COLORADO
Department of Labor and Employment

2021 Annual Report from the Office of the Future of Work

Office of the Future of Work
Colorado Department of Labor and Employment
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The 2021 Annual Report by the Office of the Future of Work (OFOW) in the Colorado Department of Labor and Employment (CDLE). The OFOW was established through Executive Order B-2019-009 to raise awareness and identify policy and program solutions that prepare all Coloradans for the future of work. The OFOW's vision is a future where all Coloradan workers have access to education and skill training that is connected to meaningful and sustainable employment.

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Executive Summary

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 second annual report from the OFOW which provides an update on the future of work trends explored in its [first report](#); provides an update on the OFOW activities; and lays out its plan for the upcoming year.

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.*

Future of Work Trends

- Technological advances continue at a faster rate due to the ongoing pandemic. New research reveals that automation has also played a larger role in relative wage declines from 1980-2016 than previously thought. Displacement due to automation primarily affects low-wage, younger, diverse workers, with ripple effects impacting higher income brackets. Displacement due to artificial intelligence impacts more white-collar workers and higher-paying jobs. To reduce worker deficits, researchers suggest prioritizing efforts to upskill and reskill workers that need to transition, are employed part-time, and those that lag behind in the digital economy.

- As the demand for digital skills increases across all sectors, so does the digital divide. While access to broadband has improved across the country, among those Americans for whom a broadband network is available there are still tens of millions who have not adopted broadband in their homes due to lack of digital readiness and unaffordability. The future of work post-COVID-19 requires a strategic effort to build the digital skills of the Colorado workforce, increase connectivity to ensure access to online education and employment opportunities, and proactive support for workers at risk for displacement.

- Globalization is on track to return to pre-pandemic levels, meanwhile COVID-19 continues to have an outsized impact on the low-wage workforce in the United States and in Colorado. As of August 2021, Colorado workers making less than $27,000 per year were at -30.5 percent employment rates compared to January 2020. This is especially concerning as low wage workers often face significant barriers to securing higher-paying work. For every four years they remain in low wage work, the probability of moving out shrinks by half, with the chances reaching only 1 percent in their 10th year. At the same time, traditional pathways from low- to high-wage work are expected to disappear. Though there are occupations that can serve as gateways to higher paying

work, competition and systemic barriers to entry make the path to these jobs quite narrow. Recovery efforts should specifically target low-wage workers, unemployed workers, and workers in industries at risk of displacement to facilitate their transition to sustainable occupations.

- National data shows that independent contractors represent a growing, diverse, and multifaceted workforce across many sectors. To inform ongoing research and policymaking for this growing segment of Colorado's workforce, it is critical to obtain necessary data and independent worker voices from TNCs, DNCs and the broader landscape of individuals performing work as independent contractors in Colorado.

- Colorado is aging rapidly and diversifying, with younger, more diverse populations bearing the brunt of the economic impact of the ongoing pandemic. At the same time, the general population and workforce is expected to decline over the coming decades. Strategies for the future of work must address the needs of a 60-year worklife, a diverse workforce with systemic barriers to success in our economy.

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; and participates and aligns with related efforts across Colorado and the United States. The OFOW has three areas of exploration determined in partnership with thought leaders, state agency partners, and stakeholders:

- Modernizing worker protections and benefits
- Transformation Planning for individuals, employers, and communities
- Support for historically excluded populations

In 2021, the OFOW gave 33 presentations on the future of work to over 1,400 Coloradans and wrote 22 articles that were viewed by more than 3,200 people. The OFOW managed the launch of OnwardCO in April 2020 which has connected more than 129,000 COVID-19 impacted workers in all Colorado counties to essential services, training, or work. The OFOW has partnered with, participated in, and supported efforts of 15 state agencies and offices and seven of the divisions and offices within CDLE.

OFOW 2022 Projects:

In 2022, the OFOW will also 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 implementation of HB21-1007: State Apprenticeship Agency and the apprenticeship expansion efforts currently funded through federal discretionary grants. 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.

- **Digital Literacy and Inclusion**: The OFOW leads the Digital 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. As part of this effort the OFOW leads the Broadband Advisory Board Subcommittee on Digital Literacy and Inclusion (SDLI)

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. In 2022 this includes the publication of a 2022 Economic Complexity Report, a tailored case study for a Just Transition community. The report will include analysis aimed at building a more resilient economy by providing coal workers access to jobs with economic mobility.

- Research on independent contractors and exploration of portable benefits. In 2022, the OFOW will work with the legislature, working groups, and others to continue the research using the SB20-207 menu of policy options, the process outlined in the Labor Protections for Contracted Workers toolkit as well as the Aspen Institute's Roadmap for a Renewed Work-Related Safety Net.

- Remote Work Initiative to ensure Coloradan workers, employers, and communities are equipped to leverage remote work opportunities. In 2022 this includes the publication of case studies describing how four rural communities and one company have leveraged remote work as part of their economic development strategies.

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 second annual report provides an update on the future of work trends explored in its [first report](#) as Colorado looks to continue its recovery from the economic impact of the ongoing COVID-19 pandemic. Then we'll provide an update on the OFOW activities and an overview of the policy and programmatic priorities in the next year. The future of work remains an expansive, complex topic; this report aims to provide an overview of the major trends that can inform the state's work ahead to create a Colorado for all.

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 interventions that mitigate their negative impacts while taking advantage of the positive impacts. One of the main takeaways from the [2020 Annual OFOW Report](#) was that COVID-19 accelerated every force shaping the future of work. The data from 2021 for each trend reinforced this takeaway. At the same time, additional research released over the last year provided greater insight into the nature of these trends and their impact on the work we do and how we do it. In this year's report we'll provide a reminder of the key themes related to each force (for a more in-depth review of each, please refer to the [2020 Annual Report](#)), provide an update on new research and insights related to each.

Technological Advances

In its initial research, the OFOW honed in on three technological advances that are transforming workplaces: 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.[1] 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.[2] 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.[3]

Automation and Artificial Intelligence (AI) 2021 Update
Occupations that rely on routine cognitive tasks (e.g. sales and office occupations) and routine manual tasks (e.g. production, transportation, material moving, construction, extraction, installation, maintenance, repair) are more likely to be displaced due to technological advances.[4] Research published in 2021 found that between 50 percent and 70 percent of the changes in US wage structure between 1980 and 2016 are accounted for by the relative wage declines of worker groups specialized in routine tasks in industries experiencing rapid automation, and are not driven by other factors including import competition, or declining unionization rates.[5] From 1979 until 2018, individuals without a high school diploma saw hourly wages decline by 20 percent; individuals with a high school diploma saw wages decline by 13 percent; and those with some college saw wages decline by 12 percent over the same period.[6] In the 2020 OFOW Annual report we attributed these wage declines primarily to globalization rather than technological adoption, when in fact the opposite occurred.

Additionally, research on robot adoption after previous pandemics suggest that robot adoption increases after pandemic events, especially when the health impact is severe and is associated with a significant economic downturn.[7] As a result, demographic groups suffering displacement will compete for tasks performed by other groups that have similar age and education and specialize in similar occupations and industries.[8] Although the bulk of the displacement occurred for lower wage workers, the ripple effect of these disruptions negatively impacted wages across different income brackets.[9]

McKinsey & Company's State of AI in 2021 survey of 1,843 employers representing the full range of regions, industries, company sizes, functional specialties, and tenure found that 56 percent of all respondents report AI adoption in at least one function, up from 50 percent in 2020.[10] As a result of increased technology adoption, the United States will likely experience a

