6 of the 13 clusters/subclusters grew more than 20% between 2012 and 2017.

12 of the 13 clusters and subclusters posted positive employment growth between 2016 and 2017.

6 of the 13 clusters/subclusters ranked among the top 10 in employment concentration, led by aerospace.

Aviation was the fastest growing cluster in the 9-county region in 2017 in terms of employment, increasing 5.7% from 2016-2017.

IT-Software was the fastest growing cluster from 2012-2017, rising 32.2% compared with 26.1% nationwide.

Aerospace employment increased for the 3rd consecutive year in 2017 and grew at its fastest pace since 2007.

The investments subcluster had the highest average wage of all 13 clusters/subclusters, totaling $156,770 in 2017.
Metro Denver and Northern Colorado Industries Economic Performance Snapshot

Bubble charts are popular tools used to illustrate industry clusters. These charts allow multiple variables to be plotted within the same graph, making it easy to assess relative economic performance. Bubble charts are often used for pinpointing priority industries since they allow visual comparisons of economic measures.

This chart illustrates industry cluster relationships for the 13 industry clusters and subclusters. The following three variables are plotted:

- One-year direct employment growth, 2016 to 2017; on the x-axis (horizontal);
- The industry’s location quotient, 2017; on the y-axis (vertical); and
- Employment size of the industry, 2017; indicated by the size of the bubble.

Industry subcluster bubbles are color coded to reflect that they belong to the same cluster. For example, fossil fuels and cleantech are green, indicating that they belong to the energy cluster.

Bubble charts show the clusters in a state or region as measured by total employment size (the bigger the bubble, the larger the industry in terms of employment), employment growth (the further to the right on the graph, the more growth), and the location quotient (the further up in the graph, the higher the location quotient (LQ)).

The LQ is a ratio that compares the region’s employment share of a particular industry with the employment share nationwide. The following guidelines are used to evaluate the LQ:

- LQ > 1 indicates a significant employment concentration compared with the nation.
- LQ = 1 indicates that the region’s employment concentration is equal to that of the nation.
- LQ < 1 indicates that the region has less of an employment concentration compared with the nation.

The dotted red line on the graph represents the location quotient equal to 1 to easily identify the bubbles that are above this demarcation.

For example, Aviation had significant employment growth from 2016 to 2017, aerospace had a key locational advantage represented by its high LQ position on the graph, and healthcare and wellness had a significant number of employees represented by the size of its bubble. Looking at other clusters, broadcasting and telecommunications is a relatively large industry represented by its bubble size and has above-average employment concentration compared with the nation. Twelve of the 13 clusters and subclusters posted positive employment growth between 2016 and 2017, while fossil fuels was the only industry to contract. Further, the majority of the region’s industries have locations quotients greater than 1. This indicates that the Metro Denver and Northern Colorado region remains a competitive location for these clusters, making them priority industries to pursue.
Bubble charts are popular tools used to illustrate industry clusters. These charts allow multiple variables to be plotted within the same graph, making it easy to assess relative economic performance. Bubble charts are often used for pinpointing priority industries since they allow visual comparisons of economic measures.

This chart illustrates industry cluster relationships for the 13 industry clusters and subclusters. The following three variables are plotted:

- Average annual employment growth, 2012 to 2017; on the *x*-axis (*horizontal*);
- The industry’s location quotient, 2017; on the *y*-axis (*vertical*); and
- Employment size of the industry, 2017; indicated by the size of the bubble.

Industry subcluster bubbles are color coded to reflect that they belong to the same cluster. For example, fossil fuels and cleantech are green, indicating that they belong to the energy cluster.

Bubble charts show the clusters in a state or region as measured by total employment size (the bigger the bubble, the larger the industry in terms of employment), employment growth (the further to the right on the graph, the more growth), and the location quotient (the further up in the graph, the higher the location quotient (LQ)).

The LQ is a ratio that compares the region’s employment share of a particular industry with the employment share nationwide. The following guidelines are used to evaluate the LQ:

- LQ > 1 indicates a significant employment concentration compared with the nation.
- LQ = 1 indicates that the region’s employment concentration is equal to that of the nation.
- LQ < 1 indicates that the region has less of an employment concentration compared with the nation.

The dotted red line on the graph represents the location quotient equal to 1 to easily identify the bubbles that are above this demarcation.

For example, IT-Software had substantial employment growth from 2012 to 2017, aerospace had a key locational advantage represented by its high LQ position on the graph, and healthcare and wellness had a significant number of employees represented by the size of its bubble. Looking at other clusters, broadcasting and telecommunications and Investments are relatively large industries represented by their bubble size and have above-average employment concentration compared with the nation. All 13 clusters and subclusters posted positive employment growth between 2012 and 2017. Further, the majority of the region’s industries have locations quotients greater than 1. This indicates that the Metro Denver and Northern Colorado region remains a competitive location for these clusters, making them priority industries to pursue.
# Metro Denver Industries Employment Snapshot

<table>
<thead>
<tr>
<th>Metro Denver Industries</th>
<th>Aerospace</th>
<th>Aviation</th>
<th>Beverage Production</th>
<th>Bioscience</th>
<th>Pharmaceuticals &amp; Biotechnology</th>
<th>Broadcasting &amp; Telecommunications</th>
<th>Energy</th>
<th>Financial Services</th>
<th>Healthcare &amp; Wellness</th>
<th>IT-Software</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct Employment</td>
<td>21,090</td>
<td>20,140</td>
<td>9,790</td>
<td>11,240</td>
<td>4,860</td>
<td>42,430</td>
<td>28,840</td>
<td>22,440</td>
<td>39,720</td>
<td>29,830</td>
</tr>
<tr>
<td>Companies</td>
<td>130</td>
<td>680</td>
<td>240</td>
<td>360</td>
<td>370</td>
<td>2,750</td>
<td>1,860</td>
<td>1,620</td>
<td>3,120</td>
<td>7,900</td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th>Metro Denver Industries</th>
<th>Aerospace</th>
<th>Aviation</th>
<th>Beverage Production</th>
<th>Bioscience</th>
<th>Pharmaceuticals &amp; Biotechnology</th>
<th>Broadcasting &amp; Telecommunications</th>
<th>Energy</th>
<th>Financial Services</th>
<th>Healthcare &amp; Wellness</th>
<th>IT-Software</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct Employment</td>
<td>7.3%</td>
<td>23.1%</td>
<td>29.4%</td>
<td>6.6%</td>
<td>1.1%</td>
<td>1.7%</td>
<td>4.8%</td>
<td>20.5%</td>
<td>0.4%</td>
<td>27.9%</td>
</tr>
<tr>
<td>Companies</td>
<td>7.3%</td>
<td>23.1%</td>
<td>29.4%</td>
<td>6.6%</td>
<td>1.1%</td>
<td>1.7%</td>
<td>4.8%</td>
<td>20.5%</td>
<td>0.4%</td>
<td>27.9%</td>
</tr>
</tbody>
</table>

## One-Year Employment Growth (2017)

<table>
<thead>
<tr>
<th>Metro Denver Industries</th>
<th>Aerospace</th>
<th>Aviation</th>
<th>Beverage Production</th>
<th>Bioscience</th>
<th>Pharmaceuticals &amp; Biotechnology</th>
<th>Broadcasting &amp; Telecommunications</th>
<th>Energy</th>
<th>Financial Services</th>
<th>Healthcare &amp; Wellness</th>
<th>IT-Software</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct Employment</td>
<td>5.5%</td>
<td>5.7%</td>
<td>4.7%</td>
<td>0.9%</td>
<td>4.4%</td>
<td>0.8%</td>
<td>-0.2%</td>
<td>1.0%</td>
<td>3.3%</td>
<td>4.9%</td>
</tr>
<tr>
<td>Companies</td>
<td>5.5%</td>
<td>5.7%</td>
<td>4.7%</td>
<td>0.9%</td>
<td>4.4%</td>
<td>0.8%</td>
<td>-0.2%</td>
<td>1.0%</td>
<td>3.3%</td>
<td>4.9%</td>
</tr>
</tbody>
</table>

## Average Wage

<table>
<thead>
<tr>
<th>Metro Denver Industries</th>
<th>Aerospace</th>
<th>Aviation</th>
<th>Beverage Production</th>
<th>Bioscience</th>
<th>Pharmaceuticals &amp; Biotechnology</th>
<th>Broadcasting &amp; Telecommunications</th>
<th>Energy</th>
<th>Financial Services</th>
<th>Healthcare &amp; Wellness</th>
<th>IT-Software</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct Employment</td>
<td>$129,730</td>
<td>$66,880</td>
<td>$59,580</td>
<td>$76,940</td>
<td>$94,850</td>
<td>$99,880</td>
<td>$107,410</td>
<td>$81,630</td>
<td>$82,730</td>
<td>$156,770</td>
</tr>
</tbody>
</table>

## Direct Employment Concentration Ranking (2017)

<table>
<thead>
<tr>
<th>Metro Denver Industries</th>
<th>Aerospace</th>
<th>Aviation</th>
<th>Beverage Production</th>
<th>Bioscience</th>
<th>Pharmaceuticals &amp; Biotechnology</th>
<th>Broadcasting &amp; Telecommunications</th>
<th>Energy</th>
<th>Financial Services</th>
<th>Healthcare &amp; Wellness</th>
<th>IT-Software</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct Employment</td>
<td>1</td>
<td>13</td>
<td>2</td>
<td>12</td>
<td>28</td>
<td>5</td>
<td>9</td>
<td>6</td>
<td>16</td>
<td>13</td>
</tr>
</tbody>
</table>
AEROSPACE:  
Colorado Industry Cluster Profile

Industry Overview

With the nation’s second-largest aerospace economy, Colorado is an aerospace leader and a premier location for companies conducting aerospace-related activities. The state has a distinguished history of groundbreaking space exploration and travel, major space missions and projects, and aerospace research and development. Colorado is a top aerospace state supported by the combination of military presence, renowned research laboratories and universities, natural attributes, and a dynamic business environment. Eight of the nation’s top aerospace contractors have significant operations in the state. Colorado hosts major U.S. Department of Defense (DoD) facilities and the National Aeronautics and Space Administration (NASA) research and development activities, and the state’s universities are among the world’s best for aerospace engineering.

Colorado’s aerospace industry includes a broad range of companies, products, and systems for commercial, military, and civil space applications. Colorado’s aerospace companies research, develop, design, and manufacture guided missiles, spacecraft, satellites and communications equipment, as well as navigation and detection instruments. Colorado companies also produce planetary spacecraft and launch systems and provide mission support. The state’s companies and public agencies have achieved some of the most innovative advancements in space exploration technology in recent history and are leading the nation’s major commercial, civil, and military space missions and projects. Colorado’s unique convergence of aerospace and other high-tech industries such as cleantech, cybersecurity, and information technology, provides further opportunities for innovation, collaboration, and growth.

Colorado’s aerospace industry contributes significantly to the state’s economic output. Colorado is home to 180 businesses classified as aerospace companies, and more than 500 companies and suppliers providing space-related products and services. Direct employment in the aerospace cluster totals 26,620 private sector workers and approximately 28,810 military personnel. Aerospace employment increased for the third-consecutive year in 2017 and grew at its fastest pace since 2007, rising 4.7 percent between 2016 and 2017. In total, the 55,430 workers in the aerospace cluster support an additional 135,450 workers in all industries throughout Colorado, bringing direct and indirect employment supported by the aerospace cluster to 190,880 workers. In total, Colorado’s aerospace industry generates $15.4 billion in total output each year.¹

The majority of Colorado’s key aerospace businesses, facilities, and research institutions are located in the nine-county Metro Denver and Northern Colorado region.² The region’s 21,090 private sector aerospace workers represent 79.2 percent of all aerospace workers in Colorado. The region’s 130 aerospace companies represent 73.3 percent of the state’s total companies in the cluster.

² The nine-county region is comprised of two principal areas, Metro Denver and Northern Colorado. Metro Denver consists of Adams, Arapahoe, Boulder, Broomfield, Denver, Douglas, and Jefferson counties. Northern Colorado consists of Larimer and Weld counties.
Private Aerospace Economic Profile

The aerospace cluster consists of 19, six-digit North American Industry Classification System (NAICS) codes including search, detection, and navigation instrument manufacturing; guided missile and space vehicle manufacturing; satellite telecommunications; and research and development.

### Rankings

<table>
<thead>
<tr>
<th>Nine-County Region</th>
<th>Aerospace direct employment concentration rank</th>
<th>1st</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aerospace direct employment rank</td>
<td>1st</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Colorado</th>
<th>Aerospace direct employment concentration rank</th>
<th>1st</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aerospace direct employment rank</td>
<td>2nd</td>
<td></td>
</tr>
</tbody>
</table>

### Aerospace Employment and Company Profile, 2017

<table>
<thead>
<tr>
<th>Nine-County Region</th>
<th>Colorado</th>
<th>United States</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct employment, 2017</td>
<td>21,090 26,620 346,030</td>
<td></td>
</tr>
<tr>
<td>Number of direct companies, 2017</td>
<td>130 180 5,360</td>
<td></td>
</tr>
<tr>
<td>One-year direct employment growth, 2016-2017</td>
<td>5.5% 4.7% -1.3%</td>
<td></td>
</tr>
<tr>
<td>Five-year direct employment growth, 2012-2017</td>
<td>7.3% 6.1% -4.6%</td>
<td></td>
</tr>
<tr>
<td>Avg. annual direct employment growth, 2012-2017</td>
<td>1.4% 1.2% -0.9%</td>
<td></td>
</tr>
<tr>
<td>Direct employment concentration</td>
<td>0.9% 0.8% 0.2%</td>
<td></td>
</tr>
</tbody>
</table>


### Colorado Aerospace Employment by County, 2017

<table>
<thead>
<tr>
<th>County</th>
<th>Employment Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arapahoe</td>
<td>30.5%</td>
</tr>
<tr>
<td>Jefferson</td>
<td>23.8%</td>
</tr>
<tr>
<td>El Paso</td>
<td>20.3%</td>
</tr>
<tr>
<td>Boulder</td>
<td>21.3%</td>
</tr>
<tr>
<td>Adams</td>
<td>2.2%</td>
</tr>
<tr>
<td>Douglas</td>
<td>0.4%</td>
</tr>
<tr>
<td>Denver</td>
<td>0.4%</td>
</tr>
<tr>
<td>Weld</td>
<td>0.3%</td>
</tr>
<tr>
<td>Broomfield</td>
<td>0.1%</td>
</tr>
<tr>
<td>Larimer</td>
<td>0.1%</td>
</tr>
<tr>
<td>All Other Colorado Counties</td>
<td>0.4%</td>
</tr>
</tbody>
</table>

Source: Market Analysis Profile, 2017; Development Research Partners.

### Colorado Aerospace Employment by Category, 2017

<table>
<thead>
<tr>
<th>Category</th>
<th>Employment Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Space Research &amp; Technology</td>
<td>1.6%</td>
</tr>
<tr>
<td>Space Satellite Communications Equip. Mfg.</td>
<td>1.9%</td>
</tr>
<tr>
<td>Optical Instruments &amp; Lenses Mfg.</td>
<td>2.2%</td>
</tr>
<tr>
<td>Guided Missiles &amp; Space Vehicles</td>
<td>27.7%</td>
</tr>
<tr>
<td>Space Vehicle &amp; Satellite Supplies &amp; Parts</td>
<td>0.7%</td>
</tr>
<tr>
<td>Aerospace Castings &amp; Metal Mfg.</td>
<td>0.5%</td>
</tr>
<tr>
<td>Search, Detection, Navigation, &amp; Guidance</td>
<td>64.3%</td>
</tr>
</tbody>
</table>

Source: Market Analysis Profile, 2017; Development Research Partners.

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1 Direct employment rank based on the number of employees in the industry cluster in a state or region. Employment concentration rank based on the direct cluster employment in a state or region expressed as a percent of total employment in all industries in the same state or region. Rankings are for the 50 largest metropolitan statistical areas (MSAs) and 50 largest states. No multiplier effects are included. 1st = highest for both rankings.
Major Aerospace Contractors
Eight of the country’s major space contractors have a significant presence in Colorado. These companies support the U.S. Department of Defense (DoD) to procure, place, and manage national space assets for the military. They also provide manned and unmanned spacecraft, instrumentation, and ground control services for the National Aeronautics and Space Administration (NASA) and other agencies.

Based in Boulder, **Ball Aerospace & Technologies Corp.** provides support of space and Earth science, space exploration, national security and intelligence, and tactical programs. Ball Aerospace creates innovative space solutions, enables more accurate weather forecasts, drives insightful observations of our planet, and delivers actionable data and intelligence. [www.ballaerospace.com](http://www.ballaerospace.com)

**The Boeing Company** has several locations throughout Colorado with the largest concentrations in Arapahoe County and Colorado Springs. Core business activities include: Jeppesen, a subsidiary of Boeing that provides navigational information to commercial, business, and military aviation; strategic missile defense systems; space and intelligence and Global Positioning System (GPS) support; and Boeing military aircraft support at Fort Carson. [www.boeing.com](http://www.boeing.com)

**Harris Corporation** is a leading technology innovator, solving customers’ toughest mission-critical challenges by providing solutions that connect, inform, and protect. The company has offices in 10 Colorado locations, including Broomfield and Colorado Springs. Colorado is a key location for the **Space and Intelligence Systems** segment, which provides complete solutions encompassing advanced sensors and payloads, processing systems, and analytics for global situational awareness, space superiority missions, and Earth insights. [www.harris.com](http://www.harris.com)

**Lockheed Martin** develops products ranging from human space flight systems and navigation, meteorological, and communications satellites to ground station and missile defense systems. The **Space Systems Company** unit headquartered in Jefferson County designs, develops, tests, and manufactures advanced technology systems for its government, international, and commercial customers. [www.lockheedmartin.com](http://www.lockheedmartin.com)

**Northrop Grumman** provides a range of products and services related to systems integration, missile systems and national security technologies, defense electronics, marine and space systems, and battle management. The company also works with advanced aircraft, unmanned aircraft vehicles, naval vessels, and space technology. [www.northropgrumman.com](http://www.northropgrumman.com)

**Raytheon Company**, with the majority of its employees located in Aurora, manages spacecraft missions and analyzes post-launch data through a variety of technologies including radio frequency, GPS, communications and intelligence, and electro-optical/infrared. [www.raytheon.com](http://www.raytheon.com)

**Sierra Nevada Corporation’s (SNC) Space Systems** business area, located in Louisville, develops subsystems and components for space applications, is a prime contractor for small satellites, and owns and operates the *Dream Chaser*® spacecraft. The company’s two Centennial divisions—the **Intelligence, Surveillance, and Reconnaissance** and the **Information and Sensor Solutions**—provide products and services for a variety of airborne systems. The company has a growing presence in Colorado Springs. [www.sncorp.com](http://www.sncorp.com)

**United Launch Alliance (ULA)** With more than a century of combined heritage, ULA is the nation’s most experienced and reliable launch service provider. ULA employs nearly half of its workforce at its Centennial headquarters. ULA’s program management, engineering and mission support functions are concentrated in Colorado. This includes development of ULA’s new Vulcan Centaur rocket. In 2018, ULA will begin flights of its Atlas V rocket carrying Boeing’s Starliner capsule in support of NASA’s Commercial Crew program which will return astronauts to space from U.S. soil. [www.ulalaunch.com](http://www.ulalaunch.com)
Additional Major Private Aerospace Companies

- Braxton Technologies  
  www.braxtontech.com
- Cobham  
  www.cobham.com
- Honeywell International  
  www.honeywell.com
- IHS Markit Aerospace, Defense & Security  
  www.ihs.com
- Intrex Aerospace  
  www.intrexcorp.com
- Maxar Technologies (formerly DigitalGlobe)  
  www.digitalglobe.com
- Merrick & Company  
  www.merrick.com
- Research Electro-Optics, Inc.  
  www.reoinc.com
- Rocky Mountain Instrument Company  
  www.rmico.com
- Science Applications International Corp.  
  www.saic.com
- SEAKR Engineering, Inc.  
  www.seakr.com
- Special Aerospace Services  
  www.specialaerospaceservices.com
- Surrey Satellite Technology US LLC  
  www.sst-us.com
- Trimble  
  www.trimble.com
- UP Aerospace Inc.  
  www.upaerospace.com
- Vectrus  
  www.vectrus.com

Military Aerospace Profile

Colorado is the U.S. center for military space. The state is home to a diverse mix of U.S. Department of Defense (DoD) military installations and major command centers that foster important synergies between private aerospace companies and government entities. The state is also a national hub for cybersecurity and is home to the National Cybersecurity Center in Colorado Springs. The state’s military installations provide an annual economic impact of $27 billion to Colorado’s economy and employ more than 170,000 military and defense-related civilian personnel—or 5.2 percent of the state’s workforce. Additionally, 7.5 percent of Colorado’s labor income is derived from DoD employment and 6.5 percent of the state’s Gross State Product is DoD-related.

- Buckley Air Force Base in Aurora is home to the 460th Space Wing and supports more than 83 tenant organizations that represent all branches of the military. Tenants are located both on and off the base. The base is also home to the Aerospace Data Facility–Colorado, one of the nation’s three satellite ground stations operated by the National Reconnaissance Office. Buckley is home to the only space-based missile warning system in the nation. The base also hosts the Colorado Air National Guard 120th Fighter Squadron and its F-16C fighters.

  - Peterson Air Force Base is the home of the 21st Space Wing (SW) as well as the North American Aerospace Defense Command (NORAD), the U.S. Northern Command (USNORTHCOM), Air Force Space Command (AFSPC), U.S. Army Space and Missile Defense Command/ U.S. Army Forces Strategic Command (SMDC/ARSTRAT), the 302nd Airlift Wing, as well as a number of other smaller tenant units. The 21st SW is responsible for worldwide missile warning and space control.
  - Cheyenne Mountain Air Force Station is owned and operated by Air Force Space Command. It hosts the NORAD and USNORTHCOM Alternate Command Center and other national security activities.
  - Schriever Air Force Base is the home of the 50th SW as well as the Space Innovation and Development Center (SIDC), the 310th SW, the Missile Defense Integration and Operations Center (MDIOC), the Joint Functional Component Command for Integrated Missile Defense (JFCC-IMD), and numerous tenant organizations. The 50th SW provides space combat capability through command, control, operations, and support of communication, navigation, warning, surveillance, and weather satellite weapons systems.

- The U.S. Air Force Academy in Colorado Springs was established in 1954 as an accredited college to educate officers in the U.S. Air Force. The 10th Air Base Wing is the host wing for the Air Force Academy and provides base-level support activities including medical, engineering, base logistics, fire response services, communications, security, and other key support for more than 25,000 military and
AEROSPACE:
Colorado Industry Cluster Profile

civilian personnel. The Academy offers increasingly diverse interdisciplinary programs that encompass more than 20 research centers and institutes. Further, the Academy’s premier science, technology, engineering, and mathematics programs are distinguished by the college’s partnership with the Institute for National Security Studies.

Defense and Aerospace-Related Personnel Profile, 2017

<table>
<thead>
<tr>
<th>Government Installation</th>
<th>Personnel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buckley Air Force Base</td>
<td>9,500</td>
</tr>
<tr>
<td>Peterson Complex*</td>
<td>8,150</td>
</tr>
<tr>
<td>U.S. Air Force Academy</td>
<td>7,270</td>
</tr>
<tr>
<td>Schriever Air Force Base</td>
<td>3,890</td>
</tr>
<tr>
<td><strong>Total Employment</strong></td>
<td><strong>28,810</strong></td>
</tr>
</tbody>
</table>

*Peterson Complex total includes personnel at Peterson Air Force Base and Cheyenne Mountain Air Force Station (including NORAD, USNORTHCOM, AFSPC, and SMDC/ARSTRAT).

Private Aerospace Workforce Profile

Colorado employers can draw from a large, young, and highly educated workforce.

- Colorado has the nation’s second-most highly educated workforce as measured by residents with a bachelor’s degree or higher.
- 39.9 percent of Colorado adults are college graduates and 91.4 percent have graduated from high school.
- Nearly half of the state’s 5.6 million residents are under the age of 35.
- The state’s population is expected to grow 31.6 percent from 2020 to 2040, driving a 26 percent increase in the state’s labor force over the same period.

Educational Attainment of Colorado’s Population Age 25 and Older

- Graduate or Professional Degree: 14.9%
- Bachelor’s Degree: 24.9%
- Associate Degree: 8.6%
- Some College, No Degree: 21.0%
- High School Graduate (includes equivalency): 22.0%
- 9th to 12th Grade, No Diploma: 5.1%
- Less than 9th Grade: 3.4%

Source: U.S. Census Bureau, 2016 American Community Survey.

Colorado Labor Force Projections by Age (millions)

Source: Colorado Division of Local Government, State Demography Office.
AEROSPACE:
Colorado Industry Cluster Profile

Private Aerospace Workforce Profile

Colorado’s aerospace cluster has a larger share of employees that are between the ages of 35 and 64 years old (74.1 percent), compared with the age distribution across all industries in the state (59.5 percent). Specifically, the largest share of workers in the aerospace cluster are between the ages of 45 and 54.

The Occupation & Salary Profile below includes the 10 largest aerospace occupations in the state. For these 10 largest occupations, the chart details the total number of workers employed in that occupation across all industries, the number of available applicants that would like to be working in that occupation, the number of recent graduates that are qualified for that occupation, and the median and sample percentile annual salaries.

Wages

Wages in the cluster are among the highest across all industry clusters. The 2016 average annual salary was $131,200, compared with $107,240 nationwide, or 22.3 percent more than the national average. Colorado’s aerospace cluster payroll exceeded $3.3 billion in 2016.

Colorado Aerospace Occupation & Salary Profile, 2017

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<tbody>
<tr>
<td>1. Business operations specialists, all other</td>
<td>42,109</td>
<td>1,035</td>
<td>21</td>
<td>$73,904</td>
<td>$41,931</td>
<td>$54,939</td>
<td>$97,753</td>
<td>$125,027</td>
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<td>2. Software developers, systems software</td>
<td>14,350</td>
<td>353</td>
<td>2,157</td>
<td>$112,874</td>
<td>$76,627</td>
<td>$91,591</td>
<td>$136,774</td>
<td>$165,462</td>
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<td>3. Biological technicians</td>
<td>2,918</td>
<td>72</td>
<td>0</td>
<td>$44,283</td>
<td>$29,286</td>
<td>$34,757</td>
<td>$57,616</td>
<td>$70,158</td>
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<td>4. Aerospace engineers</td>
<td>2,457</td>
<td>60</td>
<td>261</td>
<td>$119,870</td>
<td>$68,619</td>
<td>$84,427</td>
<td>$158,538</td>
<td>$200,450</td>
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<td>5. Software developers, applications</td>
<td>26,987</td>
<td>663</td>
<td>1,977</td>
<td>$103,156</td>
<td>$63,893</td>
<td>$80,228</td>
<td>$126,837</td>
<td>$154,305</td>
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<tr>
<td>6. Mechanical engineers</td>
<td>5,661</td>
<td>139</td>
<td>930</td>
<td>$86,236</td>
<td>$56,440</td>
<td>$69,475</td>
<td>$114,212</td>
<td>$151,552</td>
</tr>
<tr>
<td>7. Electronics engineers, except computer</td>
<td>6,029</td>
<td>148</td>
<td>531</td>
<td>$95,711</td>
<td>$66,325</td>
<td>$76,879</td>
<td>$124,184</td>
<td>$154,229</td>
</tr>
<tr>
<td>8. General &amp; operations managers</td>
<td>44,197</td>
<td>1,086</td>
<td>9,896</td>
<td>$107,271</td>
<td>$65,033</td>
<td>$76,357</td>
<td>$166,721</td>
<td>$247,434</td>
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<tr>
<td>9. Sales representatives, services, all other</td>
<td>27,221</td>
<td>669</td>
<td>25</td>
<td>$55,565</td>
<td>$26,507</td>
<td>$37,861</td>
<td>$82,210</td>
<td>$123,307</td>
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<tr>
<td>10. Industrial engineers</td>
<td>3,402</td>
<td>84</td>
<td>24</td>
<td>$93,097</td>
<td>$56,632</td>
<td>$71,896</td>
<td>$117,565</td>
<td>$142,439</td>
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Notes: The number of available applicants is a point-in-time measurement of the number of people who have registered in Colorado’s workforce development system’s statewide database, Connecting Colorado, as being able and available to work in a particular occupation. Results should be interpreted with caution since registration in Connecting Colorado is self-reported. In addition, the skills rubric may assign up to four occupation codes for each registrant. Therefore, the number of available applicants could be inflated. Source: Provided by Arapahoe/Douglas Works!; QCEW Employees, Non-QCEW Employees, & Self Employed - EMSI 2017.3 Class of Worker.

Education & Training

Colorado’s higher education system provides an excellent support system for businesses in the state. There are 28 public higher education institutions in Colorado, consisting of 13 four-year and 15 two-year public institutions offering comprehensive curricula. There are more than 100 private and religious accredited institutions and more than 350 private occupational and technical schools offering courses in dozens of program areas throughout the state. The state higher education system served about 255,510 students in
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FY 2015-16, while 86,070 students received a degree, diploma, certificate, or other formal award over the same period of time. Although not exhaustive, a list of the major, accredited educational institutions with the greatest number of graduates for each of the 10 largest aerospace occupations in Colorado are included below. A directory of all higher education institutions with corresponding websites may be accessed via http://highered.colorado.gov.

- Colorado School of Mines  
  www.mines.edu
- Colorado State University  
  www.colostate.edu
- Colorado State University Global Campus  
  www.colostate.edu
- Metropolitan State University of Denver  
  www.msudenver.edu
- Regis University  
  www.regis.edu
- University of Colorado: Boulder, Colorado Springs, Denver  
  www.cu.edu
- University of Denver  
  www.du.edu
- U.S. Air Force Academy  
  www.usafa.af.mil
- University of Northern Colorado  
  www.unco.edu

2017 INDUSTRY HIGHLIGHTS

Key Company Announcements

- Construction is underway on Lockheed Martin Space System Co.’s (LMSS) new $350 million Gateway Center facility that will produce next-generation satellites at its Waterton Canyon campus in Jefferson County. The new 266,000-square-foot facility will include a clean room and two testing chambers, and is slated for completion in 2020. LMSS has added more than 750 local jobs since 2014 and has invested $250 million in construction and facilities at its headquarters.

- Lockheed Martin Autonomous Systems, the center for the company’s development of technologies for self-driving ground transportation, autonomous drones, machine learning, and machine vision, expanded its Littleton footprint. The new space will provide more room to test fly autonomous drones with potential to accommodate more than 100 workers.

- LMSS will move 650 jobs from California to Colorado and Florida after receiving a major contract to expand work on the submarine-launched Trident II D5 nuclear missile for the U.S. and British Navies. The engineering and design positions will be added over the next eight years.

- Sierra Nevada Corp. leased 101,000 square feet of additional industrial space at the Colorado Technology Center in Louisville and intends to add 400 workers in the next 18 months.

- Sierra Completions, a subsidiary of Sierra Nevada Corp., won a FAA repair-station license to begin turning wide body aircraft into flying offices for high-end customers and will hire 200 employees. The company opened a 60,000-square-foot, $11 million hangar at Colorado Springs Airport to complete maintenance and alterations on military and civilian aircraft. Sierra built a 30,000-square-foot hangar in 2015 and is leasing a former air-freight terminal on an adjacent site used by Sierra Completions until construction is completed over the next five years on its $100 million Colorado Aerospace Park.

- Ball Corp. will add 145,000 square feet and 300 workers to its existing Aerospace Manufacturing Center in Westminster, with completion expected in 2019. The expansion will support ongoing customer demand and projected growth.

- Trimble Inc. began construction on a second 120,000-square-foot building in Westminster, which is slated for completion in late 2018. With the capacity to accommodate more than 1,100 workers, the campus will be Trimble’s largest employment center and will continue to serve as a central business hub for several of the company’s core market segments, including geospatial.

- Special Aerospace Services opened a new 25,000-square-foot automated machining and specialized manufacturing facility in Arvada. The firm plans to expand manufacturing activities and will more than double its workforce to 30 people in the next two years.

- Tendeg LLC will move within the Colorado Technology Center in Louisville to a new 7,349-square-foot building. The aerospace engineering firm provides design, analysis, prototyping, and flight-unit assembly.

- Golden-based NFT Inc. relocated its headquarters to a 53,656-square-foot industrial building at the Colorado Technology Center. The move more than doubled the company’s nuclear, aerospace, and automation manufacturing and office space.

- Vancouver, Canada-based MacDonald Dettwiler and Associates completed its $2.4 billion purchase of Westminster-based DigitalGlobe and will rebrand the combined company as Maxar Technologies.
The new company will serve as a leader in satellite systems, earth imagery, geospatial solutions, and analytics, and offers a broader set of space-based solutions, increased scale, and a more diversified revenue base.

Colorado is a growing hub for high-growth space startups and space entrepreneurs as a result of new technologies, affordable small satellites, big data technologies, and increasing venture capital.

- Longmont-based **Roccor Inc.** partnered with the Air Force Research Laboratory (AFRL) to license its high strain component technology. Under the agreement, Roccor will deploy 1,800 solar arrays that will be secured to AFRL’s 900-satellite fleet. The company has expanded to 40 people with plans to hire additional staff as it readies for full-scale production in 2018.
- NASA selected space startup Boulder-based **Altius Space Machines** for an SBIR Phase II contract to develop a cryogenic propellant transfer coupling for in-space refueling. The technology has numerous space applications since existing designs are not capable of in-space refuelability.
- Denver-based **BridgeSat, Inc.** and **AstroTerrace, Inc.** were awarded a contract to support the development of the optical communications system on the Japanese Government’s Engineering Test Satellite 9 (ETS-IX). The company’s optical communications ground network aims to improve the transfer of data from satellites, which could deliver data rates of 10 Gbps when ETS-IX launches in 2021.

**Research and Education Announcements**

- **Lockheed Martin** will donate $1 million to **Metropolitan State University of Denver** (MSU Denver) over the next four years to support advanced manufacturing instruction and laboratories at the school’s new Aerospace and Engineering Sciences Building. The funding will provide a new Lockheed Martin Additive Manufacturing Laboratory, where students can use state-of-the-art computer-controlled machines and 3D printing technology to design and create aerospace components. Other industry partners include PADT and Stratasys Ltd.
- **York Space Systems** partnered with **MSU Denver** to move its headquarters and establish a new manufacturing facility and Mission Operations Center at the new Aerospace and Engineering Sciences building. The company plans to add staff to begin production for up to 200 satellites per year.
- **EyasSat, Inc.**, a manufacturer of desktop satellite kits for teaching spacecraft systems engineering, will relocate its headquarters to **MSU Denver’s** Aerospace and Engineering Sciences building in early 2018.
- The **University of Colorado Boulder** (CU Boulder) broke ground on an $82.5 million, 144,000-square-foot aerospace engineering building, which is slated for completion in mid-2019. The facility will house an indoor flight environment for unmanned aircraft, a 200-seat auditorium, distance learning-equipped classrooms, faculty offices, and spaces for graduate students.
- Sixteen payloads from K-12 schools and educational organizations throughout Colorado flew on Centennial-based **United Launch Alliance’s** Future Heavy intern rocket, the world’s largest high-powered sport rocket. The 53-foot-tall, high-power sport rocket launch took place at Spaceport America, N.M. during its annual Spaceport America Cup International Intercollegiate Rocket Engineering Competition.
- A consortium of universities, led by **CU Boulder’s** Ann and H.J. Smead Department of Aerospace Engineering Services, received a five-year, $7.5 million DoD grant to investigate the extreme altitudes—between 80,000 feet and 120,000 feet—where hypersonic planes would fly. The Department will launch a series of high-altitude balloons carrying instruments to record atmospheric conditions.
- Longmont-based **Blackfox Training** partnered with **Lockheed Martin** to create a first-of-its-kind program to train veterans with skills and certifications in critical electronics assembly work for a career path in the aerospace and defense industry.
- Aerospace and defense incubator, accelerator, and research and development center—**Catalyst Campus for Technology and Innovation**—will launch the Catalyst Accelerator at its Colorado Springs campus in January 2018. The Catalyst Accelerator aims to promote technology advancement for the warfighter and guide technology transfer from the government to the commercial market and vice versa. The accelerator will provide a mentor-driven curriculum for accelerator teams.
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**CU Boulder** solidified several research agreements with private aerospace partners in 2017.

- Bolstering its 60-year collaboration with **Ball Aerospace**, CU Boulder unveiled a new five-year, master university research agreement. The agreement will facilitate and streamline opportunities for students and faculty to work with Ball to conduct sponsored research.

- CU Boulder and **Harris Corporation** partnered under a new three-year master research agreement that will further mutual interests in analytical instrumentation, space antennas, space payloads and electronics, radar, universe exploration, and other capabilities. The agreement will initiate and expand upon projects and collaborative opportunities.

- **Lockheed Martin** will expand its research collaboration with CU Boulder with a master research agreement. The new agreement builds on the company’s $3 million funding of the Lockheed Martin Radio Frequency Space Systems Research Center at CU Boulder, and includes four new projects totaling $675,000.

- CU Boulder's Department of Astrophysical and Planetary Sciences research team and **NASA** partnered under a five-year, $4.5 million cooperative agreement to join its Solar System Exploration Research Virtual Institute to pursue construction of astronomical observatories on the moon.

**2017 INDUSTRY MILESTONES**

Colorado is leading the nation’s major aerospace missions and projects. Three Colorado-based projects were named to *Popular Science’s* 2017 Top 10 Most Incredible Aerospace Inventions: OSIRIS-REx, the GOES weather satellite, and Dream Chaser. These and other examples of collaborative projects and their progress are highlighted below.

**Dream Chaser®**

Louisville-based Sierra Nevada Corporation’s (SNC) Space Systems is developing the Dream Chaser spacecraft through significant collaboration with other Colorado-based aerospace companies. The Dream Chaser is a winged, lifting-body spacecraft designed for both crewed and uncrewed missions to low Earth orbit (LEO) including cargo resupply to the International Space Station (ISS) for the National Aeronautics and Space Administration (NASA), as well as international and commercial space missions for at least six missions thorough 2024. SNC is also evaluating international and commercial space opportunities. Several milestones were reached in 2017:

- SNC successfully conducted its Approach and Landing Test 2 (ALT-2) flight in late 2017. The free-flight test allowed the spacecraft to fly under its own systems and automated guidance. The ALT-2 flight followed several successful Captive Carry and tow tests earlier in the year.

- SNC passed the third integration milestone in May, which confirmed the cargo system design met NASA's key requirements and maximizes probability of mission success during future flights. The spacecraft also successfully demonstrated safety and mission assurance criteria.

- United Launch Alliance’s (ULA) Atlas V rocket was selected to launch SNC's first two resupply missions to the ISS, which are scheduled to launch in 2020 and 2021. SNC's Dream Chaser Cargo System will provide up to 5,500 kilograms of upmass, as well as both return and disposal services.

**Global Positioning System (GPS)**

Lockheed Martin Space Systems (LMSS) is developing the U.S. Air Force’s (USAF) next generation of Global Positioning System (GPS III) satellites—the newest military and civilian navigation technology that delivers three times better accuracy, provides up to eight times improved anti-jamming capabilities, and includes enhancements which extend spacecraft life 25 percent longer than the prior GPS block. Lockheed has 10 GPS III satellites in full production phase at its GPS III Processing Facility in Jefferson County.

- The USAF has declared the first GPS III satellite ready for launch, and Lockheed plans to begin pre-launch preparations ahead of the satellite’s expected launch in 2018. Integration on the second GPS III satellite is complete, and after environmental testing is expected to be delivered to the USAF in 2018.

- Lockheed has also completed assembly of its third GPS III satellite, which is being prepared to begin environmental testing.

**GOES-R**

LMSS is developing the next-generation geostationary weather satellites, the Geostationary Operation Environmental Satellite-R Series (GOES-R), which includes GOES-R (launched in November 2016), GOES-S, GOES-T, and GOES-U. The next satellite in the series, GOES-S is fully integrated, finished with environmental
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and mechanical testing, and preparing for launch in the spring of 2018. The primary subassemblies of the GOES-T satellite are underway in Jefferson County, with the launch slated for 2020. The GOES satellites provide accurate, real-time weather forecasts and early warning products to the National Oceanic and Atmospheric Administration’s (NOAA) National Weather Service and other public and private sectors.

GPS OCX
Raytheon delivered the first portion of the GPS Operational Control System (OCX) to the USAF Space and Missile Systems Center. Block 0 is a significant program milestone, as it provides the USAF with a cyber-hardened ground system to support the launch and on-orbit checkout of the GPS III satellites, and provides the hardware, software, and cybersecurity base for Block 1. Block 1 and 2 are slated for delivery in 2022. OCX will provide command and control of new capabilities associated with the new GPS III family of satellites as well as legacy satellites and all new civil and military signals.

The Imaging X-ray Polarimetry Explorer (IXPE) Mission
Ball Aerospace will provide the spacecraft and mission integration and CU Boulder’s Laboratory for Atmospheric and Space Physics will perform mission operations for NASA’s Imaging X-Ray Polarimetry Explorer (IXPE) Mission. Scheduled to launch in 2021, the mission will allow astronomers to explore the hidden details of some of the most extreme and exotic astronomical objects, such as supermassive black holes, neutron stars, and pulsars, helping scientists to better understand the origin of the universe. The mission is led by NASA’s Marshall Space Flight Center in Huntsville, Ala.

InSight
LMSS built the Mars lander spacecraft for NASA’s InSight (Interior Exploration using Seismic Investigations, Geodesy and Heat Transport) mission. InSight is a NASA Discovery-class mission to understand the processes that shaped rocky planets such as Mars and Earth. Scheduled to launch in May 2018, a Lockheed Martin team will operate the spacecraft on its seven-month journey to Mars, its landing, and during surface operations. In 2017, the lander and the environmental testing phase were successfully completed.

Joint Polar-Orbiting Satellite System
JPSS-1, built and designed by Ball Aerospace, launched in November 2017. JPSS is the next generation of polar-orbiting environmental satellites and is a cooperative program between NOAA and NASA. Ball also integrated all five of the spacecraft’s instruments and is performing satellite-level testing and launch support. Raytheon built the JPSS Common Ground System, which provides command, control, communications, data processing, and product delivery.

Mars 2020
NASA’s Mars 2020 mission will be launched by ULA in 2020, with the Mars rover scheduled to land in 2021 for a two-year exploration of the Martian surface. LMSS will build the aeroshell and heat shield which will protect the rover during its journey to Mars and descent to the planet’s surface. SNC’s Space Systems will build critical hardware for the rover, including the descent brake and actuators for the robotic arm and sample cache system.

NextSTEP-2
SNC and LMSS began construction on design ground prototypes and concepts for deep space habitats on Mars, as part of NASA’s Next Space Technologies Exploration Partnership-2 (NextSTEP-2), a program to produce habitats that could support astronauts working and living outside Earth’s orbit. Work under the Phase II contract will take place over 18 months.

Orion
LMSS is building the Orion Multi-Purpose Crew Vehicle, NASA’s first spacecraft designed to transport humans to destinations beyond LEO, such as the moon, asteroids, and eventually Mars, as early as 2023. Lockheed Martin’s new Orion Test Lab is the first testing facility of its kind for a NASA human-rated spacecraft built on a contractor’s campus. Following Orion’s highly successful, first high orbital test in 2014, the spacecraft’s next flight will be Exploration Mission-1, projected to launch in 2019 on NASA’s new Space Launch system rocket. Orion was successfully powered-on in 2017, the first step in testing the crew module subsystems, and engineers and technicians will continue integrating the spacecraft’s 55 components.
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OSIRIS-REx
LMSS built NASA’s OSIRIS-REx spacecraft, which is an asteroid sample return mission. Launched in 2016, the Origins Spectral Interpretation Resource Identification Security-Regolith Explorer will study and return a sample of carbonaceous asteroid to Earth for detailed analysis in 2023.

Space-based Missions

- NASA selected a space probe named Lucy, proposed by the Boulder office of the Southwest Research Institute, for its next Discovery-class mission. The 12-year mission will launch in October 2021 to study six asteroids near Jupiter to further scientific understanding of the early solar system. LMSS will build, assemble, and test the spacecraft.
- NASA tripled the number of flights awarded to SpaceX and Boeing Co., giving ULA four additional missions to ferry astronauts to the ISS. In 2018, Boeing’s CST-100 Starliner, capable of carrying up to four astronauts and 220 pounds of cargo, will launch aboard an Atlas V rocket.
- NASA’s Launch Services Program selected ULA’s Atlas V rocket to launch the Landsat 9 mission, the ninth in a satellite program which has provided the longest continuous global record of Earth’s surface. The Landsat 9 mission could launch as early as December 2020.
- ULA partnered with Nevada-based Bigelow Aerospace to develop and deploy experimental, inflatable space habitats by 2022 to function as a depot for lunar missions. A Bigelow test habitat has been attached to the ISS for 18 months.
- Ball Aerospace was selected to design and build a cryostat for NASA’s Galactic/Extragalactic Ultralong Duration Balloon Spectroscopic Terahertz Observatory (GUSTO) mission in 2021. The mission will study dust and material from exploding stars, which will assist researchers in understanding the lifecycle of stars in the Milky Way Galaxy.
- ULA received a contract to launch Pittsburgh-based Astrobotic Technology Inc.’s Peregrine Lunar lander to the moon in 2019, during the 50th anniversary of Apollo 11. Astrobotic has signed 11 contracts with customers who want to participate in its first flight that will carry payloads to the lunar surface.

