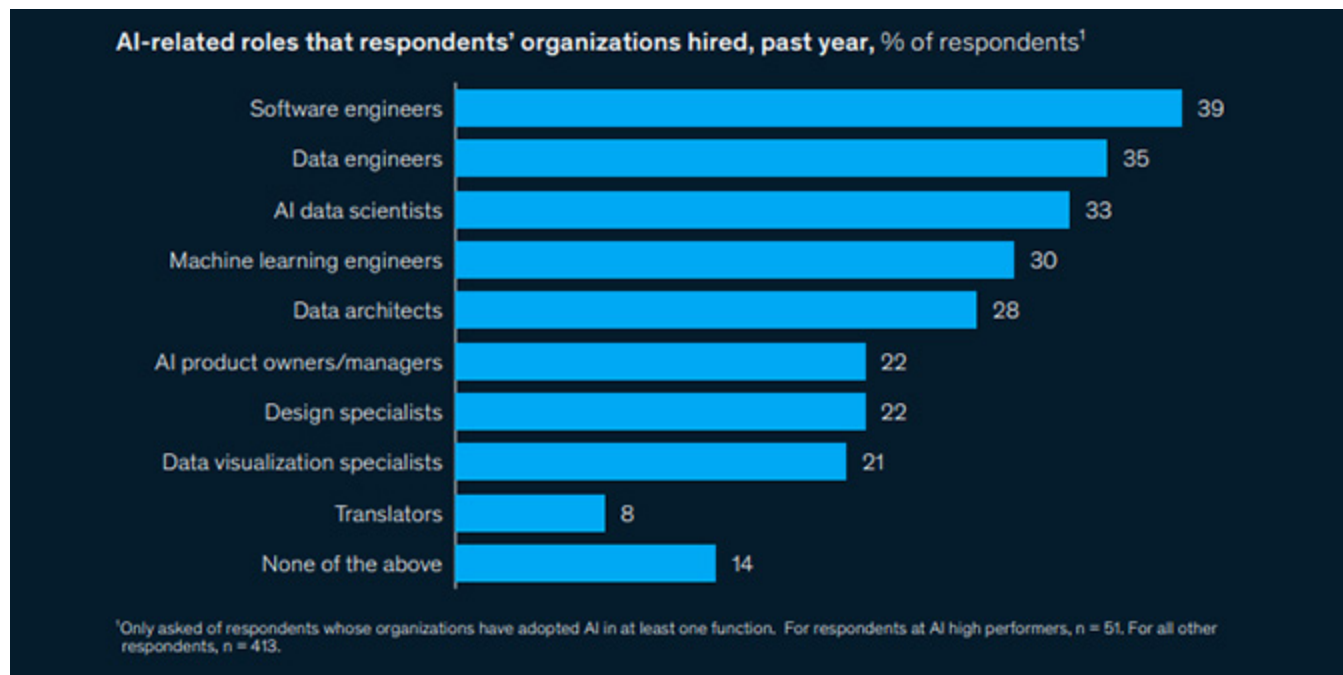
17 QuantumBlack AI by McKinsey (2022). The state of AI in 2022—and a half decade in review. Retrieved at www.mckinsey.com/~/media/mckinsey/business%20functions/quantumblack/our%20insights/the%20state%20of%20ai%20in%202022%20and%20a%20half%20decade%20in%20review/the-state-of-ai-in-2022-and-a-half-decade-in-review.pdf?shouldIndex=false

DIGITALIZATION

Data continues to show significant changes underway as a result of digitalization. OECD estimates that almost one-third of all jobs worldwide will experience transformation as a result of technology in the next decade.[18] These changes underscore the importance of ensuring that all Coloradans have digital skills, devices, and access to the internet to keep up with the digital economy. Yet we know that significant gaps remain.

In 2022, the OFOW partnered with the Colorado Center on Law and Policy (CCLP) to better understand how Coloradans feel about their own digital literacy, their access to the internet, and their ability to interact with tech-enabled government systems for services. Over the course of the year, CCLP conducted focus groups with partner agencies and met with over 190 individuals from diverse backgrounds (e.g. low wage, people with disabilities, unemployed, rural, New Americans, older). Initial, high-level takeaways are included below with a final report to come in 2023.

» Individuals who are in programs now may have received computer skills training of some type, but most of those skills are now outdated and somewhat obsolete

» Many individuals use phones to perform basic functions such as keeping in contact with family members locally, in other states, and internationally; and tracking other daily requirements via actual phone calls or text

» The issue that arises most commonly when talking to any group or individual has been that learning how to navigate new programs, apps, changes in technology is influenced and impacted depending on the amount of time that someone spent on computers, keyboards, different software, cell phones, etc. during their lives and as a result has acquired a certain level of understanding about devices and computers, and generally what they are able to do. Those populations that have had less exposure or requirement to use digital skills on a daily basis or do not have someone who is able to perform those tasks seemed to voice similar frustration, anxiety, embarrassment along with the realization of how digital skills are an integral part of life at this time.

» Input and comments heard from highly educated individuals who were content experts but not required or able to use technology until a certain time in their lives had similar perspectives about the challenges they face now as individuals who have not had access to technology due to poor connectivity where they lived, limited resources to own or access a device, limited access to skills training that is necessary to perform immediate functions, etc.

» There is a need for access to coaching, technical assistance related to equipment as well as how to use it, training on how to effectively use video conferencing platforms, and other parts of technology that are not necessarily part of obtaining a "top job"

» It will be important to provide access to opportunities for individuals within the digital framework from a variety of directions and to have that information provided and distributed in multiple ways - through graphics, radio announcements, TV announcements, posters, brochures, infographics, etc.

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18 LinkedIn (2022). A Skills-First Blueprint for Better Job Outcomes. Retrieved at economicgraph.linkedin.com/content/dam/me/economicgraph/en-us/PDF/linkedin-skillset-report.pdf

These initial findings, paired with the data on the digital divide shared in the 2021 Annual Report will serve as the foundation for the state's digital equity work detailed later to ensure Coloradans have the skills, devices, and internet they need to meet their needs.