[1] 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
[2] West, Darrell (2018). What is Artificial Intelligence? Brookings Institution. Retrieved at https://www.brookings.edu/research/what-is-artificial-intelligence/
[3] Muro, M., Liu, S., & Kulkarni, S. (2017). Digitalization and the American Workforce. Brookings Institution. Retrieved at https://www.brookings.edu/wp-content/uploads/2017/11/mpp_2017nov15_digitalization_full_report.pdf
[4] Dvorkin, M. (2016). Jobs Involving Routine Tasks Aren't Growing. Retrieved at: https://www.stlouisfed.org/on-the-economy/2016/january/jobs-involving-routine-tasks-arent-growing
[5] Acemoglu, D., & Restrepo, P. (2021). Tasks, Automation, and the Rise in US Wage Inequality. National Bureau of Economic Research. Retrieved at https://www.nber.org/papers/w28920
[6] Donovan, S. & Bradley, D. (July 2019). Real Wage Trends, 1979 to 2018. Congressional Research Service. Retrieved at https://www.hsdl.org/?abstract&did=827842
[7] Saadi Sedik, T. & Yoo, J. (2021). Pandemics and Automation: Will the Lost Jobs Come Back? International Monetary Fund. Retrieved at https://www.imf.org/en/Publications/WP/Issues/2021/01/15/Pandemics-and-Automation-Will-the-Lost-Jobs-Come-Back-50000
[8] Acemoglu, D., & Restrepo, P. (2021). Tasks, Automation, and the Rise in US Wage Inequality. National Bureau of Economic Research. Retrieved at https://www.nber.org/papers/w28920
[9] Id.
[10] McKinsey Analytics. (2021). The state of AI in 2021. Retrieved at https://www.mckinsey.com/business-functions/mckinsey-analytics/our-insights/global-survey-the-state-of-ai-in-2021.

labor shortfall of 0.9 percent to 4.4 percent by 2030 with automation directly impacting more low-wage positions, and artificial intelligence directly impacting white-collar positions.[11] Worker deficits are expected in computer and mathematics, healthcare practitioners and technical support, and educational instruction and the library sector.[12]

To reduce worker deficits and the impact of displacement, researchers suggest prioritizing efforts to upskill and reskill workers in transition, employed part-time, and who lag behind in the digital economy[13] and develop strategies for employers to understand the viable skills these workers have and can build.[14]

Digitalization
Skills required for work are transforming rapidly with digital skills becoming required across all industries. As of 2019, eight in 10 jobs that did not require a bachelor's degree, asked for digital skills and more jobs are combining skill sets that did not previously appear together (e.g. marketing managers now need to program databases while mobile app developers need to design content).[15] Research from LinkedIn Economic Graph found that across all industries worldwide, skills needed for an occupation changed by an average of 25 percent since 2015; a rate that has accelerated due to technological advances since 2015 and due to COVID-19 since 2020.[16][17]

According to a recent study of eight major economies, over 100 million workers—about one in 16 workers—will need to find a different occupation by 2030 post-COVID-19.[18] In order to weather current and future transitions, workers must strategically build specific skills and mindsets. In their study of workers in the post-COVID economy, Emsi found that resilient workers are "T-shaped."[19] "T-shaped" workers are both generalists and specialists with a combination of broad experience and some specialization. Specifically, these workers will have a combination of human skills, technology skills, core business skills, and hard-to-find skills. In fact, many of the jobs considered viable pathways for low-wage workers who don't have a four-year degree depend on interpersonal skills over the technical skills that can be learned on the job.[20] This builds off the new foundational skills of the digital economy described in the 2020 OFOW Annual Report.

[11] Strack, R., Carrasco, M., Kolo, P., Nouri, N., Priddis, M, & George, R. (2021). The Future of Jobs in the Era of AI. BCG. Retrieved at https://www.bcg.com/publications/2021/impact-of-new-technologies-on-jobs.
[12] Id.
[13] Id.
[14] Acemoglu, D., & Restrepo, P. (2021). Tasks, Automation, and the Rise in US Wage Inequality. National Bureau of Economic Research. Retrieved at https://www.nber.org/papers/w28920
[15] Burning Glass. (2021). After the Storm: The Jobs and Skills that will Drive the Post-Pandemic Recovery. Retrievedd at https://f.hubspotusercontent00.net/hubfs/4906807/after_the_storm_recovery_jobs_final.pdf?__hstc=64979120.eb3c1fba6f14374dd7d3a830e95dce7d.1638398756311.1638398756311.1638398756311.1&__hssc=64979120.1.1638398756311&__hsfp=480522258
[16] LinkedIn Economic Graph (2021). Future of Skills. Retrieved at https://linkedin.github.io/future-of-skills/.
[17] Burning Glass. (2021). After the Storm: The Jobs and Skills that will Drive the Post-Pandemic Recovery. Retrievedd at https://f.hubspotusercontent00.net/hubfs/4906807/after_the_storm_recovery_jobs_final.pdf?__hstc=64979120.eb3c1fba6f14374dd7d3a830e95dce7d.1638398756311.1638398756311.1638398756311.1&__hssc=64979120.1.1638398756311&__hsfp=480522258
[18] Coursera (2021). Global Skills Report 2021. Retrieved at https://www.coursera.org/global-skills-report/skills?utm_cta_location_source=homepage-hero&utm_cta_text=get-report
[19] Coffey, C., Burrow, G., Sentz, R., Kirschner, K., & Saleh, Y. (2020). Resilient Skills. Emsi. Retrieved at https://economicmodeling.com/wp-content/uploads/2020/09/Resilient-Skills_full-report.pdf
[20] Id; Rework America Alliance (2021). Unlocking experience based job progressions for millions of workers. Retrieved at https://www.markle.org/rework-america/unlocking-experience-based-job-progressions-millions-workers

Despite the general consensus that digital skills are crucial for the future of work, there is very little understanding of what specific digital skills individuals need to achieve their personal and professional goals and how to improve individuals' digital literacy. To address this knowledge gap, the OFOW compiled data from its Finding a Job in COVID-19 Series and conducted a literature review of 10 reports from national thought and labor market data leaders.This review led to the identification of 244 unique digital skills/competencies required for work, learning, and daily life. These skills/competencies make up the OFOW's Digital Skills Catalog, a living document to inform job seekers, employers, workforce development professionals, and educators, that will be updated as new insights on in-demand digital skills emerge.

The demand for digital skills is increasing: 150 million technology-related jobs are expected to be added globally over the next five years.[21] The World Economic Forum expects that by 2022, the core skills needed to perform most roles will change by 42 percent; meanwhile half of Americans aren't comfortable using technology to learn, 72 percent of the United States lack sufficient digital problem solving skills, including 58 percent of millennials, about one-third of workers have limited or no digital skills, and 18 million households lack internet access.[22] Research shows that workers with limited or no digital skills are present across all industries, age groups, and demographic groups.[23] Individuals who aren't comfortable using technology to learn are at risk of falling behind.[24] While some occupations are more likely to be completely displaced, all occupations will require workers to work alongside technology, and to use technology to complete tasks efficiently and effectively.

To effectively leverage new technologies in the workplace and work remotely, even part time, requires access to affordable high speed internet and digital literacy that many workers lack. Based on the American Community Survey 1-year estimate from 2019, 95,823 Colorado households have no computer device and 196,544 Colorado households have no internet subscription.[25] Based on the March 2021 U.S. Census Bureau Household Pulse Survey, 60,108 Colorado households with children in the K-12 system have inconsistent access to computers and 64,878 households have inconsistent access to the internet for educational purposes. While access to broadband has improved across the country, among those Americans for whom a broadband network is available there are still tens of millions who have not adopted broadband in their homes: the "Adoption Gap" is approximately three times larger than the "Availability Gap" due to lack of digital readiness and unaffordability.[26]

The future of work post-COVID-19 requires a strategic effort to build the digital skills of the Colorado workforce, increase connectivity to ensure access to online education and employment opportunities, and proactive support for workers at risk for displacement. To address this divide, the OFOW will work with partners to build an equitable ecosystem for digital