Defense-based Missions

- Colorado Springs-based Boecore won a $93 million USAF contract to provide early-warning information of ballistic missile launches. The work will be performed at Peterson Air Force Base, which is slated for completion by June 2022. The award is part of the Shared Early Warning System (SEWS II) Engineering and Contractor Logistics Support program.
- ULA successfully deployed three payloads on behalf of the U.S. National Reconnaissance Office. NROL-79, NROL-52, and NROL-42 spy satellites will support national security efforts.
- Denver-based York Space Systems was awarded a military contract with the U.S. Army Space and Missile Defense Command to produce a small satellite for the Harbinger Mission planned to launch in late 2017.

Satellite Programs

- CU Boulder’s Laboratory for Atmospheric and Space Physics (LASP) successfully installed its Global-Scale Observations of the Limb and Disk (GOLD) onto the SES-14 commercial communications satellite. NASA is providing LASP with $36 million for designing, building, and operating the GOLD instrument for the mission, which will capture unprecedented imaging and data of the Earth’s upper atmosphere.
- NASA awarded Ball Aerospace the five-year Suomi National Polar-Orbiting Partnership Sustainability (SNPPS) contract. Under this contract, Ball Aerospace will continue to provide sustaining engineering services to the JPSS Flight Project and NOAA’s Office of Satellite and Product Operations for the mission operations systems and subsystems, and deactivation of the Suomi NPP satellite.
- ULA launched the USAF’s Wideband Global SATCOM-8 (WGS) satellite aboard a Delta IV rocket. Two additional WGS satellites are in production, bringing the total constellation to 10 by 2019. The satellite was the eighth WGS satellite launched by ULA since 2007.
- ULA was awarded a $191.1 million USAF contract to launch the Space Test Program-3 (STP-3) mission. STP-3 is an experimental blast-detection satellite, which is scheduled to launch in mid-2019.
- Ball Aerospace completed a six-month Phase A study of the scientific and technology requirements for the Wide Field Survey Telescope (WFIRST) project’s Wide Field Instrument. WFIRST will be NASA’s next flagship space telescope under development and will follow NASA’s James Webb Space
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Telescope. WFIRST captures individual images with the depth and quality of the Hubble Space Telescope, while covering 100 times the area.

- Douglas County-based EchoStar Corp. launched its 105/SES-11 and XXIII communication satellites into orbit that will provide increased capabilities and expanded reach. The 105/SES-11 will provide Ku-band transponder capacity media distribution over North America and the Caribbean, while the XXIII will provide broadcast services for Brazil.
- Maxar Technologies selected Raytheon as the payload provider for its WorldView Legion constellation of next-generation satellites to capture Earth imagery in 2020. The payload will supersede WorldView-1 and 2—which launched in 2007—and will increase Maxar’s capacity to record multispectral and 30-centimeter satellite imagery on high-demand locations.
- The Tropospheric Emissions: Monitoring of Pollution (TEMPO) instrument, designed and built by Ball Aerospace for NASA, has completed spectrometer testing and verification. TEMPO was selected by NASA as the first Earth Venture-Instrument to provide hourly measurements of air quality across North America.
- CU Boulder designed and built NASA’s Total and Spectral Solar Irradiance Sensor (TSIS-1) to help monitor the planet’s climate, which launched in 2017. The $90 million solar instrument suite and associated mission ground system will measure the sun’s energy input to Earth.
- NOAA and the USAF will launch the first six satellites of the Constellation Observing System for Meteorology, Ionosphere and Climate (COSMIC-2S) constellation, to support improved numerical weather prediction model forecasts. The research that made this operational constellation possible was conducted by Boulder-based University Corporation for Atmospheric Research (UCAR).

Several instruments and satellites were launched to the ISS:

- Ball Aerospace’s Boulder-built Stratospheric Aerosol and Gas Experiment III (SAGE III) launched in February 2017. SAGE III will be used for environment observations, and the Vision Navigation Sensor for technical operations.
- ULA launched a mission aboard its Atlas V rocket, carrying supplies and science experiments to the ISS. The mission was the third time ULA launched Cygnus for an ISS supply run and was the first time the company used RapidLaunch to increase mission delivery speed.
- ULA launched NASA’s Tracking and Data Relay Satellite-M (TDRS-M) on an Atlas V rocket to track phone calls and data traffic for the ISS. The TDRS-M satellite is the third generation of the orbiters to be launched, and the last of three built by Boeing Space Systems under a NASA contract awarded in 2007.
- Two CU Boulder-built payloads launched, including one to examine changes in cardiovascular stem cells in microgravity and one to study novel treatments for bone loss in space. The two biomedical research payloads were developed by BioServe Space Technologies, which is also launching its third Space Automated Bioproduct Lab unit to the ISS.

Spaceport Colorado

In 2017, Front Range Airport continued the application process for certification from the FAA to operate as a horizontal-launch spaceport facility. The subsequent designation for Spaceport Colorado, which may be granted in 2018, fulfills a 2011 declaration by Gov. John Hickenlooper of Colorado’s intent to become a spaceport state. The effort will increase Colorado’s competitiveness in the aerospace industry and support new opportunities in the future growth of commercial space research and transportation. Plans for Spaceport Colorado include the development of an aerospace and technology park to support a broad range of activities and commercial opportunities, including research and development, testing and evaluation, manufacturing, crew training, scientific research, suborbital flight, and point-to-point travel. Spaceport Colorado has an abundance of surrounding land and convenient access to Denver International Airport and the state’s sizeable aerospace industry, research universities, and talented aerospace workforce.
Industry Infrastructure Support

The Colorado Space Coalition (CSC), a group of industry stakeholders, works to promote Colorado as a leader in the aerospace industry. Coalition members—including aerospace companies, military leaders, academic groups, and economic development organizations—promote Colorado’s significant aerospace assets nationally and advance legislation vital to industry growth and success.

The Colorado Space Business Roundtable (CSBR) is an independent, nonprofit organization promoting the growth of space and space-related industry in Colorado, with particular focus on small space businesses. CSBR members include a broad cross-section of the Colorado space community that support the space industry with services, advocacy, and procurement.

The Colorado Chapter of the Aerospace States Association is comprised of the CSC, the CSBR, and the Colorado Chapter of Citizens for Space Exploration. The partnership collaborates on industry events, outreach, and advocacy efforts.

The Space Foundation is a Colorado Springs-based organization that supports all sectors of the space community across the globe. Founded in 1983, the Space Foundation is a leader in space activities, educational support, major space events, and space research and development. The Space Foundation also hosts the annual Space Symposium, the premier gathering of the global space community.

The Colorado Chapter for Citizens for Space Exploration comprises private citizens, small business owners, students, teachers, space and non-space business representatives, and county and municipal officials. The Chapter actively promotes awareness of the benefits of America’s Human Space Exploration Program and support for NASA.

The American Institute of Aeronautics & Astronautics (AIAA) Rocky Mountain Section represents aerospace technical professionals, students, and educators in Colorado, Wyoming, and Montana. Members advance innovation and technical excellence through monthly programs, university chapters, policy advocacy, public outreach, STEM education, technical committees, and professional development.
Key Reasons for Aerospace Companies to Locate in Colorado

Colorado is a top aerospace location offering:

1. The ability to recruit and retain technical and scientific employees and entrepreneurial talent
   - Nearly 40 percent of Coloradans have at least a bachelor's degree, the second-highest college attainment rate in the nation behind Massachusetts. (U.S. Census Bureau, 2016 American Community Survey)
   - Established in 2014, the U.S. Department of Commerce U.S. Patent and Trademark Rocky Mountain Regional Office in Denver expedites patent examination in the region, advances cutting-edge ideas to the marketplace, empowers entrepreneurs, and creates new highly-skilled jobs. (U.S. Patent and Trademark Office, 2017)
   - Colorado ranked eighth in the nation for entrepreneurship growth, with a 74.1 percent rate of startup growth, 1.3 percent share of scaleups, and 96.9 percent high-growth company density. (Ewing Marion Kauffman Foundation, 2017)
   - Colorado ranked No. 2 for the “Best States for Jobs” in 2017 and ranked first nationally for job opportunities. (WalletHub, 2017)

2. Proximity to vendors and customers
   - Colorado ranked No. 3 in National Aeronautics and Space Administration (NASA) prime contract awards totaling $1.8 billion in 2016, or 13 percent of the nation’s total. (NASA, 2017)
   - Colorado’s aerospace cluster is anchored by eight large prime contractors: Ball Aerospace, The Boeing Company, Harris Corporation, Lockheed Martin, Northrop Grumman, Raytheon, Sierra Nevada Corporation, and United Launch Alliance.
   - Colorado is a host to major military operations including Buckley AFB, Peterson AFB, Schriever AFB, and Cheyenne Mountain Air Force Station. In addition, the U.S. Air Force Academy is located just outside of Colorado Springs.
   - Cheyenne Mountain Complex serves as NORAD and USNORTHCOM’s Alternate Command Center and as a training site for crew qualification.
   - Colorado’s Procurement Technical Assistance Centers (PTAC) provide expert procurement guidance at nominal or no cost to any Colorado business. PTAC has over 3,000 active clients that received nearly 730 government contract awards totaling $216.5 million.

3. Business organizations and public policy programs designed to encourage industry growth
   - Maj. Gen. Jay Lindell was appointed in 2013 by Gov. Hickenlooper as Colorado’s Aerospace and Defense Industry Champion to oversee implementation of the state’s aerospace strategic plan and assist aerospace businesses, defense installations, and research institutions.
   - Aerospace Day at the Colorado Capitol occurs annually to recognize the industry’s importance to the state’s economic growth. Formed in 2015, the state’s bipartisan Aerospace and Defense Caucus further supports the continued expansion of aerospace and defense in Colorado.
   - The Advanced Industries Accelerator Programs include four types of grants and a global business support program to promote growth and sustainability in Colorado’s advanced industries, including aerospace, among others. The program has awarded over $40 million in grants since its inception in 2013. (Colorado Office of Economic Development and International Trade, 2017)
   - Personal property used in an orbital space facility, a space propulsion system, satellite, or space station is exempt from sales and use taxes. The exemption encourages capital investment in aerospace manufacturing suppliers. (Exemption clarified in Colorado House Bill 14-1178)
   - To further pave the way for Spaceport Colorado, legislation passed in 2012 will help expand the state’s aerospace economy by limiting liability for public and private entities holding a Federal Aviation Administration license for spaceflight activities. (See Senate Bill 12-035 for more information)

4. Proximity to colleges/universities
   - Two academic institutions in Colorado offer nationally ranked aerospace programs or degrees:
     - The University of Colorado Boulder’s aerospace engineering sciences graduate program ranked among the top 10. (U.S. News & World Report, 2017)
AEROSPACE: 
Colorado Industry Cluster Profile


- CU Boulder’s Laboratory for Atmospheric and Space Physics is a full-cycle space institute and is the only university-based institution in the world to have designed and built space instruments for NASA that have been launched to all eight planets and Pluto.

- CU Boulder ranked among the top five U.S. universities, excluding military academies, in the number of astronaut alumni and is one of the top NASA-funded universities in the world. (University of Colorado, 2017)

- CU Boulder receives $120 million in aerospace-related research annually and is home to over a dozen aerospace-related departments, centers, and institutes. (University of Colorado, 2017)

- Colorado has the largest portfolio of research supported by the National Science Foundation’s Geosciences Division, with more than $1.4 billion in active awards. (National Science Foundation, 2017)

5. Low to moderate costs of doing business

- Colorado ranks as one of the nation’s most favorable corporate income tax structures. The state’s corporate income tax rate of 4.63 percent is one of the lowest in the nation and is based on single-factor apportionment, which allows companies to pay taxes based solely on their sales in the state. (State of Colorado; The Tax Foundation)

- Colorado ranks as the nation’s 10th-best tax system for entrepreneurs and small business. (Small Business & Entrepreneurship Council, 2017)

6. Pro-business and flexible state and local governments

- Colorado ranked No. 8 for attractiveness to the aerospace manufacturing industry. The state ranked No. 2 for tax policy, No. 3 for labor, and No. 7 for infrastructure. (PricewaterhouseCoopers, 2017)

- Colorado ranked No. 8 among *Forbes*’ 2017 “Best States for Business” list. The state received its highest rankings for labor supply (first overall), economic climate (third overall), and growth prospects (fourth overall). (*Forbes*, 2017)

- Colorado ranked fourth in the nation for Small Business Innovation Research (SBIR) grants per worker. The state received $32.90 in grants per worker compared with the U.S. average of $13.34. (U.S. Small Business Administration, 2017; U.S. Bureau of Labor Statistics, 2017)

- *CNBC* ranked Colorado No. 6 on the list of “America’s Top States for Business” in 2017. The state ranked among the top-10 in the categories that measure workforce (fourth), technology and innovation (seventh), and business friendliness (eighth). (*CNBC*, 2017)

*Colorado ranked No. 6 among the top states for business.*

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For more information on Colorado’s aerospace industry:

- 303.620.8133
- email: info@spacecolorado.org
- [www.spacecolorado.org](http://www.spacecolorado.org)

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Industry Overview

The nine-county Metro Denver and Northern Colorado region’s airport system is a strong economic engine, with a regional impact of nearly $28 billion and supporting more than 195,750 jobs in all industries. Denver International Airport (DEN) is one of the world’s busiest hubs and is responsible for $26 billion of the $28 billion impact in the region. In addition to DEN, three reliever airports and five general aviation airports facilitate commerce, create employment opportunities, and help maintain the state’s outstanding quality of life. The aviation cluster includes companies that manufacture aircraft and provide air transportation services. More specifically, the cluster includes airlines, airports, aircraft manufacturing and technology companies, and support services.

Aviation was the nine-county region’s fastest growing cluster in 2017, posting 5.7 percent employment growth between 2016 and 2017, compared with a 0.1 percent increase nationwide. Employment in the region’s aviation cluster grew for the sixth-consecutive year in 2017. The nine-county region is home to 20,140 aviation employees in close to 680 companies. Between 2012 and 2017, aviation employment rose 23.1 percent, compared with 4.1 percent nationally. Aviation companies employed 0.9 percent of the region’s total employment base, compared with a 0.6 percent employment concentration nationwide.

Aviation Economic Profile

The aviation cluster consists of 42, six-digit North American Industry Classification System (NAICS) codes including aircraft manufacturing, passenger and freight air transportation, airport operations, and air traffic control.

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<thead>
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Source: Dun & Bradstreet, Inc., Hoover’s Online Database; Market Analysis Profile, 2012-2017; Development Research Partners.

Aviation Employment and Company Profile, 2017

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1 The nine-county region is comprised of two principal areas, Metro Denver and Northern Colorado. Metro Denver consists of Adams, Arapahoe, Boulder, Broomfield, Denver, Douglas, and Jefferson counties. Northern Colorado consists of Larimer and Weld counties.

2 Direct employment rank based on the number of employees in the industry cluster in a region. Employment concentration rank based on the direct cluster employment in a region expressed as a percent of total employment in all industries in the same region. Rankings are for the 50 largest metropolitan statistical areas (MSAs). No multiplier effects are included. 1st = highest for both rankings.
Major Aviation Companies

Air Transportation

- Air Methods Corp. [www.airmethods.com]
- American Airlines, Inc. [www.americanairlines.com]
- Delta Air Lines, Inc. [www.delta.com]

Air Transportation

- Frontier Airlines [www.flyfrontier.com]
- Southwest Airlines [www.southwest.com]
- United Airlines [www.united.com]

Aircraft Manufacturing

- Jeppesen [www.jeppesen.com]

Aircraft Manufacturing

- Pilatus Aircraft [www.pilatus-aircraft.com]

Aircraft Regulating Agencies

- Federal Aviation Administration [www.faa.gov]

Aircraft Regulating Agencies

- Independence Aviation [www.ia-kapa.com]
- United Airlines Flight Training Center [www.united.com]

Aviation Training

- FlightSafety International Inc. [www.flightsafety.com]
- Front Range Flight School [www.frontrangeflightschool.com]

Aviation Training

- United Airlines Cargo [www.unitedcargo.com]
- United Parcel Service Inc. [www.ups.com]

Cargo & Logistics

- DHL [www.dhl.com]
- FedEx [www.fedex.com]

Cargo & Logistics

- Signature Flight Support [www.signatureflight.com]
- Swissport [www.swissport.com]

Terminal Services

- ABM/Air Serv Corp. [www.abm.com]
- Menzies Aviation/Simplicity Ground Services [www.menziesaviation.com]
AVIATION: Metro Denver and Northern Colorado Industry Cluster Profile

Nine-County Region Airport Information

Denver International Airport (DEN)

DEN is a state-of-the-art facility owned and operated by the City and County of Denver. Occupying 53 square miles and located approximately 24 miles northeast of downtown Denver, DEN is the primary airport serving the nine-county region and the state of Colorado. DEN is one of the few major U.S. airports with room to expand to accommodate future growth. DEN is twice the size of Manhattan Island and is larger than the city boundaries of Boston, Miami, or San Francisco. Approximately 35,000 people work at the airport, of which about 1,100 people are employed by the City and County of Denver.

Passenger Traffic

Since opening on Feb. 28, 1995, DEN has become the world’s 18th-busiest airport and the sixth-busiest airport in the U.S. With nearly 61.4 million passengers in 2017, DEN is one of the world’s busiest aviation hubs. 2017 was another record-setting year for DEN, with passenger traffic increasing by 5.3 percent over-the-year. More than 4.9 million passengers traveled through DEN in December 2017. July 2017 was the busiest month in DEN history, with more than 5.8 million passengers traveling through during the month.

Fueled by strong demand and increased carrier capacity, international passenger traffic has grown significantly over the past several years. Between 2016 and 2017, international passenger traffic increased nearly 13 percent from over 2.3 million passengers to nearly 2.6 million passengers, roughly double the pace of the airport’s overall passenger traffic growth. December 2017 was a standout month for international passenger traffic with an increase of 16.9 percent, compared with December 2016. Additionally, international traffic accounted for approximately 4 percent of the airport’s total passenger traffic.

Air Service

Located near the geographic center of the United States, DEN is the only major hub airport within a 500-mile radius. DEN provides nonstop service to nearly 190 destinations worldwide, including 26 international destinations in 11 countries. About 160 of these destinations are in the United States, making DEN the fourth-largest domestic network in the U.S. DEN is served by 25 airlines, including major hubs for United, Southwest, and Frontier Airlines. DEN serves 20 Federally-subsidized Essential Air Service (EAS) routes across the Western and Midwest U.S., making DEN the only air service option for these rural markets. DEN serves as the gateway into Colorado and the Rocky Mountain West and has direct flights to 12 destinations in Colorado, including popular ski resorts, vacation, and business destinations.

DEN is a leading air cargo center and a key distribution hub. Ten cargo airlines and 10 major and national carriers currently provide cargo service at DEN, handling nearly 585 million pounds of cargo in 2017. With 24-hour operations, the airfield and a 39-acre cargo ramp make freight handling efficient, with no curfews. DEN is home to several world-class cargo companies and support facilities, including FedEx, UPS, Southern Air, DHL, Alpine Air Express, and United Airlines cargo. The U.S. Postal Service facility is located nearby, providing a wide array of competitive shipping and receiving options.

Facilities & Infrastructure

DEN serves its ever-expanding travel market with six runways, three concourses, and 111 gates with 32 ground load positions. DEN has capacity for six additional runways, another terminal, and two additional concourses. The Jeppesen Terminal at DEN features 1.5 million square feet of space, and includes passenger ticketing, baggage claim, ground transportation, international arrivals, shops and restaurants, office areas, and Transportation Security Administration (TSA) security checkpoints. Located adjacent to the Jeppesen Terminal is the Westin Denver International Airport, which opened in 2015. The Westin offers 519 guest rooms, 37,500 square feet of conference space, 15 meeting rooms, and an open-air plaza for arts and entertainment.

Over the last several years, DEN has invested significantly in its technology infrastructure and services. In 2017, independent testing by Internet speed company Ookla found that DEN’s free WiFi is the fastest among any airport in the world. Since 2014, DEN has invested more than $3 million in new WiFi infrastructure throughout the terminal, concourses, and other areas of the airport with speeds up to 150 megabits per second. DEN also deploys the state-of-the-art Saab Sensis Aerobahn Surface Management System that provides airport operations managers with real-time information regarding aircraft deicing operations. Since 2010, DEN has worked closely with the Federal Aviation Administration (FAA), Jeppesen, the major airlines, and Rocky Mountain and Centennial Airports to implement NextGen and Unmanned Aircraft Systems (UAS) programs. DEN is at the forefront of developing, testing, and implementing NextGen flight procedures.
and was the first commercial airport to design a truly comprehensive plan of Area Navigation (RNAV) that allows aircraft to fly more predictable and smoother approaches into Denver that reduce fuel consumption and noise. In 2017, DEN surpassed 50,000 aircraft approaches using NextGen technology. DEN continues to work with airport stakeholders toward even more advanced procedures that are expected to save equipped aircraft up to 30 nautical miles per approach during inclement weather, resulting in even greater cost savings to the airlines due to reduced fuel consumption.

**Sustainability**

DEN was the first airport in the nation to receive ISO 14001 Environmental Management System certification in 2004. DEN also received the Outstanding Sustainability Infrastructure Development award in 2017 for the Hotel and Transit Center project and once again received the international Airport Carbon Accreditation in 2017. Additionally, DEN is a Gold Member of the Colorado Department of Public Health and Environment’s Environmental Leadership Program. The airport continually works to reduce its carbon footprint through a variety of energy-efficient technologies. DEN currently recycles or reuses 21 different types of materials, including approximately 75 percent of collected aircraft deicing fluids.

Since 2008, DEN has been committed to investing in on-site renewable energy technology. DEN has one of the largest airport solar installations in the world and is home to five photovoltaic solar arrays, including one solar array used as covered parking at 61st Avenue and Peña Boulevard. The airport also has one of the largest compressed natural gas fleets in the country including buses, sweepers, and other alternatively fueled vehicles, and over 120 electric and hybrid electric vehicles. In 2017, DEN ranked No.3 among 50 winners of the Government Green Fleet Award. DEN’s fleet uses 73 percent compressed natural gas fuel for lower emissions, and the airport recently established a lean fleet program and upgraded its emissions testing programs. Alternative vehicles make up 51 percent of the airport’s light duty fleet. DEN is undergoing several energy conservation upgrades including replacing older lighting with newer, more efficient lighting and upgrading its heating and air conditioning systems.

**Reliever Airports**

Three reliever airports—those designated by the FAA to relieve traffic at commercial airports and general aviation airports, and provide other aviation services—are strategically located throughout the nine-county region.

- **Centennial Airport** (APA) is the premier international reliever and business airport in the U.S. connecting people, places and product. Supporting 23 business parks and 6,000-plus businesses in the south metro area, the airport provides all services necessary to compete in the global economy. Located on 1,400 acres, APA has four award-winning fixed-based operators with premium hangar space providing all concierge services, a fully staffed 24/7 FAA Air Traffic Control Tower, and 24/7 on-demand U.S. Customs clearances. APA has top-ranked caterers, three runways including a 10,000-foot CAT 1 ILS runway, gateway service to Ronald Reagan Washington National Airport, comprehensive security, and some of the most competitive fuel prices in the country. Services such as air ambulance, law enforcement, charter, fractional, flight schools, and full 24/7 aircraft and powerplant maintenance are based at the airport. APA generates more than $1.3 billion for the region annually, the highest among the state’s general aviation airports.

- **Front Range Airport** (FTG), located six miles southeast of DEN, is one of the largest general aviation airports in the U.S. with 3,200 acres of land. FTG is the region’s only reliever airport without major residential areas nearby and no noise or over-flight impacts, and is convenient to DEN and the entire Metro Denver area with room for significant growth and development. Combined, the land mass of DEN and FTG provide a unique airport complex unlike any other location in the nation. FTG has 1,000 acres for aviation and aerospace development and is adjacent to the 6,500-acre Western Transport business park planned for development to support airport-related commercial and business activities. The airport has the nation’s tallest general aviation tower, which controls two 8,000-foot/CAT 1 ILS full-precision runways and associated taxiway and ramp system. CDOT’s Division of Aeronautics offices, outstanding fixed-based operator and concierge services, exceptional restaurant and full service catering services, aircraft maintenance, flight training, and aircraft hanging and storage are all available at FTG, supporting military, law enforcement, medical, corporate, and private aircraft operations. Spaceport Colorado will create an aerospace technology park on the airport campus for research and commercial development and the FAA is expected to issue a spaceport operator license in 2018. FTG has an annual economic impact of more than $75 million, supporting 489 jobs with an annual payroll of $32 million.
• **Rocky Mountain Metropolitan Airport (BJC)**, located between downtown Denver and Boulder, is the most convenient reliever airport to downtown Denver, and the fourth-busiest airport in Colorado. Averaging nearly 144,000 operations each year, BJC has three runways, including a 9,000-foot CAT 1 ILS runway, and offers a user-fee U.S. Customs Office open 24 hours a day. BJC is an FAA Part 139 Certified Airport with regional air service and large, on-demand aircraft charter. BJC is home to more than 50 aviation-related companies and flight departments, including the U.S. headquarters of Pilatus Business Aircraft, the U.S. Forest Service tanker base, and the National Center for Atmospheric Research. Located on 1,700 acres, BJC is adjacent to the Interlocken Business Park, the Verve Innovation Park, and the Westmoor Technology Park. A new, state-of-the-art FAA control tower opened in 2012. The airport generates more than $460 million in annual economic impact to the region.

**General Aviation Airports**

Five general aviation airports are located in the nine-county region:

- Boulder Municipal Airport
- Erie Municipal Airport
- Greeley-Weld County Airport
- Northern Colorado Regional Airport
- Vance Brand Municipal Airport

In 2017, the FAA contracted with Canada-based Searidge Technologies to build a virtual air-traffic control tower at Northern Colorado Regional Airport. The project will use cameras and radar that will be monitored and controlled at the airport to improve safety and help attract commercial airlines.

**Industry Infrastructure Support**

Metro Denver’s airports receive significant support from the region, especially from CDOT’s Division of Aeronautics and the Metro Denver Aviation Coalition (MDAC). Established in 1991, CDOT’s Division of Aeronautics supports Colorado’s general aviation and regional commercial aviation community through aviation fuel tax revenues, a discretionary aviation grant program, and long-range system planning in partnership with Colorado’s general aviation airports. MDAC is an industry affiliate of the Metro Denver Economic Development Corporation that serves as a private-sector advocate dedicated to the continued growth and development of the region’s aviation industry, including the long-term growth and vision of DEN and Metro Denver’s three reliever and five general aviation airports.

The Colorado Aviation Business Association (CABA) is a grass-roots organization focused on communicating the value of business and general aviation to state and local communities, better integrating business and general aviation into Colorado’s broader transportation system, and improving access to rural communities throughout the state.

**2017 Industry Highlights**

**Denver International Airport Project Updates**

- DEN plans to overhaul its Great Hall area in the main terminal. The $1.8 billion project will move the Transportation Security Administration’s (TSA) security screening areas to level 6 as part of a 4-year renovation that will bring shops and restaurants to the existing space. DEN also plans to consolidate TSA’s existing checked baggage resolution areas.
- DEN began construction on a new baggage platform between levels 5 and 6 of the Jeppesen Terminal. The Baggage Handling System project will be completed in 2019 and will enable airlines to intake bags from any point on level 6 and allow the bags to move into the appropriate area under the terminal where final bag screening and loading takes place.
- DEN plans to add 39 gates to its concourses by 2021 as a result of increased passenger demand. The $1.5 billion plan, which is part of DEN’s $3.5 billion, five-year capital improvement plan, includes 12 new gates in Concourse A, 11 in Concourse B, and 16 in Concourse C.
- Bombardier Transportation Holdings will provide $162 million in maintenance and operations for DEN’s underground train system. DEN also plans to expand the system’s capacity by 2020, with the net addition of 10 train cars to the transportation system that will link the concourses to the terminal and boost reliability.
DEN opened a new parking lot at 61st and Peña Station, which features 800 parking spaces. Of the total spaces, 609 are covered by a solar canopy that is part of the larger smart-city development around the commuter rail station.

The TSA began using biometric fingerprint technology testing for passengers at DEN. Passengers enrolled in TSA's pre-check programs, who have supplied fingerprints to the TSA, will have their fingerprints scanned, with that information then connected to the passenger's boarding information.

DEN completed a $29.5 million overhaul of one of its six most-used runways. Crews replaced 72,000 square yards of pavement, improved lighting and runway sensors, and upgraded taxiway safety-areas.

DEN completed concrete repairs and replacement along six miles of Peña Boulevard, between E-470 and the Jeppesen Terminal. The $2.6 million project is part of DEN’s annual pavement rehabilitation program, which replaces deteriorating concrete on a regular basis.

**Key Company Announcements**

- **Frontier Airlines** relocated its Denver headquarters to the former occupied Prologis building at 4545 Airport Way.
- **Global SuperTanker Services LLC** signed the first-of-its kind contract with **Douglas County**. The $200,000 deal gives the County exclusive access to the world’s largest firefighting aircraft—a Boeing 747-400—that can drop roughly 20,000 gallons of water or retardant.
- Centennial-based **Air Methods Corp.** will bring more than 1,000 pilots from across the country into Denver in the next year for state-of-the-art flight simulator training. The company has roughly 1,300 pilots and is in the process of moving its headquarters from Centennial Airport to a new, 62,124-square-foot space in Greenwood Village.

Several companies unveiled plans for highly innovative aircraft.

- **Boom Technology** received $33 million in Series A funding, bringing their total funding to $41 million. The funding will allow the company to begin production on their supersonic airplane that can travel between London and New York in as little as 3.4 hours, which could fly in early 2018. The company also received 76 plane orders from five airlines after the company unveiled its newly completed airplane design.
- Two Centennial Airport-based company’s—**XTI Aircraft Company** and **Bye Aerospace Inc.**—formed an alliance to develop a new hybrid/electric vertical takeoff airplane. The new airplane’s reduced weight and efficient propulsion system will improve operability.
- **XTI Aircraft** received a U.S. Patent and Trademark Office utility patent for its TriFan 600 vertical take-off airplane. The six-seat helicopter-like airplane is designed to fly at 300 mph for more than 1,000 miles, which could launch in 2019.

**Airline Service Additions**

**Europe**

- Swiss airline **Edelweiss** will fly directly from DEN to Zurich beginning June 4, 2018. The route is expected to generate a $21 million annual economic impact with its potential to bring as many as 7,500 visitors to Denver in 2018.
- **Norwegian Air** will begin offering nonstop service from DEN to Paris beginning April 9, 2018. The new service to Charles de Gaulle will operate twice weekly and is expected to generate a $40 million annual economic impact.
- Two airlines began service between DEN and London. Norwegian Air began service to Gatwick Airport in September 2017 three days per week and **United Airlines** will launch a daily seasonal nonstop flight to London-Heathrow in March 2018. The carriers will join British Airways offering direct service to the major European city.

**North and Central America**

- **Southwest Airlines** began nonstop service to Belize City, Belize in March 2017. Belize is DEN’s fourth-largest market in Central America.
- **Air Canada** launched a new nonstop flight from DEN to Vancouver, Canada in May 2017. Vancouver is Denver’s second-largest market in Canada, and seventh-largest international market overall. Nearly 200 people per day travel between Denver and Vancouver, and the market has grown by 20 percent over the past three years.
• **Copa Airlines** began nonstop service four times a week in December 2017 between DEN and Tocumen International Airport in Panama City, Panama. Denver is Copa Airlines’ 13th U.S. destination and its 74th overall.

• United Airlines began seasonal nonstop service to Cozumel, Mexico once-a-week in December 2017. Cozumel was Denver’s largest unserved destination in Mexico.

• **Sun Country Airlines** will launch seasonal nonstop service from DEN to Mazatlán, Mexico once-a-week between Jan. 24, 2018 to March 7, 2018. Mazatlán was DEN’s second-largest unserved market in Mexico, with 6,000 annual passengers.

• Canadian carrier **WestJet** will add a daily direct flight from DEN to Calgary, Canada beginning March 2018. The new route is expected to increase passenger traffic between the two cities by 40 to 50 percent.

• **Frontier Airlines** will also begin service to Calgary, Canada beginning May 2018.

• **Southwest Airlines** grew the number of daily flights it offers out of DEN to 209, exceeding 200 daily flights at DEN for the first time. The second-largest carrier at DEN will increase the frequency of heavily traveled routes, and provide daily expansions of formerly weekend-only routes.

• **Frontier Airlines** will launch nonstop service to 21 new cities within the next year. The expansion is part of a nationwide growth plan for the Denver-headquartered airline to nearly double the number of nonstop routes it flies across the U.S. Of the 21 destinations added, 16 were markets previously served from Denver that were discontinued at some point.

### Service Milestones

• **United Airlines** celebrated 80 years of service at DEN and is the only airline to continuously operate in the city since 1937. United has operated 6.5 million flights serving more than 580 million customers over its history at DEN.

• **Spirit Airlines**, **Icelandair** and **Volaris** celebrated five years of DEN service in 2017. **Alaska Airlines** celebrated 15 years of service. **Delta** celebrated 40 years of service.

### Spaceport Colorado

In 2017, Front Range Airport continued the application process for certification from the FAA to operate as a horizontal-launch spaceport facility. The subsequent designation for Spaceport Colorado, which may be granted in 2018, fulfills a 2011 declaration by Gov. John Hickenlooper of Colorado's intent to become a spaceport state. The effort will increase Colorado’s competitiveness in the aerospace industry and support new opportunities in the future growth of commercial space research and transportation. Plans for Spaceport Colorado include the development of an aerospace and technology park to support a broad range of activities and commercial opportunities, including research and development, testing and evaluation, manufacturing, crew training, scientific research, suborbital flight, and point-to-point travel. Spaceport Colorado has an abundance of surrounding land and convenient access to Denver International Airport and the state’s sizeable aerospace industry, research universities, and talented aerospace workforce.

### Unmanned Aircraft Systems (UAS)

The nine-county region is a thriving international hub in the unmanned aircraft systems (UAS) community. The region is home to a unique concentration of UAS business and technical capabilities, including industry-leading remote sensing and data analytics products, innovative airframes, and exceptional service provider and ground control systems expertise. Extensive state supported and FAA-approved UAS test, training, and research facilities provide a world-class business environment and have contributed to the state’s leading position for the number of UAS operators per capita. Colorado is one of the few global locations offering unique features vital to UAS development including more than 35,000 square miles of FAA-approved UAS operation areas.

In addition to the wealth of academic expertise, the region also has a vibrant base of commercial and military UAS activities and receives strong support from its aerospace industry. The region’s unique variety of airspace, environmental conditions, and terrain provide the ideal geographic and business environment for UAS development, testing, and operations including the Chaffee County UAS test area, and an 8,000-square-mile air space in the San Luis Valley where testing can be conducted to heights of up to 15,000 feet. The region offers the highest altitude, most geographically diverse UAS test area in the nation, covering 5.1 million acres with operations up to 15,000 feet.
The region is actively working to further expand its UAS assembly, launch, and operational test areas. In 2017 Colorado passed legislation to study drone use by public agencies relating to certain public safety functions such as firefighting and other emergency-response operations. The study is intended to help make Colorado the nation’s center of expertise for the integration of UAS into firefighting and other emergency operations, and support growth and training opportunities for Colorado’s UAS workforce.

### UAS Assets
- **The Research and Engineering Center for Unmanned Vehicles (RECUV)** at CU Boulder is a university, government, and industry partnership dedicated to developing and integrating unmanned vehicle systems. RECUV is a pioneer in the nomadic use of unmanned aircraft and deploys systems in full compliance with FAA regulations. With over 28 FAA Certificates of Authorization (COAs), RECUV has more COAs than any other U.S. university, for 12 different UAS with access to over 100,000 square miles of airspace. RECUV is a founding site of the National Science Foundation-supported Center for UAS, the only Industry/University Cooperative Research Center devoted to providing innovative solutions to key technical challenges and superb training for future leaders in the UAS industry. The Indoor Flying Robot Lab and the mobile Ground Control Station are housed at RECUV, while the Unmanned Vehicle Systems Integration Lab and the Unmanned Systems Fabrication Lab are located in CU Boulder’s College of Engineering and Applied Science.
- **The University of Denver’s Unmanned Systems Research Institute (DU²SRI)** promotes knowledge, education, research, and development in unmanned systems, and is pushing forward the frontiers of unmanned systems to develop the next generation of fully autonomous UAS. The DU²SRI infrastructure includes five unmanned ground vehicles, one all-terrain mobile robot, more than 17 (electric and non-electric) unmanned helicopters and quadrotors, FAA-approved simulators, electronics design and fabrication capabilities, and complete UAS design and testing.
- **The U.S. Geological Survey’s (USGS) National Unmanned Aircraft Systems Project Office**, located in Denver, leads and coordinates USGS efforts to promote and develop UAS technology for civil and domestic applications. These efforts will directly benefit the U.S. Department of the Interior and USGS missions, including access to an increased level of persistent monitoring of earth surface processes (e.g. forest health conditions, monitoring wildfires, earthquake zones, and invasive species) in previously difficult to access areas.
- **Metropolitan State University of Denver** is one of the first U.S. colleges to offer classes focused specifically on piloting drones and their uses. Skills taught include management, leadership, sensors, data processing, and the legal environment. Students also get hands-on experience flying drones and are prepared for the Part 107 pilot license exam.
- **UAS Colorado** is a nonprofit business league committed to promoting and improving the aerospace industry in Colorado, particularly supporting the safe integration and use of UAS throughout the state for the benefit of the public. The group provides organizational structure and support for UAS professionals, advocates for public policy that supports UAS industry development in Colorado, promotes the safe, professional operation of UAS sites in Colorado, and conducts public awareness and public relations campaigns to help the general public understand the use and importance of UAS in Colorado.
- **The Rocky Mountain Chapter of Association for Unmanned Vehicle Systems International (AUVSI)** provides leadership to promote the growth of UAS across the Rocky Mountain Region through advocacy, education, and networking. The Chapter is also dedicated to promoting the safe and legal operation of unmanned vehicles regardless of the medium within which they operate. The Chapter and UAS Colorado host the Annual Rocky Mountain Unmanned Symposium, a two-day event intended to bring together industry professionals, government, and educational institutions to provide seminars, panel discussions, drone demonstrations, networking events, and industry vendor exhibits.

### Key Project Announcements
- **Boulder-based Black Swift Technologies** was selected by the National Oceanic and Atmospheric Administration (NOAA) to use its small unmanned aircraft system to collect wildfire measurements. Black Swift will provide an airframe, avionics, and multiple sensors that will collect data on carbon dioxide, aerosol, wildfire plumes, and other measurements. The SuperSwift technology is ideal for scientific atmospheric measurements because of its ability to fly more than two hours, the payload capacity to hold up to five pounds, and its ability to hold its payload forward-facing making it easy to swap out instruments.
- **The National Aeronautics and Space Administration (NASA)** awarded Black Swift a contract to build the SuperSwift XT drones that will explore volcanoes to improve air traffic management systems and the accuracy of ashfall measurements. The technology will be designed to collect data in harsh environments and will enhance the performance and utility of NASA’s Airborne Science fleet.
Nine-County Region Workforce

- Nearly half of the nine-county region’s 3.8 million residents under the age of 35, employers can draw from a large, young, highly educated, and productive workforce.
- Of the region’s adult population, 43.2 percent are college graduates and 91.4 percent have graduated from high school.
- The region’s population is expected to grow 32.2 percent from 2020 to 2040, driving a 21.2 percent increase in the region’s labor force over the same period.

![Educational Attainment of Metro Denver and Northern Colorado's Population Age 25 and Older](chart)

Aviation Workforce Profile

The cluster has a larger share of employees that are between the ages of 45 and 64 years old (44.7 percent), compared with the age distribution across all industries in the region (37.5 percent).

The Occupation & Salary Profile below includes the 10 largest aviation occupations in the region. For these 10 largest occupations, the chart details the total number of workers employed in that occupation across all industries, the number of available applicants that would like to be working in that occupation, the number of recent graduates that are qualified for that occupation, and the median and sample percentile annual salaries.

Wages

- 2016 average annual salary was $66,880, compared with $72,430 nationwide.
- Total payroll reached nearly $1.3 billion in 2016.
Metro Denver and Northern Colorado Aviation Occupation & Salary Profile, 2017

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Business operations specialists, all other</td>
<td>32,514</td>
<td>791</td>
<td>17</td>
<td>$74,757</td>
<td>$43,128</td>
<td>$55,758</td>
<td>$98,542</td>
<td>$126,087</td>
<td></td>
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<tr>
<td>2. Civil engineers</td>
<td>7,425</td>
<td>181</td>
<td>407</td>
<td>$88,975</td>
<td>$53,110</td>
<td>$63,929</td>
<td>$104,165</td>
<td>$129,647</td>
<td></td>
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<tr>
<td>3. Flight attendants</td>
<td>3,338</td>
<td>81</td>
<td>0</td>
<td>$46,224</td>
<td>$27,716</td>
<td>$38,741</td>
<td>$53,319</td>
<td>$64,591</td>
<td></td>
</tr>
<tr>
<td>4. Airline pilots, copilots, &amp; flight engineers</td>
<td>3,082</td>
<td>75</td>
<td>76</td>
<td>$213,513</td>
<td>$129,479</td>
<td>$150,195</td>
<td>$250,214</td>
<td>$320,154</td>
<td></td>
</tr>
<tr>
<td>5. Painters, construction &amp; maintenance</td>
<td>5,132</td>
<td>125</td>
<td>4</td>
<td>$34,265</td>
<td>$25,876</td>
<td>$28,049</td>
<td>$39,059</td>
<td>$47,879</td>
<td></td>
</tr>
<tr>
<td>6. Information &amp; record clerks, all other</td>
<td>6,840</td>
<td>166</td>
<td>0</td>
<td>$43,574</td>
<td>$27,932</td>
<td>$33,963</td>
<td>$50,140</td>
<td>$60,227</td>
<td></td>
</tr>
<tr>
<td>7. Computer occupations, all other</td>
<td>10,150</td>
<td>247</td>
<td>1,273</td>
<td>$96,284</td>
<td>$54,575</td>
<td>$72,558</td>
<td>$117,803</td>
<td>$139,140</td>
<td></td>
</tr>
<tr>
<td>8. Mechanical engineers</td>
<td>4,931</td>
<td>120</td>
<td>809</td>
<td>$100,281</td>
<td>$58,328</td>
<td>$69,960</td>
<td>$116,657</td>
<td>$153,900</td>
<td></td>
</tr>
<tr>
<td>9. General &amp; operations managers</td>
<td>31,749</td>
<td>772</td>
<td>5,578</td>
<td>$115,241</td>
<td>$47,968</td>
<td>$72,558</td>
<td>$179,035</td>
<td>$261,240</td>
<td></td>
</tr>
<tr>
<td>10. Transportation workers, all others</td>
<td>1,866</td>
<td>45</td>
<td>20</td>
<td>$43,249</td>
<td>$21,118</td>
<td>$26,440</td>
<td>$55,343</td>
<td>$62,272</td>
<td></td>
</tr>
</tbody>
</table>

Notes: The number of available applicants is a point-in-time measurement of the number of people who have registered in Colorado’s workforce development system’s statewide database, Connecting Colorado, as being able and available to work in a particular occupation. Results should be interpreted with caution since registration in Connecting Colorado is self-reported. In addition, the skills rubric may assign up to four occupation codes for each registrant. Therefore, the number of available applicants could be inflated. Source: Provided by Arapahoe/Douglas Works!; QCEW Employees, Non-QCEW Employees, & Self Employed - EMSI 2017.3 Class of Worker.

Education & Training

Colorado’s higher education system provides an excellent support system for businesses in the region. There are 28 public higher education institutions in Colorado, of which seven four-year and six two-year public institutions offering comprehensive curricula are located in the nine-county region. There are more than 100 private and religious accredited institutions and more than 350 private occupational and technical schools offering courses in dozens of program areas throughout the state. The state higher education system served about 255,510 students in FY 2015-16, while 86,070 students received a degree, diploma, certificate, or other formal award over the same period of time. Although not exhaustive, a list of the major, accredited educational institutions with the greatest number of graduates for each of the 10 largest aviation occupations in the nine-county region are included below. A directory of all higher education institutions with corresponding websites may be accessed via [http://highered.colorado.gov](http://highered.colorado.gov).

