ZipRecruiter®

Future *of* Work

REPORT | 2020

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What AI has already brought us:

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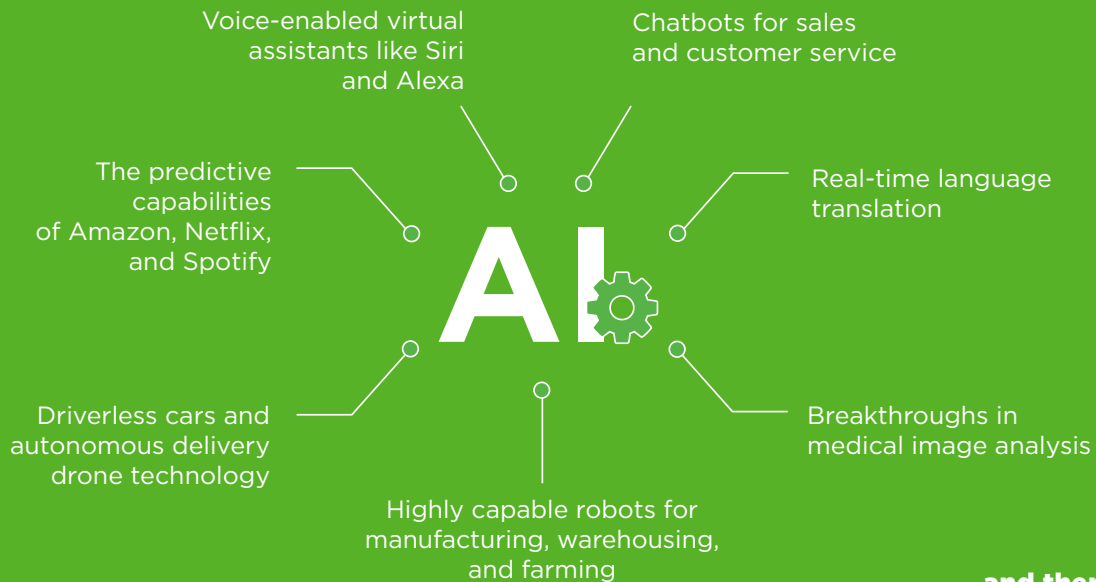
...and there's more on the way.

Artificial intelligence (AI) has greater potential than even the internet to change our lives and our future. It is already shaping the way we work and creating new jobs that didn't exist as recently as ten years ago.

In this report, we take a closer look at where those jobs are and which states have been the winners and losers in the AI gold rush.

Artificial Intelligence Jobs

Throughout the report, we use the term "artificial intelligence jobs" or "AI jobs" to refer to jobs in artificial intelligence companies or jobs requiring artificial intelligence expertise.

Examples of job titles in this category:

- AI/Machine Learning Engineer
- AI Software Developer
- Chatbot/AI Product Manager
- Data Scientist (AI)
- Technologist (AI)
- Computer Science Professor (AI and Cloud Computing)
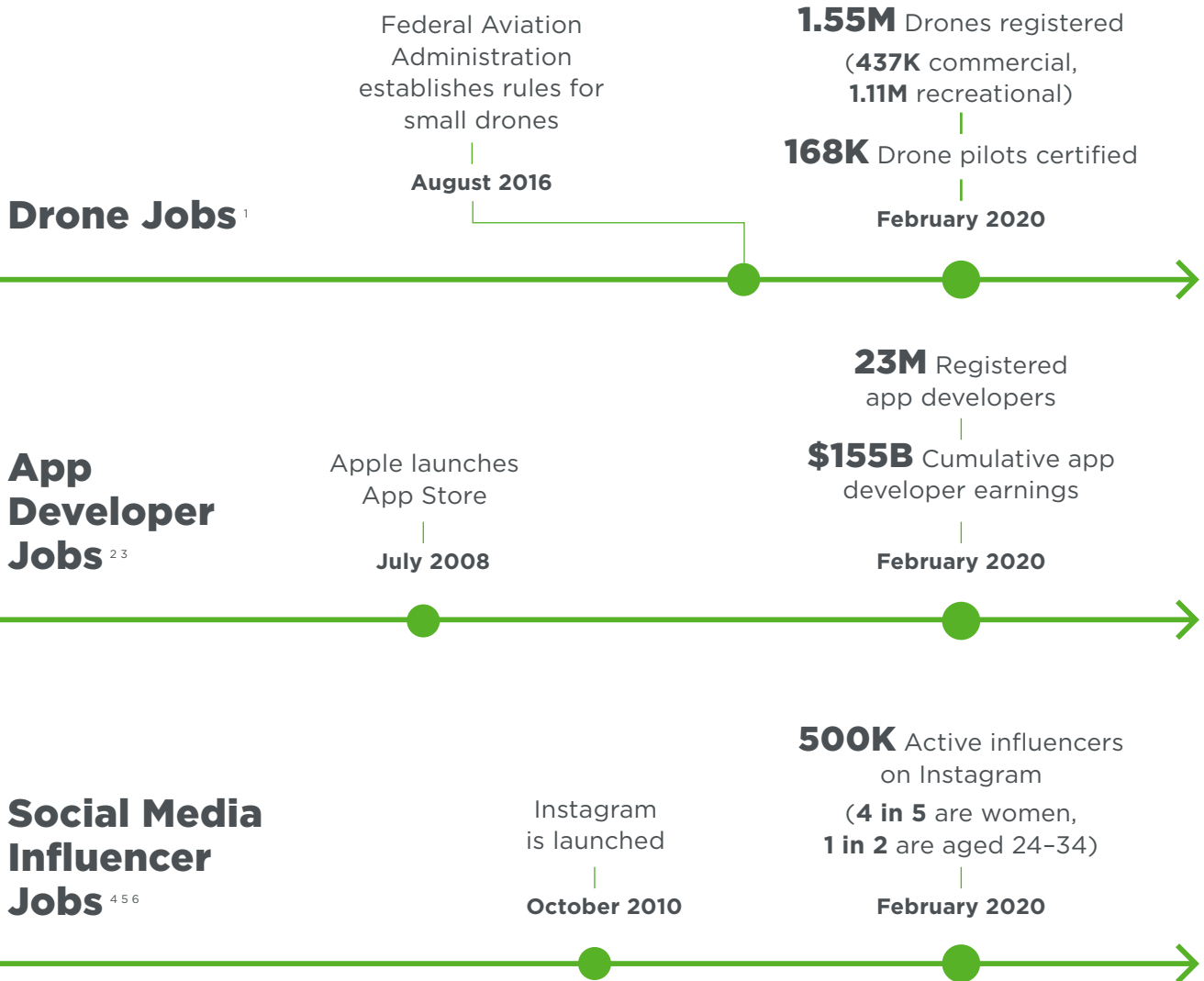- Robotics/AI Engineer

Artificial Intelligence-Related Jobs

We use the term "artificial intelligence-related jobs" or "AI-related jobs" to refer to jobs created due to artificial intelligence-based technologies.