Globalization & Market Forces

Globalization is generally used to describe the increasing internationalization of markets for goods and services, the means of production and supply chains, financial systems, competition, corporations, technology and industries.[19] In 2022, DHL released a Global Trade Growth Atlas which provides a deep dive into trade growth trends and prospects. The report shows that despite global shocks like the war in Ukraine, trade is expected to grow at a stronger rate than previous years.[20] There was growth in e-commerce throughout the pandemic that is also expected to continue, opening up opportunities for workers and businesses across the globe.[21] In the United States, the growth of remote work and freelance work are perhaps bolstered by ecommerce as well as general market forces that shifted during the pandemic.

Market forces refer to the shifts in supply and demand, trade, and government priorities that impact the economy. These impacts include the rapid transition to remote work for large segments of the workforce due to the COVID-19 pandemic. Preliminary research indicates as much as half of the U.S. workforces works remotely at least some days of the week.[22] Additionally, we've seen increases in independent work. UpWork's 2022 Freelance Forward finds significant growth in freelancing with 60 million Americans freelancing, up three percentage points from 2021 to 39.[23] Younger generations are more likely to freelance, and participation in freelance work is growing among more educated workers.[24] At the same time workers are transitioning jobs and combining incomes more frequently: "Diversified workers become more common: 17 percent of U.S. workers seek multiple sources of income from a mix of traditional employment and freelance work, up three percentage points from 2021."[25] Research predicts that today's youngest workers will hold twelve to fifteen jobs in their lifetime.[26]

19   OECD Glossary of Statistical Terms. Retrieved at stats.oecd.org/glossary/detail.asp?ID=1121#:~:text=OECD%20Statistics,%2C%20corporations%2C%20technology%20and%20industries.

20   Altman, S. & Bastian, C. (2022). DHL Trade Growth Atlas. DHL. Retrieved at www.dhl.com/content/dam/dhl/global/delivered/documents/pdf/dhl-trade-growth-atlas-2022-key-highlights-brochure.pdf.

21   Id.

22   Brynjolfsson, E., Horton, J., Makridis, C. Mas, A., Ozimek, A., Rock, D. and TuYe, H. (2022). How Many Americans Work Remotely? Stanford Digital Economy Lab. Retrieved at digitaleconomy.stanford.edu/publications/how-many-americans-work-remotely

23   UpWork (2022). Freelance Forward 2022. Retrieved at www.upwork.com/research/freelance-forward-2022

24   Id.

25   Id.

26   Ogunwale, S. (2022). Five key trends shaping the new world of work. World Economic Forum. Retrieved at www.weforum.org/agenda/2022/09/five-trends-endure-world-of-work

As discussed in the previous section and in previous annual reports, market forces have led to a distinct polarization between high-wage workers and low-wage workers. The low-wage workforce in the United States and in Colorado continue to have significantly lower levels of employment. As of October 2022, Colorado workers making less than $29,000 per year had -33.7 percent employment rates compared to January 2020 (Figure 5).[27]

Figure 5. Employment levels by wages in Colorado since January 2020.[28]
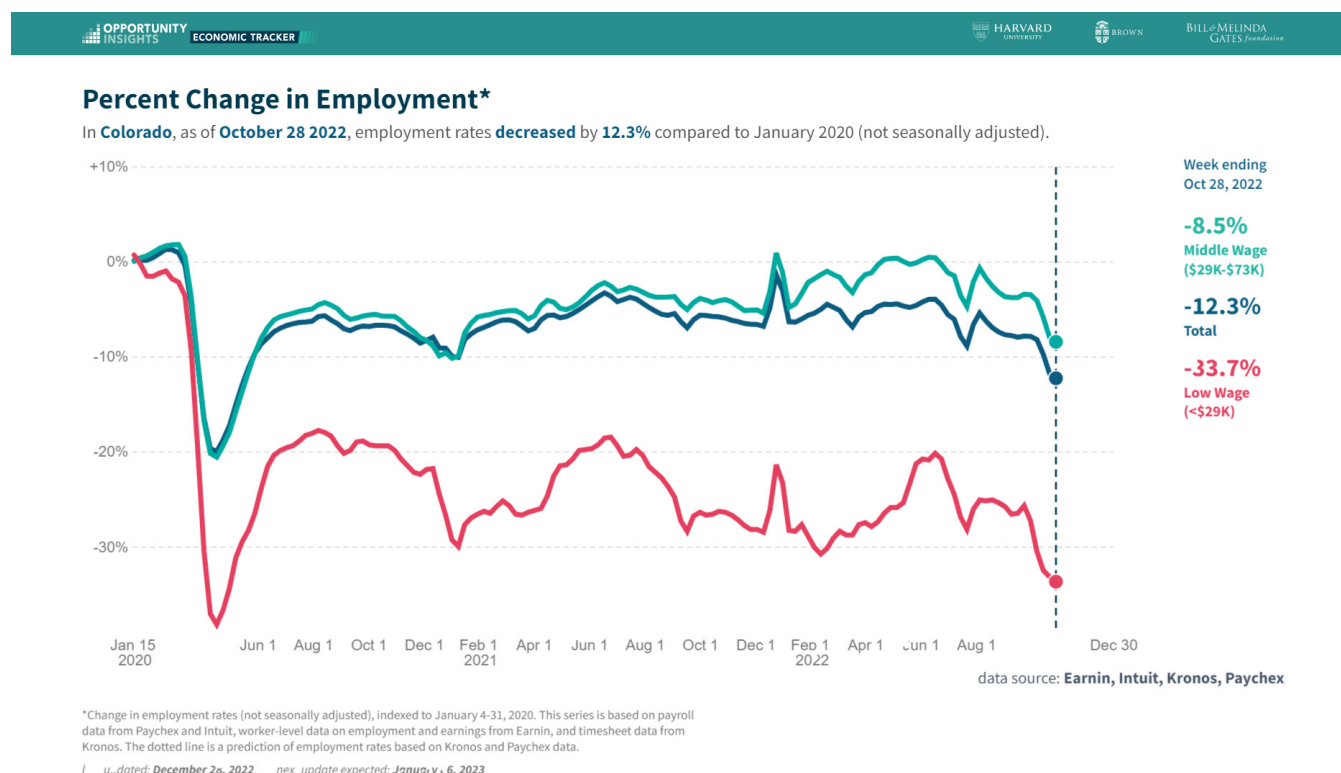
Ongoing economic recovery efforts should target low-wage workers, unemployed workers, and workers in industries at risk of displacement to facilitate their transition to sustainable occupations. These efforts should include supportive services to remove barriers, data and coaching to guide their decision making, and resources to access training for in-demand skills. Ongoing efforts to improve job quality for critical service occupations are necessary as well to reduce the number of low-wage positions in the labor market. Modernizing worker protections and benefits such as establishing more portable benefits would support low wage workers as well as individuals performing work as independent contractors.