- Colorado State University
  - [www.colostate.edu](http://www.colostate.edu)
- Colorado State University Global Campus
  - [www.colostate.edu](http://www.colostate.edu)
- Colorado School of Mines
  - [www.mines.edu](http://www.mines.edu)
- Front Range Community College
  - [www.frontrange.edu](http://www.frontrange.edu)
- Metropolitan State University of Denver
  - [www.msudenver.edu](http://www.msudenver.edu)
- Red Rocks Community College
  - [www.rrcc.edu](http://www.rrcc.edu)
- Regis University
  - [www.regis.edu](http://www.regis.edu)
- Spartan College of Aeronautics and Technology - Denver Campus
  - [www.spartan.edu](http://www.spartan.edu)
- University of Colorado Boulder
  - [www.colorado.edu](http://www.colorado.edu)
- University of Colorado Denver
  - [www.ucdenver.edu](http://www.ucdenver.edu)
- University of Denver
  - [www.du.edu](http://www.du.edu)
AVIATION: Metro Denver and Northern Colorado Industry Cluster Profile

Key Reasons for Aviation Companies to Locate in the Nine-County Region

The region is a top aviation location offering:

1. A prime air transportation location
   - Denver International Airport (DEN) was the sixth-busiest airport in the nation and 18th-busiest worldwide in terms of passenger traffic in 2016. (U.S. Bureau of Transportation Statistics, 2017; Airports Council International 2017; and Denver International Airport, 2017)
   - Located on the 105th meridian, Metro Denver’s central location at the exact midpoint between Tokyo and Frankfurt positions the region favorably to serve growing world markets.
   - Encompassing 53 square miles, DEN is the largest airport in North America and the second largest airport in the world. At full buildout, DEN could accommodate more than 100 million annual passengers. (Denver International Airport, 2017)
   - DEN has one of the most efficient runway layouts in the U.S., with six, non-intersecting runways and six additional runways approved to meet future global demand. DEN is home to the longest commercial runway in the nation, one of the reasons it is certified to handle Airbus 380 operations. (Denver International Airport, 2017)
   - Denver ranked No. 5 among the 20 "Best U.S. Cities for Business Travel." (On Call International, 2017)
   - DEN ranked as the second-best airport in the nation and the 28th-best airport in the world. DEN also ranked among the top five for the world’s best regional airports and ranked fourth for the best airport staff in North America. (Skytrax, 2017)
   - The University of Colorado A Line to DEN ranked No. 4 in the nation for the best U.S. airport transportation option. (Milecards.com, 2017)

   *Denver ranked No. 5 among the 20 "Best U.S. Cities for Business Travel."*  
   —On Call International, 2017

   *DEN was the sixth-busiest airport in the nation and 18th-busiest worldwide in terms of passenger traffic in 2016.*  

   - Three general purpose Foreign Trade Zones in Metro Denver and Northern Colorado allow manufacturers using imported parts and materials to expedite customs and reduce or eliminate fees and tariffs. The three zones are located near the former Stapleton Airport, one at the former WorldPort at DEN, and one at the Great Western Industrial Park in Windsor. (City and County of Denver)

2. Lower overall costs of doing business
   - Colorado ranks as one of the nation’s most favorable corporate income tax structures. The state’s corporate income tax rate of 4.63 percent is one of the lowest in the nation and is based on single-factor apportionment, which allows companies to pay taxes based solely on their sales in the state. (State of Colorado; The Tax Foundation)
   - Aircraft manufacturers or companies that are involved in the maintenance and repair, completion, or modification of aircraft located in aviation development zones can qualify for a state income tax credit of $1,200 per new full-time employee. (Colorado Department of Revenue)
   - Colorado provides sales and use tax exemptions for on-demand air carriers and eligible aircraft that on-demand air carriers utilize only for the purpose of final assembly, maintenance, modification, or completion of the aircraft manufacturing process. (Exemption clarified in Colorado House Bill 14-1374)
   - The City and County of Denver supports a business-friendly climate for aviation companies. The city provides sales and use tax exemptions on aviation parts. (The City and County of Denver, 2017)
   - Colorado’s fly-away sales tax exemption on planes manufactured in Colorado, a valuable incentive for aircraft manufactures, applies to aircraft built in Colorado but housed in another state. (State of Colorado, Office of the Governor)

   *Metro Denver ranked fourth among the "Best Places for Business and Careers" in 2017.*  
   —Forbes, 2017
3. Access to aviation-related training programs

- The Aviation and Aerospace Science Department at Metropolitan State University of Denver (MSU Denver) is one of the largest and most advanced collegiate aviation programs in the country. The Robert K. Mock World Indoor Airport, located on campus, is one of the world’s premier collegiate aviation and aerospace computer and flight simulation training laboratories.

- The nine-county region offers more than 20 flight training schools at Boulder Municipal Airport, Centennial Airport, Erie Municipal Airport, Northern Colorado Regional Airport, Front Range Airport, and Rocky Mountain Metropolitan Airport. These schools provide pilot training, aviation instruction, and certification programs. (Metropolitan State University of Denver, 2017)

- Aims Community College and MSU Denver are among 36 schools in the nation approved under the FAA’s Air Traffic Collegiate Training Initiative. (Federal Aviation Administration, 2017)

- Spartan College of Aeronautics and Technology, located near Rocky Mountain Metropolitan Airport, offers programs in airframe and power plants (A&P) and aviation electronics technology. (Spartan College, 2017)

4. An overall better quality of life

- Metro Denver ranked as the nation’s seventh-fittest metropolitan area in 2017. Low obesity, increased physical activity, and low prevalence of diabetes and heart disease contributed to its high rank. (American College of Sports Medicine, 2017)

- Denver was named as the second-best place to live in the U.S. in 2017. The city’s desirability, prominent research institutions, and growing job market contributed to its notable rank. (U.S. News & World Report, 2017)

- The city of Lone Tree ranked seventh in the “Best Places to Live” list. Superior (49th) and Louisville (50th) were named to the list’s top-50 locations. (MONEY Magazine, 2017)

- FasTracks is a multibillion dollar comprehensive transit expansion plan to build 122 miles of new commuter rail and light rail, extend existing routes, and expand the regional bus network across the eight-county district.

- Metro Denver has a semi-arid, four-season climate with mild temperatures and nearly 300 days of annual sunshine. (U.S. National Oceanic and Atmospheric Administration, National Climatic Data Center, 2017)

For additional information, contact us:

1445 Market Street
Denver, CO 80202-1790
303.620.8092
email: info@metrodenver.org
www.metrodenver.org

For more information on the region’s aviation cluster:

303.620.8083
email: info@metrodenver.org
www.metrodenver.org/MDAC

Industry Overview

Colorado is a leader in the beverage production industry. Fresh ingredients, robust markets, and a highly innovative workforce drive this growing part of the Metro Denver economy. Companies in the beverage production cluster manufacture everything from malt beverages to herbal teas. It supports business activities in agriculture, energy, and bioscience sectors, as similar production processes and raw materials are used. Though not specifically included in this cluster, ancillary services such as bottle and can manufacturing are readily available in the nine-county Metro Denver and Northern Colorado region.¹

The beverage production cluster in the region ranks as having the second-highest employment concentration out of the 50 largest metropolitan areas in 2017. The region has the fourth-largest beverage production sector in the nation, with 9,790 workers at nearly 240 companies. The beverage production cluster posted 4.7 percent employment growth between 2016 and 2017, rising for the eighth-consecutive year. Between 2012 and 2017, employment in the region’s beverage production cluster rose 29.4 percent and added 2,230 jobs over this five-year period.

The MillerCoors Brewery in Golden is synonymous with Colorado and was founded in Golden in 1873. Fort Collins is home to Anheuser-Busch InBev, which opened a brewery in 1988 and runs distribution companies in Colorado. The company recently announced a $28.9 million investment into its Fort Collins facility. The region is also home to both large and small breweries, and numerous wineries, distilleries, and cideries. Beverage production companies in the region have adopted the “grain-to-glass” philosophy, providing everything from the malted barley, grain, yeast, and fruit from the Western Slope to the finished product. The Global Barley Research Center at Anheuser-Busch’s Fort Collins brewery breeds about 1,500 new grain varieties to offer higher yields at harvest, use less water, and become more disease- and pest-resistant. MillerCoors sources 25 percent of the grain for its beers from 180 farmers and 47,000 acres in Colorado. The company also operates a 1,100-acre grain test farm to improve its proprietary Moravian barley for arid Colorado seasons, among other maladies. Fort Collins-based companies Colorado Malting and Troubadour Maltings deliver malted barley for smaller beer makers and custom-malt some of the barley to suit specific beers at specific locations. Denver-based Inland Island Yeast Laboratories offers the highest yeast cell count in the industry among its 300 strains and is the fourth largest national yeast supplier.

Several of the region’s companies have revolutionized the craft canned market, one of the fastest growing segments of the industry. Boulder-based Wild Goose Canning Systems has outgrown three Boulder spaces and will move in 2018 to Louisville to accommodate growth. Longmont-based CanSource manufactured 40 million cans in 2017, up from 25 million in 2016, and was named as one of the nation’s fastest growing companies, according to Inc. magazine. Windsor’s Anheuser-Busch Metal Container Corp. facility is one of the company’s five canning plants across the nation and manufactures more than 2 billion aluminum cans each year. Since 2009, Anheuser-Busch has invested about $14 million into the Windsor plant and celebrated its 30th anniversary in 2017. Other major canning and support operations include Ball Corporation’s Metal Beverage Packaging Division in Golden and the O-I glass manufacturing plant in Windsor.

¹ The nine-county region is comprised of two principal areas, Metro Denver and Northern Colorado. Metro Denver consists of Adams, Arapahoe, Boulder, Broomfield, Denver, Douglas, and Jefferson counties. Northern Colorado consists of Larimer and Weld counties.
Craft Beer

The region has a strong presence of craft breweries, or those that produce less than 6 million barrels of beer per year and have less than 25 percent outside ownership, that are a vibrant economic force. According to the Boulder-based Brewers Association, Colorado craft beer has grown to a $3 billion industry, nearly tripling its economic impact since 2014. Colorado craft beer has the highest economic impact per capita of any state, excluding major breweries. Colorado has the second-highest number of craft breweries in the nation, with nearly 350, including New Belgium Brewing Company and Oskar Blues Brewing. Colorado has roughly six breweries for every 100,000 residents. The state has the third-highest craft beer production, totaling over 1.4 million barrels of craft brew produced each year.

The Great American Beer Festival (GABF), hosted by the Brewers Association, is one of the largest commercial beer competitions and beer festivals in the world. In 2017, the GABF created an economic impact of over $35 million, attracted 60,000 attendees, expanded to 800 breweries, and over 7,900 beers entered the competition—a nearly 15 percent increase over 2016. Another growing trend across Colorado’s craft beer industry is brewing collaboratively. Roughly 180 breweries from across Colorado and the U.S. have combined their beers, ranging from standard pale ales to kettle sours with habanero and raspberries.

Several specialized industry sectors and companies have prospered with the growth of the craft-brewing boom, including brewing software developers and event producers. Boulder-based Arryved is a point-of-sale service company that caters to breweries and provides tools to manage and view sales data. The software is currently used in several Metro Denver breweries including Avery Brewing Co., Left Hand Brewing, and Denver Beer Co. Several companies are also growing their beer-promotion services. Denver-based event-production company Two Parts offers an annual Festivus celebration bringing together all of Denver’s breweries each December. The company provides beer festivals, events, and promotion services for the craft beer industry. Another local company, Customized Craft Beer Programs, provides professional craft beer events, staff training, craft beer programming, and other craft beer services.

Distilleries

The region is home to more than 30 craft distilleries, offering a unique variety of liquors that boast farm-fresh ingredients. Across the state, over 80 craft distilleries—double the number from just five years ago and up 11.1 percent from a year ago—contribute more than $30 million annually into the state’s economy. Stranahan’s Colorado Whiskey in Denver, the first microdistillery in Colorado, was one of the nation’s early craft whiskey distillers. Other distillers are making a significant impact in Metro Denver. Denver-based Leopold Bros. designed the nation’s largest malting floor, where 700,000 pounds of barley produces nearly 50 varieties of liquor. Several new distillers joined the community in 2017, including Longmont’s Longtucky Spirits and Loveland’s Big Fat Pastor Spirits.

Wineries & Cideries

The state’s wine industry began in the Grand Valley on the western slope more than a century ago. On average, production and sales of local wine in Colorado has grown 15 percent per year since 1992. Over the last several years, there has been a gradual shift toward locating wineries and cideries in Metro Denver as a result of the growing desire for local products by both residents and tourists. Wineries and cideries along the Front Range now outnumber those west of the Continental Divide among Colorado’s approximately 180 wine and cider producers. Five of the 12 wineries that won awards at the recent Governor’s Cup are from the Metro Denver region. Several producers are generating national attention. Denver’s Infinite Monkey Theorem and Boulder’s Decadent Saint are distributing into multiple states and are increasing their market share in stores and restaurants. Craft hard cider may be the smallest and newest of Colorado’s liquid-asset industries. The Metro Denver region is home to over 15 cider producers that continue to innovate new products daily, including large cider producers such as Denver-based C Squared Ciders and Colorado Cider Company.

The wine and cider industry hosts several events to showcase its products. The Denver International Wine Festival was recently recognized by Food & Wine magazine as one of the “Best Wine Festivals Across America,” attracting vintners from around the world and showcasing the largest selection of international and domestic wines in the Rocky Mountain region. Several Metro Denver festivals, including The Mile High Wine Fest, Lakewood Cider Days, and Morrison Ciderfest, celebrate the local craft cider culture.
Other Beverages

The region also includes numerous milk, water, coffee, soft drink, tea, and fruit juice manufacturers. Celestial Seasonings in Boulder is one of the world’s largest herbal tea manufacturers. DanoneWave is a leading plant-based beverage company in North America and its widely-known brands include Silk, So Delicious, International Delight, and Horizon Organic. Additionally, MeadowGold Dairy® is the inter-mountain region’s oldest and largest full-service dairy company, producing fresh quality dairy products since 1901. Large bottled water companies in the region include Nestlé Waters North America, Niagara Bottling, and Eldorado Springs Water. In fact, Nestlé Waters North America is one of the nation’s largest bottled water companies, distributing seven of the top 10 brands in North America. Major beverage distributors located in the region include Pepsi-Cola, Coca-Cola, and 7-Up Bottling Co. Coca-Cola has invested $50 million along the Front Range since expanding to the area in 2014.

Beverage Production Economic Profile

The beverage production industry cluster is defined by 12, six-digit North American Industry Classification System (NAICS) codes including malt beverages, wines, distilled liquors, and bottled drinks ranging from milk, water, and coffee to soft drinks, tea, sports drinks, and fruit juices.

### Beverage Production Employment and Company Profile, 2017

<table>
<thead>
<tr>
<th>Nine-County Region</th>
<th>United States</th>
</tr>
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<tbody>
<tr>
<td>Direct employment, 2017</td>
<td>9,790</td>
</tr>
<tr>
<td>Number of direct companies, 2017</td>
<td>240</td>
</tr>
<tr>
<td>One-year direct employment growth, 2016-2017</td>
<td>4.7%</td>
</tr>
<tr>
<td>Five-year direct employment growth, 2012-2017</td>
<td>29.4%</td>
</tr>
<tr>
<td>Avg. annual direct employment growth, 2012-2017</td>
<td>5.3%</td>
</tr>
<tr>
<td>Direct employment concentration</td>
<td>0.4%</td>
</tr>
</tbody>
</table>

### Nine-County Rankings

| Beverage production direct employment concentration rank | 2nd |
| Beverage production direct employment rank | 4th |

### Beverage Production Number of Employees Growth Rate

<table>
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<tr>
<th>Year</th>
<th>Nine-County Region</th>
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</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>10%</td>
<td>10%</td>
</tr>
<tr>
<td>2013</td>
<td>5%</td>
<td>5%</td>
</tr>
<tr>
<td>2014</td>
<td>0%</td>
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<td>2015</td>
<td>0%</td>
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<td>2016</td>
<td>0%</td>
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</tr>
<tr>
<td>2017</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Avg Annual Growth</td>
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</tr>
</tbody>
</table>

### Beverage Production Employment by County, 2017

- **Jefferson**: 23.3%
- **Denver**: 21.7%
- **Boulder**: 10.6%
- **Arapahoe**: 12.0%
- **Larimer**: 16.5%
- **Weld**: 4.6%
- **Douglas**: 1.7%
- **Broomfield**: 6.1%

### Beverage Production Employment by Category, 2017

- **Malt Beverage Mfg.**: 47.2%
- **Distilled & Blended Liquor Mfg.**: 1.1%
- **Wine Mfg.**: 2.3%
- **Coffee & Tea Mfg.**: 6.9%
- **Milk Mfg.**: 16.8%
- **Soft Drink, Bottled Water, & Ice Mfg.**: 24.7%
- **All Other Beverage Mfg.**: 1.0%

---

2 Direct employment rank based on the number of employees in the industry cluster in a region. Employment concentration rank based on the direct cluster employment in a region expressed as a percent of total employment in all industries in the same region. Rankings are for the 50 largest metropolitan statistical areas (MSAs). No multiplier effects are included. 1st = highest for both rankings.
BEVERAGE PRODUCTION:
Metro Denver and Northern Colorado Industry Cluster Profile

Major Beverage Production Companies (top 10 based on employment size)

- Anheuser-Busch InBev
  www.anheuser-busch.com
- Celestial Seasonings
  www.celestialseasonings.com
- Coca-Cola Company
  www.coca-colacompany.com
- DanoneWave
  www.whitewave.com
- Dr. Pepper Snapple Group (7-Up Bottling)
  www.drpeppersnapplegroup.com
- Meadow Gold Dairy
  www.meadowgold.com
- MillerCoors
  www.millercoors.com
- New Belgium Brewing Company
  www.newbelgium.com
- Noosa Yoghurt
  www.noosayoghurt.com
- Pepsi-Cola
  www.pepsico.com

2017 Industry Highlights

Key Company Announcements (alphabetical by company name)

Breweries

- Anheuser-Busch InBev plans to invest $28.9 million at its Fort Collins brewery, including upgrades to its nearby Global Barley Research Center. The investments support expansion of the aluminum bottle line and implementation of new technology, such as new dry-hop capabilities that allow them to brew styles of beer that require various quantities of hops. The Colorado investments are part of Anheuser-Busch’s national commitment of almost $500 million across its facilities in the U.S. in 2017, and $2 billion through 2020.

- Boulder Beer Company opened its second Boulder location at the former Walnut Brewery space near Pearl Street Mall. The company will maintain its taproom and production facility on Wilderness Place.

- BURLY Brewing Co. will open its first location in Castle Rock in early 2018, with the ability to produce up to 3,000 barrels annually. The brewery will start with brewing for the taproom, with some local keg distribution, and eventually add canning and bottling operations.

- Declaration Brewing Co. added 5,000 square feet of warehouse space near its current Denver brewery to decentralize grain and milling operations. The space will be used for beer-related experiments and will house their new grain-grinding setup. With the new addition, the brewery aims to brew 20,000 barrels of beer a year and expand distribution into Wyoming.

- Denver Beer Co. opened a new 4,350-square-foot brewery and taproom in Olde Town Arvada. The location features seven-barrel beer-making capacity.

- Boulder-based FATE Brewing Co. opened a brewery and tasting room in Louisville. FATE Brewing will use the new location to expand its production capacity.

- Highlands Ranch-based Grist Brewing Co. opened its second Metro Denver taproom near Park Meadows Mall in May 2017. The second taproom will be geared towards smaller batches and supplying the demand of their customers.

- Odell Brewing Co. opened a second 4,000-square-foot taproom and brewhouse in the River North neighborhood. The two-story facility includes a 10-barrel pilot brewhouse, an outdoor patio, and space for live performances.

- River North Brewery will open a 4,000-square-foot taproom at 34th Ave. and Blake Street in early 2018. The Blake Street location will accommodate between 800 and 1,000 barrels of beer annually with a five- to seven-barrel brewhouse.

- Two Denver craft breweries, Strange Craft Beer and Wit’s End Brewing, will combine their taprooms and brewing operations. Strange Craft will handle distribution for Wit’s End, likely expanding the number of places where Wit’s End is served.

- Upstart 14er Brewing Co. will open a 3,000-square-foot brewery and tasting room at the corner of 28th Avenue and Walnut Street in Denver’s River North neighborhood. The brewery is slated to open in early 2018 and will feature a 10-barrel brewing system.

Wineries

- Bigsby’s Folly Craft Winery & Restaurant opened a 7,000-square-foot warehouse in the River North neighborhood. The winery includes a tasting room, outdoor patio, and a barrel view area where patrons can view the wine being made.
Distilleries

- The **Block Distilling Co.** opened a new 2,600-square-foot location in the River North neighborhood. The company will start a lineup of vodka and gin, followed by brandies and whiskey that are in the aging process. The company expects to expand its production with another 2,400 square feet in 2018.

- **Denver Distillery** opened a new location on South Broadway in Denver. The 1,500-square-foot distillery will make liqueur, moonshine, rum, and gin, and plans to make vodka, whiskey, and absinthe.

- **Hogback Distillery** opened a 2,000-square-foot production facility in Wheat Ridge. Hogback will concentrate on Scottish-style whiskey with international appeal.

- **Laws Whiskey** opened a second 31,000-square-foot storehouse in Denver that can hold up to 10,000 barrels, up from the 1,600 barrels at the current distillery. The company will add 10 to 12 more fermenting tanks, a new still, and a cooker to quadruple its whiskey output.

Cideries

- **Clear Fork Cider** opened its first production space at 16th Avenue and Lafayette Street in Denver. The facility has the capacity for up to 1,700 gallons of cider annually.

- The owner of **Colorado Plus Brew Pub** will open a new 2,900-square-foot cidery and restaurant in Golden in April 2018.

- **Haykin Family Cider** opened its first 1,650-square-foot cidery in Aurora. The location will house a production facility and a tasting room.

- **Stem Ciders** will opened a new $7 million taproom, demonstration orchard, and production facility in Lafayette. Once the 30,000-square-foot facility is completed, the company will have the capacity to make 100,000 barrels of cider.

Other Beverage

- Boulder-based **Alpine Start**, maker of instant coffee geared toward campers and climbers, raised $1 million in venture capital. The funding will be used to expand the company’s marketing and sales team.

- Boulder-based chai tea maker **Bhakti Inc.** raised $5.3 million in Series D financing. The company produces tea concentrate, iced chai, tea leaves for brewing, and sparkling tea beverages.

- French multinational dairy company **Danone** completed its $10 billion purchase of Broomfield-based **WhiteWave Foods Co.** The combined company operates as **DanoneWave**, with dual headquarters in Broomfield and White Plains, N.Y. DanoneWave is the largest public benefit corporation in the U.S.

- Denver-based coffee roaster **Logan House Coffee Company** will open its second location at Catalyst HTI in the River North neighborhood.

- **Nestlé Waters North America** is launching a new ReadyRefresh facility in Denver. It is a 10,000 square-foot expansion to the company’s existing 350,000-square-foot facility. Coinciding with the move, the company will increase its delivery truck fleet from two to 30 vehicles, serving customers in a 50-mile radius.

- Denver-based **New Age Beverage Corp.** raised $15 million in a public stock offering. The company was founded 14 years ago and distributes XingTea, Aspen Pure Rocky Mountain Water, Buche Live Kombucha, Marley One Drop Coffee, and Marley Mellow Mood Mood Relaxation Drinks.

- **Swire Coca-Cola USA** acquired Coca-Cola’s Production Center in Denver. The company built a new distribution center in Denver’s Stapleton neighborhood in 2014, opened a distribution center in Pueblo in 2016, and opened a distribution facility in Johnstown in early 2017 as a result of increasing product demand.

- **TruBucha** opened a 1,900-square-foot kombucha taphouse and production facility in Lone Tree. The company makes up to 40 barrels per week.

- **WTRMLN WTR**, which makes cold-pressed watermelon water, is moving its headquarters to Denver. The company, whose product is sold in more than 10,000 stores across the country, cited Denver’s reputation for a healthy lifestyle as motivation for its move.
Nine-County Region Workforce

- Nearly half of the nine-county region’s 3.8 million residents are under the age of 35. Employers can draw from a large young, highly educated, and productive workforce.
- Of the region’s adult population, 43.2 percent are college graduates and 91.4 percent have graduated from high school.
- The region’s population is expected to grow 32.2 percent from 2020 to 2040, driving a 21.2 percent increase in the region’s labor force over the same period.

Beverage Production Workforce Profile

The cluster has a larger share of employees that are between the ages of 25 and 44 years (55.4 percent), compared with the age distribution of all industries across the nine-county region (45.1 percent).

The Occupation & Salary Profile below includes the 10 largest beverage production occupations in the region. For these 10 largest occupations, the chart details the total number of workers employed in that occupation across all industries, the number of available applicants that would like to be working in that occupation, the number of recent graduates that are qualified for that occupation, and the median and sample percentile annual salaries.
BEVERAGE PRODUCTION:
Metro Denver and Northern Colorado Industry Cluster Profile

Wages
- 2016 average annual salary was $59,600, compared with $54,610 nationwide.
- Total payroll reached nearly $557 million in 2016.

Metro Denver and Northern Colorado Beverage Production Occupation & Salary Profile, 2017

<table>
<thead>
<tr>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Packaging &amp; filling machine operators &amp; tenders</td>
<td>4,636</td>
<td>113</td>
<td>0</td>
<td>$29,679</td>
<td>$20,181</td>
<td>$23,639</td>
<td>$41,743</td>
<td>$52,712</td>
</tr>
<tr>
<td>2. Separating, filtering, clarifying, precipitating, &amp; still machine setters, operators, &amp; tenders</td>
<td>1,325</td>
<td>161</td>
<td>0</td>
<td>$35,736</td>
<td>$22,612</td>
<td>$27,141</td>
<td>$37,882</td>
<td>$47,581</td>
</tr>
<tr>
<td>3. Industrial truck &amp; tractor operators</td>
<td>6,823</td>
<td>850</td>
<td>0</td>
<td>$34,482</td>
<td>$23,296</td>
<td>$28,091</td>
<td>$35,326</td>
<td>$41,439</td>
</tr>
<tr>
<td>4. Food batchmakers</td>
<td>1,974</td>
<td>338</td>
<td>96</td>
<td>$24,468</td>
<td>$19,347</td>
<td>$21,201</td>
<td>$27,614</td>
<td>$29,654</td>
</tr>
<tr>
<td>5. Laborers &amp; freight, stock, &amp; material movers, hand</td>
<td>27,156</td>
<td>4,402</td>
<td>0</td>
<td>$27,616</td>
<td>$19,726</td>
<td>$22,481</td>
<td>$29,139</td>
<td>$34,597</td>
</tr>
<tr>
<td>6. Industrial machinery mechanics</td>
<td>3,523</td>
<td>470</td>
<td>44</td>
<td>$56,523</td>
<td>$35,132</td>
<td>$43,373</td>
<td>$58,167</td>
<td>$68,558</td>
</tr>
<tr>
<td>7. Stock clerks &amp; order fillers</td>
<td>24,409</td>
<td>3,665</td>
<td>4</td>
<td>$25,044</td>
<td>$18,885</td>
<td>$20,896</td>
<td>$28,614</td>
<td>$34,599</td>
</tr>
<tr>
<td>8. General &amp; operations managers</td>
<td>31,749</td>
<td>772</td>
<td>5,578</td>
<td>$115,241</td>
<td>$47,968</td>
<td>$72,558</td>
<td>$179,035</td>
<td>$261,240</td>
</tr>
<tr>
<td>9. Heavy &amp; tractor-trailer truck drivers</td>
<td>20,384</td>
<td>2,752</td>
<td>0</td>
<td>$46,278</td>
<td>$33,005</td>
<td>$39,006</td>
<td>$48,271</td>
<td>$55,249</td>
</tr>
<tr>
<td>10. First-line supervisors of production &amp; operating workers</td>
<td>4,881</td>
<td>119</td>
<td>0</td>
<td>$61,170</td>
<td>$36,756</td>
<td>$45,986</td>
<td>$78,604</td>
<td>$98,736</td>
</tr>
</tbody>
</table>

Notes: The number of available applicants is a point-in-time measurement of the number of people who have registered in Colorado’s workforce development system’s statewide database, Connecting Colorado, as being able and available to work in a particular occupation. Results should be interpreted with caution since registration in Connecting Colorado is self-reported. In addition, the skills rubric may assign up to four occupation codes for each registrant. Therefore, the number of available applicants could be inflated. Source: Provided by Arapahoe/Douglas Works!; QCEW Employees, Non-QCEW Employees, & Self Employed - EMSI 2017.3 Class of Worker.

Education & Training
Colorado’s higher education system provides an excellent support system for businesses in the region. There are 28 public higher education institutions in Colorado, of which seven four-year and six two-year public institutions offering comprehensive curricula are located in the nine-county region. In addition, there are more than 100 private and religious accredited institutions and more than 350 private occupational and technical schools offering courses in dozens of program areas throughout the state. The state higher education system served about 255,510 students in FY 2015-16, while 86,070 students received a degree, diploma, certificate, or other formal award over the same period of time. Although not exhaustive, a list of the major, accredited educational institutions with the greatest number of graduates for each of the 10 largest beverage production occupations in the nine-county region are included below. A directory of all higher education institutions with corresponding websites may be accessed via [http://highered.colorado.gov](http://highered.colorado.gov).

- Colorado State University
  [www.colostate.edu](http://www.colostate.edu)
- Red Rocks Community College
  [www.rrcc.edu](http://www.rrcc.edu)
- University of Denver
  [www.du.edu](http://www.du.edu)
- Colorado State University Global Campus
  [www.colostate.edu](http://www.colostate.edu)
- Regis University
  [www.regis.edu](http://www.regis.edu)
- University of Northern Colorado
  [www.unco.edu](http://www.unco.edu)
- Front Range Community College
  [www.frontrange.edu](http://www.frontrange.edu)
- University of Colorado Boulder
  [www.colorado.edu](http://www.colorado.edu)
- Metropolitan State University of Denver
  [www.msudenver.edu](http://www.msudenver.edu)
- University of Colorado Denver
  [www.ucdenver.edu](http://www.ucdenver.edu)
Academic and Education Announcements

**Metro State University of Denver (MSU Denver)**
- MSU Denver invested $3.6 million into its beer-brewing program. The school plans to turn 8,000 square feet of space into a permanent brewing program, including five laboratories, 30 fermentation tanks, and an abundance of brewing equipment. MSU Denver hopes the program will work similar to a co-op, where local brewers can invest in the space upfront, then use the equipment and services.
- MSU Denver offers a Bachelor of Science in Brewery or Brewpub Operations, and a Brewing Minor/Certificate. The programs integrate training facilities within the Tivoli Brewing Company to provide students with access to a 28,000 annual barrel capacity brewing, bottling, and distribution center. The degree options blend the art and science of brewing beer with the hospitality, knowledge, and operational skills desired by the beer and brewing industry.

**Colorado State University (CSU)**
- CSU is building a pair of breweries inside Lory Student Center's Ramskeller Pub. The 264-gallon system—the largest housed at any four-year university in the nation—is part of the university’s four-year bachelor’s degree track specializing in brewing. CSU's new systems, donated by MillerCoors, will help the four-year-old fermentation science and technology program grow.
- CSU offers a Bachelor of Science in Fermentation Science and Technology. The major educates students in the science and art of fermenting beverages and foods. Students will be prepared for employment in the food and beverage industry including product development, processing, quality assurance and control, packaging and distribution, and plant management.
- CSU offers a viticulture and enology concentration. The program is designed to give students a background in food crop production with a focus on grapes and their processing into wine.
- CSU’s College of Business Beverage Business Institute (BBI) delivers education, training, and research that focuses on business operations, production, and distribution in all beverage-related industries. The Certificate in Beverage Business Management offers a unique opportunity to study business practices specific to the many facets of working with beverage. With specialized curricula, industry facilitators, customized tours, and face-to-face networking, the BBI is tailored to the needs of professionals in the beer, distribution, soda, wine, spirits, coffee, and water industries, as well as entrepreneurs, consultants, and professionals whose work tangents these areas.

**University of Northern Colorado (UNC)**
- The Brewing Laboratory Science Program at UNC prepares students for work in the quality control and quality assurance sector of the beer brewing industry. The Program includes an undergraduate certificate, a minor in Brewing Laboratory Science, and a lecture/laboratory program with hands-on intensive training in a seven-barrel microbrewery on campus.

**Regis University**
- Regis University offers a Certificate in Applied Craft Brewing at its north Denver campus. The part-time program includes nine months of coursework and a three-month brewery internship. Students who complete the program become certified beer judges through the national Beer Judge Certification Program.

**Front Range Community College (FRCC)**
- FRCC offers an Associate of Science degree with a Fermentation Sciences designation and students can transfer as a junior to CSU or MSU Denver. Students earning the degree can qualify for positions in beer brewing production, wine production, distillation technologies, and food and beverage processing, among others.
Key Reasons for Beverage Production Companies to Locate in the Nine-County Region

The region is a top beverage production location offering:

1. **Established infrastructure and burgeoning consumer base**
   - Denver ranked No. 3 in the nation among “America’s Top 20 Craft Spirits Tourism Destinations.” Denver ranked third in the large metro area category, while Boulder (No. 4) and Fort Collins (No. 7) ranked in the top 10 in the small metro area category. (Travelocity, 2017; American Distilling Institute, 2017)
   - Denver was named the “Best City for Beer Drinkers” and ranked among the top five for both breweries and bars per capita. (Zumper, 2017)
   - Boulder ranked first in the nation for the number of breweries per capita (13.3 breweries for every 100,000 people). Fort Collins (No. 3) and Denver (No. 8) ranked among the top-10. (Datafiniti, 2017)
   - Denver has the second-highest number of brewery headquarters per 100,000 people, with 252 brewery headquarters and 4.5 headquarters per 100,000 people. (CircleUp, 2017)
   - Metro Denver is home to four of the nation’s top 100 beverage companies, including MillerCoors, DanoneWave, J.M. Smucker Co., and New Belgium Brewery. (Beverage Industry, 2017)
   - Colorado ranked among the top five states for the number of craft distilleries in the nation in 2017, representing over 5 percent of the nation’s total craft distilleries. (American Craft Spirits Association, 2017)
   - Five Metro Denver microbreweries ranked among the 50 largest in the U.S., led by Fort Collins-based New Belgium (fourth), Longmont-based Oskar Blues Brewery (No. 10), Fort Collins-based Odell Brewing (No. 27), Longmont-based Left Hand Brewing (No. 44), and Boulder-based Avery Brewing (No. 48). (The Brewers Association, 2017)
   - Since 1980, Colorado’s wine industry has grown from one to more than 140 licensed wineries. Statewide production of Colorado wines has increased to 1.5 million liters or 165,000 cases of wine, or an estimated $33.1 million in retail sales. (Colorado Wine Industry Development Board, 2017)
   - Located on the 105th meridian, Metro Denver’s central location at the exact midpoint between Tokyo and Frankfurt positions the region favorably to serve growing world markets.

2. **An overall better quality of life**
   - Denver was named as the second-best place to live in the U.S. in 2017. The city’s desirability, prominent research institutions, and growing job market contributed to its notable rank. (U.S. News & World Report, 2017)
   - The city of Lone Tree ranked seventh in the “Best Places to Live” list. Superior (49th) and Louisville (50th) were named to the list's top-50 locations. (MONEY Magazine, 2017)
   - Metro Denver ranked as the nation’s seventh-fittest metropolitan area in 2017. Low obesity, increased physical activity, and low prevalence of diabetes and heart disease contributed to its high rank. (American College of Sports Medicine, 2017)
   - Colorado is home to one of the most active and healthiest populations in the nation. The state has one of the nation’s largest public parks systems, over 45 national and state parks, 11 world-class ski resorts, and the highest concentration of 13,000 and 14,000-foot peaks in the nation. (Colorado Tourism Office, 2017)

3. **Low to moderate costs of doing business and a competitive tax structure**
   - Colorado has the third-lowest distilled spirit tax in the nation, the fifth-lowest beer excise tax, and the 11th-lowest wine excise tax. (The Tax Foundation, 2017)
   - Colorado ranks as one of the nation’s most favorable corporate income tax structures. The state’s corporate income tax rate
4.63 percent is one of the lowest in the nation and is based on single-factor apportionment, which allows companies to pay taxes based solely on their sales in the state. (State of Colorado; The Tax Foundation)

- Colorado ranks as the nation’s 10th-best tax system for entrepreneurs and small business. (Small Business & Entrepreneurship Council, 2017)
- Colorado received an “A” grade for its business-friendly environment in 2017 and ranked seventh for ease of starting a business. Denver received a “B+” grade for overall friendliness. (Thumbtack.com, 2017; Ewing Marion Kauffman Foundation, 2017)

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Industry Overview

Bioscience is a thriving industry in the nine-county Metro Denver and Northern Colorado region\(^1\), with support from four top-ranked university bioscience programs, one of the highest per-capita concentrations of federally funded research facilities in the nation, and numerous incubators and accelerator programs. Opportunities for bioscience companies exist to develop technologies from concept to commercialization without having to leave the area. Further, the region’s scientific and entrepreneurial talent, supportive business climate, and competitive tax structure contribute to a dynamic and growing base of bioscience companies.

About 84 percent of the state’s bioscience companies are located in the nine-county region, with the center of the region’s bioscience cluster located at the Fitzsimons Life Science District and the adjacent Anschutz Medical Campus. As one of the most ambitious medical developments in the nation, the $5.2 billion project encompasses 578 total acres and more than six million square feet of cutting-edge space and services that will eventually support more than 43,000 bioscience and healthcare professionals.

Companies in the region continue to develop new products from inception to commercialization. Nearly 1,000 medical devices were approved by companies headquartered in Colorado, with over 60 percent concentrated in cardiovascular, general and plastic surgery, clinical chemistry, and radiology. Bioscience-related financings reached $1.2 billion and two life science companies went public in 2017. Companies in the region received at least 10 FDA approvals or clearances on biologics, medical devices, and drugs in 2017. The FDA accepted several New Drug Applications (NDAs) and granted one Investigational Device Exemption (IDE) to companies based in the region. At least five companies were granted U.S. patents or European CE marks.

The bioscience cluster is divided into two subclusters, each of which specializes in distinct aspects of the biosciences: (1) medical devices and diagnostics and (2) pharmaceuticals and biotechnology. Combined, the bioscience industry in the nine-county region is home to more than 16,100 workers in almost 730 companies. Between 2011 and 2017, bioscience employment in the nine-county region grew 7.5 percent, compared with 5.4 percent nationally. In 2017, the bioscience cluster posted 1.9 percent employment growth over-the-year and grew for the seventh-consecutive year, adding over 1,120 workers since 2011.

The medical devices and diagnostics subcluster represents roughly 70 percent of the total bioscience employment base in the region, while pharmaceuticals and biotechnology represents 30 percent. In 2017, the pharmaceuticals and biotechnology subcluster grew 4.4 percent in 2017, contributing 68 percent of the total bioscience employment increase over-the-year. The medical devices and diagnostics subcluster posted 0.9 percent growth in the region in 2017 and grew for the seventh-consecutive year. In 2017, the region had the eighth-largest medical devices and diagnostics sector in the nation. Recently, investments from international powerhouses such as Agilent Technologies and AstraZeneca have led smaller companies and local mainstays to spur growth in the cluster.

A related subcluster, although not specifically included in this report, is agricultural biotechnology. The agricultural biotechnology subcluster includes companies that utilize distinct elements of conventional breeding, biochemistry, molecular genetics, and plant physiology to improve the health of humans and animals. This subcluster employs nearly 1,170 workers in 110 companies in the region and grew an average of 4.4 percent per year between 2012 and 2017, compared with a 0.1 percent increase nationwide.

These subclusters have joined with the region’s emerging digital health industry. Born from the collaboration between healthcare and software innovations, the region is a recognized national leader in this arena. According to StartUp Health, Denver ranked among the top 10 U.S. cities for digital health funding, with five deals totaling $192 million in 2017. Prime Health, StartUp Health Colorado, and Catalyst HTI are examples of

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\(^1\) The nine-county region is comprised of two principal areas, Metro Denver and Northern Colorado. Metro Denver consists of Adams, Arapahoe, Boulder, Broomfield, Denver, Douglas, and Jefferson counties. Northern Colorado consists of Larimer and Weld counties.
partnerships to grow the region’s digital health presence. Many bioscience organizations, including the Colorado BioScience Association, are integrating healthcare innovation and technologies into their business strategies.

Medical Devices and Diagnostics Economic Profile

The medical devices and diagnostics subcluster includes companies that engineer, research, design, and manufacture medical equipment. The medical devices and diagnostics subcluster consists of eight, six-digit North American Industry Classification System (NAICS) codes.

<table>
<thead>
<tr>
<th>Medical Devices &amp; Diagnostics Employment and Company Profile, 2017</th>
<th>Nine-County Region</th>
<th>United States</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct employment, 2017</td>
<td>11,240</td>
<td>451,680</td>
</tr>
<tr>
<td>Number of direct companies, 2017</td>
<td>360</td>
<td>18,520</td>
</tr>
<tr>
<td>One-year direct employment growth, 2016-2017</td>
<td>0.9%</td>
<td>-0.1%</td>
</tr>
<tr>
<td>Five-year direct employment growth, 2012-2017</td>
<td>6.6%</td>
<td>1.8%</td>
</tr>
<tr>
<td>Avg. annual direct employment growth, 2012-2017</td>
<td>1.3%</td>
<td>0.4%</td>
</tr>
<tr>
<td>Direct employment concentration</td>
<td>0.5%</td>
<td>0.3%</td>
</tr>
</tbody>
</table>

Sources: Dun & Bradstreet, Inc., Hoover’s Online Database; Market Analysis Profile, 2012-2017; Development Research Partners.

Medical Devices & Diagnostics Employment by County, 2017

- Boulder: 32.7%
- Larimer: 10.5%
- Douglas: 5.8%
- Denver: 4.9%
- Adams: 1.9%
- Weld: 1.1%
- Broomfield: 0.6%
- Arapahoe: 11.1%
- Jefferson: 31.4%

Sources: Market Analysis Profile, 2017; Development Research Partners.

Medical Devices & Diagnostics Employment by Category, 2017

- Surgical & Medical Instruments Mfg.: 70.6%
- Diagnostic Substances Mfg.: 2.9%
- Dental Equipment & Supplies: 4.2%
- Electromedical Equipment Mfg.: 9.6%
- Analytical Instruments Mfg.: 12.6%

Sources: Market Analysis Profile, 2017; Development Research Partners.

Nine-County Rankings

- Medical devices & diagnostics direct employment rank: 8th
- Medical devices & diagnostics employment concentration rank: 12th

Direct employment rank based on the number of employees in the industry cluster in a region. Employment concentration rank based on the direct cluster employment in a region expressed as a percent of total employment in all industries in the same region. Rankings are for the 50 largest metropolitan statistical areas (MSAs). No multiplier effects are included. 1st = highest for both rankings.

Metro Denver Economic Development Corporation | February 22, 2018 | Page 2
BIOSCIENCE: Metro Denver and Northern Colorado Industry Cluster Profile

Major Medical Devices and Diagnostics Companies (top 10 based on employment size)

- AlloSource  
  [www.allosource.org](http://www.allosource.org)
- Cochlear Americas  
  [www.cochlear.com/us](http://www.cochlear.com/us)
- Hach Company  
  [www.hach.com](http://www.hach.com)
- LivaNova PLC  
  [www.livanova.com](http://www.livanova.com)
- Medtronic PLC  
  [www.medtronic.com](http://www.medtronic.com)
- Particle Measuring Systems  
  [www.pmeasuring.com](http://www.pmeasuring.com)
- Rocky Mountain Orthodontics  
  [www.rmortho.com](http://www.rmortho.com)
- SomaLogic, Inc.  
  [www.somalogic.com](http://www.somalogic.com)
- Terumo BCT, Inc.  
  [www.terumobct.com](http://www.terumobct.com)
- Zimmer BioMet  
  [www.zimmerbiomet.com](http://www.zimmerbiomet.com)

Pharmaceuticals and Biotechnology Economic Profile

Pharmaceutical companies manufacture, research, and develop pharmaceutical drugs. Biotechnology companies utilize cellular and molecular biology and medicinal chemistry to develop and commercialize therapeutic medicines. The pharmaceuticals and biotechnology subcluster consists of four, six-digit North American Industry Classification System (NAICS) codes.

<table>
<thead>
<tr>
<th>Pharmaceuticals &amp; Biotechnology Employment and Company Profile, 2017</th>
<th>Nine-County Region</th>
<th>United States</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct employment, 2017</td>
<td>4,860</td>
<td>468,110</td>
</tr>
<tr>
<td>Number of direct companies, 2017</td>
<td>370</td>
<td>21,640</td>
</tr>
<tr>
<td>One-year direct employment growth, 2016-2017</td>
<td>4.4%</td>
<td>2.9%</td>
</tr>
<tr>
<td>Five-year direct employment growth, 2012-2017</td>
<td>1.1%</td>
<td>9.0%</td>
</tr>
<tr>
<td>Avg. annual direct employment growth, 2012-2017</td>
<td>0.2%</td>
<td>1.7%</td>
</tr>
<tr>
<td>Direct employment concentration</td>
<td>0.2%</td>
<td>0.3%</td>
</tr>
</tbody>
</table>

Sources: Dun & Bradstreet, Inc., Hoover's Online Database; Market Analysis Profile, 2012-2017; Development Research Partners.

Nine-County Rankings

<table>
<thead>
<tr>
<th>Nine-County Rankings</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Pharmaceuticals &amp; biotechnology direct employment rank</td>
<td>17th</td>
</tr>
<tr>
<td>Pharmaceuticals &amp; biotechnology employment concentration rank</td>
<td>28th</td>
</tr>
</tbody>
</table>

Biosciences - Pharmaceuticals and Biotechnology: Number of Employees Growth Rate


Pharmaceuticals & Biotechnology Employment by County, 2017

Sources: Market Analysis Profile, 2017; Development Research Partners.

