

TECHNOLOGICAL CHANGES & COLORADO JOBS

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THE BELL POLICY CENTER • AUGUST 2018

As technology changes impact workplaces across the country, how Colorado jobs and the economy will be affected is unclear. Coloradans will see changes in how job duties are done, the number of jobs available within certain occupations and industries, and even the elimination of some jobs. We must prepare for these shifts now to protect Colorado workers whose jobs are at risk of disappearing or drastically changing.

Because communities rely upon various industries, it's important to understand the degree Colorado communities can expect workers to be affected by automation and other technological developments. Recent research done for the Bell Policy Center through a University of Colorado Denver capstone project assessed the risk of occupational change for each county, ultimately finding each county will face unique futures because of geographic distribution of jobs considered to be high risk for automation.

A well-known study by [Frey and Osborne](#) defined each occupation's risk of changing due to automation or computerization in the future. Combining this information with the number of jobs within each occupation by county, research done for the Bell Policy Center mapped job risk in two ways:

1. The total number of jobs with more than 90 percent probability of automation; this shows where we might see the largest number of jobs affected in Colorado
2. The percentage of jobs within each county that have more than 90 percent probability of automation; this shows which counties in Colorado may see the most drastic change relative to their own economies

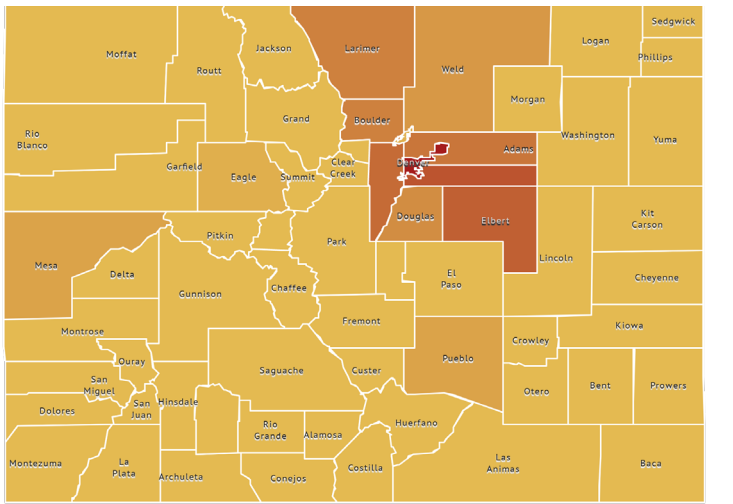
In counties with the greatest number of high-risk jobs, Coloradans can expect challenges associated with workers in these occupations finding new jobs or adapting to new duties. However, in many of these counties with larger populations, there are diverse occupation pools because of the variety of industries. If workers are displaced, there may be more opportunities in these areas to find new work.

A primary concern are the counties with a high concentration of high-risk jobs relative to the total number of jobs available in the county. In these areas, the opportunity pool is smaller if high-risk jobs diminish or are eliminated. Gilpin County, for example, has a high number of jobs within the gaming industry, many that have a high probability of future automation. Gilpin County has a less diverse job pool than Denver County, for example, so it may experience greater challenges if workers are displaced.

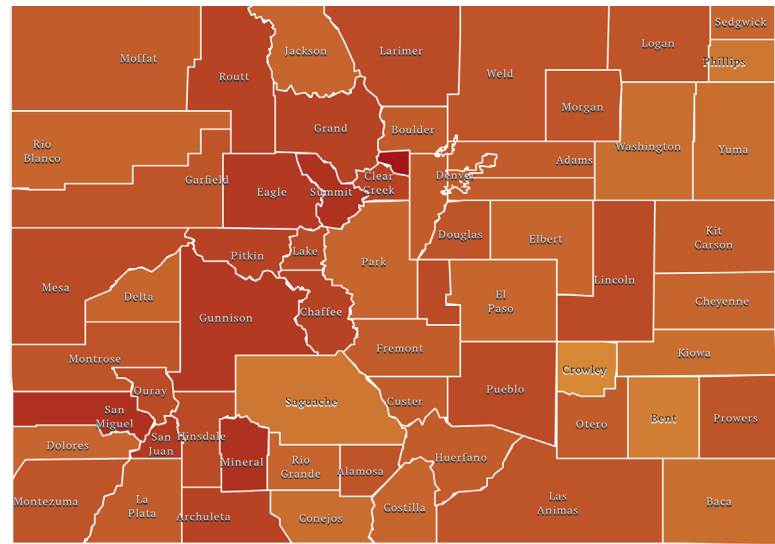
Counties with smaller populations or those relying heavily on a small number of industries should be aware of the potential impacts on their communities. If many workers within the county have high-risk occupations, that area may be disproportionately affected by changes brought on by technological developments.