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27 Opportunity Insights (2022). Economic Tracker. Retrieved at www.tracktherecovery.org

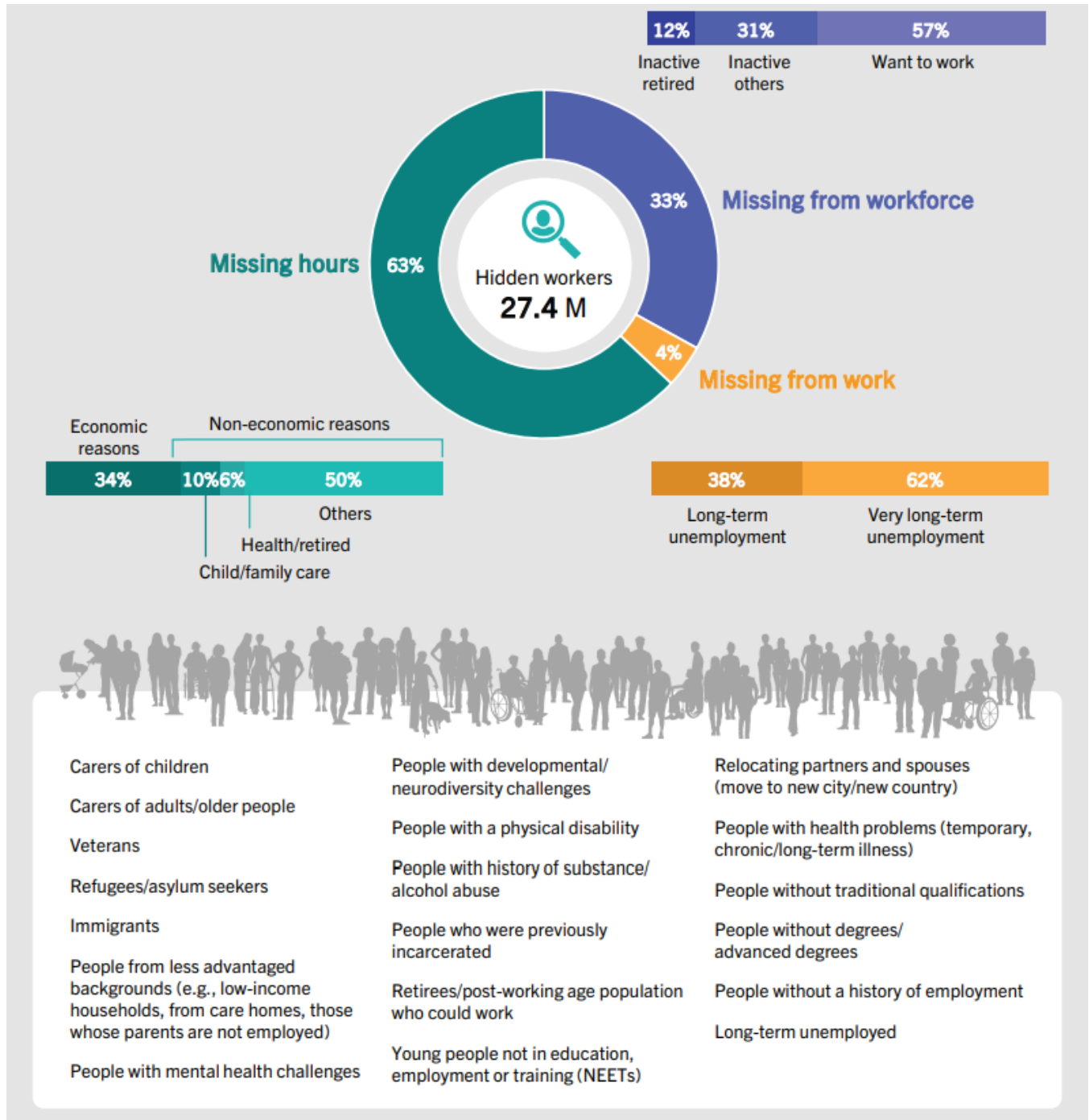28 Id.

Demographic Shifts

As we consider the future of work in our state, it is imperative to place the people of Colorado's workforce at the center of our solutions. The main trends that are impacting the workforce are Colorado's rapidly aging population and its diversifying younger generations, as well as a worsening worker shortage due to a shrinking population. With the statistics surrounding these demographic shifts covered in our previous annual reports and updated in the **Colorado Talent Pipeline Report's** section on Supply, this year we wanted to highlight the imperative to tap into untapped talent pools as well as considerations for future interventions.