Pharmaceuticals & Biotechnology Employment by Category, 2017

Sources: Market Analysis Profile, 2017; Development Research Partners.

*Direct employment rank based on the number of employees in the industry cluster in a region. No multiplier effects are included. Rankings are for the 50 largest metropolitan statistical areas (MSAs). Employment concentration rank based on the direct cluster employment in a region expressed as a percent of total employment in all industries in the same region. 1st = highest for both rankings.*
BIOSCIENCE: Metro Denver and Northern Colorado Industry Cluster Profile

Major Pharmaceuticals and Biotechnology Companies (top 10 based on employment size)

- Agilent Technologies  
  [www.agilent.com](http://www.agilent.com)
- Heska Corporation  
  [www.heska.com](http://www.heska.com)
- Array BioPharma Inc.  
  [www.arraybiopharma.com](http://www.arraybiopharma.com)
- Sandoz, Inc.  
  [www.sandoz.com](http://www.sandoz.com)
- Colorado Serum Company  
  [www.thepeakofquality.com](http://www.thepeakofquality.com)
- TOLMAR, Inc.  
  [www.tolmar.com](http://www.tolmar.com)
- Colorado State University Natural Resource Ecology Laboratory  
  [www.nrel.colostate.edu](http://www.nrel.colostate.edu)
- USGS Fort Collins Science Center  
- CordenPharma Colorado Inc.  
  [www.cordenpharma.com](http://www.cordenpharma.com)
- University of Colorado Cancer Center  
  (formerly AMC Cancer Research)  
  [www.cudenver.edu](http://www.cudenver.edu)

2017 Industry Highlights

**Bioscience Research and Innovation Assets**

The $5.4 billion, 578-acre Fitzsimons campus includes the adjacent Anschutz Medical Campus and the Fitzsimons Innovation Campus. More than six million square feet of corporate and bioresearch facility space are being developed, combining education, research, innovation, and patient care. Located just 20 minutes from Denver International Airport (DEN) and downtown Denver, the Fitzsimons campus offers an unrivaled range of opportunity from incubator and accelerator space to pre-built laboratories and furnished office or build-to-suit space that can accommodate companies of all sizes, from small start-ups to established industry leaders.

The Anschutz Medical Campus is the largest academic health center between Chicago to the West Coast. The site, which currently employs more than 21,000, receives more than $400 million in sponsored research awards annually. The Campus is home to top-ranked hospitals and facilities including the University of Colorado Hospital; Children’s Hospital Colorado; University Physicians, Inc.; the Schools of Medicine, Nursing, Dental Medicine, Pharmacy, and Public Health; and several other centers for healthcare, biomedical research, and life sciences.

Northern Colorado supports the region’s bioscience hub through the efforts of Colorado State University (CSU), the University of Colorado Health (UCHealth), the Innosphere, the Research Innovation Center (RIC), and public and private enterprises. UCHealth has increased its capacity for clinical trials for national and local bioscience companies and has developed its own innovation capacity for surgical techniques and advancements in cancer treatment for animals. A partner to the RIC, Innosphere is an incubator formed to accelerate the success of high-impact scientific and technology companies, and to promote the development of a regional, entrepreneurial ecosystem in Colorado. Innosphere has satellite locations in Fort Collins, Denver, and Boulder to better serve entrepreneurs.

### Key Company Expansions

**Medical Devices and Diagnostics**

- **ChromaDex**, a California-based natural products company, expanded to a 10,000-square-foot facility in Longmont after outgrowing its Boulder operation. Seven employees from Boulder moved to the new location, and 30-40 positions will be added over the next five to seven years.
- **Hach Co.** opened its new $25 million, 90,000-square-foot expansion in Loveland. The two-story building will house an advanced R&D workspace, and testing and research labs.
- **Mikron Automation**, a manufacturer of products for pharmaceuticals, medical, automotive, consumer, electrical, and construction uses, will again expand its U.S. headquarters. Located in Arapahoe County, the company will add an additional 19,000 square feet of industrial space at its existing facility.
• California-based Viveve Medical relocated its headquarters to Douglas County with plans to create 132 new jobs. Viveve cited Colorado’s attractive quality of life, educated workforce, and strong economy as factors in its location decision.
• Zimmer Biomet located its 101,000-square-foot headquarters in Westminster’s Westmoor office park. The location will blend R&D, marketing, and administrative functions. The company is the sixth-largest supplier of spinal surgery tools and implants globally.

**Pharmaceuticals and Biotechnology**
• Agilent Technologies broke ground on its new $120 million manufacturing facility in Frederick. Upon completion, employment will ramp up starting in February 2018 to an estimated 150 to 200 employees at the 130,000-square-foot facility.
• Longmont-based Avista Pharma Solutions Inc. expanded the types and number of new dosage forms of drugs it can manufacture, following the completion of upgrades at its plant. The 20,000-square-foot expansion includes four new processing suites and manufacturing support areas.
• KBI Biopharma completed a $30 million expansion of its Boulder manufacturing facility and will hire over 20 workers. The expansion will support increased production of low-dose microbial products.
• Peak Serum moved its operations from Fort Collins to a 3,000-square-foot facility in Wellington. The facility will allow Peak Serum to maximize efficiency and product flow.
• Tolmar Inc. is expanding its Northern Colorado operations with a 225,000-square-foot manufacturing and administrative site in Windsor. The Fort Collins-based pharmaceutical company makes drugs targeting prostate cancer and for dermatology.

**Agricultural Biotechnology**
• Agrium Inc. opened its new four-story, 120,000-square-foot facility in Loveland. The facility will house its national corporate and wholesale office employees that were previously scattered across the Denver Tech Center and assorted buildings in the Rangeview office complex.
• Agri-tech company Inocucor Corporation opened its 30,000-square-foot U.S. headquarters and commercialization office in Centennial. The company plans to add 50 workers in both its Montreal and Denver operations over the next 18 months.
• Boulder-based PanTheryx Inc. acquired two U.S. producers of bovine colostrum to consolidate its supply chain. The deal expanded PanTheryx’s employee base from 25 to 175.

**Academic and Education Announcements**
• University of Colorado Boulder’s (CU Boulder) BioFrontiers Institute opened its newest education and research wing. The $32 million, 56,000-square-foot expansion is part of the Jennie Smoly Caruthers Biotechnology Building that features space for biotechnology startups and businesses to co-locate.
• Colorado State University (CSU) opened two new science buildings that will anchor the growing CSU Science Commons. The $58 million, four-story building includes space for teaching and research activities. The $41 million, 60,000-square-foot chemistry building includes 11 faculty labs and research space.
• CSU launched the new $65 million C. Wayne McIlwraith Translational Medicine Institute. The Institute will provide regenerative medical therapies for animals and humans, including patient-derived stem cells, to treat musculoskeletal disease and other ailments.

**Licensing and Partnership Agreements**
• AntriaBio Inc. licensed ActiveSite Pharmaceuticals’ oral plasma kallikrein inhibitor portfolio to treat vision loss in adults. The portfolio will be used for targeting the treatment of diabetic macular edema and other plasma kallikrein-mediated diseases.
• Boulder-based ArcherDX announced a partnership with China-based HeliTec to advance cancer diagnostic development in China. The partnership will entail co-developing and cross-licensing technologies with the goal of registering oncology diagnostic kits with the Chinese Food and Drug Administration.
• Boulder-based Array BioPharma Inc. partnered with California-based Amgen Inc. to develop drugs for autoimmune disorders. Amgen will be responsible for commercialization of the drug, while Array will contribute its expertise in chemistry and early-lead development.
• Array BioPharma collaborated with Merck to conduct a clinical trial involving therapies from both companies to treat patients with metastatic colorectal cancer. The Merck-sponsored trial will establish dosing for the combined treatment.
Louisville-based **JustRight Surgical** partnered with California-based **Intuitive Surgical** to expand its use of JustRight technology beyond the pediatric market and drive growth. The agreement will allow the technology to be incorporated into versions of the robotic laparoscopic devices Intuitive sells around the world.

Boulder-based **Bodesiix, Inc.** and Israel-based **Progenetics LTD** entered into an international agreement where Progenetics will market and distribute kits for Bodesiix’s GeneStrat® and VeriStrat® liquid biopsy tests for patients with non-small cell lung cancer. Both tests are now available for clinical use in Israel.

Boulder-based **Clovis Oncology Inc.** partnered with **Bristol-Myers Squibb Co.** to test the combination of Clovis’ Rubraca drug with Bristol-Myers Obdivo immunotherapy in ovarian and breast cancer drug trials. The collaboration could create new treatment options for patients with multiple tumor types.

**miRagen Therapeutics** and Paris-based **Servier** extended their collaboration for the R&D and commercialization of microRNA-targeting therapeutics. The regenerative therapies will treat cardiovascular disease and other vascular flow related diseases.

Golden-based **PharmaJet** partnered with **Serum Institute of India**, the world’s largest vaccine manufacturer, to commercialize needle-free delivery of the measles, mumps, and rubella vaccine.

### Innovative Technologies and Regulatory Approvals

Boulder-based **AmideBio, LLC** was granted a European patent for its foundational peptide production platform technology. The issuance is an important milestone to broadly commercialize the company’s core platform technology.

Westminster-based **ARCA biopharma, Inc.** received a patent from the European Patent Office for treating cardiovascular disease and conditions with a new chemical formulation based on genetic targeting. The patent was validated in 10 countries.

**miRagen Therapeutics, Inc.** was granted orphan-drug designation from the FDA for its MRG-106 product to treat mycosis fungoides, the most common form of a type of blood cancer.

Peak Serum received approval to export its fetal bovine serum to the European Union. The serum is used as a medium to culture cells in the biotechnology industry.

**Silvergate Pharmaceuticals, Inc.** received FDA approval for its XATMEP™ Oral Solution. The Solution treats pediatric patients with acute lymphoblastic leukemia and polyarticular juvenile idiopathic arthritis.

Fort Collins-based **VetDC** began selling its Tanovea-CA1 drug to treat lymphoma in dogs to licensed veterinarians in the U.S. The drug is a significant breakthrough in the rapidly evolving field of veterinary oncology.

### Venture Capital and Funding Awards (listed by investment size)

Boulder-based **SomaLogic** used a $162 million investment to commercialize its complete diagnostic exam, SomaScan. The exam creates a complete-health diagnostic test using data from more than 125,000 blood samples used to identify between 40 and 50 diseases.

Boulder-based **Muse Biotechnology Inc.** raised $23 million in Series B financing. The company will use the funding to advance its Bio’s ForgeCraft™ technology that allows for precision editing of the human genome.

Westminster-based **Cerapedics** received a $20 million loan to continue its development and commercialization of a bone graft peptide used in the treatment of orthopedic injuries. The company’s technology aims for safer and more predictable bone formation compared to commercially available products.

Biodesiix Inc. sold nearly $13.2 million in equity. The company develops and manufactures blood-test kits for cancer diagnostics.

AntriaBio Inc. closed a $13 million private placement transaction to conduct Phase I clinical trials of its injectable basal insulin for patients with type 1 and type 2 diabetes.

**Surefire Medical** raised $12.8 million in Series D financing to expand sales efforts in the U.S., Europe, and China, and for clinical trials. The Westminster company makes drug delivery catheters used to treat liver cancer.

Boulder-based **Endoshape** raised $10.5 million in equity financing. The medical device maker develops minimally invasive plugs and coils for occluding blood vessels.

Eye disorders biopharma **Ocugen** raised $7.5 million in a Series B round of fundraising to support development of its clinical and preclinical pipeline of treatments for sight-threatening diseases.
• University of Colorado Anschutz Medical Campus startup **Taiga Biotechnologies** raised $6 million for its pursuit of stem-cell therapies used to treat cancer, HIV, and other diseases.

• Westminster-based **CardioNXT** raised $2.1 million to perform clinical trials of its technology used to understand complex cardiac arrhythmias including atrial fibrillation, and deliver targeted therapy to affected areas within the heart.

• **MBC Pharma Inc.** received a $2 million Phase II Small Business Innovation Research (SBIR) grant from the U.S. National Institutes of Health to use and test drug combination in spontaneous canine osteosarcoma.

• **Front Range Biosciences Inc.** raised $1.5 million in funding from five venture-capital firms. The Lafayette-based startup was founded in 2015 to provide advanced breeding and tissue culture propagation for disease and mold resistant plant applications.

**Mergers and Acquisitions**

• **CordenPharma International GmbH** acquired the **Hospira Boulder** manufacturing plant from New York-based **Pfizer Inc.**, to be renamed **CordenPharma Boulder**. The agreement will further strengthen CordenPharma's leading position as a premier supplier of highly potent and oncology active pharmaceutical ingredients.

• miRagen Therapeutics Inc. merged with California-based **Signal Genetics** and raised $40.7 million in private equity financing to advance its clinical programs into additional trials and to target specific populations with few clinical options. Following the merger, the company went public.

• Boulder-based **Nivalis Therapeutics** was acquired by Seattle-based **Alpine Immune Systems**, with the combined company to become publicly traded and fund new immunotherapy cancer and inflammatory disease treatments.

• Loveland-based **Loveland Products** acquired Starpharma’s **Priostar** agrochemical business. The acquisition will bring technologies that can be used across Loveland Products’ broad base of crop-protection and specialty nutrition products.

• **Church & Dwight Co. Inc.** plans to acquire Fort Collins-based **WaterPik Inc.** for $1 billion. Church & Dwight is known for its Arm & Hammer products.

• Crop-nutrient producer Agrium merged with **Potash Corp. of Saskatchewan Inc.** The new company will be named **Nutrien**.

• Arapahoe County-based **MD MedTech LLC** merged with Pittsburgh-based **Multi Vendor Service** and Tulsa-based **Wetsco** to form **Innovatus Imaging**. The new company will keep MD Medtech’s medical ultrasound design and manufacturing operations in the region.

• Hangzhou-based **Peaceful Union** acquired Aurora-based **Sharklet Technologies Inc.** The acquisition will help the company to accelerate the development of its proprietary bacterial-inhibiting medical device coating and enhance its wound dressing technology.

• Highlands Ranch-based **Sandhill Scientific** merged with **Medovations Inc.** to create **Diversatek Healthcare** that will be based in Milwaukee. Sandhill develops and markets gastrointestinal diagnostic and monitoring products and the Highlands Ranch location will be home to Diversatek’s technical training and research center.

**Industry Infrastructure Support**

**Industry Partners**

The Colorado BioScience Association (CBSA) serves as the hub of Colorado’s thriving bioscience sector by connecting innovators to funding, infrastructure, research, and talent. From promising young companies to established corporations and institutions, CBSA provides opportunities for networking, education, and professional development. CBSA grows the bioscience workforce and leads business expansion policies to advance the industry in the state.

The Northern Colorado Bioscience Cluster (NoCoBio) formed through a partnership with the City of Fort Collins, CSU, CSU Ventures, UCHealth, the Colorado BioScience Association, and Innosphere to help advance bioscience in the region. NoCoBio brings together the region’s scientists, physicians, leading innovators, and executive advisors who are working together inside world-class research and business incubator environments in order to maximize the impact on Northern Colorado resources.
BIOSCIENCE: Metro Denver and Northern Colorado Industry Cluster Profile

Education & Research Institutions

**CU Boulder – Colorado BioFrontiers Institute**
- Sponsored Research Funding – $8.5M ($507.9M university-wide)
- Access to core facilities
- Four primary interdisciplinary research areas: Large Datasets and Genomics; Bioimaging: From Molecules to Organisms; New Therapeutic Paradigms; Regenerative Biology

**Colorado State University**
- Sponsored Research Funding – $338.4M (university-wide)
- Institute for Biologic Translational Therapies ($65M Gift)
- Seed Laboratory and Animal Reproduction and Biotechnology Laboratory
- Flint Animal Cancer Center – international recognized leader in clinical veterinary oncology and cancer research

**University of Colorado Anschutz Medical Campus**
- Sponsored Research Funding – $490.6M (university-wide)
- Schools of Medicine, Pharmacy, Nursing, Dentistry, Public Health Hospitals – UCHealth, Children’s Hospital Colorado, Veteran’s Administration
- Marcus Institute for Brain Health ($38M Gift)
- Centers for Personalized Medicine & Biomedical Informatics ($63M Gift)
- Colorado Clinical & Translational Sciences Institute
- Charles C. Gates Center for Regenerative Medicine
- Webb-Waring Center
- Gates BioManufacturing Center
- StartUp Health Colorado

Other Major Research Assets
- Fort Collins is home to the Centers for Disease Control and Prevention’s National Center for Emerging and Zoonotic Infectious Diseases Division of Vector-Borne Diseases. The Division is a national and international leader in researching, preventing, and controlling viruses and bacteria, spread by vectors such as mosquitoes, ticks, and fleas.

Incubators & Accelerators
- Bioscience Park Center – 215,000 square feet including R&D, office, education, and lab space adjacent to the Anschutz Medical Campus.
- Innosphere – High-tech incubator in Denver, Boulder, and Fort Collins supporting entrepreneurs building high-growth companies in health innovation, life sciences, software and hardware, energy, and advanced materials. Innosphere is implementing a $20.5 million metro-area expansion with plans for a new 50,000-square-foot startup incubator in Denver and the addition of 7,000 square feet to its headquarters in Fort Collins. The new location is expected to open in 2020.
- The Colorado Institute for Drug, Device and Diagnostic Development (CID4) accelerates life science discoveries and bridges the gap between research and successful product developments. CID4 serves universities, bioscience companies, academic groups, and professional associations by providing seed funding, active management, investor connections, and strategic consulting. As of 2016, CID4 invested more than $2 million in nine portfolio companies.
- Boomtown is the design focused technology accelerator located in Boulder focused on media, IoT, B2B, ad-tech, and health tech. The curriculum is customized to the needs of the individual startup, supporting and educating entrepreneurs.
- Research Innovation Center – Hub for university scientists and students to partner with business to develop new products to treat and diagnose infectious diseases.
- Catalyst HTI – A health-tech industry integration project slated to open in 2018 in Denver’s River North neighborhood that will integrate building space for startups, Fortune 500 companies, and healthcare providers in one location. The first-of-its-kind project will enable startups with resources to grow and expose providers and larger companies to emerging technologies and human capital.
Venture Capital & Funding Mechanisms

- The Colorado Office of Economic Development and International Trade (OEDIT) awarded its fifth round of grants for the Advanced Industries Accelerator Programs in 2017. The programs support key industries in Colorado, including bioscience and medical device manufacturers, by providing up to $150,000 for Proof-of-Concept grants, up to $250,000 for Early-Stage Capital grants, and $15,000 matching grants for businesses looking to export to global markets.
- The Blackstone Entrepreneurs Network is designed to help entrepreneurs find resources and thrive in Colorado. The network has a variety of business advisors in fields for entrepreneurship, technology, biotechnology, and health technology industries.
- The Colorado Venture Capital Authority (VCA) provides seed and early-stage capital investments in Colorado companies with the potential for rapidly scaling their businesses. The managing partner, High Country Venture, reviews funding deals and makes investments in selected businesses by using debt, equity, or debt with a conversion option into equity. VCA also established Colorado Fund I and II, each with approximately $25 million.
- Colorado PERA’s Colorado Mile High Fund is a $50 million co-investment program designed to invest in a diversified, high-quality portfolio of companies with a nexus to Colorado. With an established bioscience industry, strong growth opportunities, a dedicated research community, and an active private equity market, the nine-county region is poised for investment.
- The Boettcher Foundation’s Webb-Waring Biomedical Research Awards provides biomedical research funding for early career investigators at Colorado’s research institutions. Recipients of the awards receive research grants of $235,000, covering up to three years of biomedical research.

Incentives and Resources

- **Cleanroom Sales & Use Tax Exemption Colorado** provides an exemption from state sales and use tax paid on the purchase of machinery that comprises a cleanroom from July 1, 2007 to July 1, 2017.
- **Advanced Industry Workforce Development** provides companies a reimbursement for expenses related to hiring an intern or apprentice.
- **Biotechnology Sales and Use Tax Refund** was created for Colorado taxpayers to refund state sales and use taxes paid on purchases of tangible personal property used directly in biotechnology R&D.
- **Manufacturing Sales & Use Tax Exemption** excludes state sales and use tax paid on the purchases of manufacturing machinery and machine tools and parts.
- **The Job Growth Incentive Tax Credit** allows companies to apply to the Colorado Economic Development Commission for a state income tax credit based on the payroll tax cost from creating jobs. To qualify, companies must create at least 20 new jobs in the region and pay wages above the local average.
- **The Strategic Fund Incentive** program is a performance-based grant for the creation of net new jobs in Colorado that meet certain requirements. The program supports and encourages new business development, business expansions, and relocations that have generated new jobs throughout the state. The Strategic Cash Fund also provides support for initiatives pertaining to key industries or regional development.
- **Colorado’s Enterprise Zone (EZ) program** provides tax incentives to encourage businesses to locate and expand in designated economically distressed areas of the state.
- **The Colorado First and Existing Industry** grants are jointly administered by OEDIT and the Colorado Community College System. The state may be able to provide specific support to retain jobs or offers business-friendly tools that assist in retaining jobs (such as the Enterprise Zone Program) for this grant.
- **The Advanced Industry Investment Income Tax Credit** allows investors to receive tax credits for investing in early-stage, advanced industry companies. Investors can claim tax credits worth 25 percent of their investment in the company if they do not own more than 30 percent of the business before the investment was made or 50 percent after, up to a maximum of $50,000 in tax credits.
Cross-Cluster Convergence

The region is a leader in the development of Big Data and software technologies for the advancement of healthcare and life sciences. The synergy between bioscience, healthcare, and software supports the nine-county region as a national leader in expanding digital health—the convergence of the digital and genetics revolutions with bioscience, healthcare and wellness, and information technology-software. Other digital health companies including Prima-Temp, RxREVU, Welltok, iTriage, RxAssurance, and Cerescan are developing advanced technologies to improve health.

Digital Health

- Founded in July 2012 by the Denver South Economic Development Partnership and Innovation Pavilion, **Prime Health** is a growing statewide community of 1,600+ health care executives, physicians, technologists, academics, entrepreneurs, and investors dedicated to improving health and lowering healthcare costs through the commercialization of digital health technologies. Colorado is home to more than 130 digital health companies.

- **StartUp Health Colorado** launched to create a health innovation hub in the Rocky Mountain region. The organization partnered with Children’s Hospital Colorado, UCHealth, and the University of Colorado to streamline the pathways for health entrepreneurs to innovate and grow.

Big Data & Technologies

- Denver-based **RxRevu** developed a prescription decision-support tool that uses Big Data and artificial intelligence to improve the consistency, safety, and efficiency of the drug prescribing process. RxCheck uses "smart data" from a patient’s clinical histories to inform the provider about appropriate prescribing options.

- **CU Boulder’s Computational Bioscience** program provides computational approaches to health problems from the molecular level to the population level. Programs at the BioFrontiers Institute and the Department of Computer Science are developing novel computational and statistical techniques for understanding data from complex biological and social systems.

- CSU invested $15 million in active research projects applying Big Data, artificial intelligence, and bioinformatics to computational problems in protein and RNA function and interactions, alternative splicing, genomics and transcriptomics, genome sequencing and resequencing, and detection of transcription regulatory elements.

- Boulder-based fertility app developer **Kindara** partnered with **Helix**, a personal genetics company, to help women who are pregnant or trying to become pregnant have healthier pregnancies by accessing their DNA information. The goal is an at-home DNA test that will sync with Kindara’s fertility app to provide insights into nutrition, wellness, and fitness.

Nine-County Region Workforce

- Nearly half of the nine-county region’s 3.8 million residents are under the age of 35. Employers can draw from a large, young, highly educated, and productive workforce.

- Of the region’s adult population, 43.2 percent are college graduates and 91.4 percent have graduated from high school.

- The region’s population is expected to grow 32.2 percent from 2020 to 2040, driving a 21.2 percent increase in the region’s labor force over the same period.

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**Educational Attainment of Metro Denver and Northern Colorado’s Population Age 25 and Older**

- Bachelor’s Degree: 26.8%
- Associate Degree: 7.7%
- Less Than 9th Grade: 3.6%
- 9th to 12th Grade, No Diploma: 5.0%
- High School Graduate (includes equivalency): 20.5%
- Graduate or Professional Degree: 16.4%
- Less Than 9th Grade: 3.6%

**Metro Denver and Northern Colorado’s Labor Force Projections by Age (millions)**

- 2020
  - 16-24: 0.76
  - 25-34: 1.27
  - 35-44: 1.51
  - 45-54: 1.24
  - 55-64: 0.67
  - 65+: 0.32
- 2030
  - 16-24: 0.66
  - 25-34: 1.18
  - 35-44: 1.47
  - 45-54: 1.22
  - 55-64: 0.65
  - 65+: 0.31
- 2040
  - 16-24: 0.62
  - 25-34: 1.14
  - 35-44: 1.42
  - 45-54: 1.19
  - 55-64: 0.64
  - 65+: 0.29

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*Source: U.S. Census Bureau, 2016 American Community Survey.*

*Source: Colorado Division of Local Government, State Demography Office.*
BIOSCIENCE: Metro Denver and Northern Colorado Industry Cluster Profile

Bioscience Workforce Profile
Medical Devices and Diagnostics

The subcluster has a larger share of employees that are between the ages of 45 and 64 years old (50.8 percent), compared with the age distribution of all industries across the nine-county region (37.5 percent).

The Occupation & Salary Profile below includes the 10 largest medical devices and diagnostics occupations in the region. For these 10 largest occupations, the chart details the total number of workers employed in that occupation across all industries, the number of available applicants that would like to be working in that occupation, the number of recent graduates that are qualified for that occupation, and the median and sample percentile annual salaries.

Wages
- 2016 average annual salary was $76,940, compared with $84,710 nationwide.
- Total payroll was nearly $858 million in 2016, an increase of 3.7 percent over-the-year.

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<tbody>
<tr>
<td>1. Electrical &amp; electronic equipment assemblers</td>
<td>2,753</td>
<td>67</td>
<td>0</td>
<td>$34,581</td>
<td>$20,490</td>
<td>$25,707</td>
<td>$44,967</td>
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<td>2. Dental laboratory technicians</td>
<td>523</td>
<td>13</td>
<td>0</td>
<td>$41,539</td>
<td>$23,444</td>
<td>$29,992</td>
<td>$58,924</td>
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<td>3. Electromechanical equipment assemblers</td>
<td>1,718</td>
<td>42</td>
<td>0</td>
<td>$32,963</td>
<td>$23,038</td>
<td>$27,033</td>
<td>$41,339</td>
<td>$49,718</td>
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<td>4. Team assemblers</td>
<td>3,398</td>
<td>83</td>
<td>0</td>
<td>$31,334</td>
<td>$20,568</td>
<td>$24,640</td>
<td>$39,558</td>
<td>$49,808</td>
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<td>5. Industrial engineers</td>
<td>2,712</td>
<td>66</td>
<td>4</td>
<td>$91,768</td>
<td>$57,427</td>
<td>$71,203</td>
<td>$115,725</td>
<td>$140,154</td>
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<td>6. Software developers, systems software</td>
<td>11,131</td>
<td>271</td>
<td>1,191</td>
<td>$112,619</td>
<td>$77,723</td>
<td>$91,555</td>
<td>$137,778</td>
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<td>7. Electronics engineers, except computer</td>
<td>4,976</td>
<td>121</td>
<td>398</td>
<td>$94,837</td>
<td>$65,034</td>
<td>$75,581</td>
<td>$122,715</td>
<td>$152,011</td>
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<td>8. Inspectors, testers, sorters, samplers, &amp; weighers</td>
<td>3,894</td>
<td>95</td>
<td>0</td>
<td>$39,714</td>
<td>$20,971</td>
<td>$28,912</td>
<td>$51,747</td>
<td>$66,404</td>
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<td>9. General &amp; operations managers</td>
<td>31,749</td>
<td>772</td>
<td>5,578</td>
<td>$115,241</td>
<td>$47,968</td>
<td>$72,558</td>
<td>$179,035</td>
<td>$261,240</td>
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<td>10. First-line supervisors of production &amp; operating workers</td>
<td>4,881</td>
<td>119</td>
<td>0</td>
<td>$61,170</td>
<td>$36,756</td>
<td>$45,986</td>
<td>$78,604</td>
<td>$98,736</td>
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Notes: The number of available applicants is a point-in-time measurement of the number of people who have registered in Colorado’s workforce development system’s statewide database, Connecting Colorado, as being able and available to work in a particular occupation. Results should be interpreted with caution since registration in Connecting Colorado is self-reported. In addition, the skills rubric may assign up to four occupation codes for each registrant. Therefore, the number of available applicants could be inflated. Source: Provided by Arapahoe/Douglas Works!; QCEW Employees, Non-QCEW Employees, & Self Employed - EMSI 2017.3 Class of Worker.
Pharmaceuticals and Biotechnology Workforce Profile

The subcluster has a larger share of employees that are between the ages of 35 and 54 years old (53.9 percent), compared with the age distribution of all industries across the nine-county region (43.4 percent).

The Occupation & Salary Profile below includes the 10 largest pharmaceuticals and biotechnology occupations in the region. For these 10 largest occupations, the chart details the total number of workers employed in that occupation across all industries, the number of available applicants that would like to be working in that occupation, the number of recent graduates that are qualified for that occupation, and the median and sample percentile annual salaries.

Wages

- 2016 average annual salary was $94,850, compared with $128,130 nationwide.
- Total payroll reached nearly $442 million in 2016.

Metro Denver and Northern Colorado Pharmaceuticals and Biotechnology Occupation & Salary Profile, 2017

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</tr>
</thead>
<tbody>
<tr>
<td>1. Chemists</td>
<td>1,607</td>
<td>39</td>
<td>235</td>
<td>$76,043</td>
<td>$38,715</td>
<td>$51,803</td>
<td>$107,849</td>
<td>$128,086</td>
</tr>
<tr>
<td>2. Biological technicians</td>
<td>2,545</td>
<td>62</td>
<td>0</td>
<td>$45,003</td>
<td>$29,471</td>
<td>$34,820</td>
<td>$58,113</td>
<td>$70,875</td>
</tr>
<tr>
<td>3. Packaging &amp; filling machine operators &amp; tenders</td>
<td>4,636</td>
<td>113</td>
<td>0</td>
<td>$29,679</td>
<td>$20,181</td>
<td>$23,639</td>
<td>$41,743</td>
<td>$52,712</td>
</tr>
<tr>
<td>4. Business operations specialists, all other</td>
<td>32,514</td>
<td>791</td>
<td>17</td>
<td>$74,757</td>
<td>$43,128</td>
<td>$55,758</td>
<td>$98,542</td>
<td>$126,087</td>
</tr>
<tr>
<td>5. Chemical equipment operators &amp; tenders</td>
<td>667</td>
<td>16</td>
<td>0</td>
<td>$34,973</td>
<td>$24,188</td>
<td>$28,571</td>
<td>$43,514</td>
<td>$54,574</td>
</tr>
<tr>
<td>6. Managers, all other</td>
<td>11,723</td>
<td>285</td>
<td>6,021</td>
<td>$71,462</td>
<td>$31,691</td>
<td>$36,510</td>
<td>$127,018</td>
<td>$171,930</td>
</tr>
<tr>
<td>7. Natural sciences managers</td>
<td>1,241</td>
<td>30</td>
<td>3,095</td>
<td>$127,874</td>
<td>$85,961</td>
<td>$103,827</td>
<td>$160,947</td>
<td>$241,396</td>
</tr>
<tr>
<td>8. Inspectors, testers, sorters, samplers, &amp; weighers</td>
<td>3,894</td>
<td>95</td>
<td>0</td>
<td>$39,714</td>
<td>$20,971</td>
<td>$28,912</td>
<td>$51,747</td>
<td>$66,404</td>
</tr>
<tr>
<td>9. Chemical technicians</td>
<td>808</td>
<td>20</td>
<td>0</td>
<td>$42,121</td>
<td>$21,295</td>
<td>$32,668</td>
<td>$53,481</td>
<td>$66,410</td>
</tr>
<tr>
<td>10. First-line supervisors of production &amp; operating workers</td>
<td>4,881</td>
<td>119</td>
<td>0</td>
<td>$61,170</td>
<td>$36,756</td>
<td>$45,986</td>
<td>$78,604</td>
<td>$98,736</td>
</tr>
</tbody>
</table>

Notes: The number of available applicants is a point-in-time measurement of the number of people who have registered in Colorado’s workforce development system’s statewide database, Connecting Colorado, as being able and available to work in a particular occupation. Results should be interpreted with caution since registration in Connecting Colorado is self-reported. In addition, the skills rubric may assign up to four occupation codes for each registrant. Therefore, the number of available applicants could be inflated. Source: Provided by Arapahoe/Douglas Works! QCEW Employees, Non-QCEW Employees, & Self Employed - EMSI 2017.3 Class of Worker.

Education & Training

Colorado’s higher education system provides an excellent support system for businesses in the region. There are 28 public higher education institutions in Colorado, of which seven four-year and six two-year public institutions offering comprehensive curricula are located in the nine-county region. There are more than 100 private and religious accredited institutions and more than 350 private occupational and technical schools offering courses in dozens of program areas throughout the state. The state higher education system served about 255,510 students in FY 2015-16, while 86,070 students received a degree, diploma, certificate, or other formal award over the same period of time. Although not exhaustive, a list of the major, accredited educational institutions with the greatest number of graduates for each of the 10 largest bioscience...
occupations in the nine-county region are included below. A directory of all higher education institutions with corresponding websites may be accessed via http://highered.colorado.gov.

- Colorado School of Mines
  www.mines.edu
- Metropolitan State University of Denver
  www.msudenver.edu
- University of Colorado Boulder
  www.colorado.edu
- Colorado State University
  www.colostate.edu
- Red Rocks Community College
  www.rccc.edu
- University of Colorado Denver
  www.ucdenver.edu
- Colorado State University Global Campus
  www.colostate.edu
- Regis University
  www.regis.edu
- University of Denver
  www.du.edu
- Front Range Community College
  www.frontrange.edu
- University of Colorado Anschutz Medical Campus
  www.ucdenver.edu
- University of Northern Colorado
  www.unco.edu

**Key Reasons for Bioscience Companies to Locate in the Nine-County Region**

The region is an emerging bioscience location offering:

1. **The ability to recruit and retain technical and scientific employees and entrepreneurial talent**
   - Colorado is home to four, top-ranked university bioscience programs at the University of Colorado Boulder (CU Boulder), Colorado State University (CSU), the University of Colorado Denver, and the University of Denver. (*U.S. News & World Report*, 2017)
   - Colorado ranked ninth for the number of science, engineering, and health graduate students per 1,000 individuals ages 25 to 34 years old. (National Science Foundation, 2017)
   - Established in 2014, the U.S. Department of Commerce United States Patent and Trademark Rocky Mountain Regional Office in Denver expedites patent examination in the region, advances cutting-edge ideas to the marketplace, empowers entrepreneurs, and creates new highly-skilled jobs. (U.S. Patent and Trademark Office, 2017)
   - Denver ranked 11th among the nation’s top biopharmaceutical clusters, and ranked No. 9 in laboratory space (4 million square feet) and No. 10 in employment. (*Genetic Engineering and Biotechnology News*, 2017)
   - Denver ranked 14th in the nation in life sciences employment, number of establishments, and funding availability. (Jones Lang LaSalle, 2017)
   - Colorado ranked fourth for the total number of National Institute of General Medical Sciences Maximizing Investigators’ Research Awards in 2016, which increase productivity and the chances for important breakthroughs for investigators. (National Institutes of Health, 2017)

2. **Affordable operating costs**
   - Denver had the third-lowest average rent for life sciences laboratory space at $14.83 per square foot, compared with other major bioscience markets. (Jones Lang LaSalle, 2017)
   - Bioscience companies can recruit affordable, productive employees as the nine-county average wage for bioscience workers is slightly below the national average. (Development Research Partners, 2017)
   - The nine-county region offers a variety of real estate opportunities for bioscience companies, ranging from fully furnished executive suites to build-to-suit laboratories and office space.
3. A pro-business environment and competitive tax structure

- Colorado ranks as one of the nation’s most favorable corporate income tax structures. The state’s corporate income tax rate of 4.63 percent is one of the lowest in the nation and is based on single-factor apportionment, which allows companies to pay taxes based solely on their sales in the state. (State of Colorado; The Tax Foundation)
- Colorado ranks as the nation’s 10th-best tax system for entrepreneurs and small business. (Small Business & Entrepreneurship Council, 2017)
- Colorado received an “A” grade for its business-friendly environment in 2017 and ranked seventh for ease of starting a business. Denver received a “B+” grade for overall friendliness. (Thumbtack.com, 2017; Ewing Marion Kauffman Foundation, 2017)

4. Access to financial resources to fund research and development

- Denver life sciences companies received $58.8 million in venture capital funding in 2016, representing 0.6 percent of total U.S. life sciences funding. (Jones Lang LaSalle, 2017)
- Colorado bioscience companies have received $1 billion in venture capital investments since 2012 with three segments receiving more than $200 million each—human biotechnology, biofuels, and health information technology. (Biotechnology Innovation Organization, 2017)
- Colorado offers several public and private sources of business funding including the Certified Capital Companies Program, the Venture Capital Authority, and Colorado Capital Access. (Contact the Colorado Office of Economic Development and International Trade for more information.)
- The nine-county region has six venture firms currently investing in bioscience: Boulder Ventures, Lightstone Ventures, Morgenstaller Ventures, Stakeholder Ventures, Tango/HCV, and Three Leaf Ventures.
- Colorado ranked fourth in the nation for Small Business Innovation Research (SBIR) grants per worker. The state received $32.90 in grants per worker compared with the U.S. average of $13.34. (U.S. Small Business Administration, 2017; U.S. Bureau of Labor Statistics, 2017)
- NIH funding in 2016 totaled a record $349.5 million in Colorado, increasing 9.3 percent since 2011. The University of Colorado ranked among the nation’s top-25 institutions in total NIH funding in 2016. (National Institutes of Health, 2017)

5. Business organizations and public policy programs designed to encourage industry growth

- The Advanced Industries Accelerator Programs include four types of grants and a global business support program to promote growth and sustainability in Colorado’s advanced industries, including bioscience, among others. The program has awarded over $40 million in grants since its inception in 2013. (Colorado Office of Economic Development and International Trade, 2017)
- The Colorado Innovation Network is a catalyst for economic prosperity through innovation by partnering with government, business, and civil society to foster collaboration around global ideas, talent, capital, and the entrepreneurial spirit.

For additional information, contact us:

For additional information, contact us:  
1445 Market Street  
Denver, CO  80202-1790  
303.620.8092  
email: info@metrodenver.org  
www.metrodenver.org

Industry Overview

The broadcasting and telecommunications cluster includes companies that deliver voice, data, and video to end users. It includes landline and wireless telephone communications companies, radio and television communications services, and cable and Internet service providers.

The nine-county Metro Denver and Northern Colorado region is home to a significant concentration of broadcasting and telecommunications companies including CenturyLink, Comcast, DISH Network, and others. Comcast’s second-largest employment presence outside of Philadelphia is in Colorado. Five of Forbes’ 2017 Global 2000 broadcasting and telecommunications companies and four Fortune 500 broadcasting and telecommunications companies have headquarters in the region.

The region ranks as having the fifth-highest employment concentration for the industry cluster out of the 50 largest metropolitan areas in 2017. It is the ninth-largest broadcasting and telecommunications employment center in the nation, with more than 42,430 workers at nearly 2,750 companies. In 2017, employment rose 0.8 percent, compared with a 3.8 percent decline nationwide. Major 2017 company expansions included growth by AT&T, Comcast, Charter Communications, and Google, slightly offsetting layoffs at other major companies. Since 2012, the cluster has grown 1.7 percent and added 730 jobs.

It was a landmark year for mergers and acquisitions that are changing the broadcasting and telecommunications industry landscape. Notable deals included CenturyLink’s $24 billion acquisition of Broomfield-based Level 3 Communications and Denver-based Liberty Global’s merger with Netherlands-based Vodafone Group. Comcast, AT&T, and Verizon are offering more integrated services for businesses and consumers, largely as a result of mergers. Increased Internet speeds and rising competition has led customers to switch from traditional cable and satellite services to subscription video on-demand services. High-definition, on-demand, online, mobile, and multicasting services offered by local companies such as Douglas County-based Sling TV continue to rise in popularity. The region’s economic growth, low unemployment rate, pro-business environment, and entrepreneurial culture have contributed to favorable conditions for acquisitions, particularly for middle-market mergers or those companies with $5 million to $500 million in revenue.

Several of the region’s educational and research institutions focus their programs and training on all aspects of broadcasting and telecommunications. In 2017, the University of Colorado Denver announced a new media and technology facility created through a $5 million gift from Comcast. The Comcast Media and Technology Center functions as a place where students, researchers, and professionals can generate, develop, and activate culturally-focused, action-oriented education, research, commercial enterprises, and community services. The Cable Center, located on the University of Denver campus, launched a partnership with AMP10x, a local workforce development organization to establish MediaAMP. The 4,700-square-foot coworking space is more than 90 percent full and provides meeting and educational space. Silicon Flatirons is a center for innovation at the University of Colorado Boulder that serves students, entrepreneurs, policymakers, and professionals at the intersection of law, policy, and technology.

The region has extensive broadband and wireless network coverage. According to BroadbandNow, 78 percent of the region’s population has access to speeds of at least 100 megabits per second (Mbps). Across Colorado, 90 percent have access to broadband and nearly 10 percent have access to 1 gigabit broadband. Most of the state’s population has access to mobile broadband service. Broadband deployment has a significant economic

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1 The nine-county region is comprised of two principal areas, Metro Denver and Northern Colorado. Metro Denver consists of Adams, Arapahoe, Boulder, Broomfield, Denver, Douglas, and Jefferson counties. Northern Colorado consists of Larimer and Weld counties.
BROADCASTING AND TELECOMMUNICATIONS:  
Metro Denver and Northern Colorado Industry Cluster Profile

impact. According to the Colorado Department of Local Affairs, a 1 percent increase in broadband penetration results in approximately 9,000 jobs. Expanding broadband access is a key focus of Colorado economic development, information technology, and local government capacity-building efforts. Colorado developed a program through the Department of Local Affairs that has awarded over $20 million in matching grants for a statewide investment of $34 million to numerous communities in the region.

Over the last several years, the region’s major carriers have invested in infrastructure and network improvements. AT&T invested more than $325 million since 2014 to enhance Denver’s wireless networks and Sprint made ongoing improvements to its local network as part of its nationwide Network Vision program. All four of the region’s major carriers—Sprint, T-Mobile, AT&T, and Verizon—nearly doubled their network speeds in the region in 2017, according to RootMetrics. The development of 5G networks is currently underway and carriers are proceeding with lab and field trials for at least the basic connectivity elements, which could be fully developed nationwide by 2020. In 2017, Verizon announced Denver as one of the 11 cities nationwide to pilot a new 5G network.

Regional Broadcasting and Telecommunications Assets

- **Data Centers** – The region is an attractive location for high-tech data centers, with low risk of natural disasters and a thriving economy. Centers for both private companies and government entities are located throughout the region including IBM’s largest data center in the world.

- **Satellite** - Metro Denver’s unique geographic location in the Mountain time zone makes it the largest city in the U.S. to offer one-bounce satellite uplinks. This provides real-time connections to six of the seven largest continents in a single business day. The region is home to two of the nation’s largest satellite television providers

- **Subscription TV** - Metro Denver has a long history with the cable television industry and is home to a significant concentration of broadcasting and telecommunications companies.

- **Federal Laboratories and Research Centers** – The city of Boulder is home to the Institute for Telecommunication Sciences (ITS), which is the research and engineering laboratory of the National Telecommunications and Information Administration (NTIA). ITS performs basic research in radio science that provides the technical foundation for NTIA’s policy development and spectrum management activities. The National Institute of Standards and Technology’s Communications Technology Laboratory (CTL) in Boulder unites wireless communications efforts and develops instruments, creates protocols, models, and simulation tools to enable a range of emerging wireless technologies.

- **Voice and Data Services** - Metro Denver businesses and households can access numerous providers that offer landline and wireless phone services and high-speed Internet. The region includes more than 30 long-distance providers. Metro Denver’s extensive fiber-optic network allows the flow of voice and data traffic at lower prices.

- **Wireless Networks** - The downtown Denver WiFi Zone was among the first in the nation to provide large-scale, public Internet access. Several locations throughout Denver offer free WiFi, including the 16th Street Mall, Skyline Park, the Denver Performing Arts Complex, and Denver International Airport (DEN). DEN has the fastest WiFi of any airport worldwide, according to Ookla.
The broadcasting and telecommunications industry cluster consists of 16, six-digit North American Industry Classification System (NAICS) codes including radio and television communications equipment, telephone communications, and cable television services.