Examples of job titles in this category:

- Chatbot Trainer
- Driverless Forklift Manufacturer
- UX Designer
- Digital Marketing Specialist
- Robotic Surgery Physician Assistant

New Technologies Create New Jobs

Drone Jobs [1]

Federal Aviation Administration establishes rules for small drones

August 2016

1.55M Drones registered

(**437K** commercial, **1.11M** recreational)

168K Drone pilots certified

February 2020

App Developer Jobs [2][3]

Apple launches App Store

July 2008

23M Registered app developers

$155B Cumulative app developer earnings

February 2020

Social Media Influencer Jobs [4][5][6]

Instagram is launched

October 2010

500K Active influencers on Instagram

(**4 in 5** are women, **1 in 2** are aged 24–34)

February 2020

Between 2018 and 2019, job posting volumes on ZipRecruiter grew... [7]

| **43%**	**44%**	**91%**	**151%**	**176%**
For candidates with robotics engineering skills	For candidates with AI or machine learning skills	For candidates with experience in robotic-assisted surgery	For candidates with deep learning skills	For candidates with robotic design skills

The Early Winners

The clear winners at the start of 2020 are four states which together account for over 90% of the workforce with advanced AI expertise.
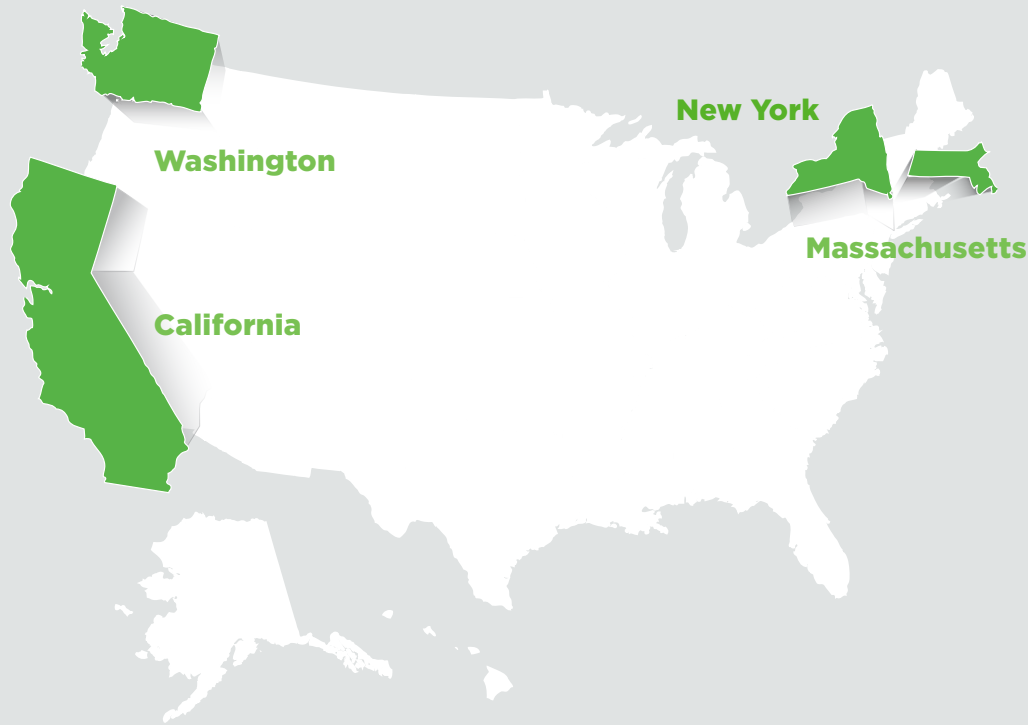
Over the past two years, **job postings on the ZipRecruiter marketplace in AI-related industries grew 35% in these states.**

These **AI pioneer states** are home to the so-called FAANG companies (Facebook, Apple, Amazon, Netflix, and Google)—the tech titans at the forefront of U.S. investments in AI.

They also happen to be **deep blue coastal states**, whose voters predominantly choose the Democratic Party.

They offer high-wage jobs in high-growth industries, both in their megacities and in newer tech hubs springing up nearby. They are seeing rapid growth in employer demand for advanced tech skills, but much slower growth in the supply of such workers. The result is above-average wage growth but high—and in some cases, widening—inequality.[8]

Historically, people have moved to high-wage areas in search of better job opportunities. But, other than Washington, today's winners have seen inbound migration slow to a trickle. Limited housing, lengthy commutes, and uncompetitive business policies are reducing their potential and leading thousands of businesses and residents to leave for other states.

Tomorrow's Winners

The exodus from today's winners is benefiting another set of states.

Several states are experiencing an "echo boom" thanks to friendly business environments, low living costs, high quality of life, and expanding technology bases. Sunny weather helps, too. **States with emerging Silicon Valleys promise to give birth to the next generation of FAANG companies and AI startups likely to change the world.**

AI-related job postings on ZipRecruiter in these states have grown 93% from 2018 to 2020— i.e. more than 2.6 times as fast as in the AI pioneer states.

About 100 million Americans live in states like these and stand to benefit if they continue to flourish in the AI gold rush. These states tend to be purple states, more evenly divided between Democrats and Republicans, or red states with bluer cities. Centrist policies may be part of their broad appeal. With the right policies and investments, these sunny, purple states could achieve spectacular job growth and offer job seekers and workers expanding job opportunities, even as innovation causes disruption in some industries.

Today's Losers

A third set of states is losing out in the AI gold rush.
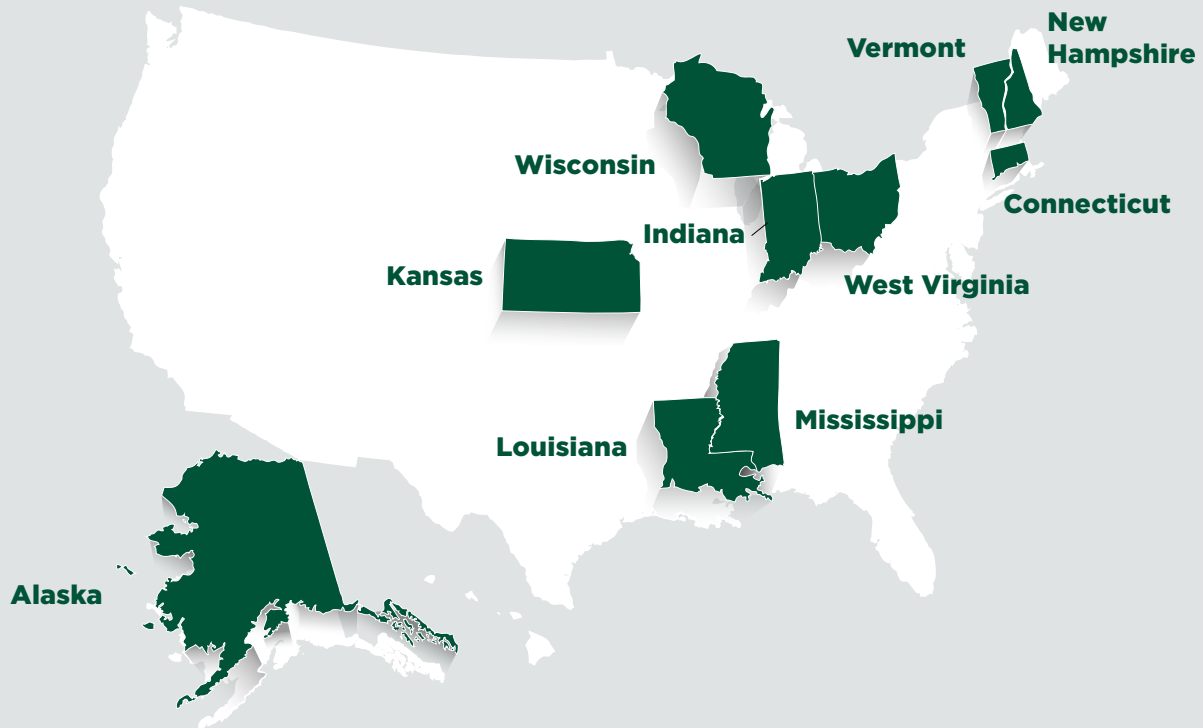
About half of Americans live in states with job markets that are vulnerable to AI-driven automation, brain drain, and aging. Among the states least prepared to harness the productivity benefits and new job growth that AI promises, each has a unique mix of factors holding it back.

Of course, a state's past and its geography need not be its destiny:

- Michigan and Minnesota have recently pulled off labor market turnarounds[9]

- Boston, MA and Long Beach, CA have achieved sustained education system improvements[10]

- Chattanooga, TN and Albuquerque, NM have revitalized their downtowns[11]

Success stories from around the country show how decisions of just one company or educational institution or city government can sometimes make a profound difference that has ripple effects across the local economy.

In this report, we explore ways today's winners can continue to flourish, tomorrow's winners can rise to their potential, and today's losers can catch up and join the winners' circle.

