A major step in crafting a region’s economic development strategy focuses on the types of industries to target for expansion and retention. Industry targets are chosen to meet varying community goals ranging from diversifying the economic base, to increasing the average wage, to utilizing natural and labor resources more fully. A community’s economic development efforts should focus on industries in which the community has clear competitive advantages. Further, target industries should be economically, environmentally, and socially acceptable to the community.

This study is based on the concept of industry clusters, which are geographic concentrations of interconnected companies and institutions in a particular field. Where an industry’s employment concentration is greater than the national economy, it is presumed that the production of goods and services is more than sufficient to meet local demand, and is therefore exported, either physically or financially. Where industries are highly concentrated, it is presumed that a high degree of specialization among firms exists, a feature of competitive industry clusters, commonly called primary jobs. These industries drive wealth creation within a region.

Nine major industry clusters in the nine-county Metro Denver and Northern Colorado region (Adams, Arapahoe, Boulder, Broomfield, Denver, Douglas, Jefferson, Larimer, and Weld Counties) are key to our economy, making them primary targets for national recruitment as well as economic development retention and expansion efforts to develop and expand the region’s industry cluster base.

This report summarizes key points about each industry cluster, including a brief description, employment concentration ranking compared to the 50 largest U.S. metropolitan areas, workforce profiles, and other major industry information. In addition, primary location factors are identified along with a brief assessment of the region’s competitive position and future viability in attracting additional employment in each industry cluster.
Nine major industry clusters drive the regional economy

- **AEROSPACE** – The nine-county region ranks second in private-sector aerospace employment concentration out of the 50 largest metropolitan areas, with 19,520 workers. The aerospace cluster is anchored by an abundance of high-tech companies, four military commands, eight major space contractors, National Aeronautics and Space Administration (NASA) research activities, and several universities involved in extensive space research. Colorado ranked as the second-largest space economy in the United States in 2015, behind California.

- **AVIATION** – Denver International Airport (DEN) is a major economic engine for the region’s aviation industry, which employs 16,880 workers. Major expansion at DEN including the upcoming opening of the commuter rail line to downtown Denver in April 2016 and the start of a new, nonstop flight to Munich in May 2016 creates further momentum in the industry. Aviation employment rose 11.1 percent between 2010 and 2015 (2.8 percent nationwide). In addition, three reliever airports—those designated by the Federal Aviation Administration to relieve traffic at commercial airports and general aviation airports—are strategically located throughout the nine-county region.

- **BEVERAGE PRODUCTION (NEW)** – With a broad range of beverage producers including malt beverages, wines, distilled liquors, bottled drinks, and ice products, the region ranked third among the 50 largest metropolitan areas for employment concentration. Beverage production employment grew 5.2 percent in 2015 and has been growing since 2010, adding nearly 1,600 jobs over the five-year period. Colorado is home to more than 10 percent of the nation’s craft breweries and the state ranked first in the nation for output per capita.

- **BIOSCIENCE** – Nearly 15,230 employees work at more than 670 bioscience companies in the nine-county region. The medical devices and diagnostics subcluster grew 10 percent from 2010-2015 compared with 4.3 percent nationally. Research universities and numerous innovation assets support the industry, as well as opportunities to bring together academic, research, and bioscience companies at the 578-acre Fitzsimons Innovation Campus and the adjacent Anschutz Medical Campus in Aurora.

- **BROADCASTING & TELECOMMUNICATIONS** – With 41,970 broadcasting and telecommunications workers, the nine-county region has the sixth-highest employment concentration out of the 50 largest metropolitan areas. The region is the largest in the United States to offer one-bounce satellite uplinks due to its unique geographic location in the Mountain time zone.
ENERGY – The region continues to position itself as a leader in the energy industry with both fossil fuels and cleantech together employing 54,720 people at 3,140 companies. The National Renewable Energy Laboratory in Golden, the Department of Energy’s only laboratory committed to the research, development, commercialization, and deployment of renewable energy and energy efficiency, is a vital asset to the energy and natural resources industry. The region ranks fourth for fossil fuels and fifth in cleantech employment concentration among the 50 largest metropolitan areas. Cleantech was the region’s fastest growing industry in 2015.

FINANCIAL SERVICES – The nine-county region is one of the few areas outside of the northeast with a significant financial industry in three key market segments: banking and finance, investments, and insurance. The region’s universities and research institutions offer first-class educational resources to engage students and prepare the future financial services workforce. Various associations and service firms support the region’s diverse financial services base of nearly 13,800 companies and about 97,000 employees. Employment growth in the investments subcluster in 2015 was 7 percent, compared with 2.5 percent growth nationally, making it the region’s second-fastest growing industry in 2015.

HEALTHCARE & WELLNESS – With nearly 202,550 healthcare and wellness workers at more than 19,450 companies across the region, healthcare and wellness is the region’s largest cluster in terms of employment. A premier healthcare and wellness hub, the region has one of the fittest populations in the nation and has the nation’s lowest rate of adult obesity due to its active lifestyle and access to the outdoors. The industry posted its 12th-consecutive year of employment growth at 5.5 percent in 2015, compared with 2.9 percent nationally.

INFORMATION TECHNOLOGY–SOFTWARE – The region is a hotbed of innovation activity, fueled by a talented IT workforce, modern infrastructure, and an entrepreneurial spirit. Colorado ranked third in the nation (for the seventh-consecutive year) for high-tech workers per capita, according to CompTIA’s Cyberstates 2015 report. A consortium of supportive programs, organizations, and professional associations provide a synergistic climate for the region’s thriving IT-software industry. The region employs 48,610 IT workers at 4,810 companies throughout the nine-county region. IT-software employment grew 4.5 percent in 2015 and ranked ninth out of the 50 largest metropolitan areas.
Factors driving company location and expansion decisions

Location decisions are driven by a number of factors as companies within each of these industries examine communities in which to locate or expand. Some factors are industry specific. For example, proximity to military customers and prime contractors is important in aerospace company location decisions whereas fossil energy companies focus on access to natural resources. Other key locational factors cut across numerous industries, focusing on broader community attributes. While the combination of factors that enhance company success varies by industry, there are several common themes:

- The ability to recruit and retain technical and scientific talent
- Affordable business operating costs
- Favorable tax policies and pro-business state and local governments
- A central location and easy global access
- A culture of innovation and entrepreneurism
- Proximity to quality colleges, research universities, and federal laboratories
- An overall better quality of life

Competitive positioning to create jobs and investment

- The ability to recruit and retain technical and scientific talent – Of Colorado's adult population, more than 38 percent has completed a bachelor's or higher-level degree, making Colorado the second-most highly educated state in the nation behind Massachusetts. (U.S. Census Bureau, 2014 American Community Survey)

- Affordable business and operating costs – Colorado ranks No. 1 for labor supply, fourth for economic climate, and fifth overall on Forbes' 2015 "Best States for Business and Careers" list. In addition, the Denver-Aurora-Broomfield metropolitan statistical area ranked first overall for economic development and job growth in the "Leading Locations for 2015" list. The Greeley and Boulder metro areas were also named to the list's top-10. (Forbes, 2015; Area Development, 2015)

- Favorable tax policies and pro-business state and local governments – Legislation passed in 2008 simplified Colorado's corporate tax structure by establishing a single sales factor for multistate corporations. Single factor apportionment allows companies to pay taxes based solely on their sales in the state. Colorado's corporate income tax rate of 4.63 percent is one of the lowest in the nation. (State of Colorado; The Tax Foundation)

- A central location and easy global access – Denver International Airport is the fifth-busiest airport in the nation and is 17th-busiest worldwide for passenger traffic. Denver's central U.S. location allows travelers efficient access to both coasts. Service to Asia through Tokyo's Narita Airport, as well as new nonstop service to Munich, broadens the region's global reach. (U.S. Bureau of Transportation Statistics, 2015; Airport Council International, 2015; Denver International Airport, 2015)
A culture of innovation and entrepreneurism – The U.S. Department of Commerce’s United States Patent and Trademark Office located one of four new satellite offices in Denver, the first permanent office west of the Mississippi, due to the state’s expansive culture of innovation and entrepreneurism. Colorado ranked as the second-most entrepreneurial state, with nearly $18 million in venture capital funding per 100,000 people and 2.81 small businesses per 100 people. (U.S. Patent and Trademark Office, 2015; NerdWallet, 2015)

Proximity to quality colleges, research universities, and federal laboratories
Metro Denver ranked as the fourth-best metro area for science, technology, engineering, and mathematics (STEM) professionals in 2015. Metro Denver ranked fourth for the projected number of STEM jobs needed in 2018 and seventh for openings per capita for STEM graduates. (WalletHub, 2015)

An overall better quality of life – Denver was named as the best city to live in the West in 2015. The city was cited as a “mecca for millennials” with great access to recreation. Louisville ranked fourth and Erie ranked 13th among the best small towns to live in the United States. (MONEY Magazine, 2015)

Ensuring economic growth through industry diversity
Successful companies rely on market research to guide their marketing efforts, and economic development is no different. Armed with in-depth data on the industries showing the most promising job growth over the long term, the Metro Denver EDC has a business plan to guide its job creation efforts. This industry data helps determine: which legislation will be conducive or detrimental to industry, what opportunities exist to reach industry decision makers and site selection consultants, where might a supplier recruitment strategy come into play, what are the current and future labor force needs, and most importantly, which factors are vital to companies analyzing a community for location or expansion.

This diversified industry strategy showed strong employment growth in many clusters following the Great Recession. From 2010 to 2015, industry clusters and subclusters such as beverage production, fossil fuels, cleantech, investments, healthcare and wellness, and IT-software have posted employment growth of more than 15 percent. This report shows that Metro Denver’s leading industries are among the top performing in the nation, with six clusters/subclusters ranking in the top 10 for employment concentration in 2015 among the nation’s 50 largest metropolitan areas.