### Nine-County Rankings

<table>
<thead>
<tr>
<th>Broadcasting &amp; telecommunications</th>
<th>Nine-County Rankings</th>
<th>United States</th>
</tr>
</thead>
<tbody>
<tr>
<td>Broadcasting &amp; telecommunications direct employment concentration rank</td>
<td>5th</td>
<td>0.6%</td>
</tr>
<tr>
<td>Broadcasting &amp; telecommunications direct employment rank</td>
<td>9th</td>
<td>0.6%</td>
</tr>
</tbody>
</table>

### Broadcasting & Telecommunications Employment and Company Profile, 2017

<table>
<thead>
<tr>
<th>Nine-County Region</th>
<th>United States</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct employment, 2017</td>
<td>42,430</td>
</tr>
<tr>
<td>Number of direct companies, 2017</td>
<td>2,750</td>
</tr>
<tr>
<td>One-year direct employment growth, 2016-2017</td>
<td>0.8%</td>
</tr>
<tr>
<td>Five-year direct employment growth, 2012-2017</td>
<td>1.7%</td>
</tr>
<tr>
<td>Avg. annual direct employment growth, 2012-2017</td>
<td>0.3%</td>
</tr>
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<td>Direct employment concentration</td>
<td>1.8%</td>
</tr>
</tbody>
</table>

Sources: Dun & Bradstreet, Inc., Hoover’s Online Database; Market Analysis Profile, 2012-2017; Development Research Partners.

### Broadcasting & Telecommunications Employment by County, 2017

<table>
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<th>Nine-County Region</th>
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</tr>
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</tr>
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</table>

Sources: Dun & Bradstreet, Inc., Hoover’s Online Database; Market Analysis Profile, 2012-2017; Development Research Partners.

### Broadcasting & Telecommunications Employment by Category, 2017

<table>
<thead>
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<th>Nine-County Region</th>
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<tr>
<td>Direct employment, 2017</td>
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<td>1.8%</td>
</tr>
</tbody>
</table>

Sources: Dun & Bradstreet, Inc., Hoover’s Online Database; Market Analysis Profile, 2012-2017; Development Research Partners.

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2 Direct employment rank based on the number of employees in the industry cluster in a region. Employment concentration rank based on the direct cluster employment in a region expressed as a percent of total employment in all industries in the same region. Rankings are for the 50 largest metropolitan statistical areas (MSAs). No multiplier effects are included. 1st = highest for both rankings.
BROADCASTING AND TELECOMMUNICATIONS:  
Metro Denver and Northern Colorado Industry Cluster Profile

Major Broadcasting and Telecommunications Companies

- AT&T Inc.  
  www.att.com
- CenturyLink, Inc.  
  www.centurylink.com
- Charter Communications Inc.  
  www.charter.com
- Comcast Corp.  
  www.xfinity.com
- DISH Network  
  www.dish.com
- Google  
  www.google.com
- Sprint Corp.  
  www.sprint.com
- Starz  
  www.starz.com
- Verizon  
  www.verizon.com
- Zayo Group  
  www.zayo.com

2017 Industry Highlights

Key Company Announcements

- **Google** opened its new $131 million Boulder campus that spans four acres near Pearl and 30th streets. The site could ultimately accommodate up to 1,500 employees and help the company consolidate its operations across several area office spaces. Google doubled its Colorado workforce in the last two years to more than 650 people that translates to a $2.9 billion economic impact.
- **Peak 10 + ViaWest**, that merged in 2017, added 88,000 square feet to its Compark data center in northern Douglas County, bringing the facility’s total data space to 138,000 square feet. The Compark facility is now one of the largest raised floor data halls in the world.
- Denver-based broadband and communications company **WideOpenWest, Inc. (WOW!)** completed an IPO going public on the New York Stock Exchange. WOW! provides services in 19 markets across the Midwest and Southeast. It serves over 3 million residential, business, and wholesale consumers.
- **Comcast** opened a new customer service center in Fort Collins that will employ 600 customer service agents. The 80,000-square-foot center supports residential customers across the country.
- **Lightwave Logic, Inc.** will consolidate all of its corporate and R&D operations into a new facility in Englewood. The new 13,420-square-foot facility’s $1.6 million infrastructure includes fully functional cleanrooms and analytic laboratories.
- **Sprint Corp.** will open five retail stores in former RadioShack locations across Metro Denver, and another four stores in former RadioShack sites elsewhere in Colorado. Sprint employs about 1,400 people at its retail stores across the state and its regional offices in Douglas County.
- Boulder-based **Zayo** purchased a colocation facility in Westminster, the fourth in Colorado, in response to strong customer demand in the area between Boulder, Denver, and the Northwest Corridor. Zayo plans to serve new and existing customers from the facility as well as the Front Range’s startup and accelerator community.

Expanded Broadband and Network Improvements

- **Sprint Corp.** invested in its Metro Denver network, including replacing its old network equipment with new equipment. Denver is one of the best performing markets for the Sprint network nationwide.
- **CenturyLink** continues to invest in its local Colorado network, bringing broadband speeds up to 100 Mbps. In addition, speeds up to 1 gigabit per second (Gbps) will soon be available to about 700,000 homes and businesses in Metro Denver. CenturyLink also expanded its network into more rural communities including Cortez, Estes Park, Pueblo, and others.
- Denver is one of 12 cities where **Comcast** is launching a wireless network to handle data coming from “smart” utilities, hospital patient monitoring, and other Internet-connected devices. The machine network is expected to be established by mid-2018.
- **AT&T Inc.** won a contract to build and manage Boulder-based FirstNet’s wireless broadband network for 25 years. FirstNet’s goal is a national communications system that will allow all police, fire, and other emergency agencies to respond to large scale incidents. The network is expected to launch in the spring of 2018.
- **Charter Communications** reached an agreement with Comcast Corp. to collaborate on mobile virtual network operator reseller agreements geared at accelerating the companies’ ability to participate in national wireless markets. Both companies have significant operations in Colorado and Charter plans on expanding by between 800 and 1,200 people at its new offices in Greenwood Village.
BROADCASTING AND TELECOMMUNICATIONS:
Metro Denver and Northern Colorado Industry Cluster Profile

- **The city of Centennial** partnered with Canadian-based **Ting Internet** to build fiber-optic lines to homes in some neighborhoods, with gigabit service planned to start in early 2018. The city is building a municipally-funded, fiber-optic network backbone and will begin the project in the Willow Creek neighborhood.
- **Layer3** launched its TV service in Longmont, accessing customers of the city-owned NextLight Gbps Internet service. Combining the cost of the service and Internet, Longmont customers can access nearly 300 channels of high-definition TV starting at $125 a month.
- San Francisco-based high-speed Internet provider **Webpass** will debut its 1 Gbps Internet service at a condo tower in downtown Denver. Webpass will use the building as a foothold to expand its network to other apartment and condo buildings in the area.

Merger and Acquisition Activity

- **CenturyLink** completed its $24 billion acquisition of Broomfield-based **Level 3 Communications**. The merger expands CenturyLink’s data and network services. The company’s fiber-optic network now stretches 450,000 miles on routes worldwide and directly connects to more than 100,000 office buildings.
- Denver-based **Liberty Global** merged with Netherlands-based **Vodafone Group**, a company that operates European mobile phone networks. The $3.7 billion deal allows the joint-venture partners to offer bundles of cable television, broadband, and mobile services to 4.2 million video subscribers and 5.3 million wireless phone subscribers. Liberty Global is the largest multinational cable television and broadband provider worldwide.
- Charlotte, N.C.-based **Peak 10 Inc.** acquired Greenwood Village-based **ViaWest** from Shaw Communications in a $1.7 billion sale. The deal creates North America’s largest privately held data center company with 24 data centers.
- Denver-based cloud-services manager **Hosting.com Inc.** acquired Virginia-based **Stelligent Systems** to expand its offerings to users of Amazon Web Services cloud. Hosting.com currently serves more than 2,000 customers with its managed cloud services.
- Douglas County-based **EchoStar** and **DISH Network** reached an agreement to interchange certain business assets, giving DISH most of the video aspects held by EchoStar including Sling TV and the Slingbox. DISH will also receive a 10 percent equity interest in Sling TV and in return, DISH will relieve its 80 percent interest in Hughes Retail Group to Echostar.
- Boulder-based startup **Congruex** made its first acquisition as it begins plans to develop an engineering- and construction-management platform for broadband networks. The company acquired Georgia-based CCLD Technologies, a firm that engages in engineering and construction of large project work for broadband providers in the United States.
- Boulder-based **Zayo** entered into an agreement to acquire Spread Networks for $127 million. Spread Networks owns and operates 825 miles of fiber-optic cable between New York and Chicago. The acquisition provides Zayo’s customers better access between two major financial markets, and combines customers with Zayo’s existing routes connecting Seattle, San Francisco, and Chicago.
- **Zayo** closed a $1.4 billion acquisition of Washington-based Electric Lightwave in a deal that is expected to strengthen the company as the only nationwide independent provider of communications infrastructure. Electric Lightwave provides fiber networks that serve 35 western U.S. markets.
Nine-County Region Workforce

- Nearly half of the nine-county region’s 3.8 million residents are under the age of 35. Employers can draw from a large, young, highly educated, and productive workforce.
- Of the region’s adult population, 43.2 percent are college graduates and 91.4 percent have graduated from high school.
- The region’s population is expected to grow 32.2 percent from 2020 to 2040, driving a 21.2 percent increase in the region’s labor force over the same period.

Broadcasting and Telecommunications Workforce Profile

The cluster has a larger share of employees that are between the ages of 35 and 54 years and older (56 percent), compared with the age distribution of all industries across the nine-county region (43.4 percent).

The Occupation & Salary Profile below includes the 10 largest broadcasting and telecommunications occupations in the region. For these 10 largest occupations, the chart details the total number of workers employed in that occupation across all industries, the number of available applicants that would like to be working in that occupation, the number of recent graduates that are qualified for that occupation, and the median and sample percentile annual salaries.

Wages

- 2016 average annual salary was $99,880, compared with $86,930 nationwide.
- Total payroll exceeded $4.2 billion in 2016.
## Metro Denver and Northern Colorado Broadcasting and Telecommunications Occupation & Salary Profile, 2017

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<td>3,940</td>
<td>96</td>
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<td>$74,226</td>
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</tr>
<tr>
<td>2. Sales representatives, services, all other</td>
<td>21,578</td>
<td>525</td>
<td>21</td>
<td>$56,574</td>
<td>$26,542</td>
<td>$38,572</td>
<td>$84,237</td>
<td>$122,791</td>
</tr>
<tr>
<td>3. Customer service representatives</td>
<td>34,879</td>
<td>848</td>
<td>0</td>
<td>$34,245</td>
<td>$22,588</td>
<td>$27,079</td>
<td>$43,508</td>
<td>$53,566</td>
</tr>
<tr>
<td>4. Business operations specialists, all other</td>
<td>32,514</td>
<td>791</td>
<td>17</td>
<td>$74,757</td>
<td>$43,128</td>
<td>$55,758</td>
<td>$98,542</td>
<td>$126,087</td>
</tr>
<tr>
<td>5. Electronics engineers, except computer</td>
<td>4,976</td>
<td>121</td>
<td>398</td>
<td>$94,837</td>
<td>$65,034</td>
<td>$75,581</td>
<td>$122,715</td>
<td>$152,011</td>
</tr>
<tr>
<td>6. Telecommunications line installers &amp; repairers</td>
<td>1,798</td>
<td>44</td>
<td>0</td>
<td>$45,076</td>
<td>$28,116</td>
<td>$34,412</td>
<td>$59,631</td>
<td>$73,141</td>
</tr>
<tr>
<td>7. Software developers, applications</td>
<td>21,917</td>
<td>533</td>
<td>1036</td>
<td>$102,873</td>
<td>$64,460</td>
<td>$80,273</td>
<td>$127,026</td>
<td>$152,551</td>
</tr>
<tr>
<td>8. Network &amp; computer systems administrators</td>
<td>8,899</td>
<td>216</td>
<td>655</td>
<td>$84,157</td>
<td>$52,185</td>
<td>$65,748</td>
<td>$104,263</td>
<td>$123,672</td>
</tr>
<tr>
<td>9. Software developers, systems software</td>
<td>11,131</td>
<td>271</td>
<td>1,191</td>
<td>$112,619</td>
<td>$77,723</td>
<td>$91,555</td>
<td>$137,778</td>
<td>$170,634</td>
</tr>
<tr>
<td>10. Computer user support specialists</td>
<td>12,530</td>
<td>305</td>
<td>916</td>
<td>$57,285</td>
<td>$35,956</td>
<td>$44,740</td>
<td>$74,312</td>
<td>$93,525</td>
</tr>
</tbody>
</table>

Notes: The number of available applicants is a point-in-time measurement of the number of people who have registered in Colorado’s workforce development system’s statewide database, Connecting Colorado, as being able and available to work in a particular occupation. Results should be interpreted with caution since registration in Connecting Colorado is self-reported. In addition, the skills rubric may assign up to four occupation codes for each registrant. Therefore, the number of available applicants could be inflated. Source: Provided by Arapahoe/Douglas Works!; QCEW Employees, Non-QCEW Employees, & Self Employed - EMSI 2017.3 Class of Worker.

## Education & Training

Colorado’s higher education system provides an excellent support system for businesses in the region. There are 28 public higher education institutions in Colorado, of which seven four-year and six two-year public institutions offering comprehensive curricula are located in the nine-county region. There are more than 100 private and religious accredited institutions and more than 350 private occupational and technical schools offering courses in dozens of program areas throughout the state. The state higher education system served about 255,510 students in FY 2015-16, while 86,070 students received a degree, diploma, certificate, or other formal award over the same period of time. Although not exhaustive, a list of the major, accredited educational institutions with the greatest number of graduates for each of the 10 largest broadcasting and telecommunications occupations in the nine-county region are included below. A directory of all higher education institutions with corresponding websites may be accessed via [http://highered.colorado.gov](http://highered.colorado.gov).

- **Colorado State University**
  - [www.colostate.edu](http://www.colostate.edu)
- **Colorado State University Global Campus**
  - [www.colostate.edu](http://www.colostate.edu)
- **Community College of Aurora**
  - [www.ccaurora.edu](http://www.ccaurora.edu)
- **Front Range Community College**
  - [www.frontrange.edu](http://www.frontrange.edu)
- **Metropolitan State University of Denver**
  - [www.msudenver.edu](http://www.msudenver.edu)
- **Red Rocks Community College**
  - [www.rrcc.edu](http://www.rrcc.edu)
- **Regis University**
  - [www.regis.edu](http://www.regis.edu)
- **University of Colorado Boulder**
  - [www.colorado.edu](http://www.colorado.edu)
- **University of Colorado Denver**
  - [www.ucdenver.edu](http://www.ucdenver.edu)
- **University of Denver**
  - [www.du.edu](http://www.du.edu)
Key Reasons for Broadcasting and Telecommunications Companies to Locate in the Nine-County Region

The region is a top broadcasting and telecommunications location offering:

1. **A central location and easy global access**
   - Denver International Airport (DEN) was the sixth-busiest airport in the nation and 18th-busiest worldwide in terms of passenger traffic in 2016. (U.S. Bureau of Transportation Statistics, 2017; Airports Council International 2017; and Denver International Airport, 2017)
   - DEN serves 25 international destinations in 11 countries, with eight international flights added in 2017 alone. (Denver International Airport, 2017)
   - Metro Denver is the largest region in the U.S. to offer one-bounce satellite uplinks to six out of seven continents in one business day due to its unique geographic location in the Mountain time zone.
   - Located on the 105th meridian, Metro Denver’s central location at the exact midpoint between Tokyo and Frankfurt positions the region favorably to serve growing world markets.

2. **A large concentration of high-quality technology workers and entrepreneurial talent**
   - Nearly 40 percent of Coloradans have at least a bachelor’s degree, the second-highest college attainment rate in the nation behind Massachusetts. (U.S. Census Bureau, 2016 American Community Survey)
   - Telecommunications services and Internet services ranked among the top 5 leading tech industry sector by employment in Denver in 2017. Tech workers in Denver earn nearly double the average private-sector worker. (CompTIA, *Cyberstates 2017: The Definitive National, State, and City Analysis of the U.S. Tech Industry and Tech Workforce, 2017*)
   - Denver ranked fourth in the nation for the best overall value for technology workers. About 50 percent of a Denver tech salary is allotted to cost of living, with 50 percent left as expendable income. (Paysa, 2017)
   - Tech salaries in Denver are the second-highest of 10 ranked North American cities, adjusted for cost of living. (Hired, 2017)
   - Boulder (first) and Metro Denver (third) ranked among the top 10 metro areas for female entrepreneurs in 2017. (Version 2.0 Communications, 2017)

3. **Low to moderate costs of doing business**
   - Colorado ranked No. 8 among *Forbes’ 2017 “Best States for Business”* list. The state received its highest rankings for labor supply (first overall), economic climate (third overall), and growth prospects (fourth overall). (*Forbes, 2017*)
   - Metro Denver office rental rates averaged $30.16 per square foot in the fourth quarter of 2017, making the region’s office market highly competitive with other major markets in the U.S. (CoStar Realty Information, The CoStar Office Report, 4Q 2017)

4. **A pro-business environment and competitive tax structure**
   - Colorado ranked as the nation’s easiest state for starting, operating, and growing an Internet business. (Internet Association, 2017)
   - Colorado ranks as one of the nation’s most favorable corporate income tax structures. The state’s corporate income tax rate of 4.63 percent is one of the lowest in the nation and is based on single-factor apportionment, which allows companies to pay taxes based solely on their sales in the state. (State of Colorado; The Tax Foundation)
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- Colorado ranks as the nation’s 10th-best tax system for entrepreneurs and small business. (Small Business & Entrepreneurship Council, 2017)

5. An overall better quality of life
- Colorado has the seventh-best infrastructure in the nation, measuring states’ Internet, energy, and transportation. (U.S. News & World Report, 2017)
- Denver was named as the second-best place to live in the U.S. in 2017. The city’s desirability, prominent research institutions, and growing job market contributed to its notable rank. (U.S. News & World Report, 2017)
- Metro Denver ranked as the nation’s seventh-fittest metropolitan area in 2017. Low obesity, increased physical activity, and low prevalence of diabetes and heart disease contributed to its high rank. (American College of Sports Medicine, 2017)
- The city of Lone Tree ranked seventh in the “Best Places to Live” list. Superior (49th) and Louisville (50th) were named to the list’s top-50 locations. (MONEY Magazine, 2017)
- Denver ranked ninth among the 2017 “Best Big Cities to Live In” and scored fourth for local economy. (WalletHub, 2017)

For additional information, contact us:

1445 Market Street
Denver, CO 80202-1790
303.620.8092
email: info@metrodenver.org
www.metrodenver.org

ENERGY:
Colorado and Metro Denver and Northern Colorado Industry Cluster

Industry Overview

Colorado’s balanced energy economy is attributable to a wealth of fossil fuels and renewable energy resources. The state’s diverse geography and geology include substantial deposits of coal, natural gas, and petroleum. Renewable resources, including an abundance of solar and wind, support Colorado’s position as a leader in renewable energy generation.

Electric power generation in the state is provided based on location by either two investor owned utilities (IOUs), 29 municipal providers, or one of the 22 rural cooperatives. Colorado has one major refinery located in the nine-county Metro Denver and Northern Colorado region¹ that produces gasoline, diesel, and asphalt.

Colorado’s progressive energy policy positions, such as a requirement for the state’s largest utility to make the transition from coal-fired generation to cleaner burning forms of generation, have facilitated the expansion of natural gas development and renewable energy. Voters led the charge to the first renewable energy standard for the state in 2004, which has been updated three times. Currently, the state’s IOUs must generate 30 percent of their power from renewables by 2020 and cooperatives or municipals must meet a 10 to 20 percent mix of renewables dependent on their size. As a result, significant renewable energy projects have come online in the last several years. Wind is the fastest growing energy resource on the grid and is the predominant renewable resource in Colorado, with over 3,029 megawatts (MW) of installed capacity. The state has a mature solar industry that includes a mix of utility-scale generation, community solar gardens, and distributed generation at customer locations. In 2017, about 19 percent of the power generation in the state was from renewable resources, 27 percent from natural gas, and 54 percent from coal-fired generation.

The diversity of energy resources also support the state’s world-class hub for energy research and technology innovation at universities, energy incubators, and federal facilities. With 33 federally funded laboratories, Colorado has one of the highest per-capita concentrations of federally funded research facilities in the nation.

The state’s energy industry is a significant source of economic activity in Colorado. Combined, the 66,820 direct energy workers earning $6.5 billion in the state support an additional 194,060 indirect workers earning $7.5 billion in all industries throughout the state. In total, the energy industry in Colorado supports 260,880 workers in all industries earning $14 billion annually.

Cluster Definition and Methodology

This report evaluates Colorado’s energy industry in two subclusters: (1) cleantech and (2) fossil fuels. The fossil fuels subcluster includes companies involved in the extraction of naturally occurring fuels used to produce energy as well as the generation, transmission, and distribution of energy resources. The cleantech subcluster includes companies developing and delivering products and technologies across solar, wind, biomass, and sustainable transportation sectors that improve operational performance, efficiency, or productivity, while reducing energy costs and energy consumption.

It is often difficult to distinguish how an organization’s operations are divided between fossil fuels and cleantech components. For example, research is a critical component of all energy industries, from oil and gas to solar and wind energy. So that the two subclusters may be analyzed independently, all energy research entities are included in the cleantech subcluster while all energy transmission and distribution activities are included in the fossil fuels subcluster, even though a portion of the energy may be coming from renewable resources.

¹ The nine-county region is comprised of two principal areas, Metro Denver and Northern Colorado. Metro Denver consists of Adams, Arapahoe, Boulder, Broomfield, Denver, Douglas, and Jefferson counties. Northern Colorado consists of Larimer and Weld counties.
Cleantech Economic Profile

The cleantech industry, for purposes of this subcluster, includes companies that produce energy from wind, solar, biomass, fuel cells, and hydroelectric resources. It also includes manufacturers of renewable energy equipment, battery storage, and businesses that provide engineering and other support services. Energy research companies that provide laboratory testing, scientific and technical consulting services, and institutional research related to the environment, natural resources, and energy are included as well. The cleantech subcluster consists of 29, six-digit North American Industry Classification System (NAICS) codes.

<table>
<thead>
<tr>
<th>Cleantech Employment and Company Profile, 2017</th>
<th>Nine-County Region</th>
<th>Colorado</th>
<th>United States</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct employment, 2017</td>
<td>22,440</td>
<td>26,400</td>
<td>885,930</td>
</tr>
<tr>
<td>Number of direct companies, 2017</td>
<td>1,620</td>
<td>2,140</td>
<td>59,240</td>
</tr>
<tr>
<td>One-year direct employment growth, 2016-2017</td>
<td>1.0%</td>
<td>1.2%</td>
<td>2.1%</td>
</tr>
<tr>
<td>Five-year direct employment growth, 2012-2017</td>
<td>20.5%</td>
<td>21.7%</td>
<td>14.6%</td>
</tr>
<tr>
<td>Avg. annual direct employment growth, 2012-2017</td>
<td>3.8%</td>
<td>4.0%</td>
<td>2.8%</td>
</tr>
<tr>
<td>Direct employment concentration</td>
<td>1.0%</td>
<td>0.8%</td>
<td>0.5%</td>
</tr>
</tbody>
</table>

Sources: Dun & Bradstreet, Inc., Hoover’s Online Database; Market Analysis Profile, 2012-2017; Development Research Partners.

Rankings

<table>
<thead>
<tr>
<th>Nine-County Region</th>
<th>Colorado</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cleantech direct employment concentration rank</td>
<td>6th</td>
</tr>
<tr>
<td>Cleantech direct employment rank</td>
<td>6th</td>
</tr>
</tbody>
</table>

| Cleantech direct employment concentration rank | 4th |
| Cleantech direct employment rank               | 9th |

Sources: Dun & Bradstreet, Inc., Hoover’s Online Database; Market Analysis Profile, 2012-2017; Development Research Partners.

2 Direct employment rank based on the number of employees in the industry cluster in a state or region. Employment concentration rank based on the direct cluster employment in a state or region expressed as a percent of total employment in all industries in the same state or region. Rankings are for the 50 largest metropolitan statistical areas (MSAs) and 50 largest states. No multiplier effects are included. 1st = highest for both rankings.

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ENERGY:
Colorado and Metro Denver and Northern Colorado Industry Cluster

Cleantech Overview

Colorado is a leader in cleantech employment, R&D, and investment. The national laboratories and university resources create new opportunities in energy efficiency and renewable energy that allow for cleaner and more efficient use of energy. Companies in the cleantech subcluster create jobs, fuel economic growth, and stimulate innovation and technology development.

Cleantech Company Announcements

General Cleantech

- The National Renewable Energy Laboratory (NREL), Xcel Energy, Panasonic Enterprise Solutions, LC Fulenwider Inc., and Denver International Airport (DEN) partnered to develop the 382-acre Peña Station NEXT as a transit-oriented, carbon neutral community between the airport and downtown on the Regional Transportation District's light rail line. The initiative leverages innovative technologies including renewable energy, battery storage, carbon capture, and grid modeling capabilities. The cost-effective, net-zero development infrastructure could be replicated and adopted across the U.S. in future developments.

- United Power and SoCore Energy plan to build the state's largest commercial-scale energy storage system in Firestone. The 4-MW/16-MWh battery storage system will help curb peak demand to reduce costs and improve overall efficiency for more than 82,000 meters.

- The Wells Fargo Foundation added $20 million to NREL's Innovation Incubator to grow and sustain cleantech startups, and expand to other vertical markets. The Incubator provides a grant of up to $250,000 to help cleantech startup companies improve their technology and test their various products at Wells Fargo buildings.

- AMP Robotics was selected as a finalist in The Ecolab Award for Circular Economy Tech Disruptor. The Circulars, an initiative of the World Economic Forum and the Forum of Young Global Leaders, is the world’s premier circular economy award program. The Circulars event will be held at the World Economic Forum Annual Meeting in Davos, January 2018. AMP Robotics was formed with the goal of bringing artificial intelligence and robotics to the recycling industry to fundamentally change the costs of recycling. They have successfully developed a new kind of sorting technology for recycling facilities called the Cortex robot.

- Louisville-based, Solid Power, a leading developer of solid-state rechargeable batteries, announced a partnership with BMW to develop next generation electric vehicle batteries. The BMW Group will assist Solid Power in advancing its technology in order to achieve production levels required for high-performance electric vehicles. Established in 2012 as a spin-out company from the University of Colorado Boulder, Solid Power is focused on developing and scaling competitive solid-state batteries, paying special attention to safety, performance, and cost.

Solar Energy

- Boulder-based Namasté Solar Inc. raised $3.1 million from more than 91 investors, the second-largest amount ever raised by an employee-owned cooperative in the U.S. The company relocated to larger space to accommodate growth and is the leading solar installer in the state.

- Utah-based Vivint Solar Inc. opened a new sales office in Centennial to service the Metro Denver region. Vivint is a leading full-service residential solar provider offering integrated residential solar solutions for the entire customer lifecycle. Through an exclusive collaboration with Mercedes-Benz Energy in the U.S., Vivint offers solar plus storage systems with batteries from Mercedes-Benz.

- Fort Collins-based Ampt raised $15 million in new funding to expand the company’s product portfolio and accelerate global growth, which brings their total investment to over $50 million. The company provides power conversion technology for solar power plant optimization.


- Weld County is the site of several utility-scale solar farms.
  - The 30-acre Platte Valley Solar Farm in Kersey provides power for the Poudre Valley Rural Electric Association. The 3.5-MW project constructed by Silicon Ranch Corporation generates enough power to support 600 homes.
  - The 16-MW Platteville Solar Farm began operating in late 2017 as the largest cooperative solar farm in the state. It was constructed and is owned and operated by Silicon Ranch
**ENERGY:**

**Colorado and Metro Denver and Northern Colorado Industry Cluster**

- The Poudre Valley Rural Electric Association partnered with Denver-based GRID Alternatives Colorado and the Colorado Energy Office to construct a 9-acre community solar farm with portions designated for low-income households and nonprofit organizations. Approximately 35 percent of the 1.95-MW Coyote Ridge Community Solar Farm will be dedicated to members whose household income is at or below 80 percent of the median income in Larimer County.

- Denver hosted the 2017 DOE Solar Decathlon competition which attracted over 60,000 visitors. The international contest challenges collegiate teams to design, build, and operate solar-powered houses that are cost-effective, energy-efficient, and attractive. Eleven finalists reconstructed their full-size homes for judges and the public to visit.

- Denver-based RGS Energy Inc. signed a licensing deal for The Dow Chemical Co.’s Powerhouse solar-shingle system, which has been deployed on 1,000 homes. RGS will lead all commercial activities for the product, including supply-chain management, marketing, sales, installation, and warranty.

- Ascent Solar Technologies, Inc. headquartered in Thornton, closed a private placement of $1.7 million of new investment. Ascent is the developer and manufacturer of state-of-the-art, flexible thin-film photovoltaic (PV) solutions.

- As part of Xcel’s Solar*Rewards program, NextEra Energy Resources will install a 6 MW solar array at the IBM facility in Boulder. It will be Boulder’s largest solar project covering 54 acres of IBM’s site.

**Wind Energy**

- Construction is underway at Xcel Energy’s 600-MW Rush Creek Wind Project and 83-mile transmission line in eastern Colorado. The $1.1 billion project will include 300 Vestas wind turbines and would be the state’s largest wind farm, which is slated for completion in late 2018.

- Denmark-based PolyTech Wind Power Technology Inc. leased 20,323 square feet of warehouse space in Greeley. The company will use the space to store components for wind turbine blades shipped to the U.S. before distributing them to Vestas Wind Systems’ plants in Windsor and Brighton.

- Black Hills Energy constructed a 34-turbine, 60-MW wind power station near Walsenburg. The Peak View Wind Project will supply enough power for 28,000 homes.

- Vestas Wind Systems, which employs about 3,500 people at its four Colorado factories, led the nation in wind turbine orders for the first half of 2017. Globally, the company broke its previous record for equipment with 10,595 MW of order intake for 2017. In the first half of 2017, Vestas’ Colorado operations were boosted by February order for 174 wind turbines that will be made in Colorado. The Danish corporation said the 174 turbines will produce 348 megawatts of energy. In 2016, Colorado ranked 4th in the nation for wind employment with 17 manufacturing facilities producing a variety of components for the wind industry.

**Biomass**

- Colorado State University received a three-year, $3.5 million U.S. Department of Energy grant to improve the way algae-based biofuels and bioproducts are manufactured. The project goal will be to double the yield of biofuel precursors from algae.

**Green Transportation**

- Loveland-based Lightning Systems, formerly Lightning Hybrids, moved to a larger headquarters facility at the Rocky Mountain Center for Innovation and Technology. The 45,000-square-foot space will accommodate new product development, increased production, and additional staff.

- Ford Motor Company selected Lightning Systems and Longmont-based UQM Technologies to participate in the Advanced Fuel Qualified Vehicle Modifier (eQVM) program. UQM will provide eQVM with its electric motors and components and Lightning will provide a product that converts a gasoline engine to an all-electric vehicle.

- Louisville-based Solid Power Inc. partnered with BMW Group to make solid-state batteries for electric vehicles. BMW will help Solid Power advance its technologies to create batteries for high-performance vehicles with increased driving range a longer shelf-life that can withstand higher temperatures.

- EasyMile, a French manufacturer of driverless shuttles, opened its U.S. headquarters and a warehouse at the Panasonic campus near DEN.
ENERGY:
Colorado and Metro Denver and Northern Colorado Industry Cluster

Major Cleantech Companies

Battery Storage
- Nikola Power
  www.nikolapower.com
- Solid Power
  www.solidpowerbattery.com

Energy Efficiency
- GE
  www.ge.com
- Woodward
  www.woodward.com

Engineering & Technical Services
- AECOM
  www.aecom.com
- ARCADIS
  www.arcadis.com
- TestAmerica Laboratories
  www.testamericainc.com
- Tetra Tech
  www.tetratech.com
- Chicago Bridge & Iron
  www.cbi.com
- ARCADIS
  www.arcadis.com
- Tetra Tech
  www.tetratech.com
- AECOM
  www.aecom.com
- TestAmerica Laboratories
  www.testamericainc.com
- Tetra Tech
  www.tetratech.com
- Chicago Bridge & Iron
  www.cbi.com

Solar
- Abengoa Solar
  www.abengoaasolar.com
- Namasté Solar
  www.namastesolar.com
- Ascent Solar Technologies, Inc.
  www.ascent.com
- SolarCity
  www.solarcity.com
- Abengoa Solar
  www.abengoaasolar.com
- Namasté Solar
  www.namastesolar.com
- Ascent Solar Technologies, Inc.
  www.ascent.com
- SolarCity
  www.solarcity.com

Wind
- Aluwind
  www.aluwind.com
- Vests
  www.vestas.com
- Senvion USA Corp.
  www.repower.com
- Aluwind
  www.aluwind.com
- Vests
  www.vestas.com
- Senvion USA Corp.
  www.repower.com

Major Renewable Energy Government and Research Facilities
- Colorado Energy Office
  www.colorado.gov/energyoffice
- National Renewable Energy Laboratory
  www.nrel.gov
- Colorado Energy Research Collaboratory
  www.coloradocollaboratory.org
- National Renewable Energy Laboratory
  www.nrel.gov
- U.S. Bureau of Reclamation
  www.usbr.gov
- Colorado Energy Research Institute
  www.ceri-mines.org
- U.S. Dept. of Energy, Golden Field Office
  www.energy.gov/eere
- JILA
  www.jila.colorado.edu
- U.S. Environmental Protection Agency
  www.epa.gov
- National Center for Atmospheric Research
  www.ncar.ucar.edu
- U.S. Geological Survey
  www.usgs.gov
- National Institute of Standards & Technology
  www.nist.gov
- Western Area Power Administration
  www.wapa.gov
- National Oceanic & Atmospheric Administration
  www.noaa.gov
ENERGY:  
Colorado and Metro Denver and Northern Colorado Industry Cluster

Fossil Fuels Economic Profile

The fossil fuels subcluster includes companies that extract naturally occurring mineral liquids, gases, and solids used to produce energy. The fossil fuels subcluster also includes mining machinery manufacturers and companies that provide mining, exploration, and related support services. Companies providing generation, transmission, and distribution of energy resources are also included. The fossil fuels subcluster consists of 29, six-digit North American Industry Classification System (NAICS) codes.

### Rankings

<table>
<thead>
<tr>
<th>Nine-County Region</th>
<th>Colorado</th>
<th>United States</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fossil fuels direct employment concentration rank</td>
<td>9th</td>
<td></td>
</tr>
<tr>
<td>Fossil fuels direct employment rank</td>
<td>5th</td>
<td></td>
</tr>
<tr>
<td>Fossil fuels direct employment concentration rank</td>
<td>9th</td>
<td></td>
</tr>
<tr>
<td>Fossil fuels direct employment rank</td>
<td>9th</td>
<td></td>
</tr>
</tbody>
</table>

### Fossil Fuels Employment and Company Profile, 2017

<table>
<thead>
<tr>
<th>Nine-County Region</th>
<th>Colorado</th>
<th>United States</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct employment, 2017</td>
<td>28,840</td>
<td>40,420</td>
</tr>
<tr>
<td>Number of direct companies, 2017</td>
<td>1,860</td>
<td>2,610</td>
</tr>
<tr>
<td>One-year direct employment growth, 2016-2017</td>
<td>-0.2%</td>
<td>-3.9%</td>
</tr>
<tr>
<td>Five-year direct employment growth, 2012-2017</td>
<td>4.6%</td>
<td>-8.4%</td>
</tr>
<tr>
<td>Avg. annual direct employment growth, 2012-2017</td>
<td>0.9%</td>
<td>-1.7%</td>
</tr>
<tr>
<td>Direct employment concentration</td>
<td>1.2%</td>
<td>1.3%</td>
</tr>
</tbody>
</table>

### Energy - Fossil Fuels

- **Number of Employees Growth Rate**

<table>
<thead>
<tr>
<th>Nine-County Region</th>
<th>Colorado</th>
<th>United States</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy - Fossil Fuels</td>
<td>-3.9%</td>
<td>-0.2%</td>
</tr>
</tbody>
</table>

### Colorado Fossil Fuels Employment by Category, 2017

- **All Other Colorado Counties** 23.6%
- **Oil & Gas Extraction** 19.9%
- **Utility System Construction** 12.8%
- **Oil & Gas Machinery & Equip. Mfg. & Wholesale** 5.9%
- **Coal & Metal Ore Mining** 3.6%
- **Pipeline Transportation** 1.2%
- **Fossil Fuels-Related Financial Services** 0.2%
- **Engineering Services, Surveying, & Mapping** -1.0%

### Colorado Fossil Fuels Employment by County, 2017

- **Denver** 24.4%
- **Arapahoe** 4.3%
- **Boulder** 2.8%
- **Broomfield** 2.6%
- **Jefferson** 6.1%
- **Adams** 8.4%
- **Weld** 9.8%
- **All Other Colorado Counties** 23.6%

---

3 Direct employment rank based on the number of employees in the industry cluster in a state or region. Employment concentration rank based on the direct cluster employment in a state or region expressed as a percent of total employment in all industries in the same state or region. Rankings are for the 50 largest metropolitan statistical areas (MSAs) and 50 largest states. No multiplier effects are included. 1st = highest for both rankings.
ENERGY:  
Colorado and Metro Denver and Northern Colorado Industry Cluster

Fossil Fuels Overview

Fossil fuels play an integral role in Colorado’s economy, offering significant deposits of coal, natural gas, and petroleum. While many fossil fuel companies conduct business operations from the Metro Denver region, the majority of the drilling is concentrated along the Western Slope of the Rocky Mountains and in the Northeastern Weld County. Colorado’s active wells totaled nearly 55,160 in 2017, with about 64 percent of total active wells located in Weld and Garfield counties.

Colorado continues to recover from the oil and gas downturn, record low prices, and ongoing policy challenges in the fossil fuels industry. These challenges have continued to improve prospects for the use of directional drilling and hydraulic fracturing technologies. Primary oil producing basins—the Niobrara shale formation in the Denver-Julesburg (DJ) Basin and the Piceance Basin—have led to substantial new production, job creation, technology deployment, and growing export possibilities. Further, state and local governments benefit from taxes on energy production. According to the Colorado Office of State Planning and Budgeting, severance tax collections increased slightly to $19.5 million in fiscal year 2016-17, after $18.9 million in revenue was collected in fiscal year 2015-16.

Northwestern Colorado overlays part of the Green River oil shale, a kerogen-rich formation that, by some estimates, could be the world’s largest crude oil resource. Colorado has one petroleum refinery in Commerce City near Denver. Recent upgrades enable the refinery to process more crude oil from Colorado producers. Colorado is among the major natural gas-producing states in the nation and the state holds substantial estimated recoverable coal reserves, including bituminous, subbituminous, and lignite coals. Coal mining is currently focused in the Green River, Piceance, and San Juan Basins.

Fossil Fuels Company Announcements

- **Colorado’s oil and gas industry contributed nearly $31.4 billion** to the state’s economy in 2015, according to PricewaterhouseCoopers. Oil and gas jobs across the state accounted for nearly 7 percent of total state employment and school districts received nearly $202 million from companies paying property taxes in the state.
- **BP Lower 48** is moving their headquarters from Houston to downtown Denver. The company anticipates the office will open with at least 200 employees in early 2018, with more staff to be added later. The new office will improve access to key fossil fuel producing basins in the region and will create a strategic platform for growth. In early 2015, BP began operating its U.S. Lower 48 business as a separate business, with its own governance, processes, and systems.
- **Noble Energy Inc.** will shift about 100 workers from its Denver office to Greeley and Houston as a result of company restructuring and efficiency measures. Noble planned to invest more than $850 million in the DJ Basin in 2017, which accounts for about 47 percent of the company’s $1.8 billion budget for U.S. onshore operations.
- **Xcel Energy** will invest $612 million over the next six years to equip homes and businesses in Colorado with smart meters to allow customers to closely track their energy usage. The upgrades will also include equipment to control voltage on Xcel’s system, saving about 2 percent of the electricity now sold that goes to waste.
- **Encana Corp.** renewed its lease for 335,000 square feet in Republic Plaza in downtown Denver until 2026. Encana’s Denver office manages its U.S. operations in Texas and in the natural gas fields of the Piceance Basin in western Colorado.
- **Tallgrass Energy Partners** and **Saddle Butte Pipeline** partnered to develop a new oil terminal in Platteville. The Tallgrass Grasslands Oil Terminal Complex will interconnect with Saddle Butte’s DJ Basin crude oil gathering system to ultimately move at least 80,000 barrels of crude oil per day by mid-2018.
- **Williams** is constructing a new natural gas liquids pipeline in Parachute. The 2,000-foot pipeline will connect to the company’s nearby gas processing plant.
- **Anadarko Petroleum Corp.**, planned to invest $950 million in the DJ Basin in 2018 and will operate five drilling rigs and three fracking crews. Using new technology, the company boosted the amount of oil, natural gas, and liquids it could extract from the DJ Basin by over 30 percent to more than 2 billion barrels of oil equivalent.
- **United Power** purchased a 130,117-square-foot facility in Longmont to expand its administrative, service, and maintenance capabilities. The building will allow the company to centrally locate these functions with quick access to highways.
ENERGY:  
Colorado and Metro Denver and Northern Colorado Industry Cluster

- Denver-based Extraction Oil & Gas Inc. will build a pipeline to transport oil out of the Triple Creek drilling site in Greeley. Drilling on the 22-well site began in December 2016, with oil expected to start flowing from the wells in early 2018. The company expects to invest up to $840 million in Colorado in 2018.
- Ursa Resources plans to drill over 55 wells in its second phase of oil and gas development in Battlement Mesa. The first phase included drilling 50 wells in early 2017.
- Late in 2017, Noble Midstream Partners, the pipeline unit of Noble Energy, announced a joint venture with Greenfield Midstream to buy Colorado’s Saddle Butte Pipeline for $625 million.
- PDC Energy Inc. plans to invest $480 million in the Wattenberg Field in 2018. The company plans to drill 131 new wells, using three drilling rigs and will begin producing oil and gas at 139 wells in the area.
- The Bureau of Land Management approved expansions of GCC Energy LLC’s King II coal mine near Hesperus and the West Elk coal mine in Somerset. King II’s lease will expand by up to 950 acres, which will extend the mine’s active life by an estimated 5 to 7 years. West Elk’s lease modifications totaled 1,721 acres, gaining access to 10.1 million tons of additional coal.

Merger and Acquisition Activity

- Denver-based DCP Midstream Partners LP acquired the assets of a joint venture between Phillips 66 and Spectra Energy Corp. to create the largest natural gas liquids producer and gas processor in the U.S. The $11 billion combined company will be renamed DCP Midstream LP and will help simplify its corporate structure and expand its projects in key U.S. producing basins, including the DJ Basin.
- Denver’s Caerus Oil and Gas LLC purchased $735 million of Encana Corp.’s natural gas assets in the Piceance Basin. With the acquisition, Caerus has more than 800 wells that are spread across more than 500,000 acres of mineral rights. The wells involved in the purchase produced an average 240 million cubic feet per day of natural gas plus 2,178 barrels per day of associated liquids (such as butane and propane) during the first quarter of 2017.
- Hilcorp San Juan L.P. acquired ConocoPhillips oil and gas assets in the San Juan Basin, totaling 1.3 million acres. The $2.5 billion deal will support Hilcorp’s goal to increase production in southwestern Colorado.
- Noble Energy divested approximately 30,200 net acres from the company’s non-core DJ Basin acreage in Weld County to SRC Energy Inc. The $608 million transaction is anticipated to close on two separate dates, with acreage and non-operated production included in the initial closing by the end of 2017, followed by a second closing for operated producing properties by mid-2018.
ENERGY:
Colorado and Metro Denver and Northern Colorado Industry Cluster

Major Fossil Fuels Companies

Infrastructure
- Kinder Morgan
  www.kindermorgan.com
- Northern Pipeline Construction
  www.gonpl.com

Oil & Gas Extraction
- Anadarko Petroleum Corporation
  www.anadarko.com
- Encana Corporation
  www.encana.com

Oil & Gas Field Services
- Halliburton
  www.halliburton.com
- Schlumberger Ltd.
  www.slb.com

Power Generation & Transmission
- Black Hills Corporation
  www.blackhillscorp.com
- Colorado Springs Utilities
  www.csu.org
- Intermountain Rural Electric Association
  www.irea.coop
- Tri-State Generation & Transmission Assoc.
  www.tristategt.org
- United Power
  www.unitedpower.com
- Xcel Energy
  www.xcelenergy.com

Industry Affiliates, Associations, & Partnerships
Colorado Workforce

- Nearly half of the state’s 5.6 million residents are under the age of 35.
- Of Colorado’s adult population, 39.9 percent are college graduates and 91.4 percent have graduated from high school.
- The state’s population is expected to grow 31.6 percent from 2020 to 2040, driving a 26 percent increase in the state’s labor force over the same period.

Energy Workforce Profile

Cleantech Workforce Profile

The subcluster has a larger share of employees that are between the ages of 35 and 64 years old (66.5 percent), compared with the age distribution of all industries across the state (59.5 percent).

The Occupation & Salary Profile below includes the 10 largest cleantech occupations in the state. For these 10 largest occupations, the chart details the total number of workers employed in that occupation across all industries, the number of available applicants that would like to be working in that occupation, the number of recent graduates that are qualified for that occupation, and the median and sample percentile annual salaries.