Early Winners in the AI Gold Rush Are Still Far Ahead but Their Lead is Narrowing

35%

Growth in AI-related jobs in the ZipRecruiter marketplace in the winning states between 2017 and 2019

In the ZipRecruiter employment marketplace, artificial intelligence (AI) jobs are growing rapidly. They accounted for four in 1,000 job postings in 2019, up from fewer than one in 1,000 in 2016. They are still heavily concentrated in four AI pioneer states, the current winners in the AI economy.

In the ZipRecruiter marketplace, AI jobs now account for ten of every 1,000 job postings in California, eight of every 1,000 in Massachusetts and Washington, and six of every 1,000 in New York. These states are winning by creating the most AI startups, clinching the most AI venture capital deals, and hiring the majority of the country's AI engineers.

Their superstar cities have been the natural settings for AI research and development to take off. They have, for decades, led the global economy in innovation and digitization, largely because they house some of the world's best universities and largest companies, most highly skilled workforces, most important ports, and most developed financial sectors.

Today's winners

The clear winners so far in the AI gold rush are:

CALIFORNIA.
WASHINGTON.
MASSACHUSETTS.
NEW YORK.

● Blue state   ● Red state   ● Purple state

Profiles of Today's Winners [12] [13] [14]

California

	AI Jobs	AI-Related Jobs	Net Migration, 2017–2018	Job Growth Dec 2016– Dec 2019	Wage Growth Dec 2016– Dec 2019
	10 in 1,000 job postings	68 in 1,000 job postings	lost 3.95 in 1,000 residents	5.9%	12.7%

Washington

	AI Jobs	AI-Related Jobs	Net Migration, 2017–2018	Job Growth Dec 2016– Dec 2019	Wage Growth Dec 2016– Dec 2019
	8 in 1,000 job postings	56 in 1,000 job postings	gained 6.18 in 1,000 residents	7.6%	11.8%

Massachusetts

	AI Jobs	AI-Related Jobs	Net Migration, 2017–2018	Job Growth Dec 2016– Dec 2019	Wage Growth Dec 2016– Dec 2019
	8 in 1,000 job postings	63 in 1,000 job postings	lost 3.73 in 1,000 residents	3.0%	11.1%

New York

	AI Jobs	AI-Related Jobs	Net Migration, 2017–2018	Job Growth Dec 2016– Dec 2019	Wage Growth Dec 2016– Dec 2019
	6 in 1,000 job postings	61 in 1,000 job postings	lost 9.23 in 1,000 residents	3.5%	12.0%

AI pioneer states are the early winners in the AI gold rush[15]

AI jobs per 1,000 job postings in the ZipRecruiter marketplace
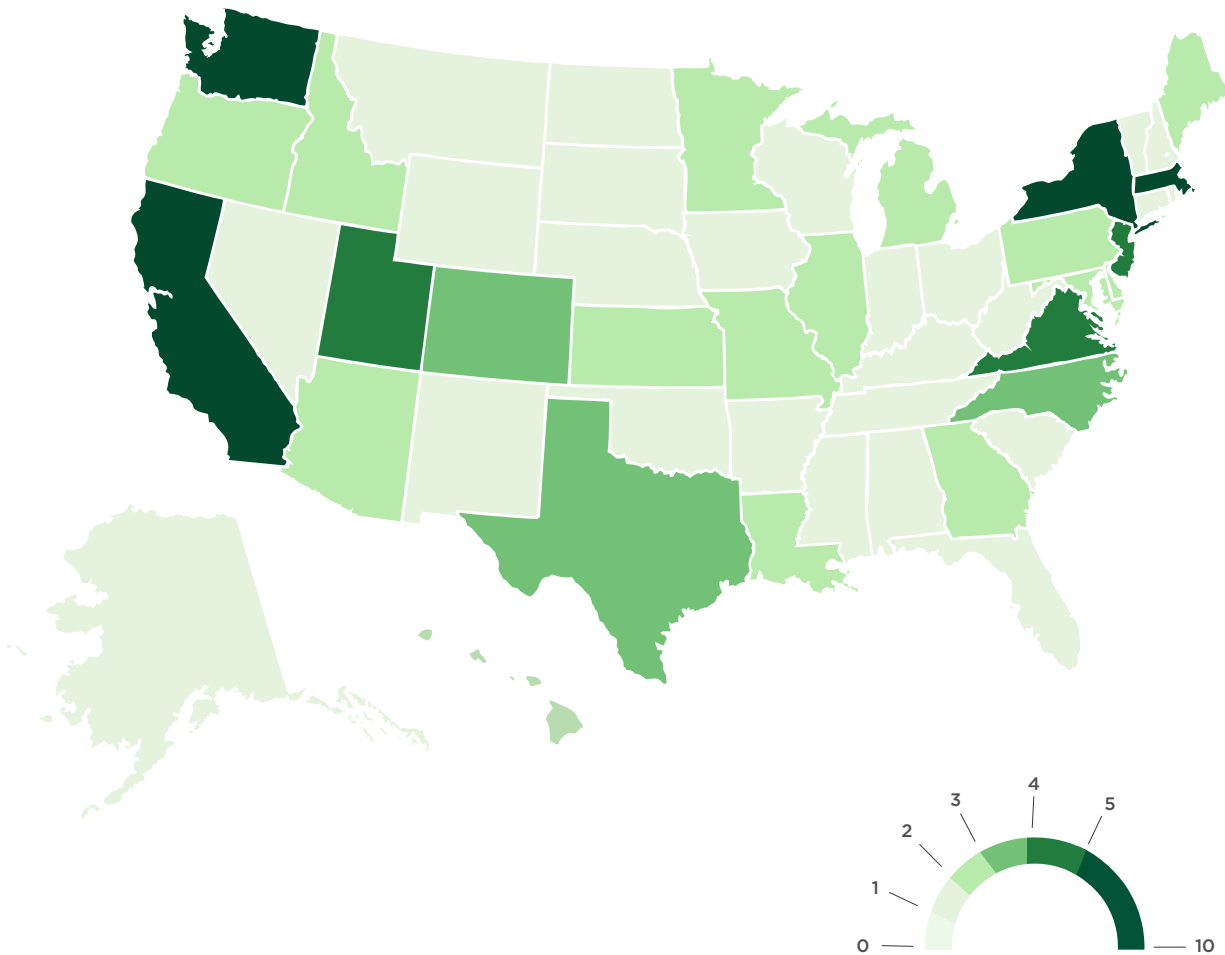
The Winning States [16] [17] [18]

60%	**34%**	**28%**	**32%**
Combined share of AI jobs in the ZipRecruiter marketplace, 2019	Combined share of AI-related jobs in the ZipRecruiter marketplace, 2019	Combined share of U.S. GDP, 2019 Q3	Combined share of U.S. population

Just five metro areas at the forefront of AI advancements—namely, Boston, San Francisco, San Jose, Seattle, and San Diego—have been responsible for 90% of growth in "innovation sector" jobs since 2005, according to the Brookings Institute.[19]

RECIPE FOR SUCCESS

The four AI pioneer states are widely seen as economic miracles. The key factors that have made these states AI leaders include:

The world's leading universities

The world's leading hospitals

A long history of international migration

Some of the world's most vibrant cities and downtown areas

Highly developed financial sector

The unique conditions that combined to make them economic powerhouses and leading tech innovators cannot easily be replicated. For example, it will likely never again be possible in the U.S. to flatten a city and reshape it as a grid for the sake of maximizing economic efficiency, as New York's planners did in the early 19th century. But other states can nevertheless learn from them.

Key elements of their continued success are strong educational institutions and vibrant downtowns that both serve as employment centers and as lively urban

San Jose, a major hub for AI firms

environments, full of cherished activities, entertainment, and retail, where people want to live. While it may be impossible for other states to recreate Harvard University or Union Square, they can nevertheless benefit by improving their universities and cultivating dynamic downtowns. Cosmopolitan metropolises with excellent universities attract large numbers of college students, young people and foreign-born residents—demographic groups that tend to make an outsized contribution to technological progress (and to push the envelope in music, arts, and culture, as well).