For additional information on Metro Denver’s major industry clusters, please contact 303.620.8092, info@metrodenver.org, or the industries section on www.metrodenver.org.
<table>
<thead>
<tr>
<th>Metro Denver Industries</th>
<th>Aerospace</th>
<th>Aviation</th>
<th>Beverage Production</th>
<th>Bioscience</th>
<th>Broadcasting &amp; Telecom</th>
<th>Energy</th>
<th>Financial Services</th>
<th>Healthcare &amp; Wellness</th>
<th>IT Software</th>
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<tbody>
<tr>
<td>Direct Employment</td>
<td>19,520</td>
<td>16,880</td>
<td>8,640</td>
<td>10,820</td>
<td>4,410</td>
<td>41,970</td>
<td>33,120</td>
<td>21,600</td>
<td>38,140</td>
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<tr>
<td>Companies</td>
<td>120</td>
<td>590</td>
<td>180</td>
<td>340</td>
<td>330</td>
<td>2,560</td>
<td>1,590</td>
<td>1,550</td>
<td>3,130</td>
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<tr>
<td>Five-Year Employment Growth (2010-2015)</td>
<td>0.9% (-3.3%)</td>
<td>11.1% (2.8%)</td>
<td>22.4% (19.7%)</td>
<td>10% (4.3%)</td>
<td>-6.8% (2.0%)</td>
<td>-1.1% (-3.4%)</td>
<td>48.7% (16.3%)</td>
<td>23.7% (19.7%)</td>
<td>-0.8% (0.3%)</td>
</tr>
<tr>
<td>One-Year Employment Growth (2015)</td>
<td>0.03% (-1.2%)</td>
<td>2% (0.7%)</td>
<td>5.2% (5.1%)</td>
<td>2.8% (2.4%)</td>
<td>-4.3% (1.6%)</td>
<td>-0.8% (1.0%)</td>
<td>2.8% (-1.9%)</td>
<td>8.5% (4.9%)</td>
<td>-0.7% (-0.3%)</td>
</tr>
<tr>
<td>Direct Employment Concentration (2015)</td>
<td>1% (0.2%)</td>
<td>0.9% (0.7%)</td>
<td>0.4% (0.2%)</td>
<td>0.6% (0.3%)</td>
<td>0.2% (0.3%)</td>
<td>2.2% (0.8%)</td>
<td>1.7% (1.2%)</td>
<td>1.1% (0.6%)</td>
<td>2% (1.7%)</td>
</tr>
<tr>
<td>Average Wage</td>
<td>$128,120</td>
<td>$58,300</td>
<td>$60,520</td>
<td>$75,880</td>
<td>$102,550</td>
<td>$106,060</td>
<td>$110,070</td>
<td>$76,610</td>
<td>$73,860</td>
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<td>Employment Concentration Ranking (among 50 largest metros)</td>
<td>2</td>
<td>13</td>
<td>3</td>
<td>11</td>
<td>27</td>
<td>6</td>
<td>4</td>
<td>5</td>
<td>10</td>
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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, 2014 to 2015; on the x-axis \((\text{horizontal})\);
- The industry’s location quotient, 2015; on the y-axis \((\text{vertical})\); and
- Employment size of the industry, 2015; 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:

- \(\text{LQ} > 1\) indicates a significant employment concentration compared with the nation.
- \(\text{LQ} = 1\) indicates that the region’s employment concentration is equal to that of the nation.
- \(\text{LQ} < 1\) 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, cleantech had substantial employment growth from 2014 to 2015, 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 IT-Software are relatively large industries represented by their bubble size and have above-average employment concentration compared with the nation. While three of the region’s industry clusters and subclusters contracted between 2014 and 2015—broadcasting and telecommunications, pharmaceuticals, and banking and finance—the majority of the region’s industries reflect growing employment and have location 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.
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**Industry Overview**

Colorado is an aerospace powerhouse, ranking first in the nation in 2015 for private aerospace employment as a percentage of total employment, and second in total private-sector employment. For nearly 70 years, the combination of military presence, space-related science, open space, and a dynamic business environment has made Colorado an aerospace leader. The state’s highly educated workforce, leading contractors, research assets, and synergy between industry, commercialization, research, and workforce development supports its position as a top aerospace state.

Colorado’s aerospace industry includes a broad spectrum 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 other communications equipment, as well as navigation and detection instruments. Companies in the aerospace cluster also produce planetary spacecraft and launch systems and provide mission support.

Colorado’s aerospace cluster receives support from its abundance of high-tech companies, four military commands, eight major space contractors, National Aeronautics and Space Administration (NASA) research activities, and several universities involved in extensive space research. The state is also at the forefront of innovation and commercial space opportunities. Colorado has nearly 170 businesses classified as aerospace companies, and more than 400 companies and suppliers providing space-related products and services. Direct employment in the aerospace cluster totals 25,120 private sector workers and approximately 27,740 military personnel. These 52,860 workers in the aerospace cluster support an additional 109,350 workers in all industries throughout Colorado, bringing direct and indirect employment supported by the aerospace cluster to 162,210 workers.

The majority of Colorado’s key aerospace businesses, facilities, and research institutions are located in the nine-county Metro Denver and Northern Colorado region.1 The region’s 19,520 private sector aerospace workers represent about 78 percent of all aerospace workers in Colorado. The region’s 120 aerospace companies represent about 74 percent of the state’s total companies in the cluster.

**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.

*The nine-county region ranked second in the nation for its 2015 concentration of private aerospace employment.* The region’s aerospace cluster ranked first out of the 50 largest metro areas in total private-sector employment.2

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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 Employment concentration is the private aerospace cluster employment in a region expressed as a percent of total employment in all industries in the same region. Employment concentration is calculated and ranked for the 50 largest metropolitan statistical areas (MSAs). Private-sector employment is the number of employees in the industry cluster in a region. No multiplier effects are included. Private-sector employment is estimated and ranked for the 50 largest MSAs.
AEROSPACE: Metro Denver and Northern Colorado Industry Cluster Profile

Aerospace Employment and Company Profile, 2015

<table>
<thead>
<tr>
<th>Nine-County Region</th>
<th>United States</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct employment, 2015</td>
<td>19,520</td>
</tr>
<tr>
<td>Number of direct companies, 2015</td>
<td>120</td>
</tr>
<tr>
<td>One-year direct employment growth, 2014-2015</td>
<td>0.0%</td>
</tr>
<tr>
<td>Five-year direct employment growth, 2010-2015</td>
<td>0.9%</td>
</tr>
<tr>
<td>Avg. annual direct employment growth, 2010-2015</td>
<td>0.2%</td>
</tr>
<tr>
<td>Direct employment concentration</td>
<td>1.0%</td>
</tr>
</tbody>
</table>


Aerospace Employment

The nine-county region’s aerospace cluster directly employed about 19,520 workers in 2015. Employment in the region’s aerospace cluster rose slightly between 2014 and 2015 (+0.03 percent), compared with a 1.2 percent decrease at the national level. From 2010 to 2015, employment in the region’s aerospace cluster increased 0.9 percent, compared with a 3.3 percent decline nationwide. Nearly 6 percent of the nation’s aerospace employment is located in the region. Additionally, aerospace companies employed 1 percent of the region’s total employment base, compared with a 0.2 percent employment concentration nationwide.

About 120 aerospace companies operated in the nine-county region in 2015, a 5.2 percent increase from 2014. Approximately 54 percent of the region’s aerospace companies employed fewer than 10 people, while 12.3 percent employed 250 or more.

Aerospace Employment by County, 2015

Sources: Market Analysis Profile, 2015; Development Research Partners.
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.

- **Ball Aerospace & Technologies Corp.** employs more than 2,000 workers in Colorado, and supports critical missions for national agencies such as the DoD, NASA, the National Oceanic and Atmospheric Administration, and other U.S. government and commercial entities. The company develops and manufactures spacecraft, advanced instruments and sensors, components, data exploitation systems, and radio frequency solutions for strategic, tactical, and scientific applications. [www.ballaerospace.com](http://www.ballaerospace.com)

- **The Boeing Company** has about 1,900 employees at several locations throughout Colorado with the largest concentrations in Arapahoe County and Colorado Springs. Core business activities include: Jeppesen, a key commercial aviation subsidiary; strategic missile defense systems, including Ground-based Midcourse Defense; space and intelligence and Global Positioning System (GPS) support; and Boeing military aircraft at Fort Carson. Boeing spent $199 million with 225 Colorado suppliers in 2014. [www.boeing.com](http://www.boeing.com)

- **Harris Corporation** has offices in Aurora, Boulder, and Colorado Springs, altogether employing more than 1,000 people. The Critical Networks segment provides a broad set of services including radiological, nuclear, and missile defense engineering services, space, ground and range services, as well as development and operations support to the intelligence community. The Space and Intelligence Systems segment is represented on the GPS Operational Control System program, and includes the Visual Information Solutions (VIS) group which provides software solutions and services for data and image analysis, visualization, image delivery, and rapid development for commercial, research, and government markets. [www.harris.com](http://www.harris.com)

- **Lockheed Martin** employs nearly 8,700 people in Colorado. Of these workers, nearly 5,300 are employed at the Space Systems Company unit headquartered in Jefferson County. Space Systems designs, develops, tests, and manufactures advanced technology systems for its government and commercial customers. The company also develops products ranging from human space flight systems and navigation, meteorological, and communications systems to laser radar and missile defense systems. [www.lockheedmartin.com](http://www.lockheedmartin.com)

- **Northrop Grumman** provides a diverse portfolio 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. Northrop Grumman employs more than 2,100 people throughout Colorado. [www.northropgrumman.com](http://www.northropgrumman.com)
AEROSPACE: Metro Denver and Northern Colorado Industry Cluster Profile

- **Raytheon Company** employs about 2,700 people throughout the state, with the majority of employees located in Aurora. Raytheon Company 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 (SNC)** has a significant presence in Colorado, employing more than 800 people in the state. SNC’s **Space Systems Group**, located in Louisville, develops small spacecraft mechanical subsystems, satellite components, and space propulsion systems for government and commercial customers. The company’s **Intelligence, Surveillance and Reconnaissance Group** in Centennial provides products and services for a variety of airborne systems. [www.sncorp.com](http://www.sncorp.com)

- **United Launch Alliance (ULA)**, a joint venture between Lockheed Martin’s Atlas and Boeing’s Delta launch divisions, celebrated its ninth year of operation in 2015. ULA employs about 1,500 of its 3,400-person U.S. workforce at its Centennial headquarters. Most of ULA’s management, engineering, and mission support functions are concentrated in Colorado, while most assembly and integration operations are concentrated in Alabama, Texas, and California. The company’s **Human Launch Services** division supports NASA and its partners in developing capabilities to deliver U.S. astronauts to low Earth orbit and human exploration beyond Earth orbit. Since company formation in 2006, ULA has celebrated more than 100 consecutive, successful Delta II, Delta IV, and Atlas V rocket launches. [www.ulalaunch.com](http://www.ulalaunch.com)