Wages

- 2016 average annual salary was $81,110, compared with the national average of $79,480.
- Cleantech payroll reached more than $2.1 billion in 2016.
ENERGY: 
Colorado and Metro Denver and Northern Colorado Industry Cluster

Colorado Cleantech Occupation & Salary Profile, 2017

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>2. Business operations specialists, all other</td>
<td>42,109</td>
<td>1,035</td>
<td>21</td>
<td>$73,904</td>
<td>$41,931</td>
<td>$54,939</td>
<td>$97,753</td>
<td>$125,027</td>
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<tr>
<td>3. Engineers</td>
<td>43,594</td>
<td>1,071</td>
<td>4,594</td>
<td>$94,765</td>
<td>$61,069</td>
<td>$73,757</td>
<td>$123,906</td>
<td>$154,149</td>
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<tr>
<td>4. Plumbers, pipefitters, &amp; steamfitters</td>
<td>10,089</td>
<td>248</td>
<td>138</td>
<td>$45,912</td>
<td>$29,993</td>
<td>$34,943</td>
<td>$58,433</td>
<td>$70,845</td>
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<tr>
<td>5. Office clerks, general</td>
<td>55,044</td>
<td>1,353</td>
<td>0</td>
<td>$35,824</td>
<td>$21,080</td>
<td>$27,323</td>
<td>$47,210</td>
<td>$60,879</td>
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<td>6. Secretaries &amp; administrative assistants, except legal, medical, &amp; executive</td>
<td>59,368</td>
<td>1,459</td>
<td>100</td>
<td>$36,039</td>
<td>$22,260</td>
<td>$28,683</td>
<td>$45,059</td>
<td>$53,952</td>
</tr>
<tr>
<td>7. Physical scientists</td>
<td>11,360</td>
<td>279</td>
<td>1,562</td>
<td>$89,648</td>
<td>$49,837</td>
<td>$65,978</td>
<td>$119,434</td>
<td>$151,133</td>
</tr>
<tr>
<td>8. Heating, air conditioning, &amp; refrigeration mechanics &amp; installers</td>
<td>5,964</td>
<td>147</td>
<td>255</td>
<td>$51,892</td>
<td>$30,809</td>
<td>$37,181</td>
<td>$62,427</td>
<td>$75,166</td>
</tr>
<tr>
<td>9. Information &amp; record clerks, all other</td>
<td>9,396</td>
<td>231</td>
<td>0</td>
<td>$40,726</td>
<td>$26,915</td>
<td>$33,488</td>
<td>$49,088</td>
<td>$58,698</td>
</tr>
<tr>
<td>10. Life, physical, &amp; social science technicians</td>
<td>8,793</td>
<td>216</td>
<td>953</td>
<td>$44,283</td>
<td>$28,226</td>
<td>$33,530</td>
<td>$57,574</td>
<td>$73,029</td>
</tr>
</tbody>
</table>

Notes: The number of available applicants is a point-in-time measurement of the number of people who have registered in Colorado’s workforce development system’s statewide database, Connecting Colorado, as being able and available to work in a particular occupation. Results should be interpreted with caution since registration in Connecting Colorado is self-reported. In addition, the skills rubric may assign up to four occupation codes for each registrant. Therefore, the number of available applicants could be inflated. Source: Provided by Arapahoe/Douglas Works!; QCEW Employees, Non-QCEW Employees, & Self Employed - EMSI 2017.3 Class of Worker.

Fossil Fuels Workforce Profile

The subcluster has a larger share of employees that are between the ages of 25 and 64 years old (90.6 percent), compared with the age distribution across all industries (82.1 percent).

The Occupation & Salary Profile below includes the 10 largest fossil fuels occupations in the state. For these 10 largest occupations, the chart details the total number of workers employed in that occupation across all industries, the number of available applicants that would like to be working in that occupation, the number of recent graduates that are qualified for that occupation, and the median and sample percentile annual salaries.

Wages

- Wages in the fossil fuels subcluster are among the highest across all industry clusters.
- 2016 average annual salary was $103,780, compared with the national average of $101,890.
- Fossil fuels payroll reached nearly $4.4 billion in 2016.
ENERGY:  
*Colorado and Metro Denver and Northern Colorado Industry Cluster*

Colorado Fossil Fuels Occupation & Salary Profile, 2017

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>1. Civil engineers</td>
<td>9,175</td>
<td>225</td>
<td>448</td>
<td>$81,419</td>
<td>$53,342</td>
<td>$64,869</td>
<td>$103,632</td>
<td>$127,993</td>
</tr>
<tr>
<td>2. Roustabouts, oil &amp; gas</td>
<td>2,519</td>
<td>62</td>
<td>1</td>
<td>$38,382</td>
<td>$28,544</td>
<td>$33,041</td>
<td>$51,702</td>
<td>$61,088</td>
</tr>
<tr>
<td>3. Electrical power-line installers &amp; repairers</td>
<td>2,614</td>
<td>64</td>
<td>125</td>
<td>$71,282</td>
<td>$36,059</td>
<td>$49,424</td>
<td>$87,710</td>
<td>$97,703</td>
</tr>
<tr>
<td>5. Mechanical engineers</td>
<td>5,661</td>
<td>139</td>
<td>930</td>
<td>$86,236</td>
<td>$56,440</td>
<td>$69,475</td>
<td>$114,212</td>
<td>$151,552</td>
</tr>
<tr>
<td>6. Business operations specialists, all other</td>
<td>42,109</td>
<td>1,035</td>
<td>21</td>
<td>$73,904</td>
<td>$41,931</td>
<td>$54,939</td>
<td>$97,753</td>
<td>$125,027</td>
</tr>
<tr>
<td>7. General &amp; operations managers</td>
<td>44,197</td>
<td>1,086</td>
<td>9,896</td>
<td>$107,271</td>
<td>$45,133</td>
<td>$67,357</td>
<td>$166,721</td>
<td>$247,434</td>
</tr>
<tr>
<td>8. Secretaries &amp; administrative assistants, except legal, medical, &amp; executive</td>
<td>59,368</td>
<td>1,459</td>
<td>100</td>
<td>$36,039</td>
<td>$22,620</td>
<td>$28,683</td>
<td>$45,059</td>
<td>$53,952</td>
</tr>
<tr>
<td>10. Accountants &amp; auditors</td>
<td>38,920</td>
<td>957</td>
<td>1,485</td>
<td>$66,998</td>
<td>$42,630</td>
<td>$52,694</td>
<td>$89,535</td>
<td>$117,912</td>
</tr>
</tbody>
</table>

Notes: The number of available applicants is a point-in-time measurement of the number of people who have registered in Colorado’s workforce development system’s statewide database, Connecting Colorado, as being able and available to work in a particular occupation. Results should be interpreted with caution since registration in Connecting Colorado is self-reported. In addition, the skills rubric may assign up to four occupation codes for each registrant. Therefore, the number of available applicants could be inflated. *Source: Provided by Arapahoe/Douglas Works!; QCEW Employees, Non-QCEW Employees, & Self Employed - EMSI 2017.3 Class of Worker.*

**Education & Training**

Colorado’s higher education system provides an excellent support system for businesses in the state. There are 28 public higher education institutions in Colorado, consisting of 13 four-year and 15 two-year public institutions offering comprehensive curricula. There are more than 100 private and religious accredited institutions and more than 350 private occupational and technical schools offering courses in dozens of program areas throughout the state. The state higher education system served about 255,510 students in FY 2015-16, while 86,070 students received a degree, diploma, certificate, or other formal award over the same period of time. Although not exhaustive, a list of the major, accredited educational institutions with the greatest number of graduates for each of the 10 largest energy occupations in Colorado are included below. A directory of all higher education institutions with corresponding websites may be accessed via [http://highered.colorado.gov](http://highered.colorado.gov).

- Colorado School of Mines  
  [www.mines.edu](http://www.mines.edu)
- Metropolitan State University of Denver  
  [www.msudenver.edu](http://www.msudenver.edu)
- University of Colorado Colorado Springs  
  [www.uccs.edu](http://www.uccs.edu)
- Colorado State University  
  [www.colostate.edu](http://www.colostate.edu)
- Red Rocks Community College  
  [www.rrcc.edu](http://www.rrcc.edu)
- University of Colorado Denver  
  [www.ucdenver.edu](http://www.ucdenver.edu)
- Colorado State University Global Campus  
  [www.colostate.edu](http://www.colostate.edu)
- Regis University  
  [www.regis.edu](http://www.regis.edu)
- University of Denver  
  [www.du.edu](http://www.du.edu)
- Front Range Community College  
  [www.frontrange.edu](http://www.frontrange.edu)
- University of Colorado Boulder  
  [www.colorado.edu](http://www.colorado.edu)
Key Reasons for Energy Companies to Locate in Colorado

Colorado is a top-10 fossil resource location offering access to one of the most energy rich regions in the United States.

- **Coal** - Colorado was the 10th-largest coal-producing state in the nation as of year-to-date 2017 and borders Wyoming, the nation’s largest coal producer. Colorado produced 2.1 percent of the nationwide supply. (U.S. Department of Energy, Energy Information Administration, 2017)

- **Natural Gas** - Colorado was the nation’s sixth-largest producer of natural gas as of year-to-date 2017, accounting for 5.9 percent of U.S. natural gas production. (U.S. Department of Energy, Energy Information Administration, 2017)
  
  - Colorado is home to over 30 interstate and intrastate oil and gas pipelines totaling 45,000 miles. One of the largest pipelines in Colorado, the Rockies Express Pipeline, moves about 1.8 billion cubic feet per day of natural gas capacity from Colorado to markets in the Midwest. (U.S. Department of Energy, Energy Information Administration, 2017)

- **Oil** - Colorado ranked as the seventh-largest oil producer in the nation as of year-to-date 2017, supplying more than 3 of every 100 barrels of U.S. crude oil production. (U.S. Department of Energy, Energy Information Administration, 2017)

- **Eleven of the nation’s 100 largest natural gas fields and one of the 100 largest oil fields are located in Colorado.** (U.S. Department of Energy, Energy Information Administration, 2017)

Colorado is a top-10 cleantech location with access to clean energy resources and robust renewable energy generation requirements.

  
  - Colorado ranked among the top 10 states in utility-scale wind generation in 2016. (Clean Edge, Inc., 2017)
  
  - Colorado ranked among the top 10 states for its reliance on wind power in 2016, with 17 percent of the in-state generation derived from wind. The state installed 27.3 MW of wind power between 2003 and 2016. (American Wind Energy Association, 2017)

- **Biomass** - Electricity generation from biomass sources increased 30.6 percent over the past five years and accounted for nearly 2 percent of the state’s renewable energy generation. Research and development in this area is a key investment opportunity for companies looking to grow this sector of the energy mix. (U.S. Department of Energy, Energy Information Administration, 2017)

- **Solar** - Colorado ranked 11th in the nation for total installed solar capacity in 2017, with nearly 2.3 percent of homes in the state powered by solar. Of the state’s total solar installations in 2017, utility-scale solar represented roughly 20 percent and residential solar represented over 50 percent. (Solar Energy Industries Association, 2017)

- **Hydroelectric** - Hydroelectric facilities contributed about one-sixth of all renewable electricity generation in the state. The state’s extensive water resources offer significant hydroelectric power opportunities, including pumped-storage hydroelectricity. (U.S. Department of Energy, Energy Information Administration, 2017)

- **Colorado ranked seventh for wind and solar generation as a percentage of electricity consumption in 2016.** (Environment America Research & Policy Center, 2017)

- **Colorado ranked 11th in the nation for renewable energy generation in 2015 (excluding hydroelectric power) and ranked among the top 20 in the nation for the percent of electricity generated from renewable resources.** (U.S. Department of Energy, Energy Information Administration, 2017)

- **Colorado ranked seventh on the Clean Edge 2017 “U.S. Clean Tech Leadership Index.”** (Clean Edge, Inc., 2017)

- **Colorado ranked No. 7 in the nation in electric, hybrid, and plug-in vehicles per one million residents in 2016.** (Clean Edge, Inc., 2017)

- **Metro Denver ranked 12th in the “U.S. Metro Clean Tech Leadership Index” and ranked among the top 10 for green building usage, and cleantech investment, innovation, and workforce.** (Clean Edge, Inc., 2017)
ENERGY:
Colorado and Metro Denver and Northern Colorado Industry Cluster

Colorado is at the forefront of energy development, with a location that offers:

1. **The ability to recruit and retain senior management and scientific talent**
   - Nearly 40 percent of Coloradans have at least a bachelor’s degree, the second-highest college attainment rate in the nation behind Massachusetts. (U.S. Census Bureau, 2016 American Community Survey)
   - Colorado ranked ninth for the number of science, engineering, and health graduate students per 1,000 individuals ages 25 to 34 years old. (National Science Foundation, 2017)
   - Colorado ranked among the top 10 states for total solar employment, rising 20 percent between 2015 and 2016. (The Solar Foundation, 2017)
   - Colorado ranked No. 2 for the “Best States for Jobs” in 2017 and ranked first nationally for job opportunities. (WalletHub, 2017)

2. **Proximity to energy-related higher education programs and research centers**
   - Colorado School of Mines (CSM) in Golden ranked first among the top 10 schools in the nation for an engineering degree in 2016. (College Factual, 2017)
   - CSM is one of the few universities in the world to offer programs from baccalaureate through doctorate levels in all key fields related to energy and is the only institution in the world that offers doctoral programs in five of the major earth science disciplines. (Colorado School of Mines, 2017)
   - The Ecotech Institute in Aurora is the world’s first and only college entirely focused on preparing graduates for careers in renewable energy, sustainability, and energy efficiency. (Ecotech Institute, 2017)
   - The Solar Technology Acceleration Center (SolarTAC) is the largest test facility for solar technologies in the U.S. (The Solar Technology Acceleration Center, 2017)

3. **Access to the research of a broad collection of federal laboratories**
   - Colorado’s federally funded research facilities collectively contribute an estimated $2.6 billion to the state’s economy annually and employs 17,600 people. Ten laboratories have active commercialization programs, from technology transfer and licensed technology to spin-off companies and public-private partnerships. (University of Colorado, 2017)
   - The National Renewable Energy Laboratory’s Energy Systems Integration Facility offers industry, academia, and government partners access to an award-winning, state-of-the-art lab space and specialized scientists and engineers to accelerate the movement of renewable energy and energy-efficient solutions into practical solutions. More than 100 partners have signed on to use the facility including Panasonic, 3M, and Mercedes-Benz. (National Renewable Energy Laboratory, 2017)

4. **Business organizations and public policy programs designed to encourage industry growth**
   - Sales and use tax is exempt for equipment used in R&D of clean technology. The exemption refunds up to $50,000 per year in sales and use taxes for companies with less than 35 employees and more than 50 percent employed in Colorado. (Exemption clarified in Colorado House Bill 15-1180)
   - The Advanced Industries Accelerator Programs include four types of grants and a global business support program to promote growth and sustainability in Colorado’s advanced industries, including energy and natural resources, among others. The program has awarded over $40 million in grants since its inception in 2013. (Colorado Office of Economic Development and International Trade, 2017)

For additional information, contact us:

Metro Denver Economic Development Corporation
1445 Market Street
Denver, CO 80202-1790
303.620.8092
email: info@metrodenver.org
www.metrodenver.org
www.metrodenver.org/cec

Industry Overview

Metro Denver and Northern Colorado’s central location and reputation as a global commercial gateway gives financial services companies a competitive edge. The region’s highly educated workforce, low cost of doing business, culture of innovation, and outstanding quality of life are key ingredients to supporting this growing and thriving industry.

Metro Denver is the largest financial center between Los Angeles and Chicago. It is home to a Federal Reserve Bank branch and the location of one of only six U.S. Mints. The Denver Mint is the single largest producer of coins in the world.

The region is one of the few areas outside of the northeast with a substantial financial services industry in three subclusters: (1) banking and finance, (2) investments, and (3) insurance. The banking and finance subcluster is comprised of transaction-oriented companies including commercial banks and credit unions, lenders, credit agencies, and mortgage bankers. The investments subcluster includes companies involved in financial advising, securities and commodities trade, real estate investment trusts (REITS), portfolio management, and financial planning. The insurance subcluster consists of insurance carriers and brokerages.

With about 101,560 employees in nearly 14,770 companies, financial services is a large part of the employee base in the Metro Denver and Northern Colorado region. Over the past five years, financial services employment grew 10.7 percent, compared with 7.5 percent nationally. Employment rose for the third-consecutive year in 2017, increasing 3 percent and adding over 2,950 employees between 2016 and 2017. Financial services companies employed 4.4 percent of the region’s total employment base compared with a 3.9 percent national employment concentration. About 80 percent of the state’s total employment in financial services was located in the region.

1 The nine-county region is comprised of two principal areas, Metro Denver and Northern Colorado. Metro Denver consists of Adams, Arapahoe, Boulder, Broomfield, Denver, Douglas, and Jefferson counties. Northern Colorado consists of Larimer and Weld counties.
Banking and Finance Economic Profile

The banking and finance subcluster consists of 16, six-digit North American Industry Classification System (NAICS) codes including both depository and non-depository institutions such as commercial banks, credit card companies, and mortgage brokers.

### Nine-County Rankings

<table>
<thead>
<tr>
<th>Banking &amp; finance direct employment rank</th>
<th>12th</th>
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<tbody>
<tr>
<td>Banking &amp; finance direct employment concentration rank</td>
<td>16th</td>
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### Banking & Finance Employment and Company Profile, 2017

<table>
<thead>
<tr>
<th>Nine-County Region</th>
<th>United States</th>
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<tbody>
<tr>
<td>Direct employment, 2017</td>
<td>39,720</td>
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<tr>
<td>Number of direct companies, 2017</td>
<td>3,120</td>
</tr>
<tr>
<td>One-year direct employment growth, 2016-2017</td>
<td>3.3%</td>
</tr>
<tr>
<td>Five-year direct employment growth, 2012-2017</td>
<td>0.4%</td>
</tr>
<tr>
<td>Avg. annual direct employment growth, 2012-2017</td>
<td>0.1%</td>
</tr>
<tr>
<td>Direct employment concentration</td>
<td>1.7%</td>
</tr>
</tbody>
</table>

Sources: Dun & Bradstreet, Inc., Hoover’s Online Database; Market Analysis Profile, 2012-2017; Development Research Partners.

### Banking & Finance Employment by County, 2017

- Arapahoe: 34.7%
- Denver: 27.1%
- Jefferson: 10.6%
- Boulder: 8.6%
- Adams: 6.8%
- Larimer: 6.4%
- Weld: 3.4%
- Broomfield: 1.6%
- Douglas: 0.6%

Sources: Market Analysis Profile, 2017; Development Research Partners.

### Banking & Finance Employment by Category, 2017

- Commercial Banking: 41.5%
- Financial Transactions Processing & Clearinghouse Activities: 15.3%
- Federal Reserve Banking: 8.1%
- Personal, Business, & Federal Credit Institutions: 12.7%
- Credit Unions: 8.1%
- Savings Institutions: 1.5%
- International Trade Financing: 0.4%
- Mortgage Banking & Loan Brokerage Services: 20.5%

Sources: Market Analysis Profile, 2017; Development Research Partners.

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2 Direct employment rank based on the number of employees in the industry cluster in a region. Employment concentration rank based on the direct cluster employment in a region expressed as a percent of total employment in all industries in the same region. Rankings are for the 50 largest metropolitan statistical areas (MSAs). No multiplier effects are included. 1st = highest for both rankings.
Major Banking and Finance Companies (top 10 based on employment size)

- ADS Alliance Data Systems
  [www.alliancedata.com](http://www.alliancedata.com)
- Bank of the West
  [www.bankofthewest.com](http://www.bankofthewest.com)
- CoBank
  [www.cobank.com](http://www.cobank.com)
- FirstBank Holding Company
  [www.efirstbank.com](http://www.efirstbank.com)
  [www.chase.com](http://www.chase.com)

- Specialized Loan Servicing LLC
  [www.sls.net](http://www.sls.net)
- U.S. Bank
  [www.usbank.com](http://www.usbank.com)
- VISA Debit Processing Services
  [www.visadps.com](http://www.visadps.com)
- Wells Fargo Bank Colorado
  [www.wellsfargo.com](http://www.wellsfargo.com)
- Western Union
  [www.westernunion.com](http://www.westernunion.com)

Investments Economic Profile

The investments subcluster consists of 15, six-digit North American Industry Classification System (NAICS) codes including companies involved in securities, brokerage, real estate investment trusts, and holding companies.

<table>
<thead>
<tr>
<th>Investment Services Employment and Company Profile, 2017</th>
<th>Nine-County Region</th>
<th>United States</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct employment, 2017</td>
<td>29,830</td>
<td>1,414,080</td>
</tr>
<tr>
<td>Number of direct companies, 2017</td>
<td>7,900</td>
<td>359,510</td>
</tr>
<tr>
<td>One-year direct employment growth, 2016-2017</td>
<td>4.9%</td>
<td>0.7%</td>
</tr>
<tr>
<td>Five-year direct employment growth, 2012-2017</td>
<td>27.9%</td>
<td>8.6%</td>
</tr>
<tr>
<td>Avg. annual direct employment growth, 2012-2017</td>
<td>5.0%</td>
<td>1.7%</td>
</tr>
<tr>
<td>Direct employment concentration</td>
<td>1.3%</td>
<td>0.8%</td>
</tr>
</tbody>
</table>

Nine-County Rankings

<table>
<thead>
<tr>
<th>Investments direct employment rank</th>
<th>12th</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investments direct employment concentration rank</td>
<td>13th</td>
</tr>
</tbody>
</table>

Investments Employment by County, 2017

<table>
<thead>
<tr>
<th>County</th>
<th>Employment Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Denver</td>
<td>35.4%</td>
</tr>
<tr>
<td>Adams</td>
<td>6.4%</td>
</tr>
<tr>
<td>Boulder</td>
<td>6.4%</td>
</tr>
<tr>
<td>Jefferson</td>
<td>10.4%</td>
</tr>
<tr>
<td>Arapahoe</td>
<td>20.2%</td>
</tr>
<tr>
<td>Weld</td>
<td>2.7%</td>
</tr>
<tr>
<td>Broomfield</td>
<td>1.4%</td>
</tr>
<tr>
<td>Larimer</td>
<td>4.7%</td>
</tr>
<tr>
<td>Douglas</td>
<td>16.2%</td>
</tr>
</tbody>
</table>

Investments Employment by Category, 2017

- Security Brokers & Dealers: 16.6%
- Investors & Investment Advisory Services: 43.8%
- Real Estate Investment Trusts: 4.9%
- Holding Companies: 7.5%
- All Other Trusts: 4.7%
- Security & Commodity Services: 3.3%

3 Direct employment rank based on the number of employees in the industry cluster in a region. Employment concentration rank based on the direct cluster employment in a region expressed as a percent of total employment in all industries in the same region. Rankings are for the 50 largest metropolitan statistical areas (MSAs). No multiplier effects are included. 1st = highest for both rankings.
Major Investments Companies (top 10 based on employment size)

- ALPS  
  www.alpsinc.com
- Charles Schwab & Co.  
  www.schwab.com
- Empower Retirement  
  www.empower-retirement.com
- Fidelity Investments  
  www.fidelity.com
- Janus Henderson Investors  
  www.janushenderson.com
- M.D.C Holdings, Inc.  
  www.richmonddamerican.com
- OppenheimerFunds  
  www.oppenheimerfunds.com
- Standard & Poor’s  
  www.standardandpoors.com
- TIAA  
  www.tiaa.org
- Transamerica Capital  
  www.transamerica.com

Insurance Economic Profile

The insurance subcluster consists of 13, six-digit North American Industry Classification System (NAICS) codes including companies involved in all types of insurance ranging from life, accident, health, casualty, title, and surety insurance to pension, health, and welfare funds businesses.

<table>
<thead>
<tr>
<th>Insurance Employment and Company Profile, 2017</th>
<th>Nine-County Region</th>
<th>United States</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct employment, 2017</td>
<td>32,010</td>
<td>2,630,540</td>
</tr>
<tr>
<td>Number of direct companies, 2017</td>
<td>3,750</td>
<td>244,580</td>
</tr>
<tr>
<td>One-year direct employment growth, 2016-2017</td>
<td>0.9%</td>
<td>1.5%</td>
</tr>
<tr>
<td>Five-year direct employment growth, 2012-2017</td>
<td>11.0%</td>
<td>12.3%</td>
</tr>
<tr>
<td>Avg. annual direct employment growth, 2012-2017</td>
<td>2.1%</td>
<td>2.3%</td>
</tr>
<tr>
<td>Direct employment concentration</td>
<td>1.4%</td>
<td>1.5%</td>
</tr>
</tbody>
</table>

Nine-County Rankings

- Insurance direct employment rank: 13th
- Insurance direct employment concentration rank: 30th

Sources: Dun & Bradstreet, Inc., Hoover’s Online Database; Market Analysis Profile, 2012-2017; Development Research Partners.

Insurance Employees by Category, 2017

- Health & Medical Service Carriers: 18.4%
- Pensions, Health, & Welfare Funds: 2.3%
- Surety Insurance Carriers: 2.4%
- Title Insurance Carriers: 2.7%
- Life Insurance Carriers: 3.6%
- Property & Casualty Insurance Carriers: 6.8%
- Other Insurance Carriers: 1.1%
- Insurance Agents, Brokers, & Service: 62.7%

Sources: Market Analysis Profile, 2017; Development Research Partners.

*Direct employment rank based on the number of employees in the industry cluster in a region. Employment concentration rank based on the direct cluster employment in a region expressed as a percent of total employment in all industries in the same region. Rankings are for the 50 largest metropolitan statistical areas (MSAs). No multiplier effects are included. 1st = highest for both rankings.*
Major Insurance Companies (top 10 based on employment size)

- Allstate Insurance  
  www.allstate.com
- American Family Insurance  
  www.amfam.com
- Anthem Blue Cross and Blue Shield  
  www.anthem.com
- Farmers Insurance  
  www.farmers.com
- Great-West Financial  
  www.greatwest.com
- Kaiser Permanente  
  www.kaiserpermanente.org
- Pinnacol Assurance  
  www.pinnacol.com
- State Farm Insurance  
  www.statefarm.com
- The Travelers Indemnity Company  
  www.travelers.com
- UnitedHealthcare  
  www.uhc.com

2017 Industry Highlights

Key Company Announcements

Banking and Finance

- **U.S. Bank** will create a new regional banking campus in the Inverness Business Park in Arapahoe County, with expanded retail payment services, mortgage operations, and corporate car services. The company plans to move 400 existing Centennial employees into the new buildings, plus add 300 new employees by 2018.
- **The Western Union Co.** plans to move its headquarters from Douglas County to a new 15-story building in the Denver Tech Center. The new location, which will be more visible and more centralized, is slated to open in 2018. The company also plans to increase its economic impact in Metro Denver by roughly $300 million over the next 10 years through its new headquarters, corporate events, local giving, volunteer efforts, and sponsorships.
- Iowa-based **MidWestOne Financial Group Inc.**, the third-largest publicly traded bank holding company in Iowa, is expanding to Denver. MidWestOne expects its first Denver-area full service bank office to open in the spring of 2017.
- **Elevations Credit Union** will move its headquarters within Boulder as part of an expansion plan as it adds branches in Boulder and Fort Collins. The company also relocated a mortgage loan office in Fort Collins to a larger space in Windsor to accommodate ongoing growth. The company provides services to 122,000 members and manages more than $1.8 billion in assets.
- Glenwood Springs-based **Alpine Bank** will open a new branch in the Denver Tech Center in early 2018. The new 4,400-square-foot branch will be the company’s third Metro Denver location.
- Pittsburgh, Pa.-based **PNC Financial Services Group Inc.** plans to expand in Denver to grow and develop its middle-market business and other corporate services in 2018. The expansion will enhance the company’s ability to deliver sophisticated banking and advisory solutions to customers.
- Greenwood Village-based **Bellco Credit Union** opened a branch in Longmont. The 2,400-square-foot location will be Bellco’s 24th branch and second in Boulder County.

Several new mortgage companies expanded local operations as a result of Metro Denver’s booming residential real estate market.

- **Mutual of Omaha Mortgage** opened a new office in the Denver Tech Center.
- **Nest Home Lending LLC**, a joint venture between Cornerstone Home Lending Inc. and Oakwood Homes, opened locations in Centennial, Greeley, and Longmont.
- New Jersey-based **Garden State Home Loans Inc.** obtained a mortgage license to expand and operate in Colorado. The company will offer programs such as the exclusive 1 percent down payment program for eligible first-time homebuyers.

Investments

- **Transamerica Corp.** added 200 employees in 2017 to its downtown Denver office. With the new employees in marketing, distribution, customer care, and operations, the company’s workforce increased to 700 employees in Denver.
Denver-based **Johnson Financial Group (JFG)** launched a new wealth management division in Denver. JFG Wealth Management LLC will provide investment and advisory services to high net-worth families.

**Insurance**

- Louisville-based **Bolder Insurance** opened a new office in Boulder to accommodate company expansion. The company provides personal and business insurance to more than 2,500 clients nationwide.
- Greenwood Village-based **Empower Retirement** celebrated its third anniversary in October 2017 with an endorsement from 325 advisors conducted by PLANADVISER as the top defined contribution plan provider. Empower Retirement administers $500 billion in assets for more than $8.2 million participants.

**Merger and Acquisition Activity**

**Banking and Finance**

- Kansas-based **Sunflower Financial Inc.** merged with Texas-based **Strategic Growth Bancorp Inc.** Headquartered in downtown Denver, the combined company will be the state’s third-largest headquartered bank by total assets and will create 60 offices across five states. The combined holding company will be named **FirstSun Capital Bancorp.**
- **Guaranty Bancorp** purchased **Castle Rock Bank Holding Company** in a $22.5 million deal. Castle Rock Bank will operate under Guaranty Bank and Trust and will add $147 million in assets to Guaranty’s approximately $3.6 billion in assets.
- Denver-based **First Western Trust** purchased Greenwood Village-based **Englewood Mortgage Co.** The combined company will expand existing services and mortgage capabilities.
- Nebraska-based **Pinnacle Bancorp Inc.**, parent of Bank of Colorado, purchased **AmFirst Bank**. The combined company will operate over 40 branches in Colorado, and will continue to expand its market presence.
- Two longtime Denver credit unions—**West Denver Community Credit Union** and **Denver Community Credit Union**—merged. The merger provides West Denver Community Union members access to more branches, a variety of financial products and services, and financial education programs.
- Denver-based **Centennial Bank and Trust** merged with Aurora-based **Citywide Banks** in a $203 million deal. The combined bank will have $2.3 billion in bank assets with 29 locations along the Front Range.
- Texas-based **Independent Bank Group Inc.** sold nine of its branches in Colorado to **TBK Bank**. The deal includes $100 million in loans and $168 million in deposits.
- Glendale-based **LenderLive Network LLC** purchased New Jersey-based **PHH Mortgage Corp.** With the deal, LenderLive will be the nation’s largest firm that handles back-end mortgage services.
- Denver-based **Custer Bancorp**, the holding company for First State Bank of Colorado (FSBOC), merged with Durango-based holding company **TIG Bancorp**. The opportunity to partner with TIG Bancorp will allow FSBOC to expand to new markets and accelerate growth.
- Michigan-based **H.W. Kaufman Financial Group** acquired Conifer-based **Essential Insurance Services Inc.** and will move its operations to Kaufman’s US-Reports corporate office in Fort Collins. The combined company will have about 85 employees in Fort Collins.

**Investments**

- Denver-based **Janus Capital Group Inc.** merged with London-based **Henderson Group PLC** to create a new company called Janus Henderson Group plc. Headquartered in London, the combined company will employ 2,300 people in 23 locations worldwide. It will continue to maintain its largest employee base in Denver with about 1,000 employees. Janus Henderson Investors has about $320 billion of assets under management and a market capitalization of about $6 billion.
- Greenwood Village-based **National Bank Holdings (NBH) Corp.** purchased **Peoples Inc.**, which has six bank branches in Colorado. The $143 million deal will expand NBH’s Colorado presence and will provide a strong market position.
- Denver-based **Jones Barclay Boston** merged with Boston, Mass.-based **The Colony Group**. The Denver location will be Colony’s first in the west and its seventh office nationwide.
FINANCIAL SERVICES: Metro Denver and Northern Colorado Industry Cluster Profile

- Denver-based Andrews Securities LLC was acquired by Denver-based LoHi Merchant Bank. LoHi Securities will offer tailored compliance services for independent investment bankers, banking teams, and alternative investment funds.
- Investment consulting firm Strategies Capital Management acquired California-based Advisory Consulting Group. The combined firm will be headquartered in Denver and will advise $2.6 billion in assets.

Academic and Education Announcements

- The Jackson Charitable Foundation partnered with Junior Achievement USA to pilot a new financial literacy video program for elementary school students at Aspen Crossing Elementary in Aurora and Emerald Elementary in Broomfield. Cha-Ching Money Smart Kids will launch statewide by 2018.
- The Colorado Business School Career Fair is a collaborative effort between the business schools at the University of Denver (DU), University of Colorado, and Colorado State University (CSU). Attending organizations have the opportunity to recruit top business talent from Colorado and Wyoming, which includes over 1,500 students and alumni from over 10 colleges and universities.
- DU will launch a new online MBA program in January 2018. The 21-month MBA@Denver will mirror its part-time Professional MBA (PMBA) program where students focus on core business challenges designed to help them develop the leadership skills needed for career acceleration.
- The University of Colorado Boulder’s (CU Boulder) Leeds School of Business launched a new initiative aimed at increasing the number of women in business programs by 2020. The End the Gap by 2020 aims to create gender parity in all CU business programs over the next three years.
- CU Boulder plans to expand and renovate its Koelbel Building, home of the Leeds School of Business. The $22 million project will add 30,000 square feet to the north side of the building and will renovate 10,000 square feet of existing space, including the William M. White Business Library. The project will be completed in 2020.

Cross-Cluster Convergence

Technology continues to transform workflow and processes in the financial services industry. Innovations such as mobile applications, robo-advisors, cloud computing, and big data offer opportunities for financial services and information technology to converge. FinTech—financial technology—has been described as an umbrella term for disruptive technologies in the financial services industry. There are over 90 companies in Colorado that define themselves as FinTech. Several companies in Metro Denver expanded their financial technology product offerings:

- TIAA launched its new robo-advisor and automated, online management services. The company will use robo-advisors to help its clients build online portfolios with an eye towards appealing to millennials. The new online services include passive, active, and socially responsible investment options with five different risk levels.
- Bank of America opened automated Denver branches that feature ATMS and video systems. The robo branches have no on-site employees, but will allow customers to talk with a live banker in a remote location.
Nine-County Region Workforce

- Nearly half of the nine-county region’s 3.8 million residents are under the age of 35. Employers can draw from a large, young, highly educated, and productive workforce.
- Of the region’s adult population, 43.2 percent are college graduates and 91.4 percent have graduated from high school.
- The region’s population is expected to grow 32.2 percent from 2020 to 2040, driving a 21.2 percent increase in the region’s labor force over the same period.

Financial Services Workforce Profile

Banking and Finance Workforce Profile

The subcluster has a larger share of employees that are between the ages of 25 and 54 years old (74 percent), compared with the age distribution of all industries across the nine-county region (66.2 percent).

The Occupation & Salary Profile below includes the 10 largest banking and finance occupations in the region. For these 10 largest occupations, the chart details the total number of workers employed in that occupation across all industries, the number of available applicants that would like to be working in that occupation, the number of recent graduates that are qualified for that occupation, and the median and sample percentile annual salaries.

Wages

- 2016 average annual salary was $82,730, compared with the national average of $80,360.
- Total payroll reached nearly $3.2 billion in 2016.
**FINANCIAL SERVICES: Metro Denver and Northern Colorado Industry Cluster Profile**

**Metro Denver and Northern Colorado Banking and Finance Occupation & Salary Profile, 2017**

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<thead>
<tr>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Tellers</td>
<td>4,555</td>
<td>112</td>
<td>0</td>
<td>$28,930</td>
<td>$21,113</td>
<td>$23,689</td>
<td>$32,906</td>
<td>$39,144</td>
</tr>
<tr>
<td>2. Securities, commodities, &amp; financial services sales agents</td>
<td>9,785</td>
<td>240</td>
<td>0</td>
<td>$80,269</td>
<td>$32,532</td>
<td>$39,116</td>
<td>$92,365</td>
<td>$160,857</td>
</tr>
<tr>
<td>3. Loan officers</td>
<td>4,534</td>
<td>111</td>
<td>440</td>
<td>$75,527</td>
<td>$21,192</td>
<td>$45,481</td>
<td>$94,856</td>
<td>$127,996</td>
</tr>
<tr>
<td>4. Customer service representatives</td>
<td>34,879</td>
<td>848</td>
<td>0</td>
<td>$34,245</td>
<td>$22,588</td>
<td>$27,079</td>
<td>$43,508</td>
<td>$53,566</td>
</tr>
<tr>
<td>5. Loan interviewers &amp; clerks</td>
<td>3,400</td>
<td>84</td>
<td>0</td>
<td>$46,799</td>
<td>$31,690</td>
<td>$37,630</td>
<td>$54,927</td>
<td>$64,026</td>
</tr>
<tr>
<td>6. First-line supervisors of office &amp; administrative support workers</td>
<td>15,193</td>
<td>373</td>
<td>178</td>
<td>$62,018</td>
<td>$37,736</td>
<td>$47,077</td>
<td>$74,204</td>
<td>$92,117</td>
</tr>
<tr>
<td>7. Accountants &amp; auditors</td>
<td>30,446</td>
<td>748</td>
<td>1,063</td>
<td>$78,522</td>
<td>$44,501</td>
<td>$53,990</td>
<td>$92,270</td>
<td>$121,270</td>
</tr>
<tr>
<td>8. Financial managers</td>
<td>5,610</td>
<td>138</td>
<td>479</td>
<td>$161,491</td>
<td>$85,891</td>
<td>$109,408</td>
<td>$193,501</td>
<td>$296,647</td>
</tr>
<tr>
<td>9. Business operations specialists, all other</td>
<td>32,514</td>
<td>791</td>
<td>17</td>
<td>$74,575</td>
<td>$43,128</td>
<td>$55,758</td>
<td>$98,542</td>
<td>$126,087</td>
</tr>
<tr>
<td>10. Bookkeeping, accounting, &amp; auditing clerks</td>
<td>22,211</td>
<td>546</td>
<td>325</td>
<td>$41,381</td>
<td>$23,846</td>
<td>$32,031</td>
<td>$49,700</td>
<td>$60,424</td>
</tr>
</tbody>
</table>

Notes: The number of available applicants is a point-in-time measurement of the number of people who have registered in Colorado’s workforce development system’s statewide database, Connecting Colorado, as being able and available to work in a particular occupation. Results should be interpreted with caution since registration in Connecting Colorado is self-reported. In addition, the skills rubric may assign up to four occupation codes for each registrant. Therefore, the number of available applicants could be inflated. Source: Provided by Arapahoe/Douglas Works!; QCEW Employees, Non-QCEW Employees, & Self Employed - EMSI 2017.3 Class of Worker.

**Investments Workforce Profile**

The subcluster has a larger share of employees that are between the ages of 35 and 54 years old (52.7 percent), compared with the age distribution of all industries across the nine-county region (43.4 percent).

The Occupation & Salary Profile below includes the 10 largest investments occupations in the region. For these 10 largest occupations, the chart details the total number of workers employed in that occupation across all industries, the number of available applicants that would like to be working in that occupation, the number of recent graduates that are qualified for that occupation, and the median and sample percentile annual salaries.

**Wages**

- Wages in the investments subcluster are among the highest across all industry clusters.
- 2016 average annual salary was $156,770, compared with the national average of $211,750.5
- Total payroll reached nearly $4.5 billion in 2016.

---

5 The average annual salary in the investment services subcluster is significantly higher due to the large number of small, boutique investment services firms across the region who earn more from assets under management. Additionally, the average annual wage includes bonuses, stock options, severance pay, profit distributions, cash value of meals and lodging, and tips and other gratuities, which contributes to higher-than-average salaries in the investment services subcluster.
## 10 Largest Investments Occupations in Metro Denver and Northern Colorado

<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Securities, commodities, &amp; financial services sales agents</td>
<td>9,785</td>
<td>240</td>
<td>0</td>
<td>$80,269</td>
<td>$32,532</td>
<td>$39,116</td>
<td>$92,365</td>
<td>$160,857</td>
</tr>
<tr>
<td>2.</td>
<td>Personal financial advisors</td>
<td>4,046</td>
<td>99</td>
<td>440</td>
<td>$111,479</td>
<td>$51,533</td>
<td>$64,822</td>
<td>$118,191</td>
<td>$182,752</td>
</tr>
<tr>
<td>3.</td>
<td>Accountants &amp; auditors</td>
<td>30,446</td>
<td>748</td>
<td>1,063</td>
<td>$78,522</td>
<td>$44,501</td>
<td>$53,990</td>
<td>$92,270</td>
<td>$121,270</td>
</tr>
<tr>
<td>4.</td>
<td>Financial analysts</td>
<td>3,593</td>
<td>88</td>
<td>456</td>
<td>$107,496</td>
<td>$47,735</td>
<td>$60,287</td>
<td>$126,166</td>
<td>$198,176</td>
</tr>
<tr>
<td>5.</td>
<td>Secretaries &amp; administrative assistants, except legal, medical, &amp; executive</td>
<td>41,081</td>
<td>1,010</td>
<td>70</td>
<td>$38,192</td>
<td>$23,877</td>
<td>$29,668</td>
<td>$46,211</td>
<td>$55,301</td>
</tr>
<tr>
<td>6.</td>
<td>Brokerage clerks</td>
<td>1,007</td>
<td>25</td>
<td>325</td>
<td>$56,694</td>
<td>$36,498</td>
<td>$41,696</td>
<td>$61,412</td>
<td>$77,426</td>
</tr>
<tr>
<td>7.</td>
<td>Office clerks, general</td>
<td>38,790</td>
<td>943</td>
<td>0</td>
<td>$36,547</td>
<td>$21,898</td>
<td>$28,054</td>
<td>$39,576</td>
<td>$48,288</td>
</tr>
<tr>
<td>8.</td>
<td>Customer service representatives</td>
<td>34,879</td>
<td>848</td>
<td>0</td>
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<td>10.</td>
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<td>791</td>
<td>17</td>
<td>$74,757</td>
<td>$43,128</td>
<td>$55,758</td>
<td>$98,542</td>
<td>$126,087</td>
</tr>
</tbody>
</table>

Notes: The number of available applicants is a point-in-time measurement of the number of people who have registered in Colorado’s workforce development system's statewide database, Connecting Colorado, as being able and available to work in a particular occupation. Results should be interpreted with caution since registration in Connecting Colorado is self-reported. In addition, the skills rubric may assign up to four occupation codes for each registrant. Therefore, the number of available applicants could be inflated. Source: Provided by Arapahoe/Douglas Works!; QCEW Employees, Non-QCEW Employees, & Self Employed - EMSI 2017.3 Class of Worker.

### Insurance Workforce Profile

The subcluster has a larger share of employees that are between the ages of 35 and 64 years old (70.8 percent), compared with the age distribution of all industries across the nine-county region (59.7 percent).

The Occupation & Salary Profile below includes the 10 largest insurance occupations in the region. For these 10 largest occupations, the chart details the total number of workers employed in that occupation across all industries, the number of available applicants that would like to be working in that occupation, the number of recent graduates that are qualified for that occupation, and the median and sample percentile annual salaries.

#### Wages
- Total payroll totaled $2.4 billion in 2016.
- 2016 average annual salary was $76,510, compared with the national average of $86,650.
Metro Denver and Northern Colorado Insurance Occupation & Salary Profile, 2017

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</tr>
</thead>
<tbody>
<tr>
<td>1. Insurance sales agents</td>
<td>9,083</td>
<td>223</td>
<td>0</td>
<td>$57,469</td>
<td>$27,548</td>
<td>$36,822</td>
<td>$67,163</td>
<td>$93,961</td>
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<tr>
<td>2. Customer service representatives</td>
<td>34,879</td>
<td>848</td>
<td>0</td>
<td>$34,245</td>
<td>$22,588</td>
<td>$27,079</td>
<td>$43,508</td>
<td>$53,566</td>
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<tr>
<td>3. Claims adjusters, examiners, &amp; investigators</td>
<td>2,905</td>
<td>71</td>
<td>0</td>
<td>$70,750</td>
<td>$44,151</td>
<td>$54,471</td>
<td>$84,940</td>
<td>$100,321</td>
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<tr>
<td>4. Insurance claims &amp; policy processing clerks</td>
<td>2,143</td>
<td>53</td>
<td>0</td>
<td>$50,359</td>
<td>$33,392</td>
<td>$39,475</td>
<td>$60,139</td>
<td>$73,148</td>
</tr>
<tr>
<td>5. Insurance underwriters</td>
<td>1,339</td>
<td>33</td>
<td>0</td>
<td>$78,974</td>
<td>$47,253</td>
<td>$56,827</td>
<td>$98,017</td>
<td>$123,166</td>
</tr>
<tr>
<td>6. Business operations specialists, all other</td>
<td>32,514</td>
<td>791</td>
<td>17</td>
<td>$74,757</td>
<td>$43,128</td>
<td>$55,758</td>
<td>$98,542</td>
<td>$126,087</td>
</tr>
<tr>
<td>7. Secretaries &amp; administrative assistants, except legal, medical, &amp; executive</td>
<td>41,081</td>
<td>1,010</td>
<td>70</td>
<td>$38,192</td>
<td>$23,877</td>
<td>$29,668</td>
<td>$46,211</td>
<td>$55,301</td>
</tr>
<tr>
<td>8. Accountants &amp; auditors</td>
<td>30,446</td>
<td>748</td>
<td>1</td>
<td>$2,063</td>
<td>$78,522</td>
<td>$44,501</td>
<td>$53,990</td>
<td>$92,270</td>
</tr>
<tr>
<td>10. General &amp; operations managers</td>
<td>31,749</td>
<td>772</td>
<td>5,578</td>
<td>$115,241</td>
<td>$47,968</td>
<td>$72,558</td>
<td>$179,035</td>
<td>$261,240</td>
</tr>
</tbody>
</table>

Notes: The number of available applicants is a point-in-time measurement of the number of people who have registered in Colorado’s workforce development system’s statewide database, Connecting Colorado, as being able and available to work in a particular occupation. Results should be interpreted with caution since registration in Connecting Colorado is self-reported. In addition, the skills rubric may assign up to four occupation codes for each registrant. Therefore, the number of available applicants could be inflated. Source: Provided by Arapahoe/Douglas Works!; QCEW Employees, Non-QCEW Employees, & Self Employed - EMSI 2017.3 Class of Worker.