As we look at the labor shortage plaguing industries across Colorado and the country, there are huge segments of the population that could be engaged in the workforce with the right interventions and systems in place. As shown in Figure 6, there are 27 million hidden workers in the U.S. workforce made up of:

» 63 percent who are "missing hours" (people who are working one or more part-time jobs, but could or would like to work full time);

» 33 percent who are "missing from the workforce" (those who are currently not working and are not actively seeking employment, but who could be convinced to seek work if they believed the right circumstances could present themselves);

» 4 percent who are "missing from work" those who have been unemployed for a long time but are still seeking employment).[29]

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29 Fuller, J., Raman, M., Sage-Gavin, E., and Hines, K. (2022). Hidden Workers and Untapped Talent. Harvard Business School and Accenture. Retrieved at www.hbs.edu/managing-the-future-of-work/Documents/research/hiddenworkers09032021.pdf

Figure 6: Composition of the U.S. hidden workforce, March 2020[30]

Carers of children

Carers of adults/older people

Veterans

Refugees/asylum seekers

Immigrants

People from less advantaged backgrounds (e.g., low-income households, from care homes, those whose parents are not employed)

People with mental health challenges

People with developmental/ neurodiversity challenges

People with a physical disability

People with history of substance/ alcohol abuse

People who were previously incarcerated

Retirees/post-working age population who could work

Young people not in education, employment or training (NEETs)

Relocating partners and spouses (move to new city/new country)

People with health problems (temporary, chronic/long-term illness)

People without traditional qualifications

People without degrees/ advanced degrees

People without a history of employment

Long-term unemployed

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30 Id.

With an understanding of who makes up the hidden workforce, businesses can begin the work to engage members of these populations to design recruitment strategies and support to ensure success in the workplace, including reskilling, upskilling and next skilling initiatives. The work ahead is to build ecosystems that meet the needs of those that have been left behind or left out.

Building on their Ecosystem for Digital Resilience that we referenced last year, World Education created an ecosystem for the immigrant and refugee adult learner seen in Figure 7. The purpose of this new model is to design an ecosystem that "1) expands access to ESOL, digital inclusion, and immigrant and refugee inclusion services for all, 2) effectively remove barriers to ensure full participation in these services, and 3) support immigrants' and refugees' right to choose how they engage in the society, economy, and government of the U.S."[31] As we work to tap into untapped talent pools we should design ecosystems intentionally with the target population at the center as in Figure 7. The better we align and build capacity of local ecosystems to connect with, build trust, and serve untapped workers, the better our talent pipeline will be.

Figure 7. Ecosystem for Equitable ESOL Learning and Digital Resilience[32]

Adapted from Digital US graphic on Ecosystem for Digital Resilience

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31 World Education (2022). The Equitable ESOL Ecosystem. Retrieved at worlded.org/digital-equity/pilot-sites

32 Id.

Key Questions Guiding the Work Ahead

The OFOW continues to refine its five guiding questions as new research emerges. In this updated list of five guiding questions for the work ahead, we have emphasized the importance of proactively preparing for transitions in skills, jobs, and industries.

1. How can we reduce the number of low-wage jobs in the economy, and make transitions from low-wage jobs to better pathways more viable?

2. How can we support and prepare workers for technological adoption for roles in small and medium businesses; in roles where human touch is less critical; and in roles where work is unsafe?

3. How do we ensure that all career seekers have the skills, mindsets, and supports they need to weather transitions and transform alongside their work?

4. How do we redesign training to better meet the needs of employers, workers of all ages, and build a culture of lifelong learning?

5. How can we close the digital divide for all Coloradans so they can fully participate in a digital world?

OFOW PURPOSE, APPROACH, AND STRUCTURE

The OFOW's purpose is to:

» Identify opportunities for Colorado's communities to transition effectively to emerging industries and, where appropriate, consult with the Office of Just Transition and other state agencies to align such efforts.

» Ensure the inclusion of key stakeholders from all sectors and engage partnerships across public and private sectors, including industry, academia, employers, employees, nonprofit organizations, and government.

» Host, organize, and convene task forces, summits and other appropriate meetings with diverse stakeholders, designed to improve the state's understanding of the social and economic impacts of the changing nature of work.

» Explore ways that the state can prepare for current and future impacts, including through the modernization of worker benefits and protections and the development of a skilled and resilient workforce through oversight of the state apprenticeship agency and identification of new policy and program solutions.

In order to achieve this purpose the OFOW has identified key areas of exploration based on the OFOW's examination of the forces shaping the future of work as well as feedback from thought leaders, state agency partners, and stakeholders. These areas, which are described in more detail on the **OFOW's website**, are:

» **Modernizing worker protections and benefits**
Worker protections and the social safety net need to be modernized to address the fissuring workplace, to ensure all types of workers are protected and have access to a living wage as work continues to evolve.

» **Transformation Preparation**
Disruption to workplaces and the economy will continue as the future of work forces reshape the nature of work. The OFOW will build awareness of these transformations and equip workers, businesses, and communities across the state with tools and strategies to effectively understand what the future of work means for them and how to effectively prepare for transitions that the future brings.

» **Supporting historically excluded populations**
The OFOW works to understand the impact of the future of work on historically excluded populations, and realign government programs to better prepare them for success in the future of work.

These areas of exploration represent the overall efforts to guide the work of the OFOW, while the specific projects of the OFOW will fall within these areas. In addition to these overall areas of exploration the OFOW defined three key considerations as part of its work:

» Acknowledging regional diversity

» Focusing on the needs of left behind Coloradans

» Building policy and programs with the end user in mind

With these areas of exploration and considerations, the OFOW conducts research to understand future of work trends and their impact; shares best practices, research, and data with the workforce development system; supports and aligns with related efforts (e.g. Colorado Resiliency Framework); informs the legislature and other stakeholders. Additionally, as described in the 2021 report, the OFOW leads two key initiatives for the state: The State Apprenticeship Agency and the state's Digital Equity Literacy and Inclusion initiatives.

Over the last year, the OFOW has built its team and operational infrastructure to execute its key activities effectively. As depicted in Figure 8, the OFOW has three work units which include the State Apprenticeship Agency, Organizational Services, and FOW Labs. Organizational Services consists of staff members that support the cross-cutting operational and administrative functions of the OFOW. FOW Labs refers to projects and initiatives the OFOW conducts that may result in their own work units within the OFOW or could spin off to other organizations (e.g. pilots that move to other divisions or departments), or may sunset upon their completion (e.g. research projects). FOW Labs aims to be an incubator for projects so that the OFOW can have the flexibility to explore emerging trends, respond to legislative or other partner research/ pilot requests, and consider the most appropriate next step for each new effort.