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[21] LinkedIn Talent Solutions. (2021). Jobs on the Rise in 2021. Retrieved at
https://business.linkedin.com/talent-solutions/resources/talent-acquisition/jobs-on-the-rise-us#digital
[22] DigitalUS (2021). Digital Navigator's Playbook. Retrieved at https://digitalus.org/digital-navigator-playbook/
[23] U.S. Census Bureau (March 2021). Week 27 Household Pulse Survey: March 27 - March 29. Retrieved at
https://www.census.gov/data/tables/2021/demo/hhp/hhp27.html
[24] Zahidi, S. (2020). We need a global reskilling revolution – here's why. World Economic Forum. Retrieved at
https://www.weforum.org/agenda/2020/01/reskilling-revolution-jobs-future-skills/
[25] U.S. Census Bureau (September 2020). 2019 American Community Survey Single-Year Estimates. Retrieved at
https://www.census.gov/newsroom/press-kits/2020/acs-1year.html
[26] National Urban League (20201. The Lewis Latimer Plan for Digital Equity and Inclusion. Retrieved at
https://nul.org/sites/default/files/2021-04/NUL%20LL%20DEIA%2004142l%20Latimer%20Plan_vFINAL_1136AM.pdf

resilience, as defined by DigitalUS in Figure 1. An equitable ecosystem requires engagement from employers, including those that build technology; as well as state systems that depend on digital access to serve their citizens. According to the 2021 Digital Inclusion Benchmark which measures and ranks 150 of the world's most influential technology companies on their responsibility to advance a more inclusive digital society, most companies are lagging behind on digital inclusion, and where there have been commitments to promote digital inclusion, progress is too slow.[27] Any program aimed at solving problems of digital equity and inclusion, must include not only support for individuals but also to improve the applications that digital have-nots most require.[28]

Figure 1. Ecosystem for Digital Resilience[29]
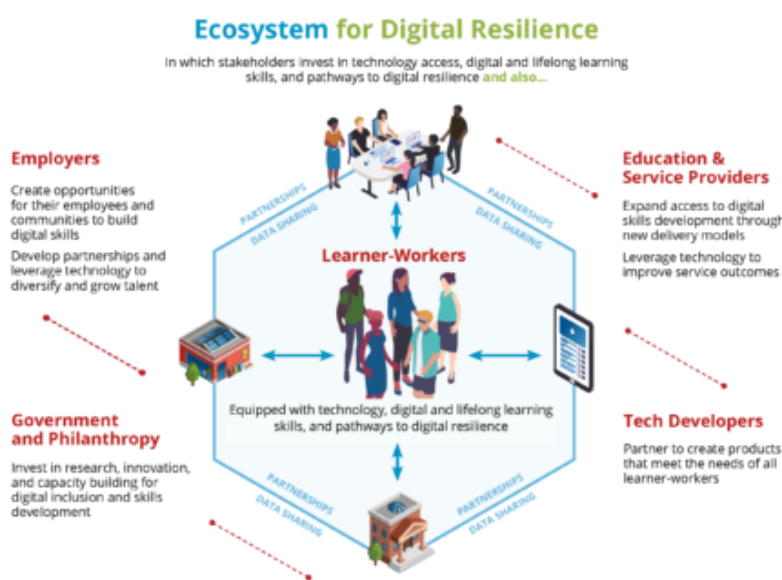
Globalization & Market Forces

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.[30] Overall, since 2001, the DHL Global Connectedness Score (a cumulative score based on an analysis of international trade, capital, information, and people) has increased, with occasional dips, showing the general trend towards increased globalization.[31] After a modest decline in 2020, the 2021 DHL Global Connectedness Index is on track to rise in 2021, and global flow patterns do not indicate a shift from globalization to more

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[27] World Benchmarking Alliance (2021). 2021 Digital Inclusion Benchmark. Retrieved at https://www.worldbenchmarkingalliance.org/publication/digital-inclusion/about/
[28] National Urban League (2021). The Lewis Latimer Plan for Digital Equity and Inclusion. Retrieved at https://nul.org/sites/default/files/2021-04/NUL%20LL%20DEIA%20041421%20Latimer%20Plan_vFINAL_1136AM.pdf
[29] DigitalUS Coalition. (2020). Building a Digitally Resilient Workforce: Creating On-Ramps to Opportunity. DigitalUS. Retrieved at https://digitalus.org/wp-content/uploads/2020/06/DigitalUS-Report-pages-20200602.pdf
[30] OECD Glossary of Statistical Terms. Retrieved at https://stats.oecd.org/glossary/detail.asp?ID=1121#:~:text=OECD%20Statistics,%2C%20corporations%2C%20technology%20and%20industries.
[31] Altman, Steven & Bastian, P (2020). DHL Global Connectedness Index 2020: The State of Globalization in a Distancing World. DHL. Retrieved from https://www.dhl.com/content/dam/dhl/global/dhl-spotlight/documents/pdf/spotlight-g04-global-connectedness-index-2020.pdf

regional approaches.[32] Market forces refer to the shifts in supply and demand, trade, and government priorities that impact the economy.

COVID-19 continues to have an outsized impact on the low-wage workforce in the United States and in Colorado, specifically. As of August 2021, Colorado workers making less than $27,000 per year had -30.5 percent employment rates compared to January 2020, while workers earning more than $60,000 had 8.6 percent change.[33] Research from the Brookings Institution indicates that low-wage workers more often churn through low-wage jobs, struggling to move up in the economy with uneven access to the tools that support mobility: education, skilling pathways, and employer-provided career development opportunities.[34] In their 2021 report, Moving Up: Promoting Workers Upward Mobility Using Network Analysis, Brookings found that over 10 years, only 43 percent of workers in low-wage occupations leave low-wage work and that for every four years they remain in low wage work, the probability of moving out shrinks by half, with the chances reaching only 1 percent in their 10th year.[35] At the same time, traditional pathways from low- to high-wage work are expected to disappear.[36] Though there are occupations that can serve as gateways to higher paying work, competition and systemic barriers to entry make the path to these jobs quite narrow.[37]

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. This should include the exploration of opportunities to leverage technology to reduce labor needs. For example, the Colorado Strategic Action Planning Group on Aging proposed an investigation of the role technology could play in improving care, reducing costs, and reducing the number of direct care workers needed given the extensive shortages of direct care workers today and into the future.[38]

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.

Individuals performing work as independent contractors are a growing segment of the workforce nationally and in Colorado, but the nature of independent work makes it challenging to understand the number of workers and their experience.

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[32] Altman, Steven & Bastian, P (2021). DHL Global Connectedness Index 2021 Update: Globalization Shock and Recovery in the COVID-19 crisis.. DHL. Retrieved from https://www.dhl.com/content/dam/dhl/global/dhl-spotlight/documents/pdf/2021-gci-update-report.pdf
[33] Opportunity Insights (2021). Economic Tracker. Retrieved at https://www.tracktherecovery.org/
[34] Escobari, M., Geismar, N. & Gandhi, D. (July 2020). Visualizing vulnerable jobs across America: A tool to understand your local economy and inform its recovery. Brookings Institution. Retrieved at https://www-brookings-edu.cdn.ampproject.org/c/s/www.brookings.edu/blog/up-front/2020/07/28/visualizing-vulnerable-jobs-across-america-a-tool-to-understand-your-local-economy-and-inform-its-recovery/amp/
[35] Escobari, M., Seyal, I., & Daboin Contreras, C. (2021). Moving up: Promoting workers' upward mobility using network analysis. Brookings Institution. Retrieved at https://www.brookings.edu/research/moving-up-promoting-workers-upward-mobility-in-a-time-of-change/
[36] Id.
[37] Id; Rework America Alliance (2021). Unlocking experience based job progressions for millions of workers. Retrieved at https://www.markle.org/rework-america/unlocking-experience-based-job-progressions-millions-workers
[38] Strategic Action Planning Group on Aging (2021). Ask List to Colorado Workforce Development Council, Colorado Department of Labor and EMployment, and the Office of Future of Work. Retrieved at https://drive.google.com/file/d/1aH_ajBHwMDuggMRs4tYlsjuzkb1wc2Gn/view?usp=sharing

To understand the state's independent workforce, the OFOW's [SB20-207 Study](#) looked to existing data sources, including those provided by the Census Bureau, Bureau of Labor Statistics, Internal Revenue Service, private studies focused on individuals performing work as independent contractors with Colorado-specific data, the Department of Revenue, and the Pandemic Unemployment Assistance (PUA) program. There are significant limitations and gaps in the data, not the least of which is the inability to determine which workers in the data set are misclassified. Despite such limitations, the data paints a picture of a growing, diverse, and multifaceted workforce across many sectors:

- Individuals performing work as independent contractors make up a significant portion of the workforce in Colorado, especially in metropolitan areas. There is no definite number of individuals working as independent contractors in Colorado, and the estimates range widely: from 130,000 in the PUA system (equivalent to 4.1 percent of the 2019 labor force) to 380,000 in the U.S. Census Bureau's Contingent Worker Supplement (equivalent to 12.7 percent of the 2017 labor force) to almost 550,000 1099-MISC filers (17.9 percent of the 2018 labor force).