Education & Training

Colorado’s higher education system provides an excellent support system for businesses in the region. There are 28 public higher education institutions in Colorado, of which seven four-year and six two-year public institutions offering comprehensive curricula are located in the nine-county region. There are more than 100 private and religious accredited institutions and more than 350 private occupational and technical schools offering courses in dozens of program areas throughout the state. The state higher education system served about 255,510 students in FY 2015-16, while 86,070 students received a degree, diploma, certificate, or other formal award over the same period of time. Although not exhaustive, a list of the major, accredited educational institutions with the greatest number of graduates for each of the 10 largest financial services occupations in the nine-county region are included below. A directory of all higher education institutions with corresponding websites may be accessed via http://highered.colorado.gov.

- Colorado State University: [www.colostate.edu](http://www.colostate.edu)
- Colorado State University Global Campus: [www.colostate.edu](http://www.colostate.edu)
- Community College of Aurora: [www.ccaurora.edu](http://www.ccaurora.edu)
- Front Range Community College: [www.frontrange.edu](http://www.frontrange.edu)
- University of Denver: [www.du.edu](http://www.du.edu)
- Metropolitan State University of Denver: [www.msudenver.edu](http://www.msudenver.edu)
- Red Rocks Community College: [www.rrcc.edu](http://www.rrcc.edu)
- Regis University: [www.regis.edu](http://www.regis.edu)
- University of Colorado: Boulder, Denver: [www.cu.edu](http://www.cu.edu)
- University of Colorado: South Campus: [www.southdenver.cu.edu](http://www.southdenver.cu.edu)
- University of Northern Colorado: [www.unco.edu](http://www.unco.edu)
Key Reasons for Financial Services Companies to Locate in the Nine-County Region

The region is a top location for financial services companies offering:

1. Access to a large, highly qualified, and entrepreneurial workforce
   - About 6.4 percent of Metro Denver’s labor force was employed in business and financial operations occupations, a higher-than-average concentration compared with the U.S. average of 4.9 percent. (U.S. Census Bureau, 2016 American Community Survey 1-Year Estimate)
   - Nearly 3 percent of U.S. certified financial planner certificates are held in Colorado even though Colorado's population represents just 1.7 percent of the national population total. (Certified Financial Planner Board of Standards, Inc., 2017; U.S. Census Bureau, 2017)
   - Metro Denver was named among the top 25 metro areas with the most finance jobs, representing 15 percent of all job openings. (Business Insider, 2017)
   - Denver ranked among the top 15 best affordable cities for finance jobs. (CNBC, 2017)
   - Denver was named among the top 10 "Best Places to Start a Career" in 2017. (WalletHub, 2017)
   - The Leeds School of Business at CU Boulder ranked among the top 100 "Best MBA Programs" in 2017. CU Boulder, CSU, and CU Denver ranked among the top 100 "Best Part-Time MBA Programs" in 2017. (U.S. News & World Report, 2017)
   - Colorado Technical University was named to the list of the “Tier One North American MBA Schools” and the “Top Ten Global Online MBA Schools” in 2017. (CEO Magazine, 2017)
   - Colorado State University's online MBA program ranked among the top 20 in the world and No. 12 in the U.S. (Financial Times, 2017)
   - The University of Colorado Denver Business School is the largest fully AACSB-accredited graduate business school in the Rocky Mountain region, placing the school in the top 5 percent of business schools worldwide. (The University of Colorado Denver, 2017)

2. An overall better quality of life
   - The city of Lone Tree ranked seventh in the "Best Places to Live" list. Superior (49th) and Louisville (50th) were named to the list's top-50 locations. (MONEY Magazine, 2017)
   - Metro Denver ranked as the nation's seventh-fittest metropolitan area in 2017. Low obesity, increased physical activity, and low prevalence of diabetes and heart disease contributed to its high rank. (American College of Sports Medicine, 2017)
   - Denver was named as the second-best place to live in the U.S. in 2017. The city’s desirability, prominent research institutions, and growing job market contributed to its notable rank. (U.S. News & World Report, 2017)
   - FasTracks is a multibillion dollar comprehensive transit expansion plan to build 122 miles of new commuter rail and light rail, extend existing routes, and expand the regional bus network across the eight-county district.

3. Low to moderate costs of doing business
   - Metro Denver office rental rates averaged $30.16 per square foot in the fourth quarter of 2017, making the region’s office market highly competitive with other major markets in the U.S. (CoStar Realty Information, The CoStar Office Report, 4Q 2017)
   - Colorado’s initial registration fees for broker-dealers ($77) and sales representatives ($18) are among the lowest in the nation. (State of Colorado, Division of Securities)

4. A pro-business environment and competitive tax structure
   - Denver was named as the second-best place to live in the U.S. in 2017. The city’s desirability, prominent research institutions, and growing job market contributed to its notable rank. (U.S. News & World Report, 2017)
   - FasTracks is a multibillion dollar comprehensive transit expansion plan to build 122 miles of new commuter rail and light rail, extend existing routes, and expand the regional bus network across the eight-county district.

   - Colorado ranks as one of the nation’s most favorable corporate income tax structures. The state’s corporate income tax rate of 4.63 percent is one of the lowest in the nation and is based on single-factor apportionment, which allows companies to pay taxes based solely on their sales in the state. (State of Colorado; The Tax Foundation)
• Colorado ranks as the nation’s 10th-best tax system for entrepreneurs and small business. (Small Business & Entrepreneurship Council, 2017)
• Metro Denver ranked fourth among Forbes’ 2017 “Best Places for Business and Careers.” The Fort Collins metro area ranked 17th, Colorado Springs ranked 18th, Boulder ranked 45th, and Greeley ranked 51st. (Forbes, 2017)
• Twelve Forbes’ 2017 Global 2000 companies and 10 Fortune 500 companies are headquartered in Metro Denver. (Forbes, 2017; Fortune, 2017)
• Colorado received an “A” grade for its business-friendly environment in 2017 and ranked seventh for ease of starting a business. Denver received a “B+” grade for overall friendliness. (Thumbtack.com, 2017; Ewing Marion Kauffman Foundation, 2017)

5. A central location and easy global access
• Denver International Airport was the sixth-busiest airport in the nation and 18th-busiest worldwide in terms of passenger traffic in 2016. (U.S. Bureau of Transportation Statistics, 2017; Airports Council International 2017; and Denver International Airport, 2017)
• Metro Denver is the largest region in the U.S. to offer one-bounce satellite uplinks to six out of seven continents in one business day due to its unique geographic location in the Mountain time zone.
• Located on the 105th meridian, Metro Denver’s central location at the exact midpoint between Tokyo and Frankfurt positions the region favorably to serve growing world markets.
• More than 1,000 miles from the nearest coast and outside of Tornado Alley, Metro Denver’s risk of natural disasters is minimal compared with locations in the east, west, and south. (National Oceanic and Atmospheric Administration, 2016; U.S. Geological Survey, 2016)

For additional information, contact us:
1445 Market Street
Denver, CO  80202-1790
303.620.8092
email: info@metrodenver.org
www.metrodenver.org

HEALTHCARE AND WELLNESS:
Metro Denver and Northern Colorado Industry Cluster Profile

Industry Overview

The nine-county Metro Denver and Northern Colorado region’s dynamic outdoor environment and emphasis on health combine to make it one of the healthiest regions in the United States. According to the American College of Sports Medicine, Metro Denver ranked as the nation’s seventh-fittest metropolitan area in 2017 and Boulder ranked among the top 10 metro areas for residents’ overall health and well-being. With one of the highest rates of physical activity in the nation, and a low prevalence of diabetes and heart disease, the Metro Denver region’s healthy population translates into a productive workforce. The nine-county region is part of a larger healthcare and wellness community in Colorado. The state’s obesity rate (22.3 percent) was the lowest in the nation in 2017 and Colorado has consistently had the lowest obesity rate of any state since 1990, as access to recreational and fitness opportunities abound. The state offers a diverse selection of outdoor recreational activities that draw visitors from every corner of the world. In fact, Colorado has one of the nation’s largest public parks systems, over 45 national and state parks, 11 world-class ski resorts, and the highest concentration of 13,000 and 14,000-foot peaks in the nation.

The healthcare and wellness cluster includes a dynamic and growing group of companies that provide preventive, curative, and rehabilitative services offered by healthcare providers, medical and specialty hospitals, kidney dialysis centers, nutrition and weight loss facilities, fitness centers, medical spas and massage facilities, public health and education, and other healthcare and wellness organizations. Extending beyond healthcare delivery, the cluster represents a continuum of businesses ranging from treating disease to a multidimensional and holistic approach that focuses on complete physical and mental health, social well-being, and disease prevention. The healthcare and wellness workforce continues to drive the region’s employment growth. Employment has increased every year since 2004, adding over 88,420 workers between 2004 and 2017. Over the past five years, employment in the region grew 24.1 percent, which was nearly double the U.S. growth rate of 10.7 percent. Between 2012 and 2017, the region added 43,250 healthcare and wellness jobs, accounting for 10 percent of the total job growth in the region over this period of time. With an employment base of over 222,700 workers in 21,160 companies, the healthcare and wellness cluster is the region’s largest cluster in terms of employment.

Between 2012 and 2017, Colorado gained approximately 1,600 physicians, bringing the total number of active licensed physicians to nearly 15,700, according to the Colorado Department of Regulatory Agencies. Of the healthcare workforce, registered nurses (RN) represent the largest subcategory with more than 60,000 RNs licensed to work across the state. Since 2012, RNs have increased 15 percent and are expected to grow another 40 percent by 2025. The number of Certified Nurse Assistants increased rapidly following the implementation of the Affordable Care Act but has since stabilized. This group is particularly important since it provides about 80 percent of the hands-on services needed by Colorado’s senior population. Other healthcare and wellness occupations have grown by at least 200 practitioners over the last five years, including dentists and dental hygienists.

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1 The nine-county region is comprised of two principal areas, Metro Denver and Northern Colorado. Metro Denver consists of Adams, Arapahoe, Boulder, Broomfield, Denver, Douglas, and Jefferson counties. Northern Colorado consists of Larimer and Weld counties.
The region is home to major healthcare systems and hospitals ensuring the health and wellness of area residents. According to the most recent data from the Colorado Hospital Association, hospitals experienced more than 9.2 million outpatient visits, 1.9 million visits to emergency departments, had 423,000 inpatient admissions, and delivered 63,000 babies in 2015. For every dollar spent at a Colorado hospital, two dollars were generated for the broader Colorado economy, creating $33 billion in total economic activity. Despite increased utilization and spending, the state has controlled its cost curve. Colorado ranked fifth-lowest among all states in per capita healthcare spending and had the fourth lowest average annual health spending growth rate across an 11-year period. According to Altarum Institute, hospital spending grew only 0.8 percent between June 2016 and June 2017, the lowest annual growth rate since Altarum began tracking hospital spending in 1989. Also, Colorado has historically ranked well for both transparency and affordability.

Demand for healthcare and wellness services is expected to increase due to a growing and aging population, a higher prevalence of chronic conditions such as heart disease and diabetes, and changes in residents' behavior and lifestyle choices. As of 2017, the nine-county region's projected population is about 3.8 million people, of which about 13 percent are 65 or older. According to the Colorado State Demography Office, the overall population growth rate was 14 percent between 2010 and 2017, while the senior population grew by 43 percent. As these seniors age out of the workforce over the next 20 years, the healthcare system infrastructure will need to shift.

Colorado and the nine-county region are leaders in the natural and organic products industry. According to the 2017 U.S. Department of Agriculture’s Certified Organic Survey, the state’s organic agricultural industry has more than doubled in sales, growing from $66.2 million in 2012 to $155.2 million in 2015. The state ranked among the top 10 in certified organic sales, totaling $181 million in 2016, and ranked among the top five states in certified organic wheat and millet acreage. Organic farmland covers more than 155,000 acres statewide, with another 70,000 acres dedicated to organic pastureland and rangeland. Further, several nationally-known organic foods companies, including Boulder Brands, Fresca Foods, and Justin’s Nut Butter, got their start in Colorado.

Breakthrough technologies, innovative software, and integrated design-based solutions are driving fundamental changes in the delivery of healthcare and wellness, and care. The shift toward participatory health including wearables and monitoring devices, cognitive technologies such as machine learning on mobile devices, and sensors are central to the shift in the new model of care. Several companies across the nine-county region are leaders in the intersection of technology and healthcare. For example, Westminster-based C3LX’s mobile app encourages patients to choose healthy behaviors to prevent disease and illness. Denver-based Welltok’s CaféWell Health Optimization Platform™ organizes the growing spectrum of health and condition management programs, communities, apps, and tracking devices. Companies such as Boulder-based Stryd and Boulder-based TrainingPeaks provide fitness monitoring devices to track workout efficiency, power, and speed. Additionally, several of the region’s hospitals including Longmont United Hospital and Boulder Community Health are ramping up their remote patient monitoring programs. Longmont United Hospital offers its LifeWatch to monitor patients with heart arrhythmia and more than 1,200 cardiovascular patients are part of the remote monitoring program at Boulder Community Health’s Boulder Heart program. Further, electronic health records and telemedicine have greatly improved the way patient care is delivered and compensated.
HEALTHCARE AND WELLNESS: 
Metro Denver and Northern Colorado Industry Cluster Profile

Healthcare and Wellness Economic Profile

The healthcare and wellness cluster includes the offices of physicians, dentists, chiropractors, optometrists, mental health practitioners, physical and speech therapists, podiatrists, and other health practitioners. The cluster includes hospitals ranging from general medical, surgical, and psychiatric to substance abuse and specialty care. The cluster also includes centers focused on family planning, outpatient mental health and substance abuse, kidney dialysis, diagnostic imaging, and emergency care. Companies focused on nursing care, assisted living, and long-term care and businesses that provide services for individuals, families, and the elderly are also included.

The cluster encompasses home health and recreation equipment rental, fitness and recreation facilities, diet and weight reducing services, and massage and yoga services. Companies that manufacture ophthalmic goods, sports and athletic equipment, and outerwear, and retailers engaged in vitamins and nutrition supplements are also a part of healthcare and wellness. The cluster includes government agencies engaged in the planning, administration, and coordination of public health programs and services. The healthcare and wellness cluster consists of 53, six-digit North American Industry Classification System (NAICS) codes.

<table>
<thead>
<tr>
<th>Healthcare &amp; Wellness Employment by County, 2017</th>
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<tbody>
<tr>
<td>Douglas</td>
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<tr>
<td>Weld</td>
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<tr>
<td>Larimer</td>
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<tr>
<td>Boulder</td>
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<td>Jefferson</td>
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<tr>
<td>Adams</td>
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<tr>
<td>Arapahoe</td>
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<tr>
<td>Denver</td>
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Sources: Market Analysis Profile, 2017; Development Research Partners.

<table>
<thead>
<tr>
<th>Healthcare &amp; Wellness Employment by Category, 2017</th>
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<tbody>
<tr>
<td>Medical &amp; Dental Laboratories 1.1%</td>
</tr>
<tr>
<td>Physician Offices &amp; Clinics 29.9%</td>
</tr>
<tr>
<td>General &amp; Medical, Surgical, &amp; Psychiatric Hospitals 31.9%</td>
</tr>
<tr>
<td>Kidney Dialysis &amp; Home Health Care Services 14.4%</td>
</tr>
<tr>
<td>Nursing Care Facilities 7.0%</td>
</tr>
<tr>
<td>Fitness &amp; Recreational Services 8.6%</td>
</tr>
<tr>
<td>All Other Health Services 4.1%</td>
</tr>
<tr>
<td>Public Health Programs &amp; Other Health Agencies 1.2%</td>
</tr>
<tr>
<td>Organic &amp; Health Food Stores 1.2%</td>
</tr>
<tr>
<td>General &amp; Medical, Surgical, &amp; Psychiatric Hospitals 31.9%</td>
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</tbody>
</table>

Sources: Market Analysis Profile, 2017; Development Research Partners.

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<thead>
<tr>
<th>Nine-County Rankings</th>
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<tr>
<td>Healthcare &amp; wellness direct employment rank 14th</td>
</tr>
<tr>
<td>Healthcare &amp; wellness direct employment concentration rank 34th</td>
</tr>
</tbody>
</table>

Sources: Dun & Bradstreet, Inc., Hoover’s Online Database; Market Analysis Profile, 2012-2017; Development Research Partners.

2 Direct employment rank based on the number of employees in the industry cluster in a region. Employment concentration rank based on the direct cluster employment in a region expressed as a percent of total employment in all industries in the same region. Rankings are for the 50 largest metropolitan statistical areas (MSAs). No multiplier effects are included. 1st = highest for both rankings.
HEALTHCARE AND WELLNESS:
Metro Denver and Northern Colorado Industry Cluster Profile

Major Healthcare & Wellness Companies (excludes major health systems, highlighted below)

- BAYADA Home Health
  www.bayada.com
- CorePower Yoga
  www.corepoweryoga.com
- DaVita Inc.
  www.davita.com
- Envision Healthcare
  www.evhc.net
- HSS Inc.
  www.hss-us.com
- InnovAge
  www.myinnovage.org
- Life Care Centers of America
  www.lcca.com
- Personal Assistance Services of Colorado (PASCO)
  www.pascoh.com
- United Natural Foods
  www.unfi.com
- Wellbridge, Inc.
  www.wellbridge.com

Major Healthcare and Wellness Foundations and Organizations

Nine-County Region Major Health Systems and Facilities

The nine-county region is home to major health systems and facilities that provide quality care to its residents. The region’s major health systems and facilities are highlighted below, along with their corresponding projects and developments that were announced in 2017.

Anschutz Medical Campus and Fitzsimons Innovation Campus

The 578-acre Fitzsimons campus includes the Anschutz Medical Campus and the Fitzsimons Innovation Campus. As one of the most ambitious medical developments in the nation, the $5.2 billion project encompasses more than six million square feet of cutting-edge space and services that will eventually support more than 43,000 bioscience and healthcare professionals.

- A $38 million gift to the University of Colorado Anschutz Medical Campus and a new $9.8 million partnership will provide mental health care for military veterans and their families. The Marcus Foundation has committed a five-year gift to establish the Marcus Institute for Brain Health. Additionally, the Cohen Veterans Network will work with the Anschutz Medical Campus to build a mental health clinic to serve veteran and military families in Metro Denver with free, or low-cost, personalized care and integrated case management support.
- Researchers from the University of Colorado Anschutz Medical Campus and the University of Colorado Boulder won a prestigious $2 million grant to refine a microscope they developed to study the brain. The fiber-coupled, two photon miniature microscope will be expanded for other scientists to use across the nation.
HEALTHCARE AND WELLNESS:  
Metro Denver and Northern Colorado Industry Cluster Profile

Banner Health

Banner Health is a premier health system in Northern Colorado, providing services to the cities of Berthoud, Eaton, Fort Collins, Greeley, Johnstown, Loveland, and Windsor. Two major health centers—the North Colorado Medical Center (NCMC) and the McKee Medical Center—have served the region for a combined 130 years. NCMC in Greeley is rated nationally among the top 1 percent of hospitals for clinical quality. The McKee Medical Center is an acute-care hospital serving the Loveland community. www.bannerhealth.com

Rankings & Notable Designations

- McKee Medical Center and NCMC received “A” grades in hospital safety from The Leapfrog Group.
- Surgical Review Corp. named the McKee Medical Center the first and only Center of Excellence in Robotic Surgery in Colorado.
- For the third year in a row, NCMC was named among “America’s 50 Best Hospitals” in 2017, according to Healthgrades.
- The American Association of Cardiovascular and Pulmonary Rehabilitation certified NCMC and McKee Medical Center, recognizing both for their commitment to improving quality of life by enhancing standards of care.

News

- Banner Health Center opened its expanded Harmony Road campus, doubling its size and expanding its pediatric, OB-GYN, and family medicine services.
- Banner Fort Collins Medical Center opened the Banner Health Structural Heart & Valve Clinic and expanded its delivery department.

Boulder Community Health

Boulder Community Health (BCH) is a community owned-and-operated health system dedicated to providing local access to high quality medical care to people and businesses in Boulder County and the City and County of Broomfield. BCH provides clinical excellence in heart care, neurosurgery, stroke care, orthopedics, and cancer care. www.bch.org

News

- BCH will open a medical office building and urgent-care facility in Erie at the end of 2018. The 40,000-square-foot facility will be Erie’s first large-scale medical site.
- Construction at BCH’s 40-bed facility in Lafayette is expected to be completed in early 2019. The 58,000-square-foot rehabilitation hospital will include a gym and outdoor courtyard for therapeutic uses.
- BCH’s hospitals in Lafayette and Boulder will participate in a six-month pilot program to study the effectiveness of alternative pain treatments, aimed at reducing the use of opioids in emergency rooms. BCH will gather data, establish best practices, and determine the efficacy of the alternative treatments in managing acute pain.

Centura Health

Centura Health connects Coloradans to affordable, world-class care through an integrated network of healthcare staff and physician partners. A part of the Catholic Health Initiatives Network, facilities in the nine-county region include Avista Adventist, Castle Rock Adventist, Littleton Adventist, Longmont United Hospital (LUH), OrthoColorado Hospital, Parker Adventist, Porter Adventist, St. Anthony, St. Anthony North Health Campus, and numerous urgent care, neighborhood health centers, surgery centers, and diagnostic imaging centers, among others. www.centura.org

Rankings & Notable Designations

- Porter Adventist and Parker Adventist were ranked among the top five best hospitals in Metro Denver, according to U.S. News & World Report. Porter Adventist’s specialties in ear, nose, and throat and orthopedics were ranked nationally.
- Porter Adventist was ranked among Becker Hospital Review’s “100 Great Hospitals in America.”
- Porter Adventist received an “A” grade in hospital safety, according to The Leapfrog Group.
HEALTHCARE AND WELLNESS:
Metro Denver and Northern Colorado Industry Cluster Profile

• Centura Health’s data center, core infrastructure, and electronic health center in Centennial earned Certified Status for information security by the Health Information Trust Alliance for the third time.

News
• The newly renamed and revamped Centura Health Integrative Medicine added a new community acupuncture clinic and community wellness training center in Longmont.
• Arapahoe County-based Catholic Health Initiatives (CHI) and Dignity Health signed a merger agreement to form one of the largest faith-based health systems in the nation. The two systems will span across 28 states and will employ more than 162,000 people.

Children’s Hospital Colorado

Children’s Hospital Colorado (CHC), whose main facility is located on the Anschutz Medical Campus, is the region’s premier hospital for children. CHC provides care to more children than any hospital in the surrounding states through its network of over 3,000 pediatric specialists. CHC is home to the only Level I pediatric trauma center in a seven-state region. CHC has over 10 satellite locations throughout the region.

www.childrenscolorado.org

Rankings & Notable Designations
• U.S. News & World Report ranked CHC among the top 10 children’s hospitals in the nation with five of its specialty areas among the top 10 in their respective categories.
• Becker Hospital Review named CHC among the “100 Great Hospitals in America.”
• Hospitals & Health Networks magazine named CHC the nation’s most wired hospital.

News
• Launched in 2017, the Pediatric Care Network, a collaboration among community pediatric providers, specialists at the University of Colorado School of Medicine, and CHC, aims to enhance the health and well-being of children by delivering higher quality and more efficient care at a lower cost. The Pediatric Care Network is the largest clinically-integrated network in the state of Colorado that is dedicated exclusively to kids.
• Englewood-based Flight For Life Colorado and CHC launched a new critical care helicopter to transport and care for small children. Supplied by Englewood-based Air Methods Corp., the Airbus H130 T2 helicopter will transport patients within a 120-mile radius to all of CHC’s facilities in the region.
• CHC and RxRevu collaborated to help prescribers better meet the needs of children by seamlessly incorporating antimicrobial-stewardship best practices into prescribers’ decision-making processes. The expected result of this effort is more judicious prescribing of antimicrobials and other medications, enhanced clinical consistency, and improved workflow.

Craig Hospital

Craig Hospital in Denver is a world-renowned center for specialty rehabilitation and research for people with spinal cord injury (SCI) and traumatic brain injuries (TBI). Craig is a national center of excellence and has treated over 31,000 patients with SCI—more than any other single center in the world—and TBI since 1956.

www.craighospital.org

Rankings & Notable Designations
• U.S. News & World Report named Craig Hospital the seventh-best rehabilitation hospital in the nation and 2017 was the 28th-consecutive year that Craig was ranked among the top 10.

News
• Craig Hospital was awarded a $2.5 million research grant from the National Institute on Disability, Independent Living and Rehabilitation Research. The project, in collaboration with the University of Michigan and Kessler Institute for Rehabilitation, will study the effect of group therapy intervention developed at Craig on people living with SCI.
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Denver Health

As a comprehensive, integrated organization providing level one care for all, Denver Health is Colorado’s primary safety net institution. Denver Health is one of four Level I trauma centers in Colorado and one of the primary teaching hospitals in Denver. Since becoming Denver Health and Hospital Authority in 1997, the number of individuals cared for at Denver Health annually has increased from 120,000 to 220,000 and the 911 ambulance transports increased from 54,000 to 112,000. As Colorado’s primary safety net institution, Denver Health has provided $5.5 billion in uncompensated care. Twenty-five percent of all Denver residents, or approximately 150,000 individuals, receive their healthcare at Denver Health. www.denverhealth.org

Rankings & Notable Designations

- Healthgrades awarded Denver Health a 2017 Distinguished Hospital Award for Clinical Excellence, placing it among the top five percent of hospitals in the nation.
- The American Hospital Association’s Health Forum recognized Denver Health as a most wired healthcare system.

HCA-HealthONE

HCA-HealthONE® is one of the region’s largest healthcare systems with more than 10,000 employees. Major facilities in the region including The Medical Center of Aurora, North Suburban Medical Center, Presbyterian/St. Luke’s Medical Center, Rocky Mountain Hospital for Children, Rose Medical Center, Sky Ridge Medical Center, Swedish Medical Center, and Spalding Rehabilitation Hospital work together to provide a higher level of care. Other services include seven free-standing emergency departments, numerous ambulatory surgery centers, CareNow Urgent Care Clinics and Occupational Medicine, physician practices, and AIRLIFE-DENVER, which provides critical care air and ground transportation across a 10-state region. www.healthonecares.com

Rankings & Notable Designations

- Rose Medical Center, the Medical Center of Aurora, Sky Ridge Medical Center, and Presbyterian/St. Luke’s Medical Center were named among the nation’s “Best Hospitals,” according to U.S. News & World Report. Rose was also named as a Best Hospital (#40) in national rankings for gynecological care, and achieved the highest rating possible in five procedures or conditions.
- Six Metro Denver HealthONE medical centers received “A” grades in hospital safety from The Leapfrog Group.
- Rose Medical Center earned The Centers for Medicare & Medicaid Services’ Hospital Compare’s five-star rating and was named a Five-Star Recipient for hysterectomy care by Healthgrades.
- Truven Health Analytics named Rose Medical Center among the nation’s “Top 100 Hospitals.”
- Swedish Medical Center was named a 2017 Gynecologic Surgery Excellence Award recipient by Healthgrades.
- The Medical Center of Aurora and Rose Medical Center received the American Heart Association/American Stroke Association’s Get With The Guidelines®-Stroke Gold Plus Quality Achievement Award. Rose Medical Center also received the Target: StrokeSM Honor Roll Elite honor.
- Rose Medical Center was designated an Aetna Institute of Quality® Orthopedic Care Facility for total joint replacement and spine surgery.
- Rose Medical Center achieved the Healthgrades 2017 Outstanding Patient Experience Award for the third year in a row.
- The American Association of Critical-Care Nurses conferred a silver-level Beacon Award for Excellence on the Intensive Care Unit at Rose Medical Center.

News

- Swedish Medical Center renovated its 10,905-square-foot Sarah Cannon Cancer Institute. The renovation includes 13 remodeled patient rooms, caring for more than 3,500 patients per year.
- Renovations are underway at Swedish Medical Center’s main campus emergency room, which is slated for completion in February 2018. The renovations include a new waiting room and a new entrance.
- The fifth Metro Denver CareNow Urgent Care clinic opened in Stapleton in October 2017. The clinic has x-rays and a laboratory on-site, and provides occupational medicine services to local employers such as drug tests and pre-employment screenings.
- HealthONE expanded its Graduate Medical Education program to include residencies in psychiatry and neurology. While both new programs will conduct their preliminary training at Sky Ridge, the new
HEALTHCARE AND WELLNESS:
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psychiatry program will be focused at The Medical Center of Aurora and utilize the expertise of its adult, geriatric, and adolescent behavioral health unit. The neurosciences program will be housed at Swedish Medical Center, known as one of the nation's top neuroscience programs, and a designated Neuroscience Center of Excellence through the Neuroscience Center of Excellence Survey.

- Swedish Medical Center was the first hospital in the nation to implant the U.S. Food and Drug Administration’s approved LivaNova Vagus Nerve Stimulation Therapy (“VNS Therapy”) System. The implantable generator and the next-generation VNS Therapy Programming System is used for the treatment of patients with drug-resistant epilepsy.
- Sky Ridge Medical Center acquired the first Mazor X™ system in Colorado and a 10-state region for spine surgery. Sky Ridge surgeons are performing spine surgeries with the Mazor X™ system, which increases the efficiency and safety of spine surgery.

Kaiser Permanente Colorado

Kaiser Permanente Colorado is the state's largest nonprofit health plan, serving over 670,000 members throughout much of Colorado for more than 40 years. Approximately 1,600 Kaiser Permanente Colorado physicians provide care in over 25 medical offices across the nine-county region. Several Kaiser-affiliated hospitals and offices provide care to patients including Children’s Hospital Colorado Main Campus, Children’s Hospital at Parker Adventist Hospital, Children’s Hospital at Saint Joseph Hospital, Good Samaritan Medical Center, HealthONE Rocky Mountain Hospital for Children, HealthONE Sky Ridge Medical Center, HealthONE Swedish Medical Center, and Saint Joseph Hospital, among others. www.kaiserpermanente.org

Rankings & Notable Designations

- The Centers for Medicare & Medicaid Services rated Kaiser Permanente Colorado’s Medicare Senior Advantage plan 5 out of 5 stars—the highest overall rating for quality and service—for 2018.
- J.D. Power 2017 Member Health Plan Study named Kaiser Permanente Colorado the highest ranked health plan in member satisfaction in the state for the 10th consecutive year.

National Jewish Health

National Jewish Health is a worldwide leader in treating patients with respiratory, cardiac, immune, and related disorders. Founded in 1899 as a nonprofit hospital, National Jewish Health remains the only facility in the world dedicated exclusively to these disorders. Patients and families come to National Jewish Health from around the world to receive cutting-edge, comprehensive, coordinated care. www.nationaljewish.org

Rankings & Notable Designations

- National Jewish Health was named the top respiratory hospital in the nation by U.S. News & World Report in its 2017 Best Hospitals rankings. The Hospital was also recognized as “High Performing,” the best rating available, for care of patients with chronic obstructive pulmonary disease and for lung cancer surgery in the Common Adult Conditions and Procedures categories.

The Rocky Mountain Regional Veterans Affairs (VA)

Located adjacent to the Anschutz Medical Campus is the Rocky Mountain Regional VA Medical Center. The 1.2 million-square-foot facility replaces the original hospital, built more than 60 years ago. The new facility is on-track for a 2018 completion and will feature 306,000 square feet of diagnostic and treatment space, 260,000 square feet of inpatient space, and 302,000 square feet of clinic space across three outpatient and two inpatient clinic buildings. The VA will also include over 180 inpatient beds in acute care, critical care, mental health, and rehabilitation, as well as a 30-bed spinal cord injury clinic. At buildout, the VA Hospital is expected to employ about 2,000 people and serve thousands of veterans annually. www.denver.va.gov

SCL Health

SCL Health is a faith-based, nonprofit healthcare organization which is headquartered in Broomfield. SCL Health provides care through four major hospitals, four community hospitals, ambulatory service centers, home healthcare, hospice, mental healthcare, and safety-net services. Major healthcare facilities in the region include Good Samaritan Medical Center, Lutheran Medical Center, Platte Valley Medical Center, Saint Joseph...
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Hospital, and SCL Health Community Hospitals in Northglenn, Littleton, Aurora, and Westminster.
www.sclhealth.org

Rankings & Notable Designations

- Lutheran Medical Center was named among the nation’s “Best Hospitals,” according to U.S. News & World Report.
- Saint Joseph Hospital received Magnet® designation, the highest credential for nursing excellence.
- Lutheran Medical Center and Saint Joseph Hospital received “A” grades in hospital safety, according to The Leapfrog Group.

News

- SCL opened a new 37,000-square-foot satellite emergency center in Aurora.
- SCL Health Community Hospital in Northglenn opened, which features an emergency department with surgical capabilities, an eight-bed inpatient unit, an advanced imaging center, and laboratory services. The 60,000-square-foot hospital will also include specialty services for heart, gastroenterology, and foot and ankle.

University of Colorado Health

University of Colorado Health (UCHealth) provides evidence-based healthcare and wellness services in Colorado, Nebraska, and Wyoming, and includes the University of Colorado Hospital (UCH), Poudre Valley Hospital (PVH), Medical Center of the Rockies, Broomfield Hospital, Highlands Ranch Hospital, Longs Peak Hospital, Greeley Emergency and Surgery Center, and other clinics and outpatient services. www.uchealth.org

Rankings & Notable Designations

- UCH, the Medical Center of the Rockies, and PVH were named among the “Best Hospitals,” according to U.S. News & World Report. UCH ranked as the top facility in Metro Denver.
- Vizient named UCH as the seventh-highest performing academic hospital in the U.S. for delivering quality health care.
- Becker’s Hospital Review named PVH and UCH as two of the "100 Great Hospitals in America” and named PVH among the top “100 Hospitals with Great Orthopedic Programs.”
- Truven Health Analytics named the Medical Center of the Rockies, PVH, and UCH among the nation’s “Top 100 Hospitals.”
- PVH received an “A” grade in hospital safety, according to The Leapfrog Group.
- UCHealth’s Longs Peak Hospital was awarded accreditation from The Joint Commission, the largest standards-setting and accreditation organization in the U.S. The accreditation qualifies the hospital to participate in the Medicare, Medicaid, and Tricare programs and is a key milestone to finalize coverage agreements with other insurance providers.

News

- The new $125 million, 210,000-square-foot Longs Peak Hospital opened in Longmont. The hospital includes a Level III trauma center, four operating rooms, a birth center, a level II special-care nursery, and an intensive-care unit. UCHealth plans to employ 350 people and work with 370 healthcare providers.
- PVH opened its expanded 64-bed emergency department, orthopedics unit, and laboratory. The hospital’s three-story, 185,000-square-foot expansion includes a retail pharmacy, a rooftop helipad, and a patient and visitor parking lot.
- UCHealth broke ground on its $185 million Greeley Campus that will include a hospital and medical center. The $135 million, 153,000-square-foot UCHealth Greeley Hospital will provide 53 beds, an intensive care unit, and an emergency department, among other facilities. The $50 million, 112,000-square-foot UCHealth Medical Center will have 192 exam rooms and outpatient services. Once completed in 2018, the Campus will create 300 healthcare jobs.
- A new urgent care clinic opened in Thornton to expand accessibility to more affordable emergency services. The clinic will employ nurse physicians, physician assistants, and nurse practitioners in order to supply basic treatments including laboratory and X-ray services.
- A comprehensive healthcare facility will open in Cherry Creek in late 2018. The 89,000-square-foot facility will offer primary care, women’s care, cancer care and imaging, and ambulatory surgery.
HEALTHCARE AND WELLNESS:
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Key Company Announcements

Healthcare

- **Front Range Orthopedics & Spine Center** opened its new 32,000-square-foot, two-story orthopedic and spine center in Longmont. The center provides access to 10 surgeons that specialize in orthopedics and spine procedures, an outpatient surgery center and physical therapy center, and digital x-ray and high-resolution MRI services.
- **MedExpress Urgent Care** plans to open clinics in Longmont, Fort Collins, and Glendale, providing walk-in treatment for illnesses and injuries, wellness exams, and employer health services. The company is also planning to open an urgent care clinic in Fort Collins.
- Vertix Builders broke ground on a four-story medical office building at South Havana Street and East Dry Creek Road. The **Dry Creek Medical Office** will include 53,000 square feet of tenant space, with a 10,000-square-foot, lower-level parking garage on a four-acre site. Construction is slated for completion by year-end 2018.
- Construction began on the four-story, 60,000-square-foot **Superior Medical Center**. The $18.5 million project is slated for completion in early 2018, with tenants including Boulder Community Health and Cornerstone Orthopedics and Touchstone Imaging.

Senior Care

- Denver-based **MGL Partners** began construction of a $52 million senior living facility near the Belleview Station area in the Denver Tech Center. The six-story Carillon at Belleview Station will include 163 independent living, assisted living, and memory care suites, which is slated for completion in May 2018.
- **Balfour Senior Living** opened two assisted living facilities in Stapleton and Littleton. The Stapleton facility includes 58 general assisted living apartments and 16 memory care units, while the Littleton facility includes 82 units.
- **MorningStar** at RidgeGate opened in early 2017 in Lone Tree. The 4.8-acre property includes independent living, assisted living, and memory care.
- **Columbine Health Systems** will construct a 45-bed skilled nursing facility for short-term rehabilitation, long-term care, and hospice at its campus in Windsor. Construction is expected to be completed by May 2018.
- **StoneGate Senior Living** opened its first Colorado facility in Golden. The 60,000-square-foot facility will serve as both an inpatient transitional care center and outpatient center for up to 80 patients, and will include physical, occupational, and speech rehabilitation services.

Organic Food

- Organic foods company **Tierra Farm Inc.** opened a 10,000-square-foot distribution center in Aurora and will add a number of employees. The New York-based organic foods company distributes to smaller grocery stores such as Alfalfa’s Market in Boulder and Crunchy Grocer in Loveland.
- Organic palm oil company **Natural Habitats USA, Inc.** moved its headquarters to Boulder from Richmond, Calif. The company cited Boulder’s history with natural products as motivation for its relocation, which it expects will benefit the company’s future growth.

Recreation & Fitness

- Denver will be the host city for the **Outdoor Retailer** show, the largest show in North America for outdoor retailers, starting in 2018. The Outdoor Retailer show will be combined with the SnowSports Industries American Snow Show and will have an estimated $110 million annual economic impact and attract an estimated 85,000 visitors per year.
- According to the **Outdoor Industry Association**, outdoor recreation in Colorado accounted for $28 billion and brought $2 billion in state and local taxes. Outdoor recreation directly created 229,000 jobs and nearly $10 billion in wages.
- **Life Time Fitness** will open a $10 million fitness center in the former Lakeshore Athletic Club in Broomfield in January 2018. The 175,000-square-foot facility will include an indoor and outdoor aquatic center; basketball courts; strength-training spaces; and group exercise, cycle, yoga, and Pilates studios.
- Construction began on the new 20-acre **Aurora Central Recreation Center**, which is slated to open by the end of 2018. The two-story, 60,000-square-foot center will feature an aquatics area, gymnasium, elevated walking/jogging track, and a fitness area.
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• The $225 million, 65-field Rocky Mountain Sports Park broke ground in Windsor. The facility will be the largest sports park in the nation and will feature a 10,000-seat stadium, five baseball fields, 10 youth fields, 32 tournament baseball and softball fields, four T-ball fields, and 12 multi-use fields. The project is slated for completion in 2019.
• Construction began for the $5.8 million, 44,000-square-foot Parker Tennis Center. The facility will include a welcome center, offices, locker rooms, lounge, and retail shop.
• Climbing and fitness company Earth Treks will convert the former Sports Authority headquarters in Englewood into the nation’s largest rock climbing gym. The 52,000-square-foot climbing and fitness facility will hire 60 to 80 workers and is slated to open in 2018.
• Gravity One, a $6 million, 20,000 square-foot climbing gym will be opening in Broomfield in 2018. The facility will be built on a two-acre parcel at 8701 Uptown Ave.

Major Collaborations and Partnership Activity

• Centura Health and CHC formed a care alliance to improve pediatric care across the state. Under the partnership, Centura’s 17 hospitals will work with CHC to share clinical guidelines and protocols, and CHC will offer educational programs for physicians and nurses.
• BCH formed an alliance with CHC to provide inpatient care for children under 15 years old, in response to a decline in the number of pediatric inpatients treated at BCH’s Foothills Hospital. Through the alliance, most pediatric care will be provided by BCH providers and local physicians will receive additional support from CHC, including a streamlined process for consulting with CHC specialists.
• Centura Health and Banner Network Colorado will enter into a provider network agreement in early 2018. Under the agreement, Banner’s nearly 300 primary care providers and specialists, and three Banner Health hospitals in northern Colorado will join Colorado Health Neighborhoods, an entity comprised of more than 1,400 primary care providers and more than 2,800 specialists who coordinate care for more than 220,000 people in value-based agreements.

Cross-Cluster Convergence

Born from the collaboration between healthcare and software innovations, the region is a recognized national leader in the digital health arena. According to StartUp Health, Denver ranked among the top 10 U.S. cities for digital health funding, with five deals totaling $192 million in 2017. Prime Health, StartUp Health Colorado, and Catalyst HTI are examples of partnerships to grow the region’s digital health presence.

• Founded in July 2012 by the Denver South Economic Development Partnership and Innovation Pavilion, Prime Health is a growing statewide community of 1,600+ health care executives, physicians, technologists, academics, entrepreneurs, and investors dedicated to improving health and lowering healthcare costs through the commercialization of digital health technologies. Colorado is home to more than 130 digital health companies.
• Denver-based CirrusMD, which builds technology to offer secure mobile messaging between doctors and patients, will nearly double their workforce from 24 to 40 after raising $7 million in venture capital. The company also plans to expand its sales and marketing staff, invest in customer support, and integrate more data analytics.
• StartUp Health Colorado launched to create a health innovation hub in the Rocky Mountain region. The organization partnered with Children’s Hospital Colorado, UCHHealth, and the University of Colorado to streamline the pathways for health entrepreneurs to innovate and grow.
• Catalyst HTI is a health-tech industry integration project slated to open in 2018 in Denver’s River North neighborhood that will integrate building space for startups, Fortune 500 companies, and healthcare providers in one location. The first-of-its-kind project will enable startups with resources to grow and expose providers and larger companies to emerging technologies and human capital.
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Nine-County Region Workforce

- Nearly half of the nine-county region’s 3.8 million residents are under the age of 35. Employers can draw from a large, young, highly educated, and productive workforce.
- Of the region’s adult population, 43.2 percent are college graduates and 91.4 percent have graduated from high school.
- The region’s population is expected to grow 32.2 percent from 2020 to 2040, driving a 21.2 percent increase in the region’s labor force over the same period.

Healthcare and Wellness Workforce Profile

Compared with the age distribution across all industries in the region, the healthcare and wellness cluster has a larger share of employees in all age categories except the 16 to 24 years old and 65 years and older categories.

The Occupation & Salary Profile below includes the 10 largest healthcare and wellness occupations in the region. For these 10 largest occupations, the chart details the total number of workers employed in that occupation across all industries, the number of available applicants that would like to be working in that occupation, the number of recent graduates that are qualified for that occupation, and the median and sample percentile annual salaries.