Figure 8. OFOW Structure

OFOW		
State Apprenticeship Agency	**Organizational Services**	**FOW Labs**
• Advisory Councils • Quality Assurance Team • Access Team • Specialist Team	• Communications • DEIA • Policy • Operations • Data	• Digital Equity, Literacy & Inclusion • Worker Protections & Benefits Research • Future of Work Research and Working Groups

In 2022 the OFOW grew from five staff members to 14. By April 2023, the OFOW will have 20.5 full-time employees. The OFOW's organizational chart can be viewed in Figure 9 below or in full in Appendix N. Within the State Apprenticeship Agency, there are three teams. The Quality Assurance Team will be responsible for ensuring compliance of all registered apprenticeship programs with USDOL and Colorado regulations once the SAA receives recognition from USDOL. The Specialist Team is responsible for developing new and expanding existing registered apprenticeship programs and providing technical assistance to apprenticeship partners, including intermediaries. The Access team is responsible for overseeing the administration of existing federal expansion grants to increase access to registered apprenticeship programs for new employers and participants.

Figure 9. Office of the Future of Work Organizational Chart (2022/23)
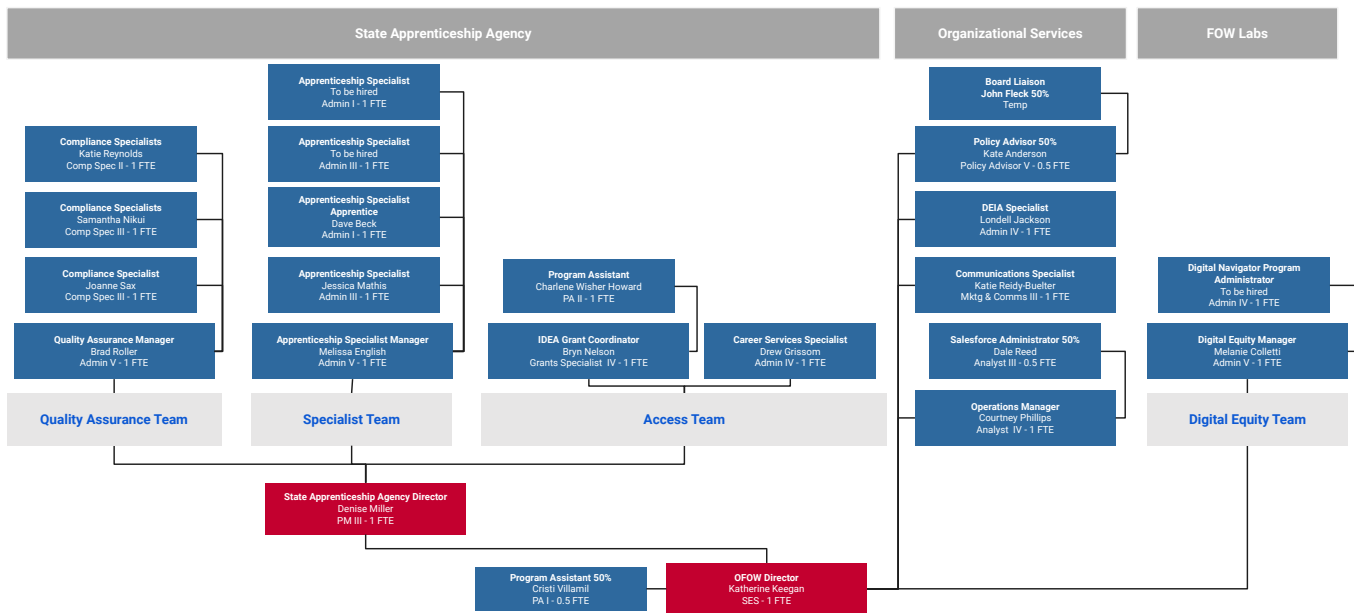
2022 OFOW ACCOMPLISHMENTS AND PLANS FOR 2023

This section describes the major activities the OFOW conducted in 2022 and its plans for 2023. Where applicable, it includes reference to CDLE's department-wide Wildly Important Goals.

Raising Awareness and Participation in Aligned Efforts

In 2022, the OFOW continued its efforts to raise awareness of the impact of the future of work in Colorado; promote, partner, and align with efforts related to the OFOW's areas of exploration; and identify specific projects that will improve Colorado's future of work.

2022 Activities and Accomplishments

In 2022, the OFOW gave 24 presentations on the future of work to over 2,100 Coloradans. The OFOW has partnered with, participated in, and supported efforts of 14 state agencies and offices and eight of the divisions and offices within CDLE. One highlight from 2022 events included the Colorado Business Roundtable's Future of Work Talent Pipelines Reimagined which invited thought leaders from business, academia, community, and government frame the challenge regarding Colorado's talent pipeline disruption and consider strategies for accelerating and creating learner-to-earner paths of opportunities to meet the workforce needs of the future. The OFOW will again partner with the Colorado Business Roundtable in 2023 for this event to raise awareness about the future of work.

In 2022, the OFOW participated in the American Council on Germany's Transatlantic Cities of Tomorrow: Digitalization and the Future of Work initiative, a reciprocal exchange program for thought-leaders in small- and medium-sized cities in Germany and the U.S. to learn how each are handling the challenges and opportunities brought forth by digitalization. The OFOW joined a delegation of 20 individuals from Mainz, Stuttgart, Heidelberg, Colorado Springs, Boulder, and Denver to visit each city over two weeks. Summaries of the trips through Germany and Colorado can be found in Appendix C and Appendix D, respectively. Through the experience the OFOW was able to learn about how German municipalities and states are working to promote digital upskilling and entrepreneurial mindsets within public institutions and workers, to understand the German models for apprenticeship and digital inclusion. These insights informed the Colorado delegation's action plan which can be found in **Appendix O**.

2023 Goals

» **Goal 1:** The OFOW will continue its efforts to raise awareness about the future of work through the ongoing publication of articles and resources on the OFOW and CDLE websites, hosting convenings and listening sessions throughout the state, and presentations to service providers, businesses, associations, state and local agencies, and other community partners. This includes participation in the Colorado Business Roundtable's second Future of Work event.