### Additional Major Private Aerospace Companies

- **ABSL Space Products** [www.abslspaceproducts.com](http://www.abslspaceproducts.com)
- **Rocky Mountain Instrument Company** [www.rmico.com](http://www.rmico.com)
- **DigitalGlobe, Inc.** [www.digitalglobe.com](http://www.digitalglobe.com)
- **Science Applications International Corp.** [www.saic.com](http://www.saic.com)
- **IHS Aerospace & Defense** [http://aero-defense.ihs.com](http://aero-defense.ihs.com)
- **SEAKR Engineering, Inc.** [www.seakr.com](http://www.seakr.com)
- **Intrex Aerospace** [www.intrexcorp.com](http://www.intrexcorp.com)
- **Surrey Satellite Technology US LLC** [www.sst-us.com](http://www.sst-us.com)
- **Merrick & Company** [www.merrick.com](http://www.merrick.com)
- **Trimble Rockies** [www.trimble.com](http://www.trimble.com)
- **Research Electro-Optics, Inc.** [www.reoinc.com](http://www.reoinc.com)
- **UP Aerospace Inc.** [www.upaerospace.com](http://www.upaerospace.com)

### Military Aerospace Profile

Colorado is home to a diverse mix of U.S. Department of Defense (DoD) military installations that foster important synergies between private aerospace companies and government entities. The state’s military installations significantly contribute to the state’s economy. In fact, Colorado’s military installations provide an annual economic impact of $27 billion to the state’s economy and employ more than 170,000 military and defense-related civilian personnel. 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 also hosts the Colorado Air National Guard 120th Fighter Squadron and its F-16C fighters.
- **Air Force Bases** in Colorado Springs include Peterson Air Force Base, Cheyenne Mountain Air Force Station, and Schriever Air Force Base.
  - **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 Space Wing is responsible for worldwide missile warning, space control, and missile defense.
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 Space Wing, 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 is responsible for the operation and support of 175 DoD satellites and installation support to 16 major tenant units with a workforce of more than 7,700 personnel. The 50th SW provides space combat capability through command, control, operations, and support of communication, navigation, warning, surveillance, and weather satellite weapons systems.

The United States 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 civilian personnel. The Academy hosts 20 research centers and institutes with more than 400 professionals and faculty dedicated to space, science, air, and atmospheric research, as well as modeling and simulation, totaling $65 million in economic impact annually.

<table>
<thead>
<tr>
<th>Government Installation</th>
<th>Personnel</th>
</tr>
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<tbody>
<tr>
<td>Buckley Air Force Base</td>
<td>9,500</td>
</tr>
<tr>
<td>Peterson Complex*</td>
<td>8,570</td>
</tr>
<tr>
<td>U.S. Air Force Academy</td>
<td>6,710</td>
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<tr>
<td>Schriever Air Force Base</td>
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<tr>
<td><strong>Total Employment</strong></td>
<td><strong>27,740</strong></td>
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*Peterson Complex total includes personnel at Peterson Air Force Base and Cheyenne Mountain Air Force Station (including NORAD, USNORTHCOM, AFSPC, and SMDC/ARSTRAT).

2015 INDUSTRY MILESTONES

Key Company Announcements

The nine-county region is the center of high-tech innovation, with support from a highly educated workforce and a dynamic business environment for aerospace companies to grow and expand. In 2015:

- The Metro Denver Economic Development Corp. named Lockheed Martin Space Systems a “Deal of the Year” award winner at its 2015 Annual Meeting, in recognition of the company’s new Commercial Space headquarters in its Jefferson County campus. Lockheed Martin Space Systems moved 350 jobs from Newtown, Pa. in 2015 and will hire several hundred additional staff locally over the next several years. The company will spend $263 million on the facility expansion, generating an estimated $4.5 billion in economic and fiscal impact.
- Melbourne, Fla.-based Harris Corporation purchased Exelis Inc. for $4.4 billion. The two companies’ complementary technologies and capabilities will strengthen core franchises and will provide new opportunities for innovation.
- DigitalGlobe moved its headquarters from Longmont to Westminster and consolidated employees from Longmont, Thornton, and other locations in the area. The company renovated a 480,000-square-foot building that can potentially house 1,000 employees. The facility currently has 650 employees.
- Boulder-based Special Aerospace Services LLC acquired Englewood-based C&C Manufacturing. As a result, C&C’s staff will double over the next year and the company will offer a more streamlined approach to rapid prototyping of specialized products.

Research and Education Announcements

The nine-county region’s educational facilities, universities, and research institutions offer world-renowned programs to educate and train the next generation of aerospace workers.
AEROSPACE: Metro Denver and Northern Colorado Industry Cluster Profile

- Metropolitan State University of Denver (MSU Denver) launched a new program that will prepare students to build the spacecraft and satellite designs produced by engineers at local aerospace companies. The Aerospace and Engineering Sciences (AES) Initiative will create specialty workers by integrating aviation and aerospace sciences, industrial design, civil, mechanical, and electrical engineering technology, computer information systems, computer sciences, and physics. The program will connect students with aerospace companies through guest lectures, internships, and hands-on project experience.

- MSU Denver broke ground on the new $60 million Aerospace Engineering Sciences Building. The four-story, 142,000-square-foot facility will include laboratories, classrooms, and other advanced spaces for the aviation and aerospace sciences, engineering technology, computer science, and industrial design, and science departments. The building, which is slated for completion in 2018, will also be the home of Colorado’s only Institute for Advanced Manufacturing.

- Launched in the fall of 2015, the Wings Aerospace Academy is a middle and future high school charter founded by Wings Over the Rockies Air and Space Museum to prepare students for careers in the aviation and aerospace industries. The school has a strong focus on science, technology, engineering and mathematics (STEM) programs and will blend hands-on experiences with online learning.

- ULA unveiled a new program that will offer researchers with CubeSats the opportunity to broaden scientific research in space. ULA’s Atlas V rockets will have a standardized payload container that can deploy as many as 24 CubeSats on each launch and University of Colorado Boulder (CU-Boulder) students will have a research CubeSat aboard the first flight. The CubeSat initiative will begin in early 2017.

- The National Science Foundation awarded Colorado State University (CSU) a $2 million, five-year grant to improve engineering and computer sciences education. The project—Revolutionizing Roles to Reimagine Integrated Systems of Engineering Formation—will replace the traditional approach of teaching one subject per course with knowledge integration modules, in which multiple fields are taught simultaneously. CSU is one of six schools to receive the funding, which will also transform the way faculty in the department are evaluated and rewarded.

- CU-Boulder launched a university-wide Grand Challenge, called Our Space, Our Future to explore solutions for complex local, regional, national, and global issues using innovative aerospace science and technology. The program will create new training opportunities for students in emerging space- and Earth science-related businesses. CU-Boulder will invest $4 million in two initiatives to develop new, integrated sensing systems, with a particular focus on unmanned aircraft systems (UAS) and small satellite platforms.

- CU Boulder’s Fiske Planetarium received a $1 million National Aeronautics and Space Administration (NASA) award to develop short, full-dome videos about space science-related discoveries that will be distributed to more than 200 planetariums nationwide. The project will advance STEM and other national education efforts and improve U.S. science literacy.

- CU-Boulder’s Laboratory for Atmospheric Space Physics (LASP) built several key components for NASA’s $1.1 billion Magnetospheric Multiscale mission (MMS) and will serve as the mission’s Science Operations Center. The mission will study the Earth’s magnetosphere to gather information about the microphysics of magnetic reconnection, energetic particle acceleration, and turbulence.

- The National Center for Atmospheric Research (NCAR) High Altitude Observatory (HAO) celebrated its 75th anniversary in 2015. The HAO is NCAR’s solar-terrestrial physics laboratory, conducting world-leading research to understand the behavior of the Sun and its impact on the Earth. The HAO supports, enhances, and extends the capabilities of the university community and the broader scientific community, and fosters the transfer of knowledge and technology.

- Lakewood High School students were selected for NASA’s High School Students United with NASA to Create Hardware (HUNCH) program. The students designed an aeroponics plant growth chamber to fly to the International Space Station (ISS). HUNCH provides cost-effective hardware for high school and middle school students to fabricate real-world products for NASA.

- LASP and the United Arab Emirates will lead a mission to study dynamic changes in the Mars atmosphere in 2021. The Emirates Mars Mission will observe changes in temperature, water vapor, and other gases throughout the layers of the atmosphere. The mission is still in its early planning stages.

- Colorado’s Finest High School of Choice located in Englewood opened a $17 million STEM program expansion. The 98,000-square-foot space includes a multi-media classroom and STEM lab, which provides a highly-integrated learning environment with hybrid technology and alternative programming.

- The Colorado Space Business Roundtable (CSBR) hosts an annual Summer Internship Program for Colorado high school and college students interested in pursuing careers in the aerospace industry. All
students pursuing STEM-related disciplines are encouraged to apply. During the two-week program, students gain valuable insight into various facets of the aerospace industry, spending time at multiple CSBR Partner facilities, participating in hands-on activities, and gaining an exclusive behind-the-scenes look at some of Colorado’s leading space projects.

Major Collaborations

The nine-county region is leading the nation’s major commercial, civil, and military space missions and projects. Examples of these collaborative projects and their progress are highlighted below.

Dream Chaser®

Louisville-based Sierra Nevada Corporation’s Space Systems Group continued to work rigorously on the Dream Chaser® spacecraft through significant collaboration with other Colorado-based aerospace companies. The Dream Chaser® is a winged, lifting-body spacecraft designed for ISS crew transportation and other human space flight operations, including international and commercial space applications. Program developments in 2015 included:

- NASA awarded Sierra Nevada Corp. a Commercial Resupply Services 2 contract to deliver cargo and scientific research material to the ISS using the Dream Chaser® spacecraft by 2024. Orbital ATK and SpaceX were also selected for resupply contracts, which includes a minimum of six cargo delivery service missions for each company. Sierra Nevada is the only contractor using a winged vehicle instead of a capsule, with landing capabilities that will allow scientists to return research samples within three and six hours of landing and subjecting them to less landing stress.
- The Dream Chaser® spacecraft will undergo suborbital and orbital flight tests in early 2016. Several significant structural changes and improvements were made to the spacecraft, including the use of newer composites, better thermal protection, new orbital avionics, and navigation and flight software upgrades.
- Several significant Thermal Protection System (TPS) material development tests were completed in June. The TPS is responsible for protecting crew members and cargo from the high temperatures the spacecraft will experience during re-entry.
- Sierra Nevada Space Systems unveiled its Preferred Landing Site Program to designate airports and spaceports as landing sites for the company’s Dream Chaser® spacecraft. A runway measuring at least 10,000 feet long is required to land a Dream Chaser®.