- Though there are individuals performing work as independent contractors in every industry, the growth of the independent workforce was concentrated in a few sectors: personal services; transportation and warehousing; arts and entertainment; professional, scientific, and technical services; and real estate.

- Annual income varies widely among individuals performing work as independent contractors. Based on the data available, average income has declined for individuals performing work as independent contractors over the last decade and there is no readily available information on earnings by occupation or industry group.

- There are some notable demographic differences in the individuals performing work as independent contractors based on the available data. For instance, Black or African-American Coloradans and Coloradans over the age of 65 filed more PUA claims than the general population.

- In December 2021, the Colorado Department of Revenue released its first [Gig Economy Report](#) which summarized aggregate information from the IRS' Form 1099-K or Form 1099-MISC to help analyze the gig economy in Colorado. Their analysis found that from 2014 through 2018, the number of individuals with 1099s increased from 300,651 to 342,420; and for Transportation Network Companies (TNC) and Delivery Network Companies (DNC), the number of individuals with 1099s increased from 3,786 in 2014 to 19,600 in 2018.[39] Not all gig workers in TNC and DNC industries will receive 1099-Ks and the 1099-K data reported here is likely understated.[40]

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[39] Colorado Department of Revenue (2021). Gig Economy Reports. Retrieved from
ttps://cdor.colorado.gov/data-and-reports/income-tax-data/gig-economy-reports
[40] Id.

Figure 2. Number of Gig Workers in Colorado from 2014-2018 based on 1099-K and 1099-MISC Forms filed[41]
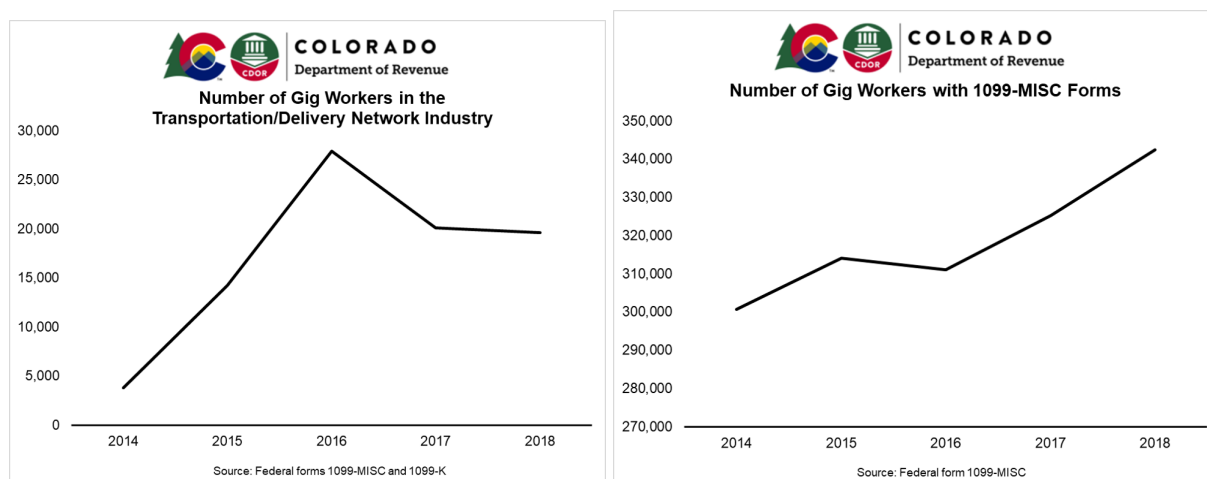
Online Platform Economy[42] workers, which include TNC and DNC workers, seem particularly vulnerable to economic shocks with extremely high rates of unemployment insurance receipt during the pandemic.[43] Platform drivers have the lowest family incomes compared to other participants in the online platform economy, and were the most likely to have received unemployment insurance during 2020.[44] The continued rise of the Online Platform Economy raises the importance of strengthening the social safety net for contingent workers and reducing the administrative burdens associated with platform income.[45]

In August 2021, Pew Research Center surveyed United States adults and found that 16 percent of Americans have ever earned money through an online gig platform, and in total, nine percent of United States adults are current or recent gig workers.[46] Half of Americans say earning money through gig platforms is a good way to make a living, while a smaller share (31 percent) believes these jobs are a good way to build a career.[47] As more workers participate in the gig economy it is important for employers and workers to understand the skills associated with this work in order to facilitate transitions into full-time "traditional" employment for those that are interested.

To inform ongoing research and policymaking for this growing segment of Colorado's workforce, it is critical to obtain necessary data and independent worker voices from TNCs, DNCs and the broader landscape of individuals performing work as independent contractors in Colorado in order to understand how the changing nature of work and work arrangements further promotes

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[41] Colorado Department of Revenue (2021). Gig Economy Reports. Retrieved from
https://cdor.colorado.gov/data-and-reports/income-tax-data/gig-economy-reports
[42] JPMorgan Chase defines the Online Platform Economy as platforms that (1) connect independent suppliers to consumers of goods and services; and (2) mediate payment. We disaggregate the Online Platform Economy into four sectors: two labor sectors in which participants sell their time or skills, and two capital sectors in which participants sell goods or lease property
[43] Greig, F. & Sullivan, D. (2021). The Online Platform Economy through the Pandemic. JPMorgan Chase Institute. Retrieved at
https://www.jpmorganchase.com/institute/research/labor-markets/online-platform-economy-through-the-pandemic
[44] Id.
[45] Id.
[46] Anderson, M., McClain, C., Faverio, M., & Gelles-Watnick, R. (2021). The State of Gig Work in 2021. Pew Research Center. Retrieved at https://www.pewresearch.org/internet/2021/12/08/the-state-of-gig-work-in-2021/
[47] Id.

or dilutes fair labor practices in Colorado. The OFOW will continue research on various approaches to modernize worker protections and benefits that ensure the following principles for work:

- Protection: Workers require basic protections to ensure decent working conditions and economic security.
- Choice: Workers should have the right to pursue the employment structure that best suits their needs.
- Adaptation: Labor protections should reflect the evolving needs of workers.[48]

The OFOW is eager to continue this research, expand it to other worker protections and benefits not discussed in the SB20-207 report, and, ultimately, to examine the fissuring of the workplace in Colorado on a larger scale.

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.

Colorado is Aging
The 65+ age group in Colorado has seen the highest aggregate population growth, increasing by nearly 41 percent from 2010 to 2019.[49] Colorado's aging factor is further convoluted when combined with projections for a relatively slow growth incline in population between 2025 and 2050.[50] Strategies for the future of work must reflect the needs of an intergenerational workforce and population so that all workers can find success in the evolving economy. Currently, older job seekers face both high rates of job loss and longer durations of unemployment.The COVID-19 pandemic has had widespread impact on mid-career women (ages 40-65): about 40 percent have experienced at least one job interruption and of those who were still unemployed, 70 percent were out of work for six months or more.[51] Nearly one-third of older women surveyed by the AARP as part of their research were providing care to a child or grandchild during the COVID-19 pandemic.[52] As our older population grows and people continue to live longer, we must consider a 60-year worklife with on-ramps and off-ramps to training and work, flexibility, and policies that support a "glide path" to retirement and maximize the productivity, skills, and economic impact of older workers.[53]