Limits to their potential

For many innovative companies, the benefits of being located in a state with an advanced tech base and incomparable talent pool outweighs the drawbacks of high taxes, high energy costs, and unaffordable housing. But many others are leaving. One report estimates that 1,800 companies left California in 2016, the latest year for which data were available, and that at least 13,000 have left since 2008.[20] Census data show that 691,000 California residents left the state for other states in 2018, while 458,014 left New York.[21]

It is no coincidence that the leading states for AI innovation are home to downtown areas generally recognized as being among the most vibrant in the world. Areas like these attract the best and brightest job seekers and foster the kinds of interactions that lead to tech innovation.

According to a recent University of California, Berkeley poll, the top reasons Californians give for wanting to leave the state are:[22]

71%
housing costs

58%
high taxes

46%
state's political culture

CALIFORNIA

Union Square, San Francisco

Downtown Santa Monica

San Diego's Gaslamp District

Hollywood

MASSACHUSETTS

Downtown Boston

NEW YORK

Times Square, New York City

Downtown Brooklyn

WASHINGTON

Downtown Seattle

The Railroad District in Snoqualmie

ZipRecruiter®

California-based job seekers responded to 1.8 million out-of-state job postings on ZipRecruiter in 2019 and New York-based job seekers to 1.6 million[23]
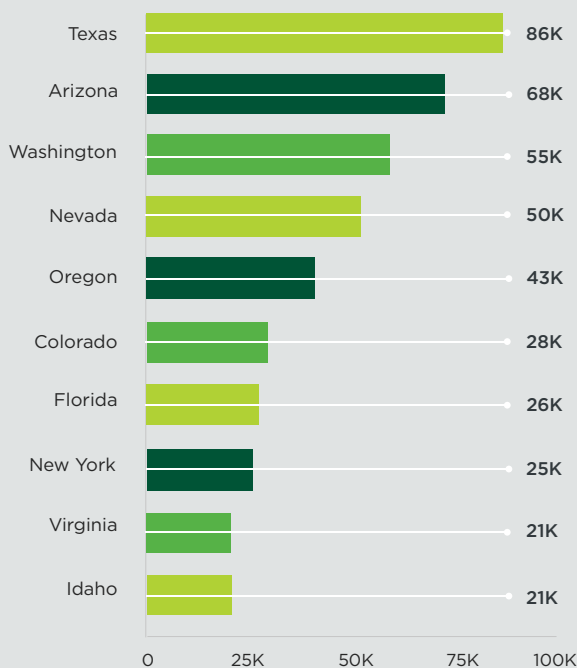
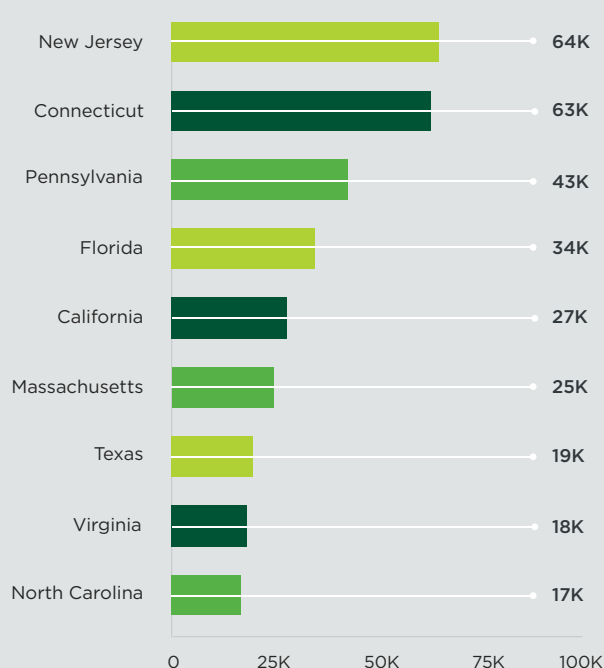Most popular destinations for Californians and New Yorkers searching for jobs out of state

Left map labels:
- 85K Washington
- 50K Oregon
- **394K Nevada**
- 79K Utah
- **353K Arizona**
- 91K Colorado
- 69K New York
- 40K Georgia
- 176K Texas
- 40K Florida

Right map labels:
- 69K Massachussetts
- **124K Connecticut**
- 83K Pennsylvania
- **824K New Jersey**
- 78K California
- 31K Ohio
- 42K Virginia
- 31K North Carolina
- 45K Texas
- 80K Florida
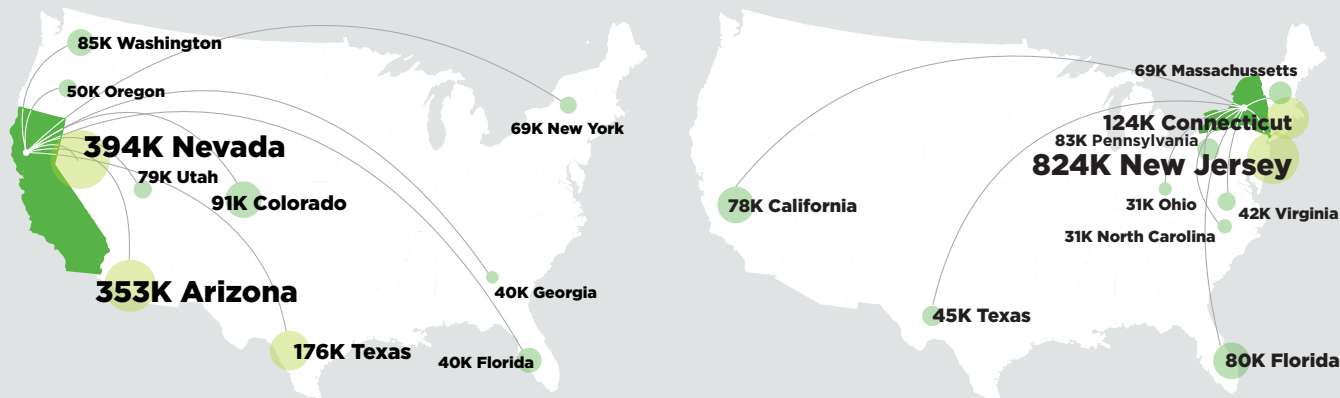
691K people moved out of California and 458K out of New York in 2018[24]

Most popular destinations for Californians and New Yorkers moving out of state

Where Californians Are Going

State	Value
Texas	86K
Arizona	68K
Washington	55K
Nevada	50K
Oregon	43K
Colorado	28K
Florida	26K
New York	25K
Virginia	21K
Idaho	21K

Where New Yorkers Are Going

State	Value
New Jersey	64K
Connecticut	63K
Pennsylvania	43K
Florida	34K
California	27K
Massachusetts	25K
Texas	19K
Virginia	18K
North Carolina	17K

While today's winning states are currently best prepared to benefit from the widespread adoption of AI, many observers fear their economic miracles are endangered by the following issues:

Unaffordable housing

All four AI pioneer states are in the bottom quartile when it comes to housing affordability.[25] That is a concern because limited housing is a drag on labor mobility and reduces net migration into these states.

New York and California are doing little to address the issue, however. Both states have some of the most highly regulated and supply-constrained housing markets in the country, but instead of throwing zoning rules out and starting over, they have been adding complexity in recent years, according to a recent study.[26]

In January of 2020, the California state legislature voted down a bill which would have allowed the construction of mid-rise apartment complexes near transit and job centers, and allowed fourplexes in most single-family neighborhoods.[27] The decision provided further evidence that the housing shortfalls in America's superstar cities are unlikely to be addressed soon.

Seattle is the one exception. In recent years, it has experienced a multifamily housing building boom. But even there, bottlenecks are emerging and the pace of housing growth appears to be slowing.[28]

Low or negative inbound migration

When state populations grow, rising demand for new housing, seats in schools, and other goods and services fuels job growth in construction, education, and other industries. Vermont's recent experience shows that when populations decline, even the safest occupations, like education, see job losses as school districts consolidate and schools shutter.

Failing infrastructure

A decaying public transport system in New York and power outages in New York and California could hold back the economic growth in those states.