GPS

- The Colorado aerospace industry and the U.S. Air Force (USAF) Space Command celebrated 20 years since the Global Positioning System (GPS) was declared fully operational on July 17, 1995. Lockheed Martin Space Systems is developing the GPS III—the most powerful GPS satellite ever developed—at the company’s advanced satellite manufacturing facility. The GPS III will deliver three times better accuracy, provide up to eight times improved anti-jamming capabilities, and will extend spacecraft life to 15 years.
- Raytheon Co. installed the first operational hardware for the GPS Next Generation Operational System (GPS OCX). The GPS OCX is the ground command and control system that will manage GPS satellites with significantly improved accuracy and precision, while providing unprecedented levels of cyber security. The company successfully completed three preliminary launch readiness events for the Launch and Checkout System to support the launch of the GPS satellites.

Joint Polar Satellite System

- Ball Aerospace powered on the Joint Polar Satellite System (JPSS-1) satellite for the first time. The JPSS-1 is the nation’s next polar-orbiting, environmental satellite scheduled for launch in 2017. The JPSS-1 will continue the accurate and timely collection of operational polar-orbiting weather and climate data currently provided by the National Oceanic and Atmospheric Administration (NOAA)/NASA Suomi National Polar-orbiting Partnership satellite. Powering on the JPSS-1 is a key milestone to delivery, with environmental testing scheduled in early 2016 and on-time delivery slated for late 2016.
- Sierra Nevada Corp. was selected by Harris Corporation (formerly Exelis) to develop and build the Radiation Budget Instrument (RBI) Azimuth Rotation Module (ARM) for the JPSS-2 mission. Sierra Nevada will develop and build the ARM, which will serve as a rotational stage for the RBI Instrument and as the primary interface between the RBI and the JPSS-2 spacecraft.

MAVEN

Mars Atmospheric and Volatile EvolutioN (MAVEN) is a prime example of Colorado’s leadership in space exploration with the entire mission and spacecraft being built and launched by Colorado organizations
AEROSPACE: Metro Denver and Northern Colorado Industry Cluster Profile

including Lockheed Martin Space Systems, CU-Boulder’s LASP, Harris Corporation (formerly Exelis), and ULA. MAVEN launched in November 2013 and entered Mars’ orbit in September 2014.

- In the latest discoveries, MAVEN detected an unexplained high-altitude dust cloud and an aurora that reaches deep into the Martian atmosphere. Although the source and composition of the dust are unknown, there is no hazard to MAVEN and other spacecraft orbiting Mars. MAVEN also identified that solar wind is the main contributor to Martian climate change by stripping away its atmosphere.
- MAVEN completed its 1,000th orbit in April. The furthest point in the spacecraft’s elliptical orbit has been 6,500 kilometers (4,039 miles) and the closest 130 kilometers (81 miles) above the Martian surface. MAVEN's instruments continue to collect data as intended.

New Horizons
Colorado’s aerospace companies played a key role in the development of NASA’s New Horizon spacecraft. After traveling 9 ½ years and more than 3 billion miles, the spacecraft reached Pluto in 2015 and was the first spacecraft to successfully fly by the dwarf planet. The spacecraft included the Student Dust Counter that was designed, built, and tested by CU-Boulder students and was the first-ever, student-built and operated instrument to ever fly on a NASA planetary mission. Ball Aerospace and the Southwest Research Institute developed the imaging equipment and instruments. Sierra Nevada Corp. supplied key components of the spacecraft’s thermal control system and Lockheed Martin constructed the Atlas V rocket that launched New Horizons. Data from New Horizons will be fully transmitted to Earth by late 2016.

Orion
Lockheed Martin Space Systems is the prime contractor building the Orion Multi-Purpose Crew Vehicle, NASA’s first spacecraft designed for long-duration, human-rated deep space exploration. Orion will transport humans to interplanetary destinations beyond low Earth orbit, such as the moon, asteroids, and eventually Mars. Project developments in 2015 included:

- Lockheed Martin unveiled a new lab built to test computer systems for the spacecraft. The Orion Test Lab will allow astronauts to learn the systems in a full-scale mock-up and is the first testing facility of its kind for a NASA human spacecraft built on a contractor’s campus instead of at a space-agency site. The lab has a structure the exact size, material, and shape of an Orion capsule and will connect to NASA’s mission control and other computers needed to fly Orion.
- Orion successfully completed the Critical Design Review and will move forward into fabrication, assembly, integration, and testing at Lockheed’s Jefferson County campus. The testing of the capsule is expected to be completed in early 2016, with the goal of making future Orion vehicles re-usable for several flights. Orion’s next flight, the uncrewed Experimental Mission-1, is projected to be launched in 2018 by NASA’s new Space Launch System.

OSIRIS-REx
Lockheed Martin Space Systems completed the assembly of NASA’s OSIRIS-REx spacecraft and began environmental testing of the spacecraft in late 2015. OSIRIS-REx is an $800 million NASA asteroid study and sample return mission. Following launch in 2016, the mission will study and return a sample of a carbonaceous asteroid to Earth for detailed analyses in 2023.

Aerospace Projects

Launch Missions

- Lockheed Martin Space Systems unveiled a new spaceflight system comprising of a space tug (the Jupiter spacecraft) and a supply module (the Exoliner). The system is intended to serve as an unmanned cargo delivery ship to the ISS, which also incorporates the removal and deorbiting of trash. The Jupiter spacecraft will be adapted from designs of interplanetary space probes that the company has built for NASA, and has the potential to become deep space habitat.
- Ball Aerospace delivered components to NASA’s Jet Propulsion Laboratory (JPL) for a laser ranging system designed to achieve greater accuracy in measuring changes in Earth’s ocean, groundwater, and glaciers. The company’s laser frequency stabilization reference flight units for the Gravity Recovery and Climate Experiment (GRACE) Follow-On spacecraft were shipped to JPL for environmental testing and the mission is scheduled for launch as early as 2017.
- In 2015, ULA launched three of the latest USAF GPS satellites into orbit. Built by Boeing, these were the 9th, 10th, and 11th of the second-generation, modernized GPS satellites.
- With the launch of the Morelos-3 satellite, ULA celebrated its 100th successful, consecutive launch since the Boeing-Lockheed Martin Corp. joint venture formed in 2006. Morelos-3 is designed to be part of a Mexsat series of orbiters to improve telecommunications capabilities in remote parts of Mexico.
Satellite Programs

- ULA unveiled the design of its next-generation launch rocket, which will replace both the Atlas V and Delta IV launch vehicles. The Vulcan launch system will feature a reusable main engine and a redesigned second stage, and could be operational by 2019.

- ULA launched a NASA cargo mission onboard an Atlas V rocket on behalf of Dulles, Va.-based Orbital ATK, Inc. The company selected ULA to launch its ISS cargo resupply obligations under its contract with NASA. ULA will launch a second NASA cargo mission for Orbital ATK in March 2016.

- ULA selected Orbital ATK, Inc. to provide solid rocket boosters for the company’s Atlas V and Vulcan launch vehicles beginning in 2018. Under the partnership, Orbital ATK will design, develop, and qualify two new rocket motors with design similarities that leverage the company’s solid motor technology.

- NASA selected ULA to launch the Solar Probe Plus (SPP) mission aboard a Delta IV rocket. The SPP mission will be the first to fly through the sun’s outer atmosphere—the corona—to find the source of the sun’s solar wind and will also study what makes the corona so much hotter than the sun’s surface. The SPP mission is scheduled to launch in July 2018.

- NASA selected an instrument developed by LASP to fly on its upcoming Europa mission. The Surface Dust Mass Analyzer (SUDA) will be used to measure the composition of solid particles emitted from Jupiter’s icy moon. Boulder-based Tech-X will also be part of the SUDA team and will conduct computer simulations and other tests to ensure that radiation around Europa does not disturb SUDA’s function. SUDA was one of nine instruments selected from 33 proposals from around the world.

- ULA received a $132.4 million NASA contract to launch the 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 from 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.

- NASA installed the first mirror built by Ball Aerospace for the James Webb Space Telescope, the nation’s next premier astrophysics observatory and the successor to the Hubble Space Telescope. The agency placed the 88-pound mirror, the first of 18 mirror segments, which will work together as one 21.3-foot (6.5-meter) primary mirror. The telescope is scheduled to launch in 2018.

- Ball Aerospace designed, tested, and built the High Resolution Imaging Science Experiment Camera (HiRISE), which is flying onboard NASA’s Mars Reconnaissance Orbiter. HiRISE is the highest resolution camera ever sent to another planet, and in 2015, revealed a salty brine flowing on the planet’s surface, suggesting possible life on Mars.

- Ball Aerospace has integrated the propulsion subsystem for NASA’s Green Propellant Infusion Mission (GPIM) onto the spacecraft bus and began system performance and environmental testing. GPIM aims to revolutionize spaceflight by demonstrating improved overall propellant efficiency while reducing the toxic handling concerns associated with the traditional hydrazine propellant. The GPIM is scheduled to launch in 2016.

Satellite Programs

- Lockheed Martin opened a national radio frequency communications research and development lab focused on satellites, which will bring dozens of experts to the Jefferson County headquarters. The Payload Center of Excellence opened in May and will concentrate the expertise and new equipment used to create and test communications technologies for satellites and satellite components in one location to expedite production and innovation. The facility will reinvent the process of payload development through advanced technology research and streamlined manufacturing.