Colorado and the U.S. are Diversifying

[48] Updegrove, N. (2021). Labor Protections for Contracted Workers. Retrieved at
https://drive.google.com/file/d/1VTE64yZL26CjWpTpsfwnCxvcjyHZaok9/view?usp=sharing
[49] University of Colorado, Boulder; Leeds School of Business (2021). Fifty-Sixth Annual Colorado Business Economic Outlook. Retrieved at colorado.edu/business/sites/default/files/attached-files/2021_cbeo_ book_lr_final.pdf
[50] Colorado Workforce Development Council (2021). 2021 Colorado Talent Pipeline Report. Retrieved at
https://cwdc.colorado.gov/resources/colorado-talent-pipeline-report
[51] Perron, R. (2021). Older Women Workers' Jobs Were Disrupted During COVID-19. AARP Research. Retrieved at https://www.aarp.org/research/topics/economics/info-2021/midcareer-older-women-workers.html
[52] Id.
[53] The Stanford Center on Longevity (2021). The New Map of Life. Retrieved from https://longevity.stanford.edu/wp-content/uploads/2021/11/NMOL_report_FINAL-5.pdf

The 2020 U.S. Census data revealed that, for the first time, children of color now comprise more than half (53%) of the nation's total youth population.[54] The population under the age of 18 in Colorado is more diverse than older Coloradans, and the number and share of racial and ethnic minorities in Colorado are projected to increase, growing to comprise 46 percent of the state's population by 2050 (See Table 1).[55]

Table 1: Population Change in Colorado by Race/Ethnicity 2010 - 2020[56]

	Non-Hispanic/Latino						Hispanic/Latino Origin (of any race)
Total Population	White Alone	Black/African American Alone	American Indian & Alaska Native Alone	Asian/Pacific Islander Alone	Some Other Race Alone	Two or More Races Total	
14.8%	6.8%	17.2%	8.1%	44.6%	287.8%	158.6%	21.6%

At the same time, people of color in Colorado were more likely to be in jobs that were disrupted by the pandemic. Individuals in Colorado who identify as Hispanic or Latinx and Black or African American had higher unemployment rates in June 2021 at 8 percent and 13.5 percent, respectively, compared to individuals who identify as white at 5.7 percent.[57] Individuals ages 16-19 in Colorado who identify as Hispanic or Latinx were also most severely impacted during the pandemic.[58] Recovery efforts should target impacted workers from these demographic groups with supportive services to remove barriers, data and coaching to guide their decision making, and resources to access training for in-demand pathways.

Rural America became more racially and ethnically diverse over the last decade with the median rural county seeing its population of color increase by 3.5 percentage points between 2010 and 2020 (see Figure 3).[59] In Colorado, Latinos make up the largest non-white groups in every county (rural or metro) except for Montezuma County where American Indians are the largest non-white group (see Figure 4).[60][61]

Figure 3. Change in Rural Population of Color, 2010-2020[62]

[54]Frey, W. (2021). Mapping America's diversity with the 2020 census. Brookings Institution. Retrieved at https://www.brookings.edu/research/mapping-americas-diversity-with-the-2020-census/
[55] Bell Policy Center (January 2018). Demographics: A Changing Colorado. Retrieved at https://www.bellpolicy.org/wp-content/uploads/2018/01/Demographics-Guide-to-Economic-Mobility.pdf
[56]State Demography Office (2021). Census Data for Colorado (2020). Colorado Department of Local Affairs. Retrieved at https://demography.dola.colorado.gov/census-acs/2020-census-data/#census-data-for-colorado-2020
[57] Colorado Workforce Development Council (2021). 2021 Colorado Talent Pipeline Report. Retrieved at https://cwdc.colorado.gov/resources/colorado-talent-pipeline-report
[58] Id.
[59] Rowlands, D.W. & Love, H. (2021). Mapping rural America's diversity and demographic change. Brookings Institution. Retrieved at https://www.brookings.edu/blog/the-avenue/2021/09/28/mapping-rural-americas-diversity-and-demographic-change/
[60] Id.
[61]Frey, W. (2021). Mapping America's diversity with the 2020 census. Brookings Institution. Retrieved at https://www.brookings.edu/research/mapping-americas-diversity-with-the-2020-census/
[62] Rowlands, D.W. & Love, H. (2021). Mapping rural America's diversity and demographic change. Brookings Institution. Retrieved at https://www.brookings.edu/blog/the-avenue/2021/09/28/mapping-rural-americas-diversity-and-demographic-change/
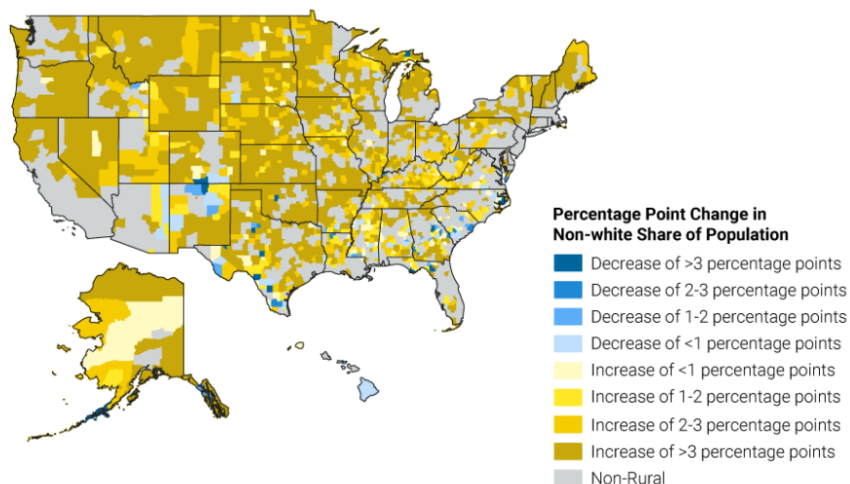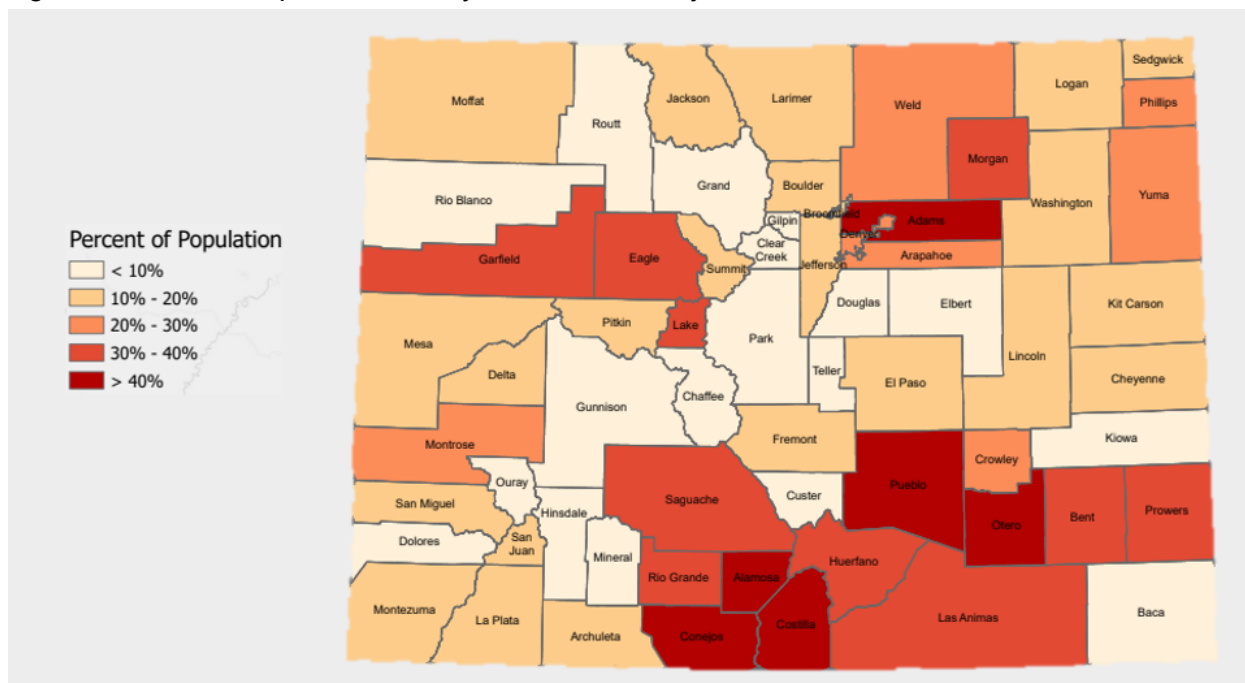
Percentage Point Change in Non-white Share of Population