Unfriendly business policies

New York and California lose thousands of businesses each year to neighboring states. Businesses often cite high taxes, high energy costs, complex regulations and other costs of doing business as the reasons for their departure.

How New Technologies Create New Jobs

With more than 1.5 million registered drones in the U.S., this scene is becoming more common

The Case of Drone Pilots

Drones are creating tens of thousands of jobs for remote pilots, maintenance technicians, software engineers, manufacturers, and business support staff. Commercial sector growth is fastest in agriculture, oil and gas, construction, insurance, real estate, and photography, but hiring for drone teams at Amazon, Google, Uber, and UPS suggests drone delivery will soon be a major industry, too.

The barriers to becoming a drone pilot are relatively low. Many are self-taught. Federal Aviation Administration certification typically requires studying for about 20 hours to pass a test and paying a $150 licensing fee. By contrast, most states require you to complete 4,000 hours of training or more to become an HVAC technician, plumber, or electrician, where pay is comparable.

160K Americans have already become certified drone pilots since the Federal Aviation Administration established rules for small drones in 2016.[29] **That's about one-quarter the total number of active certified pilots in the U.S.** Despite their minimal training requirements, drone pilot jobs are often well paid. On average, drone pilot jobs on ZipRecruiter offer annual pay of $56K. But many drone pilots earn six figures.

Certified drone pilots are not concentrated in America's supercities. Rather, they are most prevalent in Alaska, North Dakota, Wyoming, Montana, Colorado, and Idaho. While drone-related jobs overall are still concentrated in the AI-pioneer states (due to the large share of drone jobs located in major tech companies and involving software engineering), states like Texas and Virginia are quickly catching up. And drone jobs are likely to spread across the country as new capabilities leave the lab and take to the skies.

Drone-related job postings are still most prevalent in the AI pioneer states, but Texas, Virginia and other states with emerging tech hubs are catching up[30]

Drone jobs per 10,000 job postings in the ZipRecruiter marketplace

45K   67.5K

22.5K

0   90K
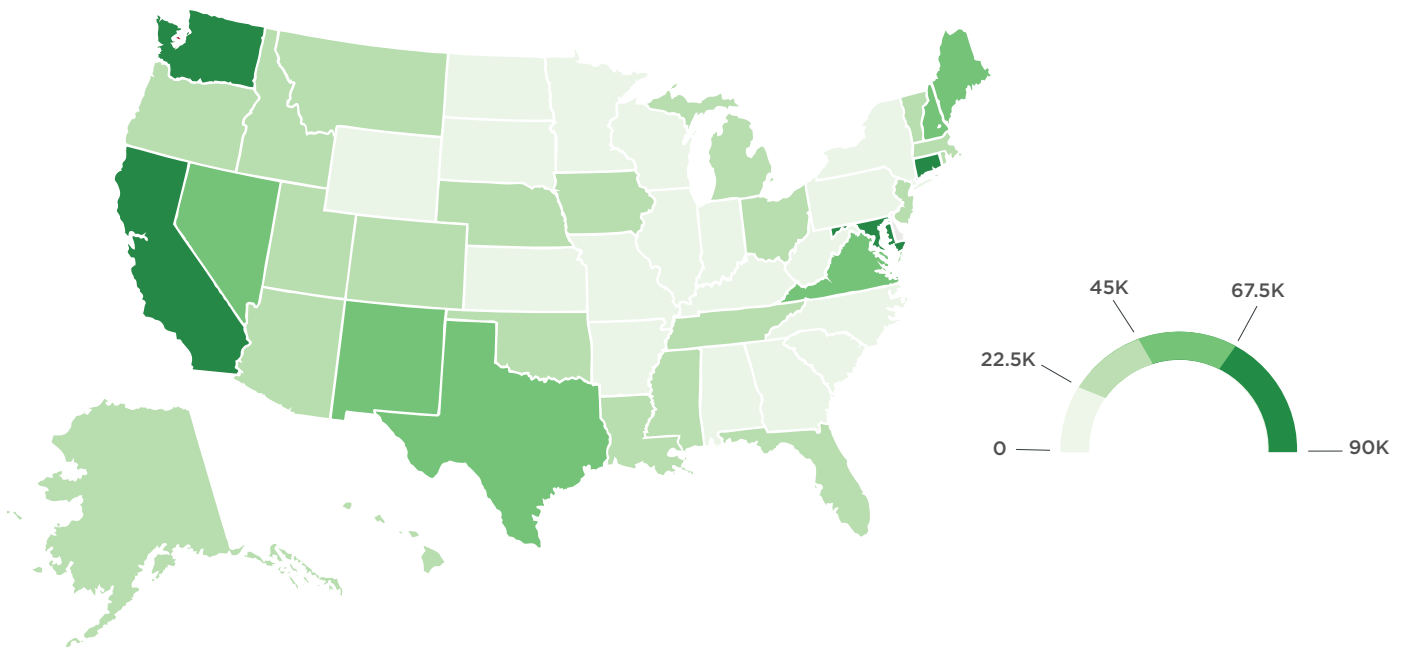
States Like Utah and Colorado Are Catching Up

93%

Growth in AI-related jobs on the ZipRecruiter marketplace between 2017 and 2019 in the emerging winner states

Tomorrow's winners have expanding tech talent pools, growing numbers of AI startups, and rapidly growing numbers of job postings in the ZipRecruiter marketplace, both for AI experts and for people in other occupations who work in AI-enabled industries. They are still far behind, but are quickly catching up.

Tomorrow's winners

A new generation of winners in the AI gold rush is emerging, each with its own budding innovation centers and bold aspirations. The states to watch are:

COLORADO ●
Silicon Mountain

FLORIDA ●
Space Coast

UTAH ●
Silicon Slopes

NORTH CAROLINA ●
Research Triangle

VIRGINIA ●
Dulles Tech Corridor

NEVADA ●
Reno-Sparks

TEXAS ●
Silicon Hills

OREGON ●
Silicon Forest

ARIZONA ●
Silicon Desert

IDAHO ●
Treasure Valley

● Blue state   ● Red state   ● Purple state

Today's winners have just 22% of the U.S. population but 60% of all AI jobs in the U.S. When one takes a broader view of the innovation sector and considers a wider set of AI-related jobs, today's winners have a far less commanding lead and their share of those job postings on ZipRecruiter falls to 34%.

AI-related jobs include those linked to the production and sale of AI-based goods and products, such as autonomous vehicles, algorithmic trading, digital marketing, streaming services, chatbots, and brain-computer interfaces. Here, emerging winners are catching up, with their share of relevant job postings reaching 29% in 2019.

Tomorrow's winners

20%

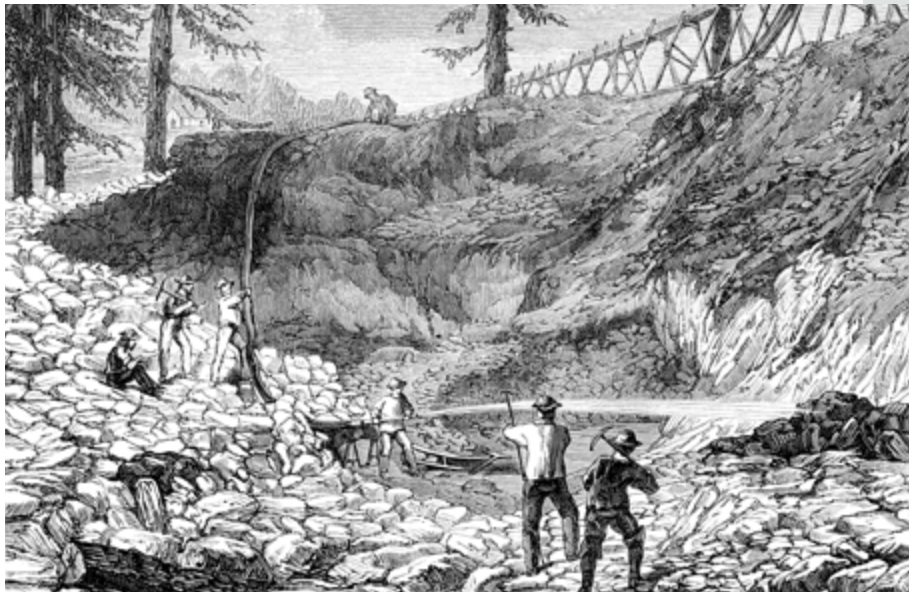Combined share of ZipRecruiter job postings for AI experts

29%

Combined share of U.S. ZipRecruiter job postings in AI-enabled industries

26%

Combined share of U.S. GDP

29%

Combined share of U.S. population

THE REAL WINNERS OF THE CALIFORNIA GOLD RUSH OF 1848–1855

The real winners of the California Gold Rush in the 19th century were the merchants, i.e. the people who sold picks, shovels, jeans, and other supplies to the miners, but also packaged and sold gold, and used gold to produce new goods and services.