- Lockheed Martin completed assembly of NOAA’s Geostationary Operational Environmental Satellite-R (GOES-R) weather satellites and began critical testing of the spacecraft. The GOES-R system is undergoing environmental testing to simulate the conditions of launch and the extreme environment the satellite will experience in space. Lockheed Martin also designed and built the Solar Ultraviolet Imager and the Geostationary Lightning Mapper instruments that will fly aboard each spacecraft. When fully assembled, the satellite will provide accurate, real-time weather forecasts and early warning products to NOAA and other public and private organizations. The satellite is scheduled to launch in October 2016.

- ULA launched the U.S. Navy’s fourth Mobile User Objective System (MUOS-4) satellite, built by Lockheed Martin Space Systems Co., to upgrade data and voice communications for the military. Launched aboard ULA’s Atlas V rocket, the satellite will provide 16 times the network capacity for more than 55,000 military communication terminals worldwide.

- The USAF selected Lockheed Martin Space Systems to maintain three military communications satellite fleets for five years. The $735.3 million contract will combine the operations and sustainment of the Defense Satellite Communications System III, Milstar, and Advanced Extremely High Frequency satcom networks. The consolidation of the three fleets’ management under the Combined Orbital Operations Logistics Sustainment (COOLS) contract is estimated to save the USAF $425 million.
AEROSPACE: Metro Denver and Northern Colorado Industry Cluster Profile

- Boulder-based Blue Canyon Technologies was selected by Bethesda, Md.-based PlanetIQ to build a new weather satellite. The satellite will be the first commercial constellation dedicated to weather, climate, and space weather. As a result, PlanetIQ opened a permanent office in Boulder and plans to hire up to two dozen employees over the next several months.

- ULA successfully launched the USAF Space Command 5 (AFSPC-5) satellite via an Atlas V rocket. The rocket carried the X-37B Orbital Test Vehicle, a reliable, reusable, unmanned space test platform for the USAF. The Atlas V mission also includes the Aft Bulkhead Carrier (ABC) carrying the National Reconnaissance Office’s (NRO’s) Ultra Lightweight Technology and Research Auxiliary Satellite (ULTRASat).

- Lockheed Martin was selected by Englewood-based EchoStar to provide commercial launch services for the EchoStar 19 communications satellite. Planned for launch in late 2016, the satellite will launch aboard a ULA Atlas V rocket and will help meet the growing demand for HughesNet® high-speed satellite internet service in North America.

- Lockheed Martin Space Systems is building two satellites for the Arab Satellite Communications Organization and King Abdulaziz City for Science and Technology. The Arabsat 6A and Hellas-Sat-4/SaudiGeoSat-1 satellites are based on the modernized A2100 common framework and will provide advanced telecommunications capabilities, including television, Internet, telephone and secure communications to the Middle East, Africa, and Europe. The satellites are expected to launch in 2018.

- The Tropospheric Emissions: Monitoring of Pollution (TEMPO) instrument, developed by Ball Aerospace, successfully completed its Critical Design Review. TEMPO is an air quality sensor that will provide hourly monitoring of pollution across North America and is the first NASA Earth Venture Instrument mission with a UV-visible air quality spectrometer to be placed in geostationary orbit. The company began hardware fabrication in 2015 and will be delivered in 2017.

Defense Missions

Lockheed Martin completed development and will test the next-generation ground system, Increment 2, for the USAF's Space Based Infrared System (SBIRS). When Increment 2 is operational, it will increase SBIRS’ overall ability to manage complex, emerging threats while reducing USAF operation and maintenance costs. The system will replace the legacy system by 2016 with significant performance improvements. The 460th Space Wing at Buckley Air Force Base in Colorado provides operational command and control of three constellations of space-based infrared missile warning systems.

Global Aerospace Agreements

- Defense and security company Saab and DigitalGlobe created a joint venture called Vircon, Inc. The venture will produce photo-realistic, three-dimensional products and digital elevation models globally for enterprise and government geospatial markets.

- DigitalGlobe signed a Memorandum of Understanding (MOU) with the United Nations to collaborate with the United Nations Office for Outer Space Affairs (UNOOSA) in geospatial observation technologies and analytics. Under the agreement, UNOOSA and DigitalGlobe will develop an online platform to provide easy access to imagery catalogues and data specifically tailored for the needs of the United Nations.

- Sierra Nevada Corporation signed two new cooperative agreements with the German Aerospace Center and the Houston Airport System. The agreement with the German Aerospace Center will identify new and advanced technologies to pursue to further advance the crewed and uncrewed spacecraft, while the agreement with Houston Airport System will allow the company to utilize Ellington Airport’s Spaceport as a future landing site for the spacecraft.

- Littleton-based Oakman Aerospace signed a Technical Assistance Agreement (TAA) with RUAG Space Switzerland to develop a program effort for early, on-orbit demonstration of the RUAG Optel-micro laser communications subsystem. The Optel-micro will support extremely high data rate space-to-ground downlinks. The company also signed an MOU with Belgium-based QinetiQ Space to sell and deliver small satellite-based space systems and missions to government commercial and academic customers in the United States.

Spaceport Colorado

Colorado is well-positioned to be a leader in commercial space transportation. In 2015, 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 2016, 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, point-to-point travel, and UAS. Spaceport Colorado has an abundance of surrounding land and convenient access to Denver International Airport and the region’s sizeable aerospace industry, research universities, and talented aerospace workforce.

**Industry Infrastructure Support**

The nine-county region’s public-private partnerships provide support, foster opportunities, and stimulate growth for the aerospace industry.

- The Colorado Space Coalition (CSC), a group of industry stakeholders, works to make Colorado a center of excellence for space. The Coalition—including aerospace companies, military leaders, academic groups, and economic development organizations—promotes the state’s significant aerospace assets nationally and advances legislation vital to industry growth and success.
- The Center of Excellence for Commercial Space Transportation—a partnership between government, industry, the FAA, and nine academic institutions including CU-Boulder—formed in 2010 to address current and future challenges of commercial space transportation. CU-Boulder plays a key role, offering its experience in spacecraft life-support systems and habitat design, human factors engineering analysis, payload experiment integration, and expertise in space environment and orbital mechanics.
- 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 including industry, government, and academia that support the space industry with services, advocacy, and procurement. In 2015, the CSBR led business development road trips throughout the state of Colorado to help connect major space contractors, aerospace business leaders, economic development professionals, and STEM advocates with small business owners, college students, and entrepreneurs.
- With more than a dozen aerospace-related units on campus, CU-Boulder’s AeroSpace Ventures brings together the university’s institutes, centers, government laboratories, and industry partners to develop new technologies focusing on unmanned aircraft, small satellites, and Earth and space sensors. Through this initiative, AeroSpace Ventures combines aerospace vehicle innovations and science discoveries for local and global measurements to advance solutions in climate, weather, and space environment.
- In 2015, a Loveland-based business accelerator called The Warehouse partnered with NASA. The Warehouse will be NASA’s first business accelerator partner under its Adopt-An-Accelerator program. Select clients of The Warehouse will have the opportunity to receive up to 40 hours of NASA consulting and assistance in developing technology and solving problems.
- 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.

**Cross-Cluster Convergence**

The nine-county region promotes an environment of collaboration among the bioscience, IT-software, and aerospace industries.

- The Colorado Office of Economic Development and International Trade awarded a $2.4 million grant to build infrastructure to assist in 3D metal printing standardization and qualification for businesses of all sizes. The consortium leading the effort is headed by Manufacturer’s Edge, and includes Faustson Tool, Ball Aerospace, the Colorado School of Mines (CSM), and Lockheed Martin. The 3D Metal Additive center will be built at CSM, and serve as a member-supported research and development center focused on understanding the performance and characteristics of 3D printed advanced metal alloys used in advanced manufacturing industries.
- CSU received a $9 million grant from NASA to build a facility that will research the effects of long-term exposure to space radiation. The facility will be the only one-of-its-kind in the world. CSU will renovate an existing gamma ray facility, which will mimic the long-term, low-dose-rate exposures to highly energetic radiation that astronauts would encounter on a multiyear mission to Mars.
Private Aerospace Workforce Profile

Many companies choose locations because of the available workforce. With nearly half of the nine-county region’s 3.7 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, 41.3 percent are college graduates and 90.5 percent have graduated from high school. The state has the nation’s second-most highly educated workforce as measured by the percentage of residents with a bachelor’s degree or higher.

The attractiveness of the region draws new residents through migration. The region’s population is expected to grow 59.9 percent from 2010 to 2040, driving a 36.3 percent increase in the region’s labor force over the same period. It is important to note the changing composition of the workforce supply as the baby boomers begin to retire, which will pose implications for businesses whose employee pool includes significant numbers of these workers.

The nine-county region’s aerospace industry employs 19,520 people and includes a large pool of talented, well-educated, and highly skilled workers. The aerospace cluster has a larger share of employees (74.7 percent) that are between the ages of 35 and 64 years old, compared with the age distribution across all industries in the region (59.7 percent).

The aerospace workforce supply consists of four main components: those currently working in the industry; those doing a similar type of job in some other industry; the unemployed; and those currently in the education pipeline. The Metro Denver and Northern Colorado Occupation & Salary Profile below includes the 10 largest aerospace 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.
AEROSPACE: Metro Denver and Northern Colorado Industry Cluster Profile

Wages

Wages in the aerospace cluster are among the highest across all industry clusters. The 2014 average annual salary for an aerospace worker in the nine-county region was $128,120, compared with the national average of $103,570. Further, aerospace workers in the nine-county region earned 24 percent more than the national average. Total nine-county payroll in the aerospace cluster exceeded $2.5 billion in 2014.