- ■ Decrease of >3 percentage points
- ■ Decrease of 2-3 percentage points
- ■ Decrease of 1-2 percentage points
- ■ Decrease of <1 percentage points
- ■ Increase of <1 percentage points
- ■ Increase of 1-2 percentage points
- ■ Increase of 2-3 percentage points
- ■ Increase of >3 percentage points
- ■ Non-Rural

Figure 4. Percent Hispanic/Latino by Colorado County 2020[63]

With these changes, "...programs in rural America must embrace intentional strategies to nurture demographic diversity and dynamic local economies…by supporting clusters of locally owned small businesses that build community wealth, implementing built environment and quality-of-life improvements for vulnerable residents, strengthening social cohesion between neighbors, and nurturing new community-led structures to build capacity and advance community priorities."[64]

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[63]State Demography Office (2021). Census Data for Colorado (2020). Colorado Department of Local Affairs. Retrieved at https://demography.dola.colorado.gov/census-acs/2020-census-data/#census-data-for-colorado-2020
[64] Rowlands, D.W. & Love, H. (2021). Mapping rural America's diversity and demographic change. Brookings Institution. Retrieved at https://www.brookings.edu/blog/the-avenue/2021/09/28/mapping-rural-americas-diversity-and-demographic-change/

The aging and diversification of Colorado's population are part of another trend shaping the future of work in America: its shrinking population. Baby boomers are leaving the workforce at faster rates; younger generations are participating in the labor force at a lower rate, especially after the pandemic; and birth rates, and the size of working populations, consistently decline.[65] Our economy faces a talent shortage that requires multiple, intentionally designed, creative solutions ranging from technological advances to reduce human labor needs, cultural shifts to promote a longer work life, a lifelong learning education system, supportive immigration policies, and skills-based practices.[66] As Emsi explains, "people are a resource we can no longer afford to take for granted" and designing an economy with the wellbeing of people at the center is the work ahead.[67]

Key Questions Guiding the Work Ahead

Given these trends and the economic impact of the ongoing pandemic, the OFOW has developed the following guiding questions to shape its work ahead.

- 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?
- How can we support technological adoption for roles in small and medium businesses, where human touch is less critical, or where work is unsafe?
- How do we ensure that all career seekers have the skills, mindsets, and supports they need to connect to meaningful work?
- How do we redesign training to better meet the needs of employers, workers of all ages, and build a culture of lifelong learning?
- How can we close the digital divide for all Coloradans so they can fully participate in a digital world?

OFOW Approach

The OFOW has a broad mandate to both raise awareness of the impact of the future of work on Coloradan communities and to identify policy and program solutions that can create a skilled and resilient workforce. As shown below, in order to meet this mandate the OFOW conducts new research and applies existing research to Colorado contexts, holds listening sessions and convenings, builds working groups, participates and aligns with related efforts across Colorado and the United States, and leads key initiatives and projects.

Figure 5: Office of Future of Work areas of exploration, activities, and initiatives

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[65] Emsi (2021). The Demographic Drought: How the Approaching Sansdemic Will Transform the Labor Market for the Rest of Our Lives. Retrieved at https://www.economicmodeling.com/demographic-drought/.
[66] Id.
[67] Id.

Office of Future of Work

Vision	A future where all Coloradan workers have access to meaningful and sustainable employment		
Areas of Exploration	Modern worker protections and benefits	Transformation planning for all	Support for historically excluded populations
Activities	- Conduct new and apply existing research to identify promising policies, practices, and programs - Hold listening sessions, working groups, and summits - Participate in, inform, and align with efforts related to the areas of exploration - Lead key initiatives and projects related to the areas of exploration (see below)		
Initiatives and Projects	**Major Initiatives:** - State Apprenticeship Agency - Digital Equity, Literacy and Inclusion Initiative **Other Projects** - Research on independent contractors and exploration of portable benefits - Research on impact of technological advances, economic complexity, and resilient economic development to inform Coloradans and the talent development ecosystem - Research and identify resources to support digital transformation for small businesses and critical industries - Remote Work Initiative to ensure Coloradan workers, employers, and communities are equipped to leverage remote work opportunities		

OFOW Areas of Exploration

In October 2019, as a result of the OFOW's examination of the forces shaping the future of work as well as feedback from thought leaders, state agency partners, and stakeholders, the OFOW established three areas of exploration to guide its ongoing work, described in more detail on the OFOW's website:

- **Modern worker protections and benefits**: Worker protections and the social safety net need to be modernized to address the fissuring workplace, to support the people most vulnerable to the changing economy, and to ensure all types of workers are protected and have access to a living wage as work continues to evolve.

- **Transformation planning for all**: 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 increase their resilience.

- **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. This work includes addressing the systemic inequities that create barriers to success for Coloradan workers.

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

2021 OFOW Accomplishments and Plans for 2022

This section describes the major activities the OFOW conducted in 2021 and its plans for 2022. Where applicable, it includes reference to CDLE's department-wide Wildly Important Goals which are part of its annual performance plan.

Raising Awareness and Participation in Aligned Efforts

In 2021, 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; identify specific projects that will improve Colorado's future of work; and support the COVID-19 response and recovery.

2021 Activities and Accomplishments

In 2021, the OFOW gave 33 presentations on the future of work to over 1,400 Coloradans and wrote 22 articles that were viewed by more than 3,200 people. The OFOW managed the launch of OnwardCO in April 2020 which has since connected more than 129,000 COVID-19 impacted workers in all Colorado counties to essential services, training, or work (see Appendix C). The OFOW has partnered with, participated in, and supported efforts of 15 state agencies and offices and seven of the divisions and offices within CDLE, including the following initiatives:

- CO POWER '21: The OFOW supported the development of and supports the ongoing implementation of CO POWER '21. CO POWER '21 is an action plan and a vision that articulates the collective priorities of Colorado's talent development network, defines indicators of success, and provides an outline for investment opportunities to support economic recovery. This plan was initially described in the 2020 Colorado Talent Pipeline Report and updated for the 2021 Colorado Talent Pipeline report as a result of participation in the the National Governors' Association Workforce Innovation Network

- 2020 Colorado Resiliency Framework and Action Plan: The OFOW co-leads the Priority Implementation Team for the Future Ready Economy & Workforce sector of the 2020 Colorado Resiliency Framework and participates in the Colorado Resiliency Working Group to implement the Action Plan, identify opportunities to improve resilience, and ultimately, build a more resilient Colorado.

- Colorado Talent Equity Agenda: The OFOW supports and informs the Colorado Talent Equity Agenda with a focus on closing the digital divide, as described in further detail later in this report.

- [Colorado Broadband Advisory Board](#): The OFOW is an advisory member of the Colorado Broadband Advisory Board and leads the Subcommittee on Digital Literacy and Inclusion, as described in further detail later in this report.

- Skills-Based Practices: The OFOW, CDLE's Office of Human Resources, the Colorado Department of Personnel and Administration, and the Colorado Workforce Development Council (CWDC) have partnered to increase adoption of skills-based practices by state agencies. The CWDC continues the externally-facing promotion and support of skills-based practices described in the OFOW's 2020 Annual Report.

2022 Plans and Goals

In 2022, 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, community partners, and other stakeholders throughout 2022.

In 2022, the OFOW will continue its efforts to implement the CO POWER '21, the Talent Equity Agenda, the Colorado Resiliency Framework, and skills-based practices in state government.

Additionally, in 2022, the OFOW will reconvene its Thought Leader working group from 2019/2020 to inform its research on the four forces of the future of work, its areas of exploration and current projects, and the strategies moving forward. With the Thought Leader working group and other partners, the OFOW will hold a summit on the future of work in Colorado which will result in an ongoing working task force to inform and coordinate the future of work efforts in the state, in accordance with the Executive Order establishing the office.