Similarly, the AI gold rush is not only creating jobs for AI engineers, but for people in a range of occupations in upstream and downstream industries.

AI companies need a wide range of tools, goods, and services (hardware, training data, sales teams, consultants, integration services). And AI innovations are themselves tools that people can use to solve problems in numerous other industries (e.g., finance, entertainment, manufacturing, healthcare, transportation).

Taking this broader view, ZipRecruiter data show that the winners' circle is much wider and more dynamic. It includes red states, blue states, and purple states, which are not concentrated in one region, but rather, geographically dispersed. Their continued success in creating innovation sector jobs could lead to rising opportunity and wealth for millions of individuals, and convergence across states.

Many states are benefiting from job growth in industries linked to AI-enabled goods and services[31]

AI-related jobs as a percentage of job postings in the ZipRecruiter marketplace
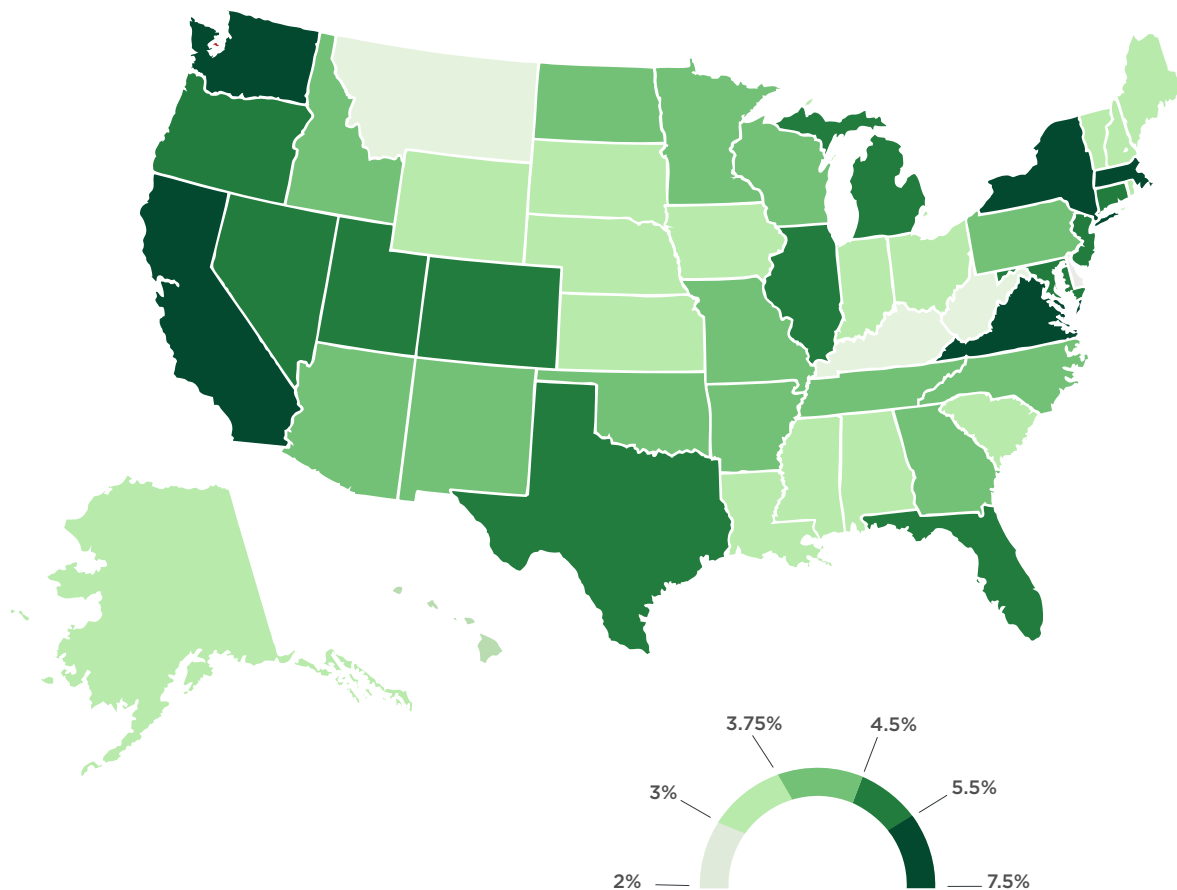
In many cases, these characteristics were not accidental, but deliberately cultivated by policymakers. For example, local leaders in Boise, Idaho decided in 2014 to take steps to turn the city into the next Austin, Seattle, or Portland. The influx of previously California-based companies and residents, and the rising number of computer science graduates, partly reflect those efforts. [32]

To expand the supply of housing and improve the vibrancy of the central business district, Austin's city council enacted an ordinance that removes mandatory minimum parking requirements.[33] On the state level, Oregon's state legislature recently voted in favor of a measure that effectively bans single-family zoning.[34] Denver has created an affordable housing fund and is converting vacant high-end apartments into affordable units.[35]

Both Portland and Denver have undertaken downtown redevelopment processes that involved steps such as burying utilities, planting trees, installing lighting, improving bicycle and pedestrian infrastructure, and improving public gathering spaces. Their efforts show how investments in creating lively urban environments can improve labor markets.[36]

Vibrant cities attract major employers and highly skilled job seekers (clockwise from far left: Denver, CO; Austin, TX; Portland, OR)

New industries where tomorrow's winners are making inroads

Tomorrow's winners are making bold advances in AI-related product and service areas. In some cases, that is because they have natural advantages for businesses in those industries. In others, it is because they are offering companies attractive incentives.

• Drone companies have an advantage in places with less congested airspace.

• Autonomous vehicle companies have an advantage in places with less congested roads.

• Space exploration companies have an advantage in places with lower land costs and less stringent environmental regulations.

In other words, existing AI-leader states will find it hard to take the prize in every category. A new generation of AI wildcards is gaining an opportunity to compete.

RECIPE FOR SUCCESS

The ten emerging winners of tomorrow broadly share the same recipe for success. Most rank highly on the following key characteristics, or at least on a large subset of those characteristics:

Access to talent

Pro-business policies

Relatively low housing costs

Short commutes

Vibrant downtown areas

High birth rates

Sunny weather

STATES WITH THE FASTEST JOB GROWTH ON ZIPRECRUITER[37]

Industry:
Drones

Texas
Virginia

———

Industry:
Robotics

Arizona
Michigan

———

Industry:
Autonomous vehicles

Michigan
Pennsylvania

———

Industry:
Chatbots

Virginia
Arizona

Half of U.S. Lives in Job Markets Vulnerable to AI Automation— But There's Time to Catch Up

21%

Growth in AI-related jobs on the ZipRecruiter marketplace between 2017 and 2019 in the states that are losing out

Today's losers

Half of Americans live in states that are losing out in the AI gold rush.