Metro Denver and Northern Colorado Aerospace Occupation & Salary Profile, 2015

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<td>$122,616</td>
<td>$147,950</td>
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<tr>
<td>10. Chemists</td>
<td>1,589</td>
<td>81</td>
<td>281</td>
<td>$73,590</td>
<td>$39,749</td>
<td>$51,168</td>
<td>$101,005</td>
<td>$124,155</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 2015.3 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 nearly 380 private occupational and technical schools offering courses in dozens of program areas throughout the state. 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 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 School of Mines**  
  [www.mines.edu](http://www.mines.edu)
- **Colorado State University**  
  [www.colostate.edu](http://www.colostate.edu)
- **Colorado State University Global Campus**  
  [www.colostate.edu](http://www.colostate.edu)
- **University of Denver**  
  [www.du.edu](http://www.du.edu)
- **University of Northern Colorado**  
  [www.unco.edu](http://www.unco.edu)
- **University of Phoenix: Colorado**  
  [www.phoenix.edu](http://www.phoenix.edu)
- **Regis University**  
  [www.regis.edu](http://www.regis.edu)
- **University of Colorado: Boulder, Denver**  
  [www.cu.edu](http://www.cu.edu)
Key Reasons for Aerospace Companies to Locate in the Nine-County Region

The region is a top aerospace location offering:

1. **The ability to recruit and retain technical and scientific employees and entrepreneurial talent**
   - Of Colorado’s adult population, more than 38 percent has completed a bachelor’s or higher-level degree, making Colorado the second-most highly educated state in the nation behind Massachusetts. (U.S. Census Bureau, 2014 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 in 2013. (National Science Foundation, 2015)
   - Colorado ranked fifth for the number of scientists and engineers as a share of all occupations in 2014. (National Science Foundation, 2015)
   - The U.S. Department of Commerce’s United States Patent and Trademark Office located one of four new satellite offices in Denver, the first permanent office west of the Mississippi, due to the state’s expansive culture of innovation and entrepreneurism. (U.S. Patent and Trademark Office, 2015)
   - The Denver-Aurora-Broomfield metropolitan statistical area ranked first overall for economic development and job growth in the “Leading Locations for 2015” list. The Greeley and Boulder metro areas were also named to the list’s top-10. Areas recognized in the study have strong pro-business environments and a highly skilled workforce. (Area Development, 2015)
   - Metro Denver ranked as the fourth-best metro area for science, technology, engineering, and mathematics (STEM) professionals in 2015. Metro Denver ranked fourth for the projected number of STEM jobs needed in 2018 and seventh for openings per capita for STEM graduates. (WalletHub, 2015)
   - Denver ranked as the third-best city for college graduates, with millennials (ages 20-34) representing 26 percent of the total population. (Rent.com, 2015)

2. **Proximity to vendors and customers**
   - Colorado ranked second nationwide in National Aeronautics and Space Administration (NASA) prime contract awards—more than $1.8 billion—in 2014, or 14 percent of the nation’s total. The University of Colorado (seventh) and Colorado State University (52nd) ranked among the top-100 public educational institutions for NASA research awards in 2014. (NASA, 2015)
   - 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.
   - Established in 2009, the Colorado Procurement Technical Assistance Center (PTAC) assists Colorado businesses with prime contractors and federal, state, and local governments at nominal or no cost. Since inception, Colorado PTAC’s nearly 3,000 active businesses have generated an estimated 55,000 jobs for Colorado.

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. In 2015, the Colorado Legislature formed a bipartisan Aerospace and Defense Caucus to further support the continued expansion of aerospace and defense within the state.
   - The Advanced Industries (AI) Accelerator Programs includes four types of grants and a global business support program to promote growth and sustainability in Colorado’s advanced industries, including advanced manufacturing, aerospace, bioscience, electronics, energy and natural resources, infrastructure engineering, and technology and information. These industries account for nearly 30 percent of the state’s wage earnings and nearly 35 percent of the state’s total exports. (The Colorado Office of Economic Development and International Trade, 2015)
• 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 will encourage capital investment in aerospace manufacturing supplies. (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. Senate Bill 35 (2012) limited the liability for public and private entities holding a Federal Aviation Administration license for spaceflight activities. The legislation is an important first step in initiating commercial spaceflight activities in the state.

4. Proximity to colleges/universities

• Two academic institutions in Colorado offer nationally ranked aerospace programs or degrees:
  o The University of Colorado Boulder’s (CU-Boulder) aerospace engineering sciences graduate program ranked among the top-four programs in the nation by the National Research Council and 10th by U.S. News & World Report in 2015. (National Research Council, 2010; U.S. News & World Report, 2015)
  o The U.S. Air Force Academy in Colorado Springs ranked second in the nation for an undergraduate aerospace engineering program where a doctoral degree is not offered. (U.S. News & World Report, 2014)

• CU-Boulder’s Laboratory for Atmospheric and Space Physics is the only university-based institution in the world to have designed and built space instruments for NASA that have been launched to every planet in the solar system.

• CU-Boulder is the only university outside of the Naval Postgraduate School to have two astronaut alumni on its faculty. (University of Colorado, 2015)

• The University of Colorado is among the top-five U.S. universities, excluding military academies, in the number of astronaut alumni: more than 20 scientists, faculty, and alumni have launched on over 50 NASA space missions. (University of Colorado, 2015)

5. Low to moderate costs of doing business

• Colorado’s simplified corporate income tax structure based on single-factor apportionment allows companies to pay taxes based solely on their sales in the state. Along with few regulatory burdens, Colorado’s corporate income tax rate of 4.63 percent is one of the lowest and most competitive tax structures in the nation. (State of Colorado; The Tax Foundation)

• Colorado’s tax climate ranked eighth in the nation for entrepreneurship and small business. (Small Business & Entrepreneurship Council, 2015)

• Metro Denver office rental rates averaged $29.64 per square foot in the fourth quarter of 2015, making the region’s office market highly competitive with other major markets in the U.S. (CoStar Realty Information, The CoStar Office Report, 4Q 2015)

6. Pro-business and flexible state and local governments

• Metro Denver ranked No. 1 among Forbes’ 2015 “Best Places for Business and Careers.” Four other Colorado metropolitan areas were included on the list. The Fort Collins metro area ranked 10th, Boulder ranked 26th, Greeley ranked 33rd, and Colorado Springs ranked 37th. (Forbes, 2015)

• Denver ranked as the 10th-most business-friendly city in 2014 and had the third-best business climate among the nation’s 100 largest cities. (MarketWatch.com, 2015)

• Colorado ranked fourth in CNBC’s annual “Top States for Business” in 2015 and the state earned top-10 rankings in the categories that measure the economy (third), technology and innovation (fifth), access to capital (eighth), and quality of life (ninth). (CNBC, 2015)

• Colorado ranked fourth in both innovation and entrepreneurship, and high-tech performance. The state also ranked among the top-10 states for economic performance and talent pipeline. (National Chamber Foundation, 2015)

• Colorado ranked as the No. 5 small-business-friendly state in the nation. Fort Collins and Boulder ranked among the top-10 cities nationally, earning “A” grades for overall friendliness. (Thumbtack.com, 2015; Ewing Marion Kauffman Foundation, 2015)
## Aerospace Industry Cluster Definition

<table>
<thead>
<tr>
<th>NAICS Code*</th>
<th>NAICS Description</th>
<th>SIC Code</th>
<th>SIC Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>331512</td>
<td>Steel investment foundries</td>
<td>3324-9901</td>
<td>Aerospace investment castings, ferrous mfg.</td>
</tr>
<tr>
<td>331524</td>
<td>Aluminum foundries (except die-casting)</td>
<td>3365-0201</td>
<td>Aerospace castings, aluminum mfg.</td>
</tr>
<tr>
<td>331529</td>
<td>Other nonferrous metal foundries (except die-casting)</td>
<td>3369-9901</td>
<td>Aerospace castings, nonferrous: except aluminum mfg.</td>
</tr>
<tr>
<td>332111</td>
<td>Iron &amp; steel forging</td>
<td>3462-05</td>
<td>Missile &amp; ordnance forgings mfg.</td>
</tr>
<tr>
<td>332112</td>
<td>Nonferrous Forging</td>
<td>3463-02</td>
<td>Nonferrous missile &amp; ordnance forgings mfg.</td>
</tr>
<tr>
<td>332313</td>
<td>Plate work mfg.</td>
<td>3443-1104</td>
<td>Space simulation chambers, metal plate mfg.</td>
</tr>
<tr>
<td>332813</td>
<td>Electroplating, plating, polishing, anodizing &amp; coloring</td>
<td>3471-0204</td>
<td>Decontaminating &amp; cleaning of missile or satellite parts mfg.</td>
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<tr>
<td>332993</td>
<td>Ammunition (except small arms) mfg.</td>
<td>3483-9910</td>
<td>Missile warheads mfg.</td>
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<tr>
<td>333314</td>
<td>Optical instrument &amp; lens mfg.</td>
<td>3663-9910</td>
<td>Space satellite communications equipment mfg.</td>
</tr>
<tr>
<td>334220</td>
<td>Radio &amp; television broadcasting &amp; wireless communications equipment mfg.</td>
<td>3812</td>
<td>Search, detection, navigation, guidance</td>
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<tr>
<td>334511</td>
<td>Search, detection, navigation, guidance, aeronautical, &amp; nautical system &amp; instrument mfg.</td>
<td>3761</td>
<td>Guided missiles &amp; space vehicles</td>
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<tr>
<td>336414</td>
<td>Guided missile &amp; space vehicle mfg.</td>
<td>3764</td>
<td>Space propulsion units &amp; parts</td>
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<tr>
<td>336415</td>
<td>Guided missile &amp; space vehicle propulsion unit &amp; propulsion unit parts mfg.</td>
<td>3769</td>
<td>Space vehicle equipment NEC</td>
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<tr>
<td>336419</td>
<td>Other guided missile &amp; space vehicle parts &amp; aux. equipment mfg.</td>
<td>3842-0113</td>
<td>Space suits mfg.</td>
</tr>
<tr>
<td>423860</td>
<td>Transportation equipment &amp; supplies (except motor vehicle) merchant wholesalers</td>
<td>5088-0300</td>
<td>Aircraft &amp; space vehicle supplies &amp; parts - wholesale trade</td>
</tr>
<tr>
<td>423860</td>
<td>Transportation equipment &amp; supplies (except motor vehicle) merchant wholesalers</td>
<td>5088-0305</td>
<td>Guided missiles &amp; space vehicles – wholesale trade</td>
</tr>
<tr>
<td>517919</td>
<td>All other telecommunications</td>
<td>4899-9902</td>
<td>Missile tracking by telemetry or photography</td>
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<tr>
<td>541712</td>
<td>Research and development in the physical, engineering, and life sciences (except biotechnology)</td>
<td>3761</td>
<td>Guided missiles and space vehicles</td>
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<tr>
<td>927110</td>
<td>Space research and technology</td>
<td>9661</td>
<td>Space research and technology</td>
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<tr>
<td>927110</td>
<td>Space research and technology</td>
<td>4789-9902</td>
<td>Space flight operations, except government</td>
</tr>
</tbody>
</table>

*(P) indicates that only part of the NAICS industry category is represented in the industry cluster definition.