OFOW Initiatives and Projects

As Colorado moves into recovery from the COVID-19 pandemic, the OFOW will continue to support and inform larger recovery efforts. These activities include the evolution of OnwardCO, training/resources for career coaches, and information to connect displaced workers to training and employment opportunities, with a particular focus on transitioning low-wage workers to better pathways. In the 2020 OFOW Annual report, the OFOW established four specific projects. The next section provides updates on those projects, the path forward for each, as well as a high level overview of the State Apprenticeship Agency which is now part of the OFOW.

State Apprenticeship Agency and Registered Apprenticeship Expansion

Areas of Exploration: Transformation Planning for All; Support for Historically Excluded Populations

2021 Activities and Accomplishments

In June 2021, Governor Polis signed [HB21-1007: State Apprenticeship Agency](#) (SAA) into law, codifying the state's commitment to increase access to earn-and-learn programs that lead to

high quality jobs and to build the talent pipeline that industry needs. On that day, CDLE was also awarded $10 million from the U.S. Department of Labor (USDOL) for its State Apprenticeship Expansion, Equity and Innovation (SAEEI) grant proposal, the latest testament to the efforts and commitment of statewide workforce and education partners to create more pathways to opportunity. This federal award alongside the creation of Colorado's SAA presented a unique opportunity to elevate, align, and accelerate CDLE's efforts to expand apprenticeships across the state and create a resilient talent pipeline. In August of 2021, CDLE announced the OFOW will house the SAA and the existing Apprenticeship Team. The State Apprenticeship Agency is designed to:

- Serve as the primary point of contact with the USDOL's Office of Apprenticeship concerning apprentices and registered apprenticeship programs;
- Accelerate new apprenticeship program growth and assist in promotion and development;
- Once recognized by USDOL in 2023, 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.

With oversight of the SAA, Apprenticeship Directory, and expansion of registered apprenticeships, the OFOW will play a direct role in ensuring more Coloradan workers and businesses have access to high quality apprenticeship programs that create a future-ready talent pipeline.

The SAA is responsible for investing in and coordinating innovations in apprenticeship expansion. These activities are supported by the federal USDOL Apprenticeship Expansion grants listed below. These expansion grants allow CDLE and its partners to provide funding, technical assistance, outreach, and other resources to support the expansion of quality pre-apprenticeship and registered apprenticeship programs.

- State Apprenticeship Expansion, Equity and Innovation
- Building State Capacity to Expand Apprenticeship through Innovation
- Apprenticeship State Expansion

With the support of these grants and the efforts of the OFOW's Apprenticeship team and its partners, Colorado has celebrated a lot of growth of apprenticeships over the past year, including new programs being registered with the USDOL, new occupations being added to existing apprenticeship programs, and apprentices joining registered apprenticeship programs (RAPs).

RAP Expansion

- **480** programs/occupations currently registered in Colorado

- Colorado **doubled** the number of new programs/occupations registered from 2020 (31 new programs registered) to 2021 (64 new programs registered). These newly

registered programs/occupations were across dozens of different occupations both in the skilled trades and other industries such as healthcare, IT, and transportation

Apprentice Enrollment

- 6,304 active apprentices

- After a decline of 17 percent in new RAP enrollments from 2019 to 2020, Colorado saw an increase in RAP enrollments from 2020 to 2021 of **14 percent**

- **18 percent** of apprentices enrolled in Colorado RAPs in 2021 are women. There has been a growth in women participating in RAPs in Colorado in the last five years; only 6% of Colorado apprentices enrolled in 2016 were women

2022 Plans and Goals

In 2022, the OFOW will continue hiring team members to support the expansion grants and the SAA. The OFOW has a robust timeline to meet to secure recognition of the SAA from USDOL and begin registering RAPs by July 1, 2023. This includes the creation of two councils to provide professional and technical expertise and advise the SAA on registered apprenticeship standards, rules, and performance. The State Apprenticeship Council (SAC) will oversee the building and construction trades, and the Interagency Advisory Committee on Apprenticeship (IAC) will oversee all other industries. In the first year, the SAC and IAC will support the SAA as it develops the State plan and standards in accordance with 29 CFR § 29.13 The 2022 timeline for the SAA is as follows:

- By 1/31/22 - SAC and IAC named
- By 2/28/22 - First SAC and IAC meetings held
- By 8/29/2022 - State plan submitted to USDOL
- By 7/01/2023 - Rules effective; SAA begins registering new apprenticeship programs

As part of the implementation of the expansion grants and to increase adoption of RAPs, the OFOW will launch two key efforts in 2022:
- Scale Up Grants to support employers and industry groups to use equity strategies to increase participation in apprenticeship by historically excluded populations; expanding or establishing apprenticeship programs in key industries; and building or modifying apprenticeship curricula.
- Economic Recovery Pilot Incentive Program which are designed to offset costs and tailor RAPs to meet local employers' needs.

CDLE 2021-2022 Wildly Important Goal:
- Increase new apprenticeship programs by 20%, from 30 to 36 programs by June 30, 2022.
- Increase the number of new apprenticeships filled by racial or ethnic minorities by 5%, from 1,196 to 1,256, by June 30, 2022.

Digital Literacy and Inclusion

Areas of Exploration: Support for Historically Excluded; Transformation Planning for All

2021 Activities and Accomplishments

In 2021, the OFOW launched its [Digital Literacy and Inclusion Initiative](#). Through this initiative, the OFOW partners with the Colorado Broadband Office, Colorado Center on Law and Policy, Colorado Department of Higher Education, Colorado Department of Education Office of Adult Education Initiatives, CWDC, community based organizations, stakeholders, and others to research digital literacy and the programmatic, technological, and educational infrastructure required to ensure all Coloradans are prepared to participate in the future of work, learning, and daily life.

As the Colorado Broadband Office and Broadband Advisory Board collaborate and coordinate efforts to improve access to high-speed internet, they have partnered with the OFOW's Digital Literacy and Inclusion Initiative. In March 2021, as directed by the [Executive Order](#), the Broadband Advisory Board created the Subcommittee on Digital Literacy and Inclusion (SDLI) to discuss, research, analyze, and draw conclusions concerning digital literacy and inclusion and to provide regular updates to the Broadband Advisory Board concerning such discussions. The key responsibilities of the SDLI include:
- Coordinating and convening state level efforts to raise awareness of and address digital inequity
- Educating policymakers, local governments, and stakeholders on the importance of digital equity, common terms and definitions, themes, best practices, and available resources
- Developing policy supportive of digital equity
- Strengthening and supporting local digital equity ecosystems
- Guiding data, research, and best practices

The SDLI has three working groups to support digital literacy and inclusion efforts:
- **Policy:** In 2021, this group established a legislative vision for digital equity in the state which will be embedded in the state's digital equity plan and in legislative efforts moving forward.

- **Data:** In 2021, this group worked with state agency partners and others to identify key data sources to inform the creation of a digital equity scorecard.

- **Promising Practices:** In 2021, this group researched and identified promising practices to amplify, scale, or adopt in Colorado as part of the SDLI's efforts as well as components of a digitally equitable community to include in a digital equity scorecard.

Beyond the SDLI, the OFOW's other accomplishments related to digital literacy and inclusion to date include:

- Launching a [Digital Literacy and Inclusion website](#) to house updates on efforts related to Digital Literacy and inclusion

- Partnering with Mile High United Way 2-1-1 to audit and update all the digital literacy and inclusion materials, resulting in 195 Services by 103 Agencies at 257 locations. The OFOW trained 2-1-1 navigators on the new additions and ways to embed digital inclusion resources in their referral process.

- In partnership with Colorado Department of Education's Adult Education Initiative, providing Northstar Digital Literacy licenses to the public workforce system and piloted VoxyEngen with three sites.

- Working with the My Colorado Journey team to develop a digital literacy outcome in the platform so users could build their skills and connect with resources.

- Delivering a technical assistance module with the CWDC to seven organizations to bridge the digital divide as part of their service delivery.

- Launching a partnership with CDHE and Fort Lewis College to build a digital inclusion program for college students including a one-credit online course to share with other institutions: Becoming a Digital Citizen.