» **Goal 2:** The OFOW will build an ongoing Future of Work Thought Leader Working group that is made up of thought leaders from the 2019/20 research groups, participants in the Transatlantic Cities of Tomorrow, and other partners. This group will convene to guide and inform the OFOW on the four forces of the future of work, its areas of exploration and current projects. With the Thought Leader working group and other partners, the OFOW will hold events on the future of work. This is a modified version of the goal originally published in the 2021 Annual Report to account for the Colorado Business Roundtable event and the Transatlantic Cities of Tomorrow delegations.

» **Goal 3:** Codify the OFOW in legislation to ensure that Colorado has the programs and infrastructure to respond to a dynamic economy.

State Apprenticeship Agency

Areas of Exploration: Transformation Preparation; Support for Historically Excluded Populations

Apprenticeships build a culture of lifelong learning, allow people to apply skills learned in the classroom to the real world, provide wages and other support throughout the experience, and create access to quality employment. This is why the Office of Future of Work leads Colorado's State Apprenticeship Agency to expand Registered Apprenticeship Programs in the state and can provide technical assistance and resources to support new program development. The State Apprenticeship Agency is designed to:

» Serve as the primary point of contact with the United States Department of Labor's Office of Apprenticeship concerning apprentices and registered apprenticeship programs;

» Accelerate new apprenticeship program growth and assist in promotion and development; and

» Oversee apprenticeship programs, including registration, required standards for registration, certification, quality assurance, record-keeping, compliance with federal laws and standards, and provision of administrative and technical assistance.

2022 ACTIVITIES AND ACCOMPLISHMENTS

Over the last year, the OFOW focused on building the operational infrastructure for the SAA and continuing the implementation of its expansion grants through USDOL. Key activities and accomplishments include:

» **SAA Plan and Councils:** The OFOW established the State Apprenticeship Council and Interagency Advisory Committee on Apprenticeship to advise the SAA. In partnership with these councils, the OFOW completed its SAA State Plan and posted it for public comment. This plan will become the foundation for the rules that will govern apprenticeship in Colorado. Rulemaking will begin in 2023.

» **Quality Assurance:** In preparation for recognition from USDOL the Quality Assurance team conducted customer-centered design interviews with 16 existing registered apprenticeship program sponsors and two intermediaries that collectively serve over 1,300 apprentices. These insights will inform the process development for the quality assurance team as it prepares to take over compliance monitoring for registered apprenticeship programs in Colorado.

» **Expansion:** The OFOW submitted **55** Apprenticeship Programs to USDOL for registration in 2022. Of those submitted, **48** Apprenticeship Programs of those programs have been registered, and the remaining **7** programs are currently in the process of finalizing their registration process. Over the last year, there were **27** expanded programs and 119 new employers added to the apprenticeship ecosystem. **In 2021/22, there were a total of 78 new apprenticeship programs in Colorado, exceeding the goal of 36 programs established in CDLE's Wildly Important Goal.**

» **Access:** Over $1.1 million was awarded to 25 Scale-Up Grantees in July of 2022 which will result in 12 new programs, 13 expanded programs, 982 new apprentices, and 34 new employers in 10 different industries. Cohort-based training model that has proven to be successful and popular with the grantees. **In 2021/22, 16.7 percent of new apprenticeships were filled by racial or ethnic minorities, exceeding the goal of 5 percent in CDLE's Wildly Important Goal.** Figure 10 shows the grant-funded programs by industry in 2022.

» **Apprenticeship Executive Order:** In June, Governor Polis signed an executive order to increase apprenticeship in state government as well as promote the adoption of apprenticeships in the private sector. Specifically, the executive order directs the OFOW and Personnel & Administration to develop statewide guidance and strategies to expand the number of registered apprenticeship programs offered by state agencies by 20 percent by the end of Fiscal Year 2022-23. The goal is to expand apprenticeship opportunities for Coloradans of all ages, abilities, and industries.

Figure 10. Grant-funded Registered Apprenticeship Programs by Industry in 2022.
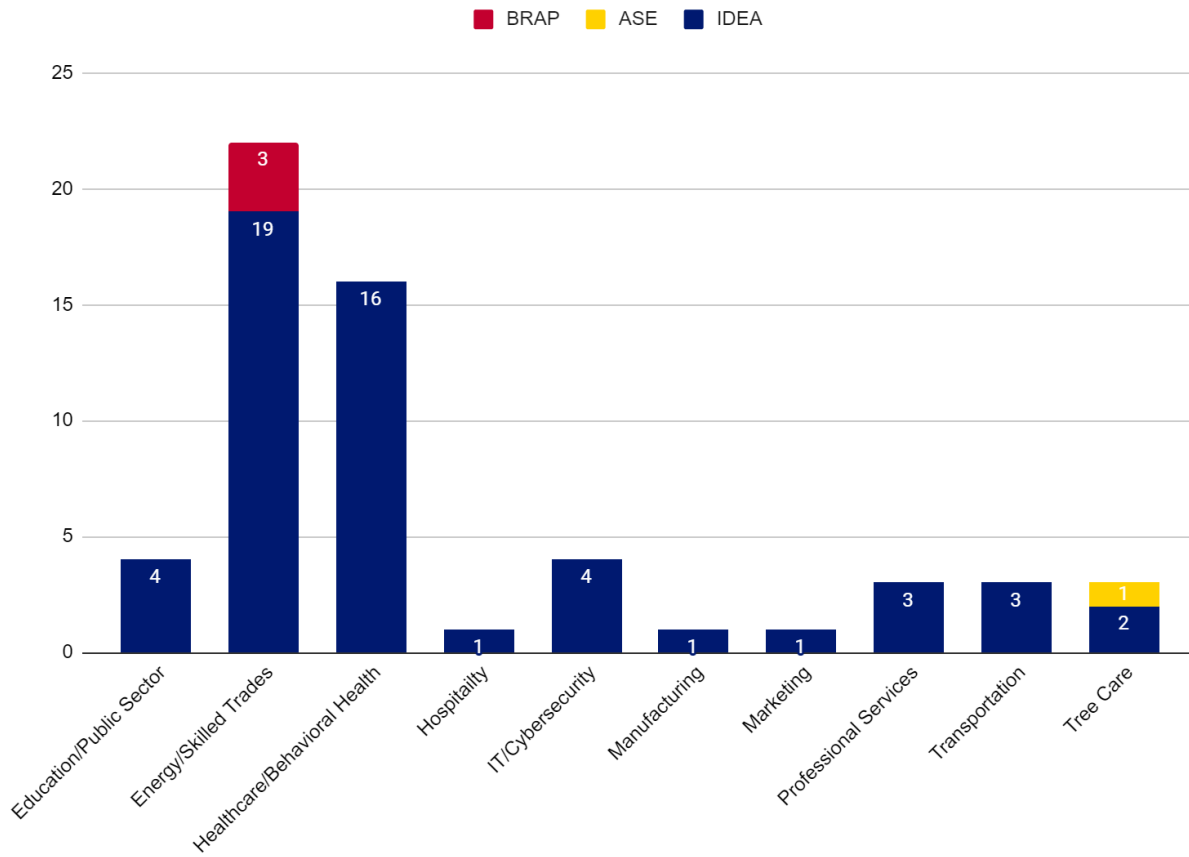
2023 PLANS AND GOALS