Note: NEC indicates "not elsewhere classified."
AEROSPACE: Metro Denver and Northern Colorado Industry Cluster Profile

Aerospace Industry Cluster Relationships

Technologies
- GIS
- GPS
- Nanotechnology
- Photonics
- Remote Sensing

Support Industries
- Aviation
- Computer Storage
- Geospatial
- Government
- Manufacturing
- Software
- Telecommunications

Client Industries
- Aviation
- Geospatial
- Security/Defense
- Telecommunications

Infrastructure
- BioServe Space Technologies
- Colorado Center for Astrodynamics
- CO Photonics Industry Association
- CO Space Business Roundtable
- CO Space Coalition
- CO Space Education Initiative
- CO Space Grant Consortium
- CU-Aerospace Engineering
- CSU-Dept. of Atmospheric Science
- GIS of the Rockies
- NCAR, NOAA, NIST
- National Defense Industrial Assoc.
- CU Boulder RECUV
- Rocky Mountain Technology Alliance
- Space Foundation
- Spaceport CO & Aeronautical Authority
- Space Science Institute

For additional information, contact us:

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

Colorado Space Coalition
For more information on Colorado’s aerospace industry:
303.620.8133
e-mail: info@spacecolorado.org
www.spacecolorado.org


Metro Denver Economic Development Corporation | January 21, 2016 | Page 17
Industry Overview

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. Colorado’s robust system of 74 public-use airports supports 265,000 jobs, $12.6 billion in payroll, and generates $36.7 billion in economic output annually. Denver International Airport (DEN) provides connectivity between the nine-county Metro Denver and Northern Colorado region¹ and worldwide markets, a key component to Colorado’s rapidly expanding business community.

DEN celebrated 20 years of service in February 2015. The first, major, new airport to be built in the U.S. in 20 years, DEN has grown from serving 31 million passengers in 1995 to a record 53.5 million in 2014. More than 50 million passengers traveled through DEN for the seventh-consecutive year in 2014, making it the fifth-busiest airport in the nation and 17th-busiest in the world. More than 32 million annual domestic passengers begin or end their trip in Denver, making Denver the third-largest domestic origination and destination hub in the nation. The airport is an economic engine for the state, generating more than $26 billion in annual economic impact and supporting nearly 190,000 jobs. In 2014, DEN managed about 1,500 flight operations and nearly 146,500 passengers every 24 hours.

Nearly 25.8 million passengers traveled through DEN in the first six months of 2015, slightly behind the record-setting pace of passenger traffic in 2014. In November 2015, DEN’s year-to-date passenger traffic exceeded 49 million and international passenger traffic continues to increase at DEN. International traffic accounted for approximately 2 million year-to-date passengers in 2015 and 4 percent of the airport’s total passenger traffic. Passengers can reach more than 170 destinations nonstop from DEN and 21 international destinations in nine countries. With the addition of international cities such as San Jose and Liberia, Costa Rica; Munich, Germany; and Montreal, Canada, and existing flights from DEN to Europe and Asia, Denver is poised to continue providing excellent global connectivity.

Located near the geographic center of the United States, DEN is the only major hub airport within a 500-mile radius. As such, DEN serves as the gateway into Colorado and the Rocky Mountain West and has direct flights to 11 destinations in Colorado, including popular ski resorts, vacation, and business destinations. The airport is also a leading air cargo center and serves as a key distribution hub, with access to an extensive freight network and major interstate highways. Eleven cargo airlines and 12 major and national carriers currently provide cargo service at DEN, handling over 495 million pounds of cargo as of November 2015. The airport’s total cargo operations currently exceed approximately 235,611 metrics tons per year. With 24-hour operations, the airfield and a 39-acre cargo ramp make freight handling efficient, with no curfews.

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.

With direct employment of 16,880 aviation workers, the nine-county region ranked 11th out of the 50 largest metro areas in 2015. The region ranked 13th for aviation employment concentration.² Roughly 75 percent of Colorado’s aviation cluster employees work 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.
² Direct employment is the number of employees in the industry cluster in a region. No multiplier effects are included. Direct employment is estimated and ranked for the 50 largest metropolitan statistical areas (MSAs). Employment concentration is the direct cluster employment in a region expressed as a percent of total employment in all industries in the same region. Employment concentration is calculated and ranked for the 50 largest MSAs.
Aviation Employment and Company Profile, 2015

<table>
<thead>
<tr>
<th></th>
<th>Nine-County Region</th>
<th>United States</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct employment, 2015</td>
<td>16,880</td>
<td>1,028,600</td>
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<td>Number of direct companies, 2015</td>
<td>590</td>
<td>40,430</td>
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<td>One-year direct employment growth, 2014-2015</td>
<td>2.0%</td>
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<td>Five-year direct employment growth, 2010-2015</td>
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</tr>
<tr>
<td>Avg. annual direct employment growth, 2010-2015</td>
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<td>0.5%</td>
</tr>
<tr>
<td>Direct employment concentration</td>
<td>0.9%</td>
<td>0.7%</td>
</tr>
</tbody>
</table>


Aviation Employment

The nine-county region’s aviation employment (16,880 workers) rose 2 percent in 2015, compared with the previous year’s level, adding more than 320 new jobs during the same period. National employment levels increased 0.7 percent over-the-year. The region employs 1.6 percent of the nation’s aviation workforce. Between 2010 and 2015, the region’s aviation employment rose 11.1 percent, compared with 2.8 percent at the national level. Aviation companies employed 0.9 percent of the region’s total employment base, compared with a 0.7 percent employment concentration nationwide.

About 590 aviation companies operated in the nine-county region in 2015. Seventy-nine percent of the region’s aviation companies employed fewer than 10 people, while 1.2 percent employed 250 or more.
Nine-County Region Airport Information

The nine-county region’s commercial, reliever, and general aviation airports are major economic catalysts, providing residents and businesses connectivity to worldwide markets and destinations. The state’s largest airport—Denver International Airport (DEN)—generates more than $26 billion for the region annually. Combined, the nine-county region’s airports contribute more than $28 billion to the region’s economy annually, according to the Colorado Department of Transportation’s (CDOT) Division of Aeronautics.

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 has more than 30,000 badged employees who work for the airport and approximately 1,200 at the City and County of Denver. 

DEN accommodates more than 50 million passengers annually with six runways, three concourses, 109 gates, and 42 regional aircraft positions. DEN serves the ever-expanding international travel market via the sixth runway, the longest in North America. With the 2015 additions of Boutique Air and Denver Air Connection, as well as the 2016 additions of Virgin America and Sun Country, DEN has 19 commercial carriers offering
scheduled nonstop service from Denver to more than 170 domestic and international destinations. DEN is a major hub for United, Southwest, and Frontier Airlines.

The nine-county region is a natural hub for cargo operations due to its central U.S. location. DEN’s airfield layout and its 39-acre cargo ramp make freight handling efficient. The airport’s air cargo and mail facilities comprise 375,000 square feet in five buildings south of the airfield, with room to expand. DEN is home to several world-class cargo companies and support facilities, including World Port Cargo Support, DHL, UPS, FedEx, and United Airlines cargo. The U.S. Postal Service facility is also located nearby, providing a wide array of competitive shipping and receiving options. Further, more than 50 freight forwarders and customs brokers operate within 20 miles of DEN.

DEN is a global environmental leader and was the first airport in the nation to receive ISO 14001 Environmental Management System certification in 2004. In 2015, DEN received the international Airport Carbon Accreditation for measuring and reducing carbon emissions. DEN became the eighth-certified airport in North America to manage and reduce its carbon emissions through independent assessment and verification.

The airport is also 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 has one of the largest airport solar installations in the world and is the largest distributed generation photovoltaic energy producer in Colorado. DEN’s four solar array systems produce approximately 6 percent of the airport’s total electrical power requirements. The airport has one of the largest compressed natural gas fleets in the country including 172 buses, sweepers, and other alternatively fueled vehicles, and 121 electric and hybrid electric vehicles. Alternative vehicles comprise roughly 51 percent of the airport’s light duty fleet. DEN also recycles or reuses 21 different types of materials, including 75 percent of collected aircraft deicing fluids. DEN is also the first commercial airport to design a fully comprehensive plan of Area Navigation (RNAV), saving each flight 14 to 21 gallons of fuel. The airport’s aircraft arrival and departure procedures help increase runway throughput and reduce fuel consumption, greenhouse gas emissions, and aircraft noise.

**Reliever Airports**

Three reliever airports—those designated by the Federal Aviation Administration (FAA) to relieve traffic at commercial airports and general aviation airports, and provide other aviation services—are strategically located throughout the nine-county region. These airports support the state and regional economies and are catalysts for growth, economic development, and job creation.

- **Centennial Airport** (APA) is the premier reliever and business airport in the state. Supporting 23 business parks in the south metro area and 6,000-plus businesses responsible for more than 27 percent of the state’s GDP, the airport provides all services necessary to compete in the global economy. The airport is home to four, award-winning fixed-based operators providing all concierge services, a fully staffed, FAA Air Traffic Control Tower, and on-demand U.S. Customs clearances, all 24/7. In addition, APA has a top ranked caterer, a 10,000-foot CAT 1 ILS runway, gateway service to Ronald Reagan Washington National Airport, and some of the most competitive fuel prices in the country. Services such as air ambulance, law enforcement, charter, fractional, flight schools, and aircraft maintenance services are also 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. 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 hangaring 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 by mid-2016. 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.
AVIATION: Metro Denver and Northern Colorado Industry Cluster Profile

Averaging more than 121,000 operations each year, BJC has three runways, including a 9,000-foot CAT 1 ILS runway, and offers a user-fee designated U.S. Customs Office open 24 hours a day. The airport also has Part 139 FAA airport certification with established requirements for commuter passenger service and large, on-demand aircraft charter. BJC is home to more than 40 aviation companies and flight departments, including the U.S. headquarters of Pilatus Business Aircraft and HeliQwest. The airport is adjacent to the Interlocken Business Park and Westmoor Technology Park, and also houses the U.S. Forest Service tanker base and the National Center for Atmospheric Research. A new, state-of-the-art FAA control tower opened at the airport in 2012. In 2015, BJC continued work on the Airport Master Plan Update including a new Corporate TaxiLane, enhanced airport pavements, and the rehabilitation of RMMA’s parallel runway will be completed in 2016. The airport generates more than $460 million in annual impact to the region.