LOUISIANA ●   CONNECTICUT ●

KANSAS ●   VERMONT ●

ALASKA ●   NEW HAMPSHIRE ●

MISSISSIPPI ●   WISCONSIN ●

WEST VIRGINIA ●   INDIANA ●

● Blue state   ● Red state   ● Purple state

Each Has its Own Unique Set of Factors Holding It Back

Poor education outcomes

Some states, like Louisiana and Mississippi, have favorable business environments but weak talent bases due to underperforming education systems.[38] Alaska, for example, ranks in the top three states for business tax climate but in the bottom five for public school quality.[39]

Unfriendly business environments

Others, like Vermont and Connecticut, have strong schools and universities, but high taxes and unfriendly business policies.[40]

Undiversified economies

Yet others, like Alaska and Indiana, are too reliant on a small number of economically sensitive industries, such as oil or manufacturing.[41]

Cold winters

Many underperforming states have relatively bad weather—a challenge, for sure, but not an insurmountable barrier to attracting businesses and residents, as Canada and Nordic countries have proven.

The slow growth rate of innovative AI-driven jobs and industries in these states could be compounded by AI-driven declines in automatable jobs. **That could cause 150 million Americans to find themselves left behind in the future of work.**

Very few displaced workers are leaving these states for ones with higher opportunity. **While key employers and top graduates are leaving, poorer residents and displaced workers are not.** Overall, Americans are moving at the lowest rate on record. 9.8% of Americans relocated last year—just half the relocation rate seen in the 1950s.[42] While lower geographic mobility may be fine for Americans in states with high job growth, it could have negative consequences for Americans in states with stagnant economies.

A winter day in Laconia, NH

Steps Today's Losers Can Take to Improve Their AI Preparedness

Today's losers need not despair. There is still time for those states to catch up—particularly if they focus on four key areas.

1

IMPROVE PUBLIC SCHOOLS AND COLLEGES

A well-educated population is key to improving job opportunities and raising wages. Three North American cities are counted among the world's most improved school systems, according to a report by McKinsey: Boston, MA; Long Beach, CA; and Ontario, CA. Each has made reforms that have achieved meaningful improvements over a sustained period. Underperforming school systems should study their examples and adopt proven best practices.

2

IMPROVE WORKER RETRAINING

States should work with local employers to encourage them to provide layoff notices as far in advance as possible so that workers have better opportunity to reskill and find new jobs when they are displaced. States should also design career counseling programs and provide sponsorships for workers to attend training and licensing programs. [43]

3

MAKE THE STATE A GREAT PLACE TO LIVE

When states invest in their downtowns and make them more pleasant, that can help attract businesses and residents, and improve retention of homegrown talent. Chattanooga, TN and Albuquerque, NM are two notable examples of successful downtown revitalization efforts, according to the Brookings Institute.[44] Other states and cities could follow their example.

4

ADOPT MORE BUSINESS-FRIENDLY POLICIES

States should consider peeling back onerous taxes and regulations, but only if the likely benefits outweigh the costs. Here, two cautionary tales are in order.

The first is the Kansas tax cut experiment of 2012. Kansas enacted deep tax cuts in an effort to boost business formation and job creation. Instead, the tax cuts hollowed out the state's budget and forced cuts to education and services, without stimulating job creation. The state ultimately repealed the tax cuts in 2017 once the failure of the policy became widely acknowledged.[45]

The second is of the Missouri–Kansas tax incentive arms race of 2011–2019. The neighboring states sought to lure companies with ever more attractive (and costly) incentives. Companies took advantage of the offers by moving their operations back and forth across the state border, reducing state revenues in the process without actually creating new jobs. The states eventually realized that the tax incentive war was costing hundreds of millions of dollars and agreed to a truce in mid-2019.[46]

Steps Job Seekers and Workers Can Take to Improve Their Own AI Readiness, Regardless of What Their States or Cities Do

Job seekers and workers who live in states where large numbers of jobs are susceptible to automation but investment in new AI-based products and services is limited should also not despair, but rather act now to improve their own prospects.

Revitalizing cities can create opportunities for new industries, like AI, and traditional ones, like construction

1

EXPLORE ONLINE TRAINING, EDUCATION, AND NETWORKING OPPORTUNITIES

Online communities can help workers avoid being trapped by their economic conditions. Increasingly, free or affordable training opportunities are available online. There are also ever more job skills one can learn by watching a few YouTube video tutorials.[47]

2

EXPLORE REMOTE WORK OPPORTUNITIES

If job opportunities are limited in a job seeker's city or state, rising numbers of remote work opportunities can offer them the opportunity to draw a paycheck in California while paying rent in Alabama. The share of jobs in the ZipRecruiter marketplace offering the opportunity to work remotely has risen 32% since 2016.

**Highest Concentration of
AI Jobs on ZipRecruiter**

1. California
2. Massachusetts
3. Washington
4. District of Columbia
5. New York

**Lowest Concentration of
AI Jobs on ZipRecruiter**

47. Hawaii
48. Montana
49. North Dakota
50. South Dakota
51. Alaska

**Highest Concentration of
AI-related Jobs on ZipRecruiter**

1. District of Columbia
2. California
3. Massachusetts
4. Virginia
5. New York

**Lowest Concentration of
AI-related Jobs on ZipRecruiter**

47. Indiana
48. South Dakota
49. Montana
50. Kentucky
51. West Virginia

**Highest Concentration
of Tech Jobs on ZipRecruiter**

1. California
2. Washington
3. Massachusetts
4. Oregon
5. New York

**Lowest Concentration of
Tech Jobs on ZipRecruiter**

47. Alaska
48. Arkansas
49. Wyoming
50. West Virginia
51. Mississippi

**Highest Concentration of
College Graduates**[48]

1. District of Columbia
2. Massachusetts
3. Colorado
4. Maryland
5. Connecticut

**Lowest Concentration
of College Graduates**

47. Kentucky
48. Louisiana
49. Arkansas
50. Mississippi
51. West Virginia

**Highest Employment-
Population Ratio**[49]

1. Minnesota
2. North Dakota
3. Nebraska
4. Colorado
5. Iowa

**Lowest Employment-
Population Ratio**

47. Arkansas
48. Alabama
49. New Mexico
50. Mississippi
51. West Virginia

Fastest Job Growth
(Dec. 2016–Dec. 2019)[50]

1. Utah
2. Nevada
3. Arizona
4. Idaho
5. Washington

Fastest Wage Growth
(Dec. 2016–Dec. 2019)[51]

1. District of Columbia
2. Hawaii
3. Nebraska
4. West Virginia
5. Colorado

Highest Venture Capital
Investment as a Share of GDP[52]

1. California
2. Massachusetts
3. New York
4. Utah
5. Washington

Highest Inbound
Net Migration[53]

1. Nevada
2. Idaho
3. Arizona
4. South Carolina
5. Colorado

Least Sensitive to Job Losses
During National Recessions[54]

1. District of Columbia
2. Alaska
3. North Dakota
4. Hawaii
5. Louisiana

Slowest Job Growth
(Dec. 2016–Dec. 2019)

47. Louisiana
48. Wyoming
49. Connecticut
50. Vermont
51. Alaska

Slowest Wage Growth
(Dec. 2016–Dec. 2019)

47. Ohio
48. New Hampshire
49. Texas
50. Pennsylvania
51. Alaska

Lowest Venture Capital
Investment as a Share of GDP

47. Alabama
48. West Virginia
49. Mississippi
50. Louisiana
51. Alaska

Highest Outbound
Net Migration

47. Wyoming
48. Hawaii
49. Illinois
50. New York
51. Alaska

Most Sensitive to Job Losses
During National Recessions

47. Idaho
48. Georgia
49. Florida
50. Arizona
51. Nevada

Winners and Losers of the AI Gold Rush in 2020 and Beyond

AI Innovations Are Creating a Gold Rush of Opportunity

AI jobs and AI-related jobs are already a significant share of all new job opportunities, and growing rapidly.

While those job opportunities are still heavily concentrated in California, Washington, Massachusetts, and New York (aka the "AI Pioneer States," today's winners), they are virtually non-existent in other states (today's losers).

Today's winners have a huge advantage in the ultimate resource: human capital. They have the world's best universities and vibrant international cities where people want to live. But they are losing businesses and residents to other states due to unaffordable housing and high business costs. The exception is Washington, which is still attracting residents and enjoying high job growth—partly because it has no income tax and is adding housing units.