» **Transition to State Apprenticeship Agency:** The OFOW's key priority over the next year is to secure recognition from USDOL to register apprenticeship programs at the state level. Colorado will join 30 other State Apprenticeship Agencies across the country that have this authority, allowing for more local solutions and development. Building on the 2022 accomplishments, the OFOW will focus on the following goals for the SAA:

  ▪ **Goal 1:** Launch an upgraded Apprenticeship Resource Directory.

  ▪ **Goal 2:** Complete rulemaking for the SAA.

  ▪ **Goal 3:** Complete staff hiring and training on USDOL processes and policies for quality assurance, Registered Apprenticeship Partners Information Database System (RAPIDS), Equal Employment and Opportunity, Affirmative Action and technical assistance in preparation for recognition.

  ▪ **Goal 4:** Secure SAA recognition from USDOL by July 1, 2023.

» **Expansion:** Expand RAP opportunities to address the needs of high growth industries. Raise employer awareness of the benefits and steps to RAP adoption through in-person and virtual business outreach activities, communications activities, and coordination with Hub and other partners to promote apprenticeship statewide.

  ▪ **Goal 1:** Launch or expand 100 registered apprenticeship programs in 2022/23, with a focus in (1) Healthcare/Behavioral Health, (2) IT/Cybersecurity, (3) Education/ Public Sector, (4) Advanced Manufacturing, (5) Transportation/Logistics, and (6) Energy/Infrastructure. This is a CDLE Wildly Important Goal for 2022/23.

  ▪ **Goal 2:** Every cabinet-level agency will participate in a registered apprenticeship program by June 30, 2023. This is in accordance with Governor Polis' Executive Order on Apprenticeships.

  ▪ **Goal 3:** Conduct 1,000 outreach activities regarding apprenticeships to employers/potential sponsors of apprenticeship in priority industries per reporting period by June 30, 2023. This is a CDLE Wildly Important Goal for 2022/23.

» **Equity:** Improve diversity, equity, inclusion, and accessibility (DEIA) in participant recruitment (youth, women, people of color, formerly incarcerated individuals, and persons with disabilities) through investment from the IDEA grant and strategies led by the OFOW's DEIA Specialist and Career Services Specialist.

  ▪ **Goal:** 1,250 new apprentices by 2025; increase; increase the number of new apprenticeships filled by racial or ethnic minorities by 5%, from 1,256 to 1,319 by June 30, 2023. This is a CDLE Wildly Important Goal for 2022/23.

» **Innovation:** Leverage existing investments and fill gaps in participants, programs, and industries.

  ▪ **Goal 1:** Launch Round 2 of Scale Up Grants.

  ▪ **Goal 2:** Distribute 80 Accelerate Apprenticeship Grants.

FOW Labs

Digital Equity, Literacy, and Inclusion

Areas of Exploration: Support for Historically Excluded; Transformation Preparation

Digital skills, devices, and access to affordable internet are necessary to work, learn, and fully participate in daily life in the future of work. The future of work requires digital equity across Colorado. This is why the OFOW leads Colorado's Digital Literacy and Inclusion Initiative. While the Broadband Office focuses on infrastructure, the OFOW focuses on adoption.

2022 ACTIVITIES AND ACCOMPLISHMENTS

In 2022, the OFOW made significant headway in its work towards digital equity in Colorado in the following areas:

» **Building statewide infrastructure:** Through HB21-1264 funds awarded by the Colorado Workforce Development Council, the OFOW hired a Digital Equity Manager to lead the Digital Equity, Literacy, and Inclusion Initiative. Additionally, the OFOW partnered with the Colorado Universities Innovation Council's LINKED program (CUIC) to explore the creation of a statewide Digital Equity Office, and participated in capacity building and training provided by the Federal Reserve Bank of Kansas City and the National Digital Inclusion alliance to inform its efforts.

» **IIJA Digital Equity Act:** The OFOW was awarded $897,119.02 to create Colorado's Digital Equity Plan. The office applied in collaboration with the Office of eHealth Innovation (OeHI) located in the Lieutenant Governor's Office, and the Office of Information Technology for the grant funding through the Digital Equity Act, a component of the federal Infrastructure Investment and Jobs Act, which was signed into law last November. With this funding the OFOW will build a statewide digital equity state plan which will include measurable objectives to close the digital divide for historically marginalized populations.

» **Digital Navigator Funding Secured:** Through SB22-140: Expansion of Experiential Learning Opportunities the OFOW received funding to launch a statewide Digital Navigator pilot.