Wages

- 2016 average annual salary was $57,070, compared with the national average of $57,600.
- Total payroll exceeded $12.2 billion in 2016.
HEALTHCARE AND WELLNESS:
Metro Denver and Northern Colorado Industry Cluster Profile

Metro Denver and Northern Colorado Healthcare and Wellness Occupation & Salary Profile, 2017

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<tbody>
<tr>
<td>1. Registered nurses</td>
<td>35,520</td>
<td>864</td>
<td>2,225</td>
<td>$70,318</td>
<td>$52,777</td>
<td>$59,217</td>
<td>$71,755</td>
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<td>2. Personal care aides</td>
<td>23,103</td>
<td>562</td>
<td>20</td>
<td>$22,828</td>
<td>$18,341</td>
<td>$20,100</td>
<td>$23,877</td>
<td>$25,710</td>
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<td>4. Home health aides</td>
<td>12,529</td>
<td>305</td>
<td>78</td>
<td>$24,269</td>
<td>$19,385</td>
<td>$21,550</td>
<td>$27,507</td>
<td>$30,918</td>
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<tr>
<td>5. Business operations specialists, all other</td>
<td>32,514</td>
<td>791</td>
<td>17</td>
<td>$74,757</td>
<td>$43,128</td>
<td>$55,758</td>
<td>$98,542</td>
<td>$126,087</td>
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<tr>
<td>6. Receptionists &amp; information clerks</td>
<td>14,905</td>
<td>363</td>
<td>0</td>
<td>$31,047</td>
<td>$20,773</td>
<td>$25,063</td>
<td>$31,905</td>
<td>$37,446</td>
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<td>7. Medical assistants</td>
<td>7,522</td>
<td>183</td>
<td>1,250</td>
<td>$35,519</td>
<td>$26,670</td>
<td>$30,289</td>
<td>$35,683</td>
<td>$40,182</td>
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<td>8. Office clerks, general</td>
<td>38,790</td>
<td>943</td>
<td>0</td>
<td>$36,547</td>
<td>$21,898</td>
<td>$28,054</td>
<td>$39,576</td>
<td>$48,288</td>
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<tr>
<td>10. Medical secretaries</td>
<td>5,563</td>
<td>135</td>
<td>261</td>
<td>$38,085</td>
<td>$27,079</td>
<td>$32,096</td>
<td>$39,361</td>
<td>$46,061</td>
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Notes: The number of available applicants is a point-in-time measurement of the number of people who have registered in Colorado’s workforce development system’s statewide database, Connecting Colorado, as being able and available to work in a particular occupation. Results should be interpreted with caution since registration in Connecting Colorado is self-reported. In addition, the skills rubric may assign up to four occupation codes for each registrant. Therefore, the number of available applicants could be inflated. Source: Provided by Arapahoe/Douglas Works!; QCEW Employees, Non-QCEW Employees, & Self Employed - EMSI 2017.3 Class of Worker.

Education & Training

Colorado’s higher education system provides an excellent support system for businesses in the region. There are 28 public higher education institutions in Colorado, of which seven four-year and six two-year public institutions offering comprehensive curricula are located in the nine-county region. There are more than 100 private and religious accredited institutions and more than 350 private occupational and technical schools offering courses in dozens of program areas throughout the state. The state higher education system served about 255,510 students in FY 2015-16, while 86,070 students received a degree, diploma, certificate, or other formal award over the same period of time. Although not exhaustive, a list of the major, accredited educational institutions with the greatest number of graduates for each of the 10 largest healthcare and wellness occupations in the nine-county region are included below. A directory of all higher education institutions with corresponding websites may be accessed via http://highered.colorado.gov.

- Colorado State University
  [www.colostate.edu](http://www.colostate.edu)
- Colorado State University Global Campus
  [www.colostate.edu](http://www.colostate.edu)
- Front Range Community College
  [www.frontrange.edu](http://www.frontrange.edu)
- Metropolitan State University of Denver
  [www.msudenver.edu](http://www.msudenver.edu)
- Red Rocks Community College
  [www.rrcc.edu](http://www.rrcc.edu)
- Regis University
  [www.regis.edu](http://www.regis.edu)
- University of Colorado Anschutz Medical Campus
  [www.ucdenver.edu](http://www.ucdenver.edu)
- University of Colorado Boulder
  [www.colorado.edu](http://www.colorado.edu)
- University of Denver
  [www.du.edu](http://www.du.edu)
- University of Northern Colorado
  [www.unco.edu](http://www.unco.edu)
- University of Colorado Denver
  [www.ucdenver.edu](http://www.ucdenver.edu)
HEALTHCARE AND WELLNESS: 
Metro Denver and Northern Colorado Industry Cluster Profile

Key Reasons for Healthcare and Wellness Companies to Locate in the Nine-County Region

The region is a top healthcare and wellness location offering:

1. **A robust culture of health and wellness**
   - Colorado ranked among the top 10 healthiest states in the nation and had the lowest prevalence of obesity and physical inactivity. (United Health Foundation, 2017)
   - Colorado ranked as the second-most physically active state in the nation with over 84 percent of adults participating in physical activity in the past month. (The Henry J. Kaiser Family Foundation, 2017)
   - Denver ranked second on Healthgrades’ National Health Index, a list of the 25 U.S. cities leading the way in healthcare. Healthgrades measured population health, access to care, risky behaviors, and hospital quality. (Healthgrades, 2017)
   - Colorado ranked fourth among the 50 states in the United Health Foundation’s “America’s Health Rankings Senior Report” in 2017. Colorado’s seniors have low obesity rates and high rates of physical activity. (United Health Foundation, 2017)
   - Douglas County ranked as the healthiest county in Colorado. The City and County of Broomfield (second), Boulder (third), and Larimer (ninth) were also included in the top 10. (University of Wisconsin Population Health Institute, 2017)
   - The University of Colorado Denver’s Anschutz Health and Wellness Center is a state-of-the-art research, education, and patient care facility that has been featured on ABC’s Extreme Weight Loss.

2. **The ability to recruit and retain a healthy, skilled, and productive workforce**
   - Boulder has the lowest prevalence of diabetes in the nation, with 4.1 percent of its adult population diagnosed. (Centers for Disease Control and Prevention, 2017)
   - Boulder (first) and Fort Collins (10th) ranked among the top 10 “2017 Healthiest Cities in America.” (Niche.com, 2017)
   - Nearly 40 percent of Coloradans have at least a bachelor’s degree, the second-highest college attainment rate in the nation behind Massachusetts. (U.S. Census Bureau, 2016 American Community Survey)
   - Denver ranked among the top 10 “Best Cities for Young Professionals” in 2017. (Forbes, 2017)
   - Colorado ranked ninth for the number of science, engineering, and health graduate students per 1,000 individuals ages 25 to 34 years old. (National Science Foundation, 2017)

3. **The convergence of health-related education, research, and application**
   - The University of Colorado School of Medicine ranked eighth nationally for primary care, with the specialties of family medicine (third), pediatrics (sixth), and rural medicine (sixth) also ranking high. The School of Medicine ranked 35th for research. (U.S. News & World Report, 2017)
   - Regis University’s Master’s in Health Services Administration ranked among the top 10 best online programs. (Master Programs Guide, 2017)
   - The Red Rocks Community College Physician Assistant Program is the only master's degree-offering community college program in the U.S. (Red Rocks Community College, 2017)
   - The University of Colorado School of Medicine is home to five health professional schools in dental medicine, medicine, nursing, pharmacy, public health, and the Graduate School offering 40 degree programs and educating 4,000 degree-seeking health professionals. (University of Colorado, 2017)
   - The Colorado School of Public Health is the first accredited and only collaborative school of public health in the Rocky Mountain region. (The Colorado School of Public Health, 2017)
   - The Skaggs School of Pharmacy and Pharmaceutical Sciences at the University of Colorado is one of the nation’s top 25 ranked pharmacy schools and seventh in the nation for total National Institutes of Health funding among pharmacy schools. (University of Colorado, 2017)

4. **A regional health hub, with expanding medical and wellness tourism opportunities**
HEALTHCARE AND WELLNESS:
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- Several nine-county region hospitals received Healthgrades awards in 2017. Twelve earned the 2017 Distinguished Hospital Award for Clinical Excellence, five were named among “America’s 100 Best Hospitals,” and eight received awards for Outstanding Patient Experience. (Healthgrades, Inc., 2017)
- Colorado’s healthcare system ranked as the sixth-best in the nation, according to the “Scorecard on State Health System Performance.” (The Commonwealth Fund, 2017)
- Colorado tied for the shortest average emergency room wait time in the nation with Utah, recording an average of 14 minutes. (ProPublica, 2017)
- Metro Denver is home to 10 hospitals that have achieved Magnet® designation, the highest credential for nursing excellence. (American Nurses Credentialing Center, 2017)
- The Barbara Davis Center for Diabetes is one of the largest diabetes institutes in the world, specializing in type 1 diabetes research and care for children and adults. (The Barbara Davis Center for Childhood Diabetes, 2017)
- The Colorado Center for Reproductive Medicine (CCRM) is one of the nation’s leading fertility clinics, providing a wide variety of treatments ranging from basic infertility care to the most advanced technology available. Two-thirds of CCRM’s patients travel to Colorado from other states and countries for treatment. (Colorado Center for Reproductive Medicine, 2017)
- HCA-HealthONE’s Rocky Mountain Hospital for Children (RMHC) houses the region’s largest neonatal intensive care unit and the largest, high-risk obstetrical program. (HCA-HealthONE, 2017)

5. An overall better quality of life
- Denver was named as the second-best place to live in the U.S. in 2017. The city’s desirability, prominent research institutions, and growing job market contributed to its notable rank. (U.S. News & World Report, 2017)
- The city of Lone Tree ranked seventh in the “Best Places to Live” list. Superior (49th) and Louisville (50th) were named to the list’s top-50 locations. (MONEY Magazine, 2017)
- Fort Collins (16th), Boulder (35th), Littleton (49th), Lakewood (57th), Longmont (62nd), and Centennial (97th) ranked among the 2017 list of the “100 Best Places to Live.” (Livability.com, 2017)
- Denver ranked No. 8 among the 2017 “Best Places to Retire.” (Zumper, 2017)
- FasTracks is a multibillion dollar comprehensive transit expansion plan to build 122 miles of new commuter rail and light rail, extend existing routes, and expand the regional bus network across the eight-county district.

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**Industry Overview**

The nine-county Metro Denver and Northern Colorado region\(^1\) is the premier information technology (IT) hub between the coasts, supported by a talented workforce, capital and funding resources, and attractive quality of life. The IT cluster supports business activities in all other sectors of the economy with a variety of products and services, ranging from virus protection and other security programs for computers to specialized custom software and computer-integrated systems design. Technology enterprises are high-knowledge, human capital-based businesses that are expanding globally. This industry cluster report is based on a narrow definition of information technology to avoid double-counting workers in other technology clusters such as telecommunications and aerospace. This analysis divides information technology into two clusters: software and hardware.

- **Hardware** includes companies that manufacture computers and computer storage solutions to manage and protect electronic information.
- **Software**, which is covered in this report, includes companies involved in off-the-shelf software products to custom computer programming, computer facilities management, computer systems design, and data processing services. Software companies also provide network solutions, web-based applications, and operating systems.

A broader information technology cluster definition includes companies involved in software, hardware, and telecommunications. The definition can be expanded to include individuals employed in information technology occupations across all industries. Using this broader definition, the Colorado Technology Association (CTA) reports there are approximately 196,700 information technology workers in the state representing nearly 14,850 software, Internet, hardware, telecommunications, and related technology companies.

The IT-software industry is a significant economic driver. According to Software.org: the BSA Foundation, the software industry contributes $14 billion in economic impact to Colorado. Further, according to **Cyberstates 2017**, the broader tech sector’s estimated direct contribution to Colorado’s economy is 11.5 percent. Tech-related exports total about $100 million in the state and are among the state’s largest exports. The software industry also attracts significant capital and investments. In fact, the first half of 2017 represented the highest level of IT-software venture capital funding in the state since the first half of 2005, totaling $47 million in seven deals.

IT-software posted 5.3 percent employment growth between 2016 and 2017, rising for the seventh-consecutive year. The region has the eighth highest employment concentration in IT-software in IT-software in the nation, employing 2.5 percent of the region’s total employment base. IT-software reached its highest employment base in 2017 since the early 2000s. Denver and Boulder counties are building a vibrant, strong, and growing technology community. In 2017, Boulder and Denver counties represented 45 percent of total IT-software employment in the region. According to CBRE’s Tech Talent Scorecard, Denver ranked among the top 10 markets for tech talent labor concentration with 5.4 percent of Denver jobs in the tech space. Further, Denver’s tech talent wages grew 20 percent over the past five years, the second-highest level of growth among major tech markets.

This concentrated talent makes the region a magnet for entrepreneurship and startup activity. According to the 2017 **Kauffman Index of Startup Activity**, Metro Denver ranked No. 10 out of 40 metropolitan areas, had a rate of entrepreneurs at 0.39 percent, and an opportunity share of new entrepreneurs at 82.9 percent. Further, the American City Business Journals named Denver as the eighth-best market for entrepreneurs in \(^1\) The nine-county region is comprised of two principal areas, Metro Denver and Northern Colorado. Metro Denver consists of Adams, Arapahoe, Boulder, Broomfield, Denver, Douglas, and Jefferson counties. Northern Colorado consists of Larimer and Weld counties.
2017 and NerdWallet ranked Boulder No. 8 among the “Best Places for Tech Jobs.” The region’s IT-software talent pipeline is driven by a highly educated and growing tech workforce across the state. Colorado has the second-highest college attainment rate in the nation and the state’s labor pool ranked as the best in the nation, which is essential to innovation and entrepreneurship.

The number of companies in the cluster reached 5,550 in 2017 and has increased each year since 2010. The IT-software cluster has a strong concentration of small companies, with nearly 85 percent employing fewer than 10 people. Wages in the cluster also tend to be higher than other industries. Since 2012, the average annual salary for IT-software workers in the region has increased over $14,230 to $110,060 in 2017. These companies continue to expand their footprint in Metro Denver. According to CBRE, at least 40 tech companies have expanded their presence in the area, with 400,000 square feet taken up by tech businesses between 2016 and 2017. Northern Colorado has also seen a boost in the tech industry, which grew by 50,000 square feet year-over-year. Further, Metro Denver tech company leases were at an all-time high of 7.9 million square feet of office space. Coworking space, incubators, and accelerators in the region have supported organic early-stage company growth in the IT-software cluster.

Software Economic Profile

The software cluster consists of seven, six-digit North American Industry Classification System (NAICS) codes including software reproduction, software publishers, custom computer programming, data processing & hosting, computer facilities management services, and computer systems design services.

<table>
<thead>
<tr>
<th>IT-Software Employment and Company Profile, 2017</th>
<th>Nine-County Region</th>
<th>United States</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct employment, 2017</td>
<td>58,190</td>
<td>3,356,160</td>
</tr>
<tr>
<td>Number of direct companies, 2017</td>
<td>5,550</td>
<td>232,290</td>
</tr>
<tr>
<td>One-year direct employment growth, 2016-2017</td>
<td>5.3%</td>
<td>3.8%</td>
</tr>
<tr>
<td>Five-year direct employment growth, 2012-2017</td>
<td>32.2%</td>
<td>26.1%</td>
</tr>
<tr>
<td>Avg. annual direct employment growth, 2012-2017</td>
<td>5.7%</td>
<td>4.7%</td>
</tr>
<tr>
<td>Direct employment concentration</td>
<td>2.5%</td>
<td>1.9%</td>
</tr>
</tbody>
</table>

Sources: Dun & Bradstreet, Inc., Hoover’s Online Database; Market Analysis Profile, 2012-2017; Development Research Partners.

Software Economic Profile

Software direct employment concentration rank 8th
Software direct employment rank 12th

IT-Software Employment by County, 2017

- Denver: 24.7%
- Boulder: 20.0%
- Arapahoe: 19.3%
- Jefferson: 11.5%
- Douglas: 8.2%
- Larimer: 6.1%
- Weld: 2.0%
- Adams: 1.0%
- Broomfield: 6.4%

Sources: Market Analysis Profile, 2017; Development Research Partners.

IT-Software Employment by Category, 2017

- Other Computer-Related Services: 36.1%
- Custom Computer Programming Services: 42.0%
- Software Publishing: 14.9%
- Data Processing & Preparation: 13.7%
- Computer Facilities Management: 0.7%
- Computer Integrated Systems Design: 12.9%
- Computer Facilities Management: 0.7%

Sources: Market Analysis Profile, 2017; Development Research Partners.

2 Direct employment rank based on the number of employees in the industry cluster in a region. Employment concentration rank based on the direct cluster employment in a region expressed as a percent of total employment in all industries in the same region. Rankings are for the 50 largest metropolitan statistical areas (MSAs). No multiplier effects are included. 1st = highest for both rankings.
Major Software Companies (top 10 based on employment size)

- CA Technologies  
  www.ca.com
- Cognizant (formerly TriZetto Corp.)  
  www.trizetto.com
- IBM Corp.  
  www.ibm.com
- IHS Markit  
  www.markit.com
- LogRhythm Inc.  
  www.logrhythm.com
- Oracle Corporation  
  www.oracle.com
- Qualfon  
  www.qualfon.com
- TSYS (formerly Transfirst)  
  www.tsys.com
- West Corporation (formerly Intrado Inc.)  
  www.west.com
- Zillow Group Inc.  
  www.zillow.com

2017 Industry Highlights

Key Company Announcements (alphabetical by company name)

- **Apple Inc.** plans to hire software engineers in downtown Denver to work on network, big data, and mapping technologies.
- **Businessolver Inc.** plans to grow to over 200 people in Greenwood Village in the next few months. The company began with a 30-person office in 2014 and has grown more than fivefold to 160 IT professionals and customer service representatives.
- IT consulting company **CapTech Consulting** opened its first office west of the Mississippi in Denver with plans to expand and hire. The Virginia-based company has 11 offices nationwide and chose Denver for its growing market and talented workforce.
- **ChannelAdvisor**, a North Carolina-based e-commerce software company, opened a new office in Denver and plans to grow.
- Douglas County-based **CSG International** plans to move to new offices near the Denver Tech Center and add 50 new jobs.
- French-based **Esker**, a cloud-based document automation company, opened its second U.S. office in Lakewood. The company cited Metro Denver’s recruitment possibilities, solid infrastructure, and economic growth as reasons for its expansion to the area.
- Reservation technology company **FareHarbor** plans to quintuple its Denver headquarters space. The company plans to double its staff of 100 Denver employees within two years of moving to the 25,000-square-foot office.
- San Francisco-based **Fastly** opened a 15,400-square-foot office in Denver to accommodate its growing employee base. The company plans to double by the end of 2018 and double again by the end of 2019.
- **Ibotta Inc.** plans to add nearly 100 employees and expand its space in downtown Denver. The company provides an application that facilitates cash back on purchases.
- Marketing technology company **Integrate** will double its workforce in Denver after raising $8 million in equity funding. The company, currently headquartered in Phoenix, develops marketing software and technology.
- Boulder-based **JumpCloud** plans to expand and fill 70 new positions over the next year after raising $20 million in venture capital. The tech startup, which manages user directories for companies, is on pace to triple its revenue in 2017 and expects to at least triple it again in 2018.
- **Marketo** opened a Denver office, which is the company’s 12th location. The company expects to have a total of 400 employees in the coming years.
- Employee-training software company **Mindflash** moved to WeWork LoHi and will expand its employee.
- European software company **msgNETCONOMY** expanded to the U.S. with the opening of a Denver office. The office will serve as the North American hub for SAP Hybris consulting and implementation.
- **Newmedia** released a new software program and plans to hire as many as 100 employees in the coming months.
- **ORA Interactive** opened an office in Denver and expects to strengthen its ability to recruit and hire quality technical and product design talent.
- Denver-based **PromonTech** plans to nearly double its space in Writer’s Square. Launched in 2015 with a single employee, the firm now has 48 engineers and developers.
INFORMATION TECHNOLOGY-SOFTWARE:
Metro Denver and Northern Colorado Industry Cluster Profile

- Fort Collins-based call center operator Qualfon plans to hire 150 positions, including customer service and sales positions.
- Cloud computing and IT consulting company Quisitive will expand by up to 15 more workers in coming months. The company’s Denver Tech Center office helps client companies move software to the cloud.
- Denver-based SendGrid is Colorado’s newest public company, filing for an IPO in late 2017. The company grew out of a TechStars startups accelerator class and will be the first TechStars company to go public.
- San Francisco-based travel software company Switchfly opened a new office in Denver and plans to hire 50 people. The Denver hub will be critical in helping the company build the next generation of travel technology.
- Fort Collins-based Technical Framework, a full-services information technology company, opened an office in Greeley to meet growing demand.
- San Francisco, Calif.-based Thanx, a software technology company that helps retailers and other companies personalize digital engagement, opened their second office in Denver and plans to double their workforce to 40 employees.
- Two joint Denver startups—ThrivePass and Wishlist—could expand to over 50 employees over the next 18 months. Wishlist launched in 2012 for customers to give friends experiences in lieu of physical gifts. ThrivePass is a platform for employers to manage fitness and health stipends for employees.
- Xactly added 4,000 square feet to its existing 1860 Blake St. location. The expansion will be followed by plans to hire 25 more workers to their current 75 employee workforce.

New Headquarters

- Appit Ventures tripled its workspace in their new headquarters at 50 S. Steele St. and plans to expand. The company has created 320 customized applications for various sized customers.
- Cloud-based backup storage company eFolder moved its new headquarters to downtown Denver and plans to add another 108 employees on top of the current 15 in Denver, paying an average annual wage of $100,278.
- Denver-based Optiv Security Inc. plans to move in 2018 to 75,000 square feet, providing room for 300 employees, which is triple the number that their current location can hold.
- Revert Inc., a provider of data-protection and electronic-waste recycling services, moved to a 5,300-square-foot site that will help support the company’s expansion plans and includes additional research and development space.
- SimPRO Software Group located its new North American headquarters operations to Broomfield. The 11,000-square-foot location could house up to 100 people.
- Synergy North America Inc. opened its U.S. headquarters in Broomfield to be closer to its U.S. customers. The small office has expectations of aggressive growth.
- Seattle-based Vertafore Inc., an insurance technology company, moved its headquarters to Denver. The company plans to hire at least 300 new workers.
- Xero moved its U.S. headquarters from San Francisco to Denver and plans to double its existing 130-person staff in the next two to three years. Since 2013, Xero has raised more than $208.7 million in venture funding.

Cross-Cluster Convergence

Cybersecurity

The Front Range is an established cybersecurity hub, attracting thousands of jobs and cultivating a workforce experienced in information and technology, telecommunications, and the defense industry. In 2016, the state launched the National Cybersecurity Center, a nonprofit industry collaborative in Colorado Springs and the U.S. Northern Command/NORAD Joint Cyber Center and the Catalyst Campus will focus on cybersecurity challenges.

Several companies and training programs provide support to this growing industry. Five schools across the state, including the University of Denver and the University of Colorado, offer cyber education programs. In fact, the University of Denver’s program earned a Centers of Academic Excellence designation from the National Security Agency and the U.S. Department of Homeland Security. In 2017, Colorado State University established the new Center for Configuration Analytics and Automation that will focus on innovative ways to protect large, networked systems from cyberattacks. Further, SecureSet Academy moved to downtown
INFORMATION TECHNOLOGY-SOFTWARE:
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Denver. SecureSet Academy offers both a full-time, 20-week core program and evening classes and graduated its first class last summer.

Numerous cybersecurity companies announced expansion plans in Metro Denver in 2017 as the outgrowth of the information technology industry continues. One of the largest U.S. cybersecurity consultancies for businesses, Optiv, is based in Denver, and a host of other companies such as LogRhythm, Ping Identity, and ProtectWise have launched to help companies protect their computer systems and data.

Digital Health

Born from the collaboration between health care and software innovations, the region is a recognized national leader in the digital health arena. According to StartUp Health, Denver ranked among the top 10 U.S. cities for digital health funding, with five deals totaling $192 million in 2017. Prime Health, StartUp Health Colorado, and Catalyst HTI are examples of partnerships to grow the region’s digital health presence.

- Founded in July 2012 by the Denver South Economic Development Partnership and Innovation Pavilion, Prime Health is a growing statewide community of 1,600+ health care executives, physicians, technologists, academics, entrepreneurs, and investors dedicated to improving health and lowering health care costs through the commercialization of digital health technologies. Colorado is home to more than 130 digital health companies.
- StartUp Health Colorado launched to create a health innovation hub in the Rocky Mountain region. The organization partnered with Children’s Hospital Colorado, UCHealth, and the University of Colorado to streamline the pathways for health entrepreneurs to innovate and grow.

Venture Capital and Investment Activity (listed by investment size)

- Convercent, a Denver-based startup that produces compliance software for businesses, raised $25 million to build out its compliance cloud software and expand its staff. Since 2013, the company has raised nearly $71 million from investors.
- Boulder-based TeamSnap raised $25 million in venture capital and plans to expand its staff by 50 percent. The company provides software and applications for more than 1.3 million teams and leagues worldwide.
- Denver’s GoSpotCheck raised $21.5 million and plans to use the funds to expand its engineering and sales teams by about 70 people, while increasing the intelligence of its technology.
- Denver-based cybersecurity company CyberGRX raised $20 million and plans to expand its employee base, including at its downtown Denver headquarters.
- Enbala landed $17.5 million in Series B funding and plans to expand locally. The company’s software helps commercial and industrial companies optimize energy usage and power demand.
- Denver-based SynchHR raised $16 million and will increase its staff by 30 percent in the coming months. SynchHR helps mid-sized companies manage human resources, benefits, and payroll services.
- Boulder-based VictorOps closed on $15 million of Series B funding with plans to add 25 employees to a team of 50.
- Denver-based Faction raised $11 million for a company expansion to meet customer demand.
- Liquid Inc. raised $10 million in Series A funding to accelerate development of its flagship Liquid CI platform, recruit engineers, and expand sales and marketing efforts.
- Home intelligence startup Josh.ai raised $8 million, bringing the total fundraising effort to $11 million since its founding two years ago. The company employs 15 people and will be adding 10 more.
- Denver-based cybersecurity firm Threat X raised $7.2 million to continue to expand its technical team to accelerate the development of its cybersecurity products.
- After nearly doubling its workforce this year, Denver ad tech startup Choozle added an additional $8.4 million in funding. The company, which employs 55 in Denver, expects to add 25 to 30 more workers.
- Boulder-based SlamData raised $6.7 million in Series A financing to double its staff to 30 employees and advance its software that allows users to explore and analyze unstructured data sources with one program.
- Denver-based Homebot received $4.5 million in capital to add local staff and expand into the 25 largest U.S. markets by year-end.
- Lafayette-based Alchemy IoT raised $4 million and is launching its first software called Clarity to help manufacturers and fleet managers optimize equipment and operations. Alchemy will double its team over the next year.
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Metro Denver and Northern Colorado Industry Cluster Profile

- **BillingPlatform**, a Denver-based billing software company, will use $4 million in new venture capital to grow and could secure enough funding to triple in size. The company has more than 20 employees and expects to hire steadily.
- **Maxwell**, a Denver-based mortgage tech startup, raised $3 million with plans to enlarge their user base. The company plans to double its staff within the next year.
- Golden-based **Ascent360** raised $1.9 million in a seed-round funding. The 15-employee company plans to grow to 100 employees in three to five years.
- Broomfield-based **Conga** raised a strategic investment from Salesforce Ventures to expand product development. The company plans to hire up to 50 additional employees.
- Denver-based **Ombud** received an investment from the venture capital arm of the Central Intelligence Agency to expand its artificial intelligence to improve organizational decision making. The company expects to grow from 25 employees to nearly 40 by the end of 2017.

Merger and Acquisition Activity

- Denver-based Optiv Security acquired Pennsylvania-based **Comm Solutions**, a cybersecurity and IT networking consultant. Optiv employs nearly 1,700 people at offices in the U.S. and about 240 in Denver.
- **Green House Data**, a cloud hosting, colocation, hybrid IT, and managed services firm, acquired **Ajubeo**, a Denver-based provider of infrastructure as a service (IaaS), including public, private, and hybrid cloud products.
- Greenwood Village-based consulting firm **ECS Team** was acquired by **CGI Group Inc.**, the world’s fifth-largest independent IT and business process services firm. CGI group has Colorado offices in Denver and Lakewood.
- Boulder-based **Occipital** acquired Florida-based **Paracosm** to broaden its reach into new industries. The company makes technology to capture three-dimensional scans of physical spaces.
- **Datavail Corp.**, a Broomfield-based database and data services company, acquired Toronto-based **Navantis Inc.** to expand into software integration and app building for clients. Navantis, a 200-employee company, specializes in developing and integrating Microsoft products.
- Denver-based **Altitude Digital**, an advertising technology company, merged with New York City-based **Genesis Media**. While the combined company will be based in New York City under the Genesis Media name, it plans to expand its Denver offices.
- Denver-based data-protection company **eFolder** merged with Silicon Valley-based **Axcient**. The combined company will maintain offices in Denver while growing its enterprise software that helps companies protect their data in the cloud.
- Douglas County-based software provider **Evolving Systems Inc.** acquired UK-based **Business Logic Systems Ltd.**, for $1.67 million.
- Denver-based **Closely** was acquired by New York City-based **Upcurve**, a digital marketing business. Closely makes the Perch app to help small businesses handle and track social media marketing. Upcurve plans to build its Denver team.
- Broomfield-based **Webroot** acquired Portland-based **Securecast** to add the company’s virtual training programs to its suite of antivirus software products. The virtual training programs educate people about phishing, ransomware, and other cyber threats.

Academic and Education Announcements

- The University of Colorado Boulder launched a new online, post-baccalaureate degree in computer science. The new program, which can be completed in one year for full-time students and three years for part-time students, will include foundational coursework in topics such as algorithms, programming languages, and software development.
- Denver-based Galvanize will partner with Amazon to train engineers to work with Alexa at 35 free workshops in seven cities. Artificial intelligence interfaces like Alexa are a rapidly growing technology, impacting the way businesses operate, develop products, and engage customers.
- Galvanize partnered with the University of Colorado Denver (CU Denver) to launch the Pathways Program that will award students credit for completing Galvanize’s Web Development Immersive program. Students can earn up to 12 credit hours and choose to start working or enroll at CU Denver.
- The Colorado STEMworks Database is the premier source for high-quality STEM education programs in Colorado. Each program in STEMworks has been independently vetted and cleared a high bar of quality.
INFORMATION TECHNOLOGY-SOFTWARE:  
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- Several coding schools, coding bootcamps, and programs in Metro Denver help train software developers.
  - Denver’s Turing School of Software & Design is a seven-month, full-time program for people who want to become professional developers.
  - Greenwood Village’s Skill Distillery is a 16-week coding school and software bootcamp aimed at training web developers and software programmers.
  - General Assembly’s Denver campus offers web development and user experience design, business fundamentals, digital marketing, data science, and product management.
  - Galvanize offers 12- and 24-week coding bootcamps in web development and data science. The web development bootcamp covers full-stack JavaScript including AngularJS, Node.js, and Express.js. The data science bootcamp covers Python, SQL, and Hadoop.
  - The DaVinci Institute in Westminster is one of the nation’s top-rated programmer training centers for the coding profession. The coding school and think tank hosts a collaborative work space and offices for startups.

Industry Infrastructure

Partners

The Colorado Technology Association (CTA) is a not-for-profit organization dedicated to advancing the state’s technology industry. In 2017, CTA launched several new initiatives to further promote the industry. In collaboration with major statewide technology companies, CTA’s Tech Nucleus program will help startups make connections and receive product advising services. CTA also partnered with Sen. Cory Gardner’s office to launch the One More Job/One More Innovation Initiatives to collect ideas from the state’s tech community regarding federal regulations that should be repealed or reworked to spur innovation.

Events

- Denver, Boulder, Fort Collins, and Longmont hosted startup weeks to celebrate companies, innovation, and ideas in 2017.
- The Rocky Mountain Technology Summit combines Colorado’s technology leaders to explore the latest technology trends.
- Colorado Tech Tour showcases powerful tech stories happening across five different regions across the state.

Incubators & Accelerators

- Boulder startup accelerator TechStars is a three-month mentorship-driven seed stage investment program, which provides up to $20,000 in seed funding for startups and an optional $100,000 convertible debt note, intensive mentorship and idea development, and the chance to present to angel investors and venture capitalists for those companies selected to participate. TechStars Ventures is the venture capital arm of TechStars and has $265 million under management.
- Innosphere is a high-tech incubator in Denver, Boulder, and Fort Collins supporting entrepreneurs building high-growth companies in health innovation, life sciences, software and hardware, energy, and advanced materials. Innosphere is implementing a $20.5 million metro-area expansion with plans for a new 50,000-square-foot startup incubator in Denver and the addition of 7,000 square feet to its headquarters in Fort Collins. The new location is expected to open in 2020.
- Boomtown is the design focused technology accelerator located in Boulder focused on media, IoT, B2B, ad-tech, and health tech. The curriculum is customized to the needs of the individual startup, supporting and educating entrepreneurs.
- Denver is home to a chapter of the Founder Institute, the world’s largest entrepreneur training and startup launch program. Based in Silicon Valley, the Founder Institute assists aspiring founders across the globe build enduring technology companies and has helped create more than 20,000 jobs in over 2,500 companies.

Venture Capital & Funding Mechanisms

- The Longmont Economic Development Partnership and the City of Longmont are helping leverage the Longmont Ignite! Fund by allocating $15,000 in grant money to a new Advance Longmont Ignite!
INFORMATION TECHNOLOGY-SOFTWARE:
Metro Denver and Northern Colorado Industry Cluster Profile

Matching Grant. Longmont Ignite! is a group of community-minded individuals who have established a fund to make grants available to entrepreneurs developing products or business concepts that will add to the economic vitality of the area.

- Founded in 2014, the Blackstone Entrepreneurs Network is designed to help entrepreneurs find resources and thrive in Colorado. The network has a variety of business advisors in fields for entrepreneurship, technology, biotechnology, and health technology industries.
- The Colorado Venture Capital Authority (VCA) provides seed and early-stage capital investments in Colorado companies with the potential for rapidly scaling their businesses. The managing partner, High Country Venture, reviews funding deals and makes investments in selected businesses by using debt, equity, or debt with a conversion option into equity. VCA also established Colorado Fund I and II, each with approximately $25 million.

Nine-County Region Workforce

- Nearly half of the nine-county region’s 3.8 million residents are under the age of 35. Employers can draw from a large, young, highly educated, and productive workforce.
- Of the region’s adult population, 43.2 percent are college graduates and 91.4 percent have graduated from high school.
- The region’s population is expected to grow 32.2 percent from 2020 to 2040, driving a 21.2 percent increase in the region’s labor force over the same period.

Software Workforce Profile

The age distribution of workers in the region’s software cluster is concentrated in the younger age brackets, especially the 35-44 and 45-54 age groups. About 54.4 percent of the region’s employees are between the ages of 35 and 54 years old, compared with the age distribution across all industries in the region (43.4 percent).

The Occupation & Salary Profile below includes the 10 largest software occupations in the region. For these 10 largest occupations, the chart details the total number of workers employed in that occupation across all industries, the number of available applicants that would like to be working in that occupation, the number of recent graduates that are qualified for that occupation, and the median and sample percentile annual salaries.

Wages

- 2016 average annual salary was $110,060, compared with $114,720 nationwide.
- Total payroll reached nearly $6.1 billion in 2016.

Metro Denver and Northern Colorado Software Occupation & Salary Profile, 2017
### 10 Largest Software Occupations in Metro Denver and Northern Colorado

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</tr>
</thead>
<tbody>
<tr>
<td>1. Software developers, applications</td>
<td>21,917</td>
<td>533</td>
<td>1036</td>
<td>$102,873</td>
<td>$64,460</td>
<td>$80,273</td>
<td>$127,026</td>
<td>$152,551</td>
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<td>2. Software developers, systems software</td>
<td>11,131</td>
<td>271</td>
<td>1,191</td>
<td>$112,619</td>
<td>$77,723</td>
<td>$91,555</td>
<td>$137,778</td>
<td>$170,634</td>
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<td>3. Computer user support specialists</td>
<td>12,530</td>
<td>305</td>
<td>916</td>
<td>$57,285</td>
<td>$35,956</td>
<td>$44,740</td>
<td>$74,312</td>
<td>$93,525</td>
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<tr>
<td>4. Computer systems analysts</td>
<td>8,142</td>
<td>198</td>
<td>1,465</td>
<td>$87,997</td>
<td>$58,485</td>
<td>$69,724</td>
<td>$113,103</td>
<td>$147,993</td>
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<tr>
<td>5. Computer occupations, all other</td>
<td>10,150</td>
<td>247</td>
<td>1,273</td>
<td>$96,284</td>
<td>$54,575</td>
<td>$72,758</td>
<td>$117,803</td>
<td>$139,140</td>
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<td>6. Network &amp; computer systems administrators</td>
<td>8,899</td>
<td>216</td>
<td>655</td>
<td>$84,157</td>
<td>$52,185</td>
<td>$65,748</td>
<td>$104,263</td>
<td>$123,672</td>
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<tr>
<td>7. Sales representatives, services, all other</td>
<td>21,578</td>
<td>525</td>
<td>21</td>
<td>$56,574</td>
<td>$26,542</td>
<td>$38,572</td>
<td>$84,237</td>
<td>$122,791</td>
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<tr>
<td>8. Computer &amp; information systems managers</td>
<td>5,741</td>
<td>140</td>
<td>1,491</td>
<td>$148,183</td>
<td>$98,662</td>
<td>$119,740</td>
<td>$184,191</td>
<td>$295,537</td>
</tr>
<tr>
<td>9. Computer programmers</td>
<td>3,082</td>
<td>75</td>
<td>704</td>
<td>$85,583</td>
<td>$55,083</td>
<td>$65,225</td>
<td>$113,714</td>
<td>$137,458</td>
</tr>
<tr>
<td>10. Business operations specialists, all other</td>
<td>32,514</td>
<td>791</td>
<td>17</td>
<td>$74,757</td>
<td>$43,128</td>
<td>$55,758</td>
<td>$98,542</td>
<td>$126,087</td>
</tr>
</tbody>
</table>

**Notes:** The number of available applicants is a point-in-time measurement of the number of people who have registered in Colorado’s workforce development system’s statewide database, Connecting Colorado, as being able and available to work in a particular occupation. Results should be interpreted with caution since registration in Connecting Colorado is self-reported. In addition, the skills rubric may assign up to four occupation codes for each registrant. Therefore, the number of available applicants could be inflated. *Source: Provided by Arapahoe/Douglas Works!; QCEW Employees, Non-QCEW Employees, & Self Employed - EMSI 2017.3 Class of Worker.*

### Education & Training

Colorado’s higher education system provides an excellent support system for businesses in the region. There are 28 public higher education institutions in Colorado, of which seven four-year and six two-year public institutions offering comprehensive curricula are located in the nine-county region. There are more than 100 private and religious accredited institutions and more than 350 private occupational and technical schools offering courses in dozens of program areas throughout the state. The state higher education system served about 255,510 students in FY 2015-16, while 86,070 students received a degree, diploma, certificate, or other formal award over the same period of time. Although not exhaustive, a list of the major, accredited educational institutions with the greatest number of graduates for each of the 10 largest software occupations in the nine-county region are included below. A directory of all higher education institutions with corresponding websites may be accessed via [http://highered.colorado.gov](http://highered.colorado.gov).

- **Colorado Christian University**
  - [www.ccu.edu](http://www.ccu.edu)

- **Colorado State University**
  - [www.colostate.edu](http://www.colostate.edu)
  - [www.colorado.edu](http://www.colorado.edu)

- **Colorado State University Global Campus**
  - [www.colostate.edu](http://www.colostate.edu)

- **Front Range Community College**
  - [www.frontrange.edu](http://www.frontrange.edu)

- **Metropolitan State University of Denver**
  - [www.msudenver.edu](http://www.msudenver.edu)

- **Red Rocks Community College**
  - [www.rrcc.edu](http://www.rrcc.edu)

- **Regis University**
  - [www.regis.edu](http://www.regis.edu)

- **University of Colorado Boulder**
  - [www.colorado.edu](http://www.colorado.edu)

- **University of Denver**
  - [www.du.edu](http://www.du.edu)

### Key Reasons for Information Technology Companies to Locate in the Nine-County Region

The region is a top information technology location offering:
INFORMATION TECHNOLOGY-SOFTWARE: 
Metro Denver and Northern Colorado Industry Cluster Profile 

1. The ability to attract and retain high-quality IT professionals and technical talent
   - Nearly 40 percent of Coloradans have at least a bachelor's degree, the second-highest college attainment rate in the nation behind Massachusetts. (U.S. Census Bureau, 2016 American Community Survey)
   - Denver is a strong tech job creator and tech talent attractor, with nearly 3,500 more tech jobs than graduates. (CBRE, 2017)
   - Denver ranked No. 8 in the nation among the “Top 15 Cities for Women in Tech” with more than 24 percent of Denver’s tech jobs filled by women. (SmartAsset, 2017)
   - Boulder (first) and Metro Denver (third) ranked among the top 10 metro areas for female entrepreneurs in 2017. (Version 2.0 Communications, 2017)
   - Denver ranked eighth for its talent, capital, and growth opportunities for technology in 2017. (Cushman & Wakefield, 2017)
   - Denver ranked fourth in the nation for the best overall value for technology workers. About 50 percent of a Denver tech salary is allotted to cost of living, with 50 percent left as expendable income. (PaySa, 2017)
   - Tech salaries in Denver are the second-highest of 10 ranked North American cities, adjusted for cost of living. (Hired, 2017)
   - IT services and custom software services was the top leading tech industry sector by employment in 2016. Tech workers in Colorado earn nearly double the average private-sector worker. (CompTIA, Cyberstates 2017: The Definitive National, State, and City Analysis of the U.S. Tech Industry and Tech Workforce, 2017)
   - The Boulder MSA (first), the Fort Collins MSA (fourth), and the Denver MSA (10th) were named to the “2017 Bloomberg Brain Concentration Index.” The MSAs’ high concentration of STEM occupations and degrees, high-tech industries, and numerous federal laboratories contributed to their high rank. (Bloomberg Businessweek, 2017)
   - Colorado was named an Innovation Champion by the Consumer Technology Association in an assessment of all 50 states’ innovation and sustainability. (Consumer Technology Association, 2017)
   - Colorado ranked No. 5 on WalletHub’s list of the "Most Innovative States" and ranked among the top 10 for eighth-grade math and science performance, the share of technology companies, the share of STEM professionals, and projected STEM-job demand by 2020. (WalletHub, 2017)
   - Denver ranked second among the best cities for job seekers in 2017. The burgeoning technology industry, robust aerospace industry, and more affordable cost of living contributed to Denver’s high rank. (NerdWallet, 2017)

2. Direct access to a large customer base and funding opportunities
   - Nearly 130 startup companies raised more than $780 million in funding in 2016, an increase of nearly $100 million over 2015 and marking Colorado’s best year of tech funding (Built In Colorado, 2017)
   - Metro Denver was named as the seventh-best area for the creation and development of small businesses. (American City Business Journals, 2017)
   - Metro Denver ranked No. 10 among the 40 largest metro areas for startup activity in the 2017 Kauffman Index of Startup Activity, with 390 people out of 100,000 adults becoming entrepreneurs each month. (Ewing Marion Kauffman Foundation, 2017)
   - Colorado ranked fourth in the nation for Small Business Innovation Research (SBIR) grants per worker. The state received $32.90 in grants per worker compared with the U.S. average of $13.34. (U.S. Small Business Administration, 2017; U.S. Bureau of Labor Statistics, 2017)
   - Colorado had the seventh-highest venture capital investments per $1,000 of gross domestic product in 2016. The state has consistently ranked among the top 10 for the last 15 years. (PricewaterhouseCoopers, MoneyTree Report, 2017; Bureau of Economic Analysis, 2016)

3. Low to moderate costs of doing business and a competitive tax structure
   - Colorado ranks as one of the nation’s most favorable corporate income tax structures. The state’s corporate income tax rate of 4.63 percent is one of the lowest in the nation and is based on single-
INFORMATION TECHNOLOGY-SOFTWARE:
Metro Denver and Northern Colorado Industry Cluster Profile

factor apportionment, which allows companies to pay taxes based solely on their sales in the state.
(State of Colorado; The Tax Foundation)

- Installed or downloaded standardized software products are exempted from state sales and use tax. The City and County of Denver also exempts custom software products from sales tax. (Colorado Department of Revenue)
- Colorado ranks as the nation’s 10th-best tax system for entrepreneurs and small business. (Small Business & Entrepreneurship Council, 2017)


4. An overall better quality of life
- Denver was named as the second-best place to live in the U.S. in 2017. The city’s desirability, prominent research institutions, and growing job market contributed to its notable rank. (U.S. News & World Report, 2017)
- The city of Lone Tree ranked seventh in the “Best Places to Live” list. Superior (49th) and Louisville (50th) were named to the list’s top-50 locations. (MONEY Magazine, 2017)
- Fort Collins (16th), Boulder (35th), Littleton (49th), Lakewood (57th), Longmont (62nd), and Centennial (97th) ranked among the 2017 list of the “100 Best Places to Live.” (Livability.com, 2017)
- Metro Denver ranked as the nation’s seventh-fittest metropolitan area in 2017. Low obesity, increased physical activity, and low prevalence of diabetes and heart disease contributed to its high rank. (American College of Sports Medicine, 2017)
- Colorado is home to one of the most active and healthiest populations in the nation. The state has one of the nation’s largest public parks systems, over 45 national and state parks, 11 world-class ski resorts, and the highest concentration of 13,000 and 14,000-foot peaks in the nation. (Colorado Tourism Office, 2017)
- FasTracks is a multibillion dollar comprehensive transit expansion plan to build 122 miles of new commuter rail and light rail, extend existing routes, and expand the regional bus network across the eight-county district.

For additional information, contact us:

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