Tomorrow's winners are catching up

Both AI jobs and AI-related jobs are growing more quickly in a group of states identified as tomorrow's winners in the AI gold rush. They are catching up thanks to their growing talent pools, strong universities, and ambitious cities, which have set their sights on becoming new Silicon Valleys. They are attracting businesses and residents from other states, and cultivating their own crop of AI startups. Sunny weather, high birth rates, short commutes, strong education systems, and less political polarization also appear to be advantages.

Several states are currently left behind in the AI gold rush due to one or more of the following weaknesses: poor education outcomes, unfriendly business environments, undiversified economies, poor weather, or highly polarized politics. But they could make up the gap by following the lead of the emerging winners.

Red states vs. blue states

The 2020 Presidential Election campaign is shining a spotlight on worker and business concerns about AI and automation. It has invigorated the policy debate over how the federal government should deal with looming labor market challenges and prompted creative thinking on ways to improve the country's AI preparedness levels and labor market resilience to technological disruption.

Given the strong likelihood of a divided House and Senate and the rising polarization in Congress, action at the federal level may be limited, no matter who wins the presidency on November 3, 2020.

New technologies solve new problems, creating markets for new products and services

As a result, **creative thinking by states and cities alike will become ever more critical.** After ten years of economic growth, most states have sufficiently healthy job markets and fiscal positions that they can afford to switch from reaction mode to planning for the long term. **States have an opportunity to make the kinds of policy changes and investments that will help their job seekers, workers, and businesses all become winners in the AI economy.**

Methodology

Our second annual report on the future of work uses proprietary ZipRecruiter data mined from more than 50 million job postings, data on job seeker behavior within our employment marketplace, and publicly available state-level data from a variety of sources.

Current winners in the AI economy were identified based on their concentrations of AI jobs (those in artificial intelligence companies or jobs requiring artificial intelligence expertise), AI-related jobs (those created due to artificial intelligence-based technologies), and technology jobs. To identify emerging winners and current losers, we considered the same measures, as well as factors that will be most important in driving future growth in AI-related employment. Those factors include measures of human capital, labor market strength, and resilience to national recessions.

Human Capital

Human capital (i.e. a well-educated and well-trained population) is central to improving job opportunities and raising wages. Human capital is especially important for success in the AI revolution, which has increased employer demand for advanced technical skills and for interpersonal skills like communication.

We looked at several measures of human capital, including data on educational attainment from the U.S. Census Bureau, eighth grade test scores from the National Assessment of Educational Progress (NAEP), and ACT scores from American College Testing.

Labor Market Strength

States with healthy, dynamic labor markets will be the ones best able to influence and adapt to technological disruption. We considered job growth and wage growth, based on Current Employment Statistics State and Area Estimates from the U.S. Bureau of Labor Statistics (BLS); measures of labor force participation from the Current Population Survey, also released by the BLS; and measures of state-to-state migration from the U.S. Census Bureau.

Economic Resilience

Recessions can quickly reverse or stall improvements in education and employment outcomes, and recovery can be slow and painful. Partly due to their industry mixes and partly due to other demographic and economic factors, some labor markets in some states are more severely disrupted during recessions than in others. To measure resilience, we used responsiveness of each state's employment level to U.S. GDP as calculated by researchers at the Federal Reserve Bank of St. Louis.

State	AI Job Concentration	AI-Related Job Concentration	Tech Job Concentration	Share of Population 25 Years & Over with Bachelor's Degree	Venture Capital Investment
Alabama	42	38	25	45	47
Alaska	51	39	47	29	51
Arizona	18	23	15	33	18
Arkansas	34	19	48	49	42
California	1	2	1	15	1
Colorado	8	10	9	3	8
Connecticut	25	17	12	5	10
Delaware	26	29	40	21	15
District of Columbia	4	1	6	1	6
Florida	29	16	31	34	17
Georgia	24	21	28	24	14
Hawaii	47	22	46	16	46
Idaho	11	30	10	40	35
Illinois	14	9	17	14	13
Indiana	43	47	41	43	25
Iowa	28	42	43	31	36
Kansas	23	40	21	17	26
Kentucky	38	50	45	46	39
Louisiana	19	44	38	48	50
Maine	22	46	24	25	37
Maryland	9	8	19	4	9
Massachusetts	2	3	3	2	2
Michigan	16	15	29	36	28
Minnesota	21	25	22	12	12
Mississippi	37	41	51	50	49
Missouri	20	31	20	35	27

Appendix: States Ranked Along Key Measures

State	AI Job Concentration	AI-Related Job Concentration	Tech Job Concentration	Share of Population 25 Years & Over with Bachelor's Degree	Venture Capital Investment
Montana	48	49	13	22	30
Nebraska	46	37	11	20	45
Nevada	31	13	16	47	32
New Hampshire	36	43	8	8	21
New Jersey	17	18	23	6	23
New Mexico	41	20	35	39	31
New York	5	5	5	10	3
North Carolina	13	26	27	26	7
North Dakota	49	32	39	30	40
Ohio	30	34	30	37	19
Oklahoma	44	24	32	44	44
Oregon	10	12	4	18	11
Pennsylvania	15	28	26	23	16
Rhode Island	45	14	34	13	29
South Carolina	40	45	37	38	41
South Dakota	50	48	44	28	38
Tennessee	33	27	36	42	34
Texas	12	11	18	32	20
Utah	6	7	7	19	4
Vermont	27	36	33	9	24
Virginia	7	4	14	7	22
Washington	3	6	2	11	5
West Virginia	39	51	50	51	48
Wisconsin	32	33	42	27	33
Wyoming	35	35	49	41	43

Appendix: States Ranked Along Key Measures

State	Job Growth, Dec 2016–Dec 2019	Wage Growth, Dec 2016–Dec 2019	Employment-Population Ratio	Net Migration	Resilience in Recessions
Alabama	13	13	48	19	25
Alaska	51	51	26	51	2
Arizona	3	17	42	3	50
Arkansas	17	7	47	20	17
California	9	9	34	41	32
Colorado	8	5	4	5	33
Connecticut	49	28	15	46	23
Delaware	19	20	30	6	41
District of Columbia	25	1	8	31	1
Florida	6	25	43	9	49
Georgia	12	33	27	14	48
Hawaii	27	2	28	48	4
Idaho	4	42	18	2	47
Illinois	33	27	21	49	21
Indiana	35	46	17	22	43
Iowa	46	38	5	27	9
Kansas	28	14	14	43	15
Kentucky	39	45	44	23	35
Louisiana	47	40	46	45	5
Maine	36	24	24	15	31
Maryland	30	10	13	42	30
Massachusetts	24	22	11	39	24
Michigan	37	18	39	33	45
Minnesota	40	21	1	18	20
Mississippi	43	44	50	38	28
Missouri	38	15	22	26	22

Appendix: States Ranked Along Key Measures

State	Job Growth, Dec 2016–Dec 2019	Wage Growth, Dec 2016–Dec 2019	Employment-Population Ratio	Net Migration	Resilience in Recessions
Montana	21	31	29	12	12
Nebraska	34	3	3	34	8
Nevada	2	11	31	1	51
New Hampshire	29	48	6	16	37
New Jersey	23	34	33	44	39
New Mexico	16	29	49	36	18
New York	20	16	41	50	13
North Carolina	14	30	40	7	42
North Dakota	45	39	2	37	3
Ohio	41	47	36	28	29
Oklahoma	32	26	37	29	10
Oregon	10	35	35	8	46
Pennsylvania	31	50	32	32	14
Rhode Island	22	41	20	35	38
South Carolina	11	8	45	4	44
South Dakota	18	32	7	21	7
Tennessee	15	36	38	11	40
Texas	7	49	23	17	11
Utah	1	6	9	13	34
Vermont	50	43	12	24	27
Virginia	26	37	16	30	36
Washington	5	19	25	10	26
West Virginia	44	4	51	40	16
Wisconsin	42	23	10	25	19
Wyoming	48	12	19	47	6

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