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## Automation Potential and Artificial Intelligence

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## AUTOMATION POTENTIAL AND ARTIFICIAL INTELLIGENCE

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Prepared by: Ember Smith, Caitlin J. Saladino, and William E. Brown, Jr.

### PURPOSE:

This Fact Sheet highlights the automation potential in the Mountain West states (Nevada, Utah, Arizona, New Mexico, and Colorado) and its metropolitan statistical areas using the findings of “Automation and Artificial Intelligence: How machines are affecting people and places,” a report by the Brookings Institution.<sup>1</sup>

### WHAT IS AUTOMATION AND WHY SHOULD WE CARE?

Automation is the process of machines substituting human labor to complete certain work tasks. Increasing work done by machines has the potential to reduce per unit cost of production, increase efficiency, and perhaps employment in some sectors as a result. In addition, it may help alleviate the obligation for human labor to complete menial or physically demanding tasks. Although there are a series of theoretical benefits to automation, it also has the potential to create substantial disruptions in labor in the short term and impact “lower-wage, lower-education roles,” especially office administration, production, and food preparation.

The first wave of automation is the most disrupting to jobs that currently pay the lowest wages. The average automation potential of occupations that require a bachelor’s degree is around 24%, whereas the automation potential faced by jobs requiring less than a bachelor’s degree is about 55%.<sup>2</sup> Policy and industry action will need to be taken to ensure vulnerable workers are not left behind in a new economy.

### KEY FINDINGS:

1. Las Vegas has the fifth highest automation potential of the United States’ top 100 largest metropolitan areas.
2. Small and rural communities are substantially more prone to automation. The average worker in a metro area with less than 250,000 residents works a job where 48% of tasks are subject to automation.
3. Around 25% of U.S. employment will be considered at “high risk” of automation by 2030.
4. Nevada is the most susceptible state to automation in the Mountain West at 48.04% average automation potential compared to the region’s average of 45.47%.
5. Nevada is the only state in the Mountain West that is in the highest 65% most susceptible states to automation of in the U.S.

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<sup>1</sup> Mark Muro, Robert Maxim, and Jacob Whiton, “Automation and Artificial Intelligence: How machines are affecting people and places,” The Brookings Institution, <https://www.brookings.edu/research/automation-and-artificial-intelligence-how-machines-affect-people-and-places/>

<sup>2</sup> Ibid.

**MEASUREMENTS**

The original report, “Automation and Artificial Intelligence: How machines are affecting people and places,” uses a combination of government and private data, including from the McKinsey Global Institute, to analyze past and future trends of the impact of automation across approximately 800 occupations.

Table 1 describes the percentage of jobs at a variety of automation risk levels. Jobs categorized as “low risk” means that between 0% and 30% of the tasks associated with the job are susceptible to automation, “medium risk” is between 30% and 70%, and “high risk” positions are jobs with over 70% of tasks susceptible to automation by 2030. The Mountain West column is calculated by taking the average potential of all of the states listed. Forward-looking data projects each occupation category’s “automation potential,” which refers to the portion of the task content that could be automated by 2030.

The jobs most vulnerable to automation include office administration, production, transportation, and food preparation. Each of these jobs fall under the “high risk” category, meaning over 70% of tasks are considered potentially automatable. A variety of other, more secure jobs often include more complex or creative roles that may require a higher level of education or social intelligence.

**Table 1: AUTOMATION POTENTIAL IN MOUNTAIN WEST STATES**

	Nevada	Utah	Arizona	Colorado	New Mexico	Mountain West Average
"Low Risk" Job Share	33.79%	39.09%	39.83%	40.79%	41.06%	38.91%
"Medium Risk" Job Share	38.83%	36.69%	37.18%	36.43%	36.85%	37.19%
"High Risk" Job Share	27.38%	24.23%	22.99%	22.79%	22.09%	23.89%
Average Automation Potential	48.04%	45.65%	44.95%	44.41%	44.30%	45.47%
Rank	5	35	41	43	44	N/A

**Figure 1: AUTOMATION POTENTIAL IN MOUNTAIN WEST STATES**

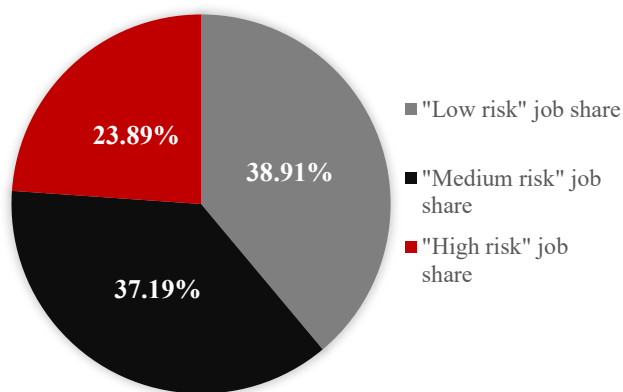


Figure 1 displays the average Mountain West automation potential by high, medium, and low risk (the red column in Table 1).

This figure shows that potential for automation in the Mountain West. The United States’ overall distribution is similar. In the U.S. at large, about 39% of jobs are at low risk, 36% are at medium risk, and around 25% are at high risk of automation by 2030. The Mountain West region has a lower portion of “high risk” jobs than the U.S., but slightly more at “medium risk.”

Table 2 displays the portion of jobs at low, medium, and high risk of automation in each of the top 100 largest metropolitan areas in the U.S. that are located in the Mountain West, as well as their average automation potential.