- Embedding digital inclusion into stimulus proposals and implementation; researching best practices from other states to inform Colorado efforts; offering digital literacy resources to state partners.

- Publishing a Digital Literacy and Inclusion report which provides an overview of the current state of digital literacy and inclusion, and what is needed to ensure all workers are future-ready.

- Publishing a Digital Skill Catalog, a living document logs and categorizes 244 digital literacy competencies required for daily life, learning, and the future of work. Skills are organized based on the following criteria:

- Publishing a Digital Equity Framework with the Colorado Center on Law and Policy (CCLP) and its Skills2Compete Coalition to develop a competency framework and policy recommendations that will increase digital literacy and inclusion across the state

- Partnering with the Colorado Universities Innovation Council's LINKED program (CUIC) to explore the creation of a statewide Digital Equity Office.

2022 Plans and Goals

Building on the initial efforts of the Digital Literacy and Inclusion Initiative established in 2020-2021, the OFOW has identified additional goals for the upcoming year. The goals and strategies below make up the state's action plan for Colorado's Digital Literacy and Inclusion Initiative. These efforts will serve as the foundation for the state's Digital Equity Plan as outlined in H.R.3684 - Infrastructure Investment and Jobs Act, the state's plan for the U.S. Treasury's Coronavirus Capital Projects Fund, and future federal funding for workforce and digital skill development.

- Develop a Digital Equity Scorecard for Colorado's communities that defines and maps the digital divide, digital inclusion levels, and strengths and needs within local digital equity ecosystems. This Scorecard will serve as the basis for 2022/2023 digital skill development and digital equity goals and investments.

- Develop a Digital Inclusion Workforce Development plan which will provide data on talent development needs and opportunities to address the digital divide, build digital skills for incumbent workers in critical Colorado industries-including state government-and create future-ready workers.

- Engage historically excluded populations to assess usability of state digital services, access to digital skill development and tech resources, and provide recommendations for improvement. Develop strategies to address any gaps in digital literacy programming to meet digital skill demand leveraging the education and workforce development ecosystem, including nonprofit providers with a particular focus on older workers, New Americans, people with disabilities, and the Black/Indigenous/People of Color (BIPOC) communities.

- Embed digital equity principles and practices in COVID-19 recovery efforts, related legislation, and programs.

- 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.

- Conduct digital navigator pilots with target populations to inform ongoing work

CDLE Wildly Important Goals 2021-2022:
- The OFOW will publish a comprehensive digital inclusion workforce development plan which will include data on talent development needs and proposed strategies to build broadband infrastructure and build digital skills of Coloradans. The data will form the baseline for 2022/2023 talent development goals.

- Through the efforts of the Digital Inclusion Committee of the Broadband Advisory Board, the OFOW will establish a baseline of digital inclusion levels across Colorado communities and populations to inform 2022/2023 digital skill development goals for the state. Digital inclusion rates will include a measure of whether communities have access to technology, access to digital skill development support, current digital skill levels, and access to high speed internet.

Colorado Economic Complexity and Regional Competitiveness
Area of Exploration: Transformation Planning for All

2021 Activities and Accomplishments
Changing circumstances, such as those driven by resource depletion or shifts in consumer preferences, can shake the economic foundations of rural communities, decreasing the labor force participation and leaving municipalities without a healthy tax base. Due to these interacting

factors, the need for regions to reabsorb disrupted industries is at an all-time high. In 2021, the [Office of Just Transition](#) and the OFOW came together to strategize on how "single-industry communities" can both expand their economic sectors to incentivize workers to relocate and attract new industries that would benefit from the already existing skills present in that region. A tool for small and mid-sized cities built largely on a single economic sector, "smart growth economic development" refers to a place-based strategy that builds upon existing assets, strengthens communities, and creates long-term value by attracting a range of investments.

2022 Plans and Goals

The OFOW's forthcoming 2022 Economic Complexity Report is a tailored case study for a Just Transition community. The report will include analysis aimed at building a more resilient economy by providing coal workers access to jobs with economic mobility, and will showcase how Colorado can leverage place-based economic and mobility data to ensure equitable outcomes for workers as well as the diversification of rural economies for long-term resilience. As a joint effort with OFOW, this work builds on the Brookings Workforce of the Future Initiative's ongoing [work with the Texas Workforce Commission](#) and applies a Colorado lens to new research to inform policy aimed at improving job quality, increasing workers' economic mobility, and fostering shared prosperity in the region.

Future of Independent Contractor Protections

Areas of Exploration: Transformation Planning for All; Modernizing Worker Protections and Benefits

2021 Activities and Accomplishments

In 2021, the OFOW released the [SB20-207 report](#) which built a foundation upon which Colorado could begin to modernize worker protections and benefits. As a follow up to the SB20-207 report, the OFOW partnered with a Masters of Public Policy student at the Goldman School of Public Policy at University of California at Berkeley to pick up where the SB20-207 study ended. Their report, [Labor Protections for Contracted Workers](#) - completed in May 2021) brings a qualitative policy analysis to the question of how Colorado and other states can provide stronger protections to the contracted workforce. The report synthesizes and systematizes available literature to create a Toolkit to aid reform efforts.

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?

2022 Plans and Goals

In 2022, the OFOW will work with the legislature, working groups, and others to continue the research using the SB20-207 menu of policy options, the process outlined in the Labor Protections for Contracted Workers toolkit as well as the Aspen Institute's recently released [Roadmap for a Renewed Work-Related Safety Net](#). Additionally, the CUIC Team's final report will be released in 2022 to inform the effort.

CDLE Wildly Important Goal 2021-2022: The OFOW, in partnership with a third-party research institution, will launch a study to explore the platform-based worker industry in Colorado.

Agile Employer

Areas of Exploration: Transformation Planning for All; Support for Historically Excluded Populations

2021 Activities and Accomplishments

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 separate online certificate programs](#) to help workers and employers alike prepare to succeed in a virtual workplace environment.

- Worker certificates provide participants with strategies for successful productivity, collaboration, and advancement within remote and hybrid work environments.
- Supervisor certificates equip managers and leaders with the best practices, tools, insights, and skills needed to effectively lead remote individuals and teams in any industry.

Since launching the certificates in April 2021, 1,545 Coloradans have completed the courses.

2022 Plans and Goals

In 2021, the OFOW partnered with OEDIT to profile four rural communities and one company that have leveraged remote work as part of their economic development strategies. These case studies will be released in early 2022 and will be incorporated into [OEDIT's Rural Technical Assistance Program](#) to support economic developers across the state.

CDLE Wildly Important Goal 2021-2022: The Remote Work Initiative will prepare 1,500 Coloradans for success in remote work through completion of a remote work certificate, attendance at a remote work job fair, and other events held by the Remote Work Initiative.

Key Reports

The following reports have informed the OFOW over the past year and its plans for 2022:

- Aspen Institute: [Portable Benefits In Action: A Roadmap For A Renewed Work-Related Safety Net](#)
- Brookings Institution: [Moving up: Promoting workers' upward mobility using network analysis](#)
- Burning Glass: [After the Storm: The Jobs and Skills that will Drive the Post-Pandemic Recovery](#)
- Colorado Center on Law and Policy: [Ready for Work After COVID-19](#)
- Emsi: [The Demographic Drought](#)
- McKinsey: [The state of AI in 2021](#)
- National Urban League: [Lewis Latimer Plan for Digital Equity and Inclusion](#)
- Rework America Alliance: [Unlocking experience-based job progressions for millions of workers](#)
- Stanford Center on Longevity: [New Map of Life](#)

Appendices

Appendix A: [Executive Order establishing OFOW](#)

Appendix B: [OFOW Connections to State Agencies, Offices, and CDLE Divisions](#)

Appendix C: [OnwardCO Impact Report](#) - December 2021

Appendix E: [OFOW Website](#)

Appendix F: [Digital Literacy and Inclusion Initiative](#)

Appendix G: [Remote Work Initiative](#)

Appendix H: [Apprenticeship Colorado](#)

Appendix I: [HB21-1007 establishing State Apprenticeship Agency in CDLE](#)