» **Partnerships to Engage Historically Excluded Populations:** The OFOW provided funding to the Colorado Center on Law and Policy (CCLP) to perform community engagement interviews with diverse populations and communities across the state. Information obtained from these interviews will be used to inform and authenticate the state digital equity competency framework (published last year), the state plan (to be published in 2023), and the digital navigator training (to launch in 2023). CCLP has spoken with 198 individuals total through November. Additionally, the OFOW was selected as a pilot site by World Education for their Transforming Immigrant Digital Equity project to build Equitable ESOL Ecosystems.

2023 PLANS AND GOALS

Building on the initial efforts of the Digital Literacy and Inclusion Initiative established in 2020-2021, the OFOW has identified the following priorities and goals for 2023:

» **Goal 1:** Build the State Digital Equity Plan: As part of the federal Infrastructure Investment and Jobs Act, the Digital Equity Act dedicates $2.75 billion to establish three grant programs that promote digital inclusion and equity to ensure that all individuals and communities have the skills, technology, and capacity needed to reap the full benefits of our digital economy. The OFOW will coordinate the creation of the state's digital equity plan.

» **Goal 2:** Deploy Digital Navigators: Per SB22-140, the OFOW will deploy community-based digital navigators to address digital inequities (access to technology, digital skills, and affordable internet)that prevent people from accessing work-based learning, job-training and employment opportunities.

» **Goal 3:** Convene: The OFOW will convene a Digital Equity Committee, Working Group, and State Agency Group to support the creation of the Digital Equity State plan, and ongoing engagement for implementation.

» **Research & Pilot:** Build a digital inclusion workforce development plan which will include data on talent development needs and proposed strategies to ensure Colorado has the talent pipeline in place to build broadband infrastructure and digital skills of Coloradans. Pilot digital tools and best practices with local partners to develop resource libraries. Update Digital Competency Framework and Digital Skill Catalog based on research and feedback from partners. Publish case studies highlighting best practices to build digital equity into service delivery.

Future of Independent Contractor Protections

Areas of Exploration: Transformation Preparation; Modernizing Worker Protections and Benefits

2022 ACTIVITIES AND ACCOMPLISHMENTS

In late 2021, OFOW partnered with a team of graduate students as part of the Colorado Universities Innovation Council's LINKED program (CUIC) to explore the following questions:

» How can a state agency effectively create access to benefits and protections for independent contractors? What information do we need? What data do we have access to?

» What could an in-depth research project on the gig economy do for us?

» What might a "Colorado solution" to this challenge look like?

This project, in combination with the research conducted in 2022, will serve as the foundation for a strategic plan to be developed in 2023.

2023 PLANS AND GOALS

In 2023, the OFOW will work with the legislature, working groups, and others to develop a strategic plan for the OFOW's independent contractor and portable benefits work. This plan will guide fundraising, staffing, and the creation of specific deliverables related to the growing independent workforce in Colorado.

Agile Employer

Areas of Exploration: Transformation Preparation; Support for Historically Excluded Populations

2022 ACTIVITIES AND ACCOMPLISHMENTS

» **Future of Work & Performance Excellence Event:** In partnership with Elevations Credit Union, the OFOW presented at and facilitated a discussion with **Malcolm Baldrige National Quality Award** recipients who are bridging the gap between employers and employees to ensure a resilient economy with workers to support vital industries. The conversation included how to build resiliency as an organization and within the workforce, lessons learned from prioritizing the Malcolm Baldrige performance excellence framework, and how to cultivate growth and leadership among a team that may be working on a hybrid work schedule.

» **Work-Based Learning Quality Expectations (Appendix L):** Per SB22-140, the OFOW published **Work-Based Learning Quality Expectations** to provide a framework for businesses and intermediaries that are interested in adopting work-based learning models as part of their workforce planning.

» **Remote Work Initiative:** The **Remote Work Initiative**, launched in 2020, provides resources, best practices, and other information to Coloradans, employers and communities so they can leverage the growth in remote work. Given the significant role that remote work will play in our evolving workforce, in 2021, the Remote Work Initiative, in partnership with CSU Global, released two online certificate programs to help workers and employers alike prepare to succeed in a virtual workplace environment. Since launching the certificates in April 2021,1,628 Coloradans have completed the courses successfully meeting the Wildly Important Goal to serve 1,500 Coloradans.

2023 PLANS

In 2023, the OFOW will conduct research and explore ways to prepare businesses for digital transformation and other transitions. Two projects will inform this effort:

» **Digital Transformation for Small & Medium Businesses:** The OFOW will partner with **CUIC** to address the current state of small rural businesses relative to their knowledge, access and adoption of emerging digital technologies, such as social media, IoT and electronic commerce, that will be critical for them to remain competitive in a rapidly changing marketplace.

» **Research on Industries in Transition:** The OFOW will work to understand how businesses can responsibly prepare workers for displacement or augmentation due to automation and other digital technologies.

APPENDICES

Appendix A: <u>Executive Order establishing OFOW</u>

Appendix B: <u>OFOW Connections to State Agencies, Offices, and CDLE Divisions</u>

Appendix C: <u>Summary of Transatlantic Cities of Tomorrow Trip to Germany</u>

Appendix D: <u>Summary of Transatlantic Cities of Tomorrow German Visit to Colorado</u>

Appendix E: <u>OFOW Website</u>

Appendix F: <u>Digital Literacy and Inclusion Initiative</u>

Appendix G: <u>SB22-140 Expansion of Experiential Learning Opportunities</u>

Appendix H: <u>Apprenticeship Colorado</u>

Appendix I: <u>HB21-1007 establishing State Apprenticeship Agency in CDLE</u>

Appendix J: <u>Executive Order Concerning Skills-Based Hiring for the State Workforce</u>

Appendix K: <u>Concerning Apprenticeships for the State Workforce and Promoting Apprenticeship as a Solution for Colorado Employers</u>

Appendix L: <u>Work-Based Learning Quality Expectations</u>

Appendix M: <u>Key Priorities for the OFOW</u>

Appendix N: <u>OFOW Organizational Chart</u>

Appendix O: <u>Transatlantic Cities of Tomorrow Colorado Action Plan</u>

For more information, visit the OFOW website at
cdle.colorado.gov/future-of-work

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