2017 Counties with Greatest Number of Jobs With Very High Risk		2017 Counties with Greatest Concentration of Jobs With Very High Risk	
County (Top Ten)	Total Number of Jobs With More Than 90% Probability of Risk	County (Top Ten)	Percent of Jobs in Each County With More Than 90% Probability of Risk
Denver	150514	Gilpin	43.74%
Arapahoe	99321	Mineral	37.59%
El Paso	89909	Summit	37.43%
Jefferson	74720	San Miguel	37.40%
Adams	60862	San Juan	36.63%
Larimer	56311	Gunnison	35.40%
Boulder	55123	Eagle	34.81%
Douglas	41356	Grand	34.13%
Weld	35028	Pitkin	33.66%
Mesa	21385	Archuleta	33.44%

Automation probability sourced from Frey & Osborne, 2013; Occupation data sourced from [Emsi, 2017](#)



2017 Total Number of Jobs per County with High-Potential for Change (>90% Probability)



2017 Percentage of Jobs with High-Potential for Change (>90% Probability) Out of Total Number of Jobs per County



As shown in the table below, 7 of the top 10 jobs with the largest five-year percentage decrease have an automation probability of more than 50 percent. Many factors contribute to job growth or reduction, but it's reasonable to conclude that technology influences demand for these jobs. As technology continues to rapidly affect the way we work, job duties of the future stand to change drastically.

Traditional tasks within a job will change, some jobs will become obsolete, and there will be [jobs created that don't even exist yet](#). To keep up with these shifts, workforce retraining will be needed. Because of this, the accessibility and affordability of education and professional training opportunities will have even greater importance as Colorado jobs evolve.

Occupations Experiencing the Most Decrease in Number of Jobs 2013-2017

(Not including jobs with less than one-third of median number of jobs in 2013)

Occupation	SOC Code	Percent Change 2013-2017	Number of Jobs 2013	Number of Jobs 2017	Automation Probability
Derrick Operators, Oil and Gas	47-5011	-32.37%	414	280	80.00%
Gaming Supervisors	39-1011	-25.25%	408	305	28.00%
Continuous Mining Machine Operators	47-5041	-25.00%	496	372	54.00%
Helpers--Extraction Workers	47-5081	-23.81%	525	400	37.00%
Rotary Drill Operators, Oil and Gas	47-5012	-22.28%	1095	851	53.00%
Service Unit Operators, Oil, Gas, and Mining	47-5013	-21.53%	2383	1870	93.00%
Farmers, Ranchers, and Other Agricultural Managers	11-9013	-20.40%	8737	6955	4.70%
Telemarketers	41-9041	-19.04%	7348	5949	99.00%
Roustabouts, Oil and Gas	47-5071	-18.18%	3063	2506	68.00%
Switchboard Operators, Including Answering Service	43-2011	-17.40%	1684	1391	96.00%

Standing before us is a great opportunity. As the way we work changes, Colorado cannot be left behind. Policies that keep Colorado competitive and productive must be embraced. Automation can lead to increased productivity and innovation, but Coloradans need to be prepared to work in the jobs of the future. In prioritizing policies that plan for the imminent job changes ahead of us, we can keep Colorado a leading economic state.