**Table 2: AUTOMATION POTENTIAL OF TOP 100 METROS IN THE MOUNTAIN WEST**

<b>Rank</b>	<b>Metropolitan Area</b>	<b>"Low Risk" Job Share</b>	<b>"Medium Risk" Job Share</b>	<b>"High Risk" Job Share</b>	<b>Average Automation Potential</b>
5	Las Vegas-Henderson-Paradise, NV	33.07%	39.34%	27.59%	48.18%
23	Ogden-Clearfield, UT	37.23%	36.63%	26.14%	46.73%
60	Provo-Orem, UT	39.87%	37.89%	22.24%	45.13%
68	Phoenix-Mesa-Scottsdale, AZ	40.16%	36.64%	23.20%	44.79%
71	Tucson, AZ	41.04%	36.91%	22.05%	44.72%
73	Salt Lake City, UT	41.00%	35.71%	23.30%	44.60%
86	Colorado Springs, CO	42.25%	36.19%	21.56%	43.62%
88	Denver-Aurora-Lakewood, CO	42.33%	35.36%	22.31%	43.57%
92	Albuquerque, NM	42.93%	36.18%	20.89%	43.28%

Table 3 displays the automation risk for each metropolitan statistical area in the Mountain West.

**Table 3: AUTOMATION POTENTIAL IN MOUNTAIN WEST STATES**

	Sum of "Low Risk" Job Share	Sum of "Medium Risk" Job Share	Sum of "High Risk" Job Share	Sum of Average Automation Potential
<b>Arizona</b>				
Flagstaff, AZ	38.22%	38.44%	23.34%	46.61%
Lake Havasu City-Kingman, AZ	31.13%	41.87%	27.00%	49.05%
Phoenix-Mesa-Scottsdale, AZ	40.16%	36.64%	23.20%	44.79%
Prescott, AZ	36.26%	38.82%	24.91%	46.89%
Sierra Vista-Douglas, AZ	44.10%	36.24%	19.66%	42.58%
Tucson, AZ	41.04%	36.91%	22.05%	44.72%
Yuma, AZ	33.18%	48.21%	18.61%	45.63%
<b>Colorado</b>				
Boulder, CO	45.26%	33.96%	20.78%	42.49%
Colorado Springs, CO	42.25%	36.19%	21.56%	43.62%
Denver-Aurora-Lakewood, CO	42.33%	35.36%	22.31%	43.57%
Fort Collins, CO	38.78%	37.87%	23.35%	45.89%
Grand Junction, CO	37.09%	38.83%	24.08%	46.35%
Greeley, CO	33.07%	36.02%	30.90%	50.10%
Pueblo, CO	37.67%	39.44%	22.89%	45.92%
<b>Nevada</b>				
Carson City, NV	37.62%	38.20%	24.18%	46.16%
Las Vegas-Henderson-Paradise, NV	33.07%	39.34%	27.59%	48.18%
Reno, NV	37.19%	36.81%	26.00%	46.85%
<b>New Mexico</b>				
Albuquerque, NM	42.93%	36.18%	20.89%	43.28%
Farmington, NM	33.97%	38.08%	27.95%	48.22%
Las Cruces, NM	42.79%	36.63%	20.58%	43.78%
Santa Fe, NM	40.30%	38.60%	21.10%	44.00%
<b>Utah</b>				
Logan, UT-ID	35.59%	36.65%	27.77%	49.27%
Ogden-Clearfield, UT	37.23%	36.63%	26.14%	46.73%
Provo-Orem, UT	39.87%	37.89%	22.24%	45.13%
Salt Lake City, UT	41.00%	35.71%	23.30%	44.60%
St. George, UT	35.14%	38.55%	26.31%	47.81%

Table 4 displays the metro areas in the region, ranked from highest to lowest automation potential and provides their population size for reference.

**Table 4: AUTOMATION POTENTIAL IN THE MOUNTAIN WEST STATES (RANKINGS)**

Rank in the Mountain West	Rank in the U.S.	Metropolitan Area	Average Automation Potential	Population (2018) <sup>3</sup>
1	29	Greeley, CO	50.10%	314,305
2	54	Logan, UT-ID	49.27%	140,794
3	63	Lake Havasu City-Kingman, AZ	49.05%	209,550
4	109	Farmington, NM	48.22%	125,043
5	113	Las Vegas-Henderson-Paradise, NV	48.18%	2,231,647
6	137	St. George, UT	47.81%	171,700
7	197	Prescott, AZ	46.89%	231,993
8	201	Reno, NV	46.85%	469,764
9	208	Ogden-Clearfield, UT	46.73%	675,067
10	218	Flagstaff, AZ	46.61%	142,854
11	239	Grand Junction, CO	46.35%	153,207
12	258	Carson City, NV	46.16%	55,414
13	270	Pueblo, CO	45.92%	167,529
14	273	Fort Collins, CO	45.89%	350,518
15	288	Yuma, AZ	45.63%	212,128
16	312	Provo-Orem, UT	45.13%	633,768
17	326	Phoenix-Mesa-Scottsdale, AZ	44.79%	4,857,962
18	331	Tucson, AZ	44.72%	1,039,073
19	334	Salt Lake City, UT	44.60%	1,222,540
20	350	Santa Fe, NM	44.00%	150,056
21	355	Las Cruces, NM	43.78%	217,522
22	357	Colorado Springs, CO	43.62%	738,939
23	359	Denver-Aurora-Lakewood, CO	43.57%	2,932,415
24	367	Albuquerque, NM	43.28%	915,927
25	372	Sierra Vista-Douglas, AZ	42.58%	126,770
26	374	Boulder, CO	42.49%	326,078

<sup>3</sup> Annual Estimates of the Resident Population: April 1, 2010 to July 1, 2018. Source: U.S. Census Bureau, Population Division Release Date: April 2019

Figure 2 shows the average automation potential data displayed in Table 3 and Table 4.

## Figure 2: AUTOMATION POTENTIAL IN THE MOUNTAIN WEST METRO AREAS