General Aviation Airports

Colorado’s general aviation airports support economic vitality and facilitate commerce and air travel needs across the state. Five general aviation airports are located in the nine-county region:

- Boulder Municipal Airport
- Greeley-Weld County Airport
- Erie Municipal Airport
- Fort Collins-Loveland Municipal Airport
- Vance Brand Municipal Airport

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.

Major Aviation Companies

- Air Methods Corp.  
  [www.airmethods.com](http://www.airmethods.com)
- Air Serv Corp.  
  [www.airservcorp.com](http://www.airservcorp.com)
- American Airlines, Inc.  
  [www.americanairlines.com](http://www.americanairlines.com)
- Delta Air Lines, Inc.  
  [www.delta.com](http://www.delta.com)
- DHL  
  [www.dhl.com](http://www.dhl.com)
- FedEx  
  [www.fedex.com](http://www.fedex.com)
- FlightSafety International Inc.  
  [www.flightsafety.com](http://www.flightsafety.com)
- Frontier Airlines  
  [www.flyfrontier.com](http://www.flyfrontier.com)
- Great Lakes Aviation  
  [www.greatlakesav.com](http://www.greatlakesav.com)
- Heli-One Colorado  
  [www.heli-one.ca](http://www.heli-one.ca)
- Jeppesen  
  [www.jeppesen.com](http://www.jeppesen.com)
- Pilatus Aircraft  
  [www.pilatus-aircraft.com](http://www.pilatus-aircraft.com)
- Signature Flight Support  
  [www.signatureflight.com](http://www.signatureflight.com)
- Southwest Airlines  
  [www.southwest.com](http://www.southwest.com)
- United Airlines  
  [www.united.com](http://www.united.com)
- United Parcel Service Inc.  
  [www.ups.com](http://www.ups.com)

2015 Industry Highlights

Denver International Airport (DEN) Project Updates

Several projects were underway at DEN in 2015:

- DEN completed numerous project milestones on the $544 million Hotel and Transit Center. The 519-room onsite Westin Denver International Airport opened in November and features 37,500 square feet of meeting space that can accommodate up to 2,500 people. The 14-story hotel sits just 200 feet from the terminal, which is claimed to be the shortest distance between a hotel and a main airport.
structure in the world. The hotel is expected to generate between $1 million and $2 million per year in revenue over the next five years. A public transit center for the 23-mile commuter rail line that connects DEN with Denver Union Station in downtown Denver opened in December, with rail service beginning April 22, 2016. Additionally, an open-air plaza above the station opened in December, providing connections to the main terminal and will serve as Denver’s newest venue for programs and events where passengers and visitors can find entertainment, relaxation, art, and restaurants.

- DEN completed a $46.5 million resurfacing project of Runway 17L-35R, which replaced 2,180 deteriorating concrete slabs and adjacent taxiways. DEN also added new lighting components and installed a pavement-sensor system that will allow the airport to monitor the concentration of chemical deicing agents applied during winter storms.

- DEN is expanding its airport parking to accommodate increased passenger traffic. Construction began on the four-story, $46 million parking structure on the southeast corner of Jeppesen Terminal. The new parking facility will add 1,795 new spaces and will be completed in 2017. Separately, DEN is nearing completion of a project to add an additional 261 parking spaces adjacent to the east parking garage. An additional 430 spaces were recently added to the east and west economy lots through a redesign project.

- Two additional parking options near DEN were either underway or completed. Fine Airport Parking broke ground on a $25 million parking project on East 56th Avenue. The 30-acre parking facility will include 3,000 spaces, a full-service detail shop, and 24-hour valet and shuttles to DEN. ParkDIA opened a new parking garage one-quarter mile from Peña Boulevard at the Jackson Gap Road exit, offering 7,500 parking spaces. The facility also offers valet parking, prepaid loyalty plans, a self-park cash exit, and 24-hour shuttle service that includes WiFi and charging stations.

- The City and County of Denver and communities in Adams County developed a new agreement for future land development at DEN. Under the new agreement, Denver and Adams County communities would create a 1,500-acre pilot project on and around DEN to allow a wider spectrum of commercial uses than is currently permitted, ranging from retail and office parks to warehouses and manufacturing facilities. Additionally, land-use restrictions would be lifted on property edges of the airport and Denver and Adams County communities will jointly market these new commercial business opportunities to create jobs, enhance regional economic opportunities, and strengthen DEN’s global competitiveness.

- DEN and the Denver Fire Department broke ground on a new 18,000-square-foot fire station. The facility will be completed in the summer of 2016 and will allow rescuers to respond to areas farther away from the airfield including the radar control center, Peña Boulevard, Final Approach, the Westin Denver International Airport, and Regional Transportation District train stations.

DEN is on the cutting-edge of aviation technology. Notable announcements in 2015 included:

- The new Westin Denver International Airport, which is part of Starwood Hotels & Resorts Worldwide Inc., will be the first Starwood in the Denver area where guests will be able to unlock their room using their smartphone. The keyless app is the first keyless mobile entry system for hotels.

- DEN is undergoing a multiyear project to digitally catalog 18,000 structures, machines, and electronic systems and its maintenance histories. The maintenance data is tied into the building information modeling system that DEN unveiled in 2014, which is a virtual representation of the airport. The maintenance data is infused with the virtual model to give every cataloged item at DEN an exact recorded physical location. DEN is the only airport in the world to have such an extensive asset system in place.

- DEN has the fastest WiFi out of the top-seven busiest airports in the nation, according to Wefi. DEN is currently upgrading its public WiFi in the Jeppesen Terminal, which is slated for completion in 2016, and the airport will be investing an additional $2.5 million in upgrades throughout the airport.

**Key Company Announcements**

Several airlines and aviation companies expanded in 2015:

- United Airlines plans to consolidate its three pilot training locations in Denver. The Flight Training Center operations in Houston and Chicago will move to the current Denver training center in Stapleton. All of United’s 12,000 pilots will complete training at the facility, which will generate 69,000 business travel nights from these training visits. United will renovate the existing Denver facility and will add more than 200 positions in Denver through the end of 2017.

- United Airlines reinstated 40 furloughed ramp workers at DEN. The employees will help meet the operational needs for the spring and summer months.
AVIATION: Metro Denver and Northern Colorado Industry Cluster Profile

- Denver-based Frontier Airlines will nearly double its existing aircraft fleet from 56 to 101 over the next five years. These new aircraft will allow the carrier to grow in new markets, reduce its operating and fuel costs, and provide operational enhancements and increased reliability.
- FlightSafety International is the newest tenant at the Denver International Business Center. The flight training and simulator manufacturer plans to build a 108,000-square-foot facility that will include eight flight simulators. The company chose the location because of the proximity to its major clients.

Global Market Additions and Service Milestones
DEN added service to several international destinations and airlines celebrated service milestones in 2015:

- United Airlines began nonstop service between Denver and San Jose and Liberia, Costa Rica in December 2015. The two Costa Rican cities will provide a direct link to its hub of international commerce and will allow connections to other Latin American cities. The weekend flights will be offered between December and April.
- Lufthansa will begin nonstop service between Denver and Munich, Germany in May 2016. With an annual economic impact of $80 million, the Munich flight will provide efficient access to about 30 new European markets and will operate five times a week.
- Air Canada will begin a daily, nonstop flight between DEN and Montreal, Canada beginning June 2016. The Montreal-Denver flight will be the sixth Canadian destination from Denver.
- British Airways upgraded its nonstop Denver to London-Heathrow service in March 2015 to a Boeing 747 aircraft (from a Boeing 777 aircraft), representing a 23-percent increase in capacity.

Cross-Cluster Convergence
The nine-county region promotes collaboration and growth opportunities across industries such as aerospace, cleantech, broadcasting and telecommunications, and aviation.

- Fort Collins-based Woodward Inc. signed two partnership agreements in 2015. The company partnered with GE Aviation to develop fuel systems for GE’s large commercial aircraft engine lines. Woodward will develop, supply, design, and service fuel systems for the GE90, GEnx, GE9X, and all future large commercial engines developed by GE Aviation. Under the second agreement with France-based Aircelle, Woodward will manufacture hardware for the new Airbus A330neo. Woodward will design, develop, and manufacture a suite of locking and feedback actuators, flex shafts, and drive units.
- Englewood-based Gevo Inc. signed an agreement with Alaska Airlines to purchase Gevo’s renewable jet fuel and will fly the first-ever commercial flight on alcohol-to-jet fuel (ATJ). The demonstration flight will occur after Gevo receives American Society for Testing and Materials International certification for its ATJ, which can be integrated into existing distribution infrastructure and onto commercial aircraft.
- Broomfield-based Gogo Business Aviation will offer Gogo Biz 4G service for business jets in 2017, allowing passengers to stream video, send attachments with email, and use virtual private networks during flight. The company provides in-flight Internet service aboard 2,400 commercial airliners and 6,800 private planes.
- DEN plans to add 10 additional electric vehicle charging stations at its public parking garages, doubling the total available for airport passengers. The 240-volt stations are AC Level 2 chargers that provide up to 20 miles of range per hour.
- Launched in the fall of 2015, the Wings Aerospace Academy is a middle and future high school charter founded by Wings Over the Rockies Air and Space Museum to prepare students for careers in the aviation and aerospace industries. The school has a strong focus on science, technology, engineering and mathematics (STEM) programs and will blend hands-on experiences with online learning.

Spaceport Colorado
In 2015, 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 2016, 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, point-to-point travel, and unmanned aircraft systems (UAS). Spaceport Colorado has an abundance of surrounding land and convenient access to DEN and the region's sizeable aerospace industry, research universities, and talented aerospace workforce.

Unmanned Aircraft Systems (UAS)

The nine-county region is at the forefront of unmanned aircraft systems (UAS) development and deployment. In addition to the wealth of academic expertise, Colorado also has a vibrant base of commercial and military UAS activities. The region is an ideal geographic location for federal, state, and private UAS research and operations with support from a strong aerospace industry and variety of airspace, environmental conditions, and terrain. With UAS representing a growing portion of the nation's military budget, and commercial UAS operations set to expand rapidly, the U.S. Congress is encouraging the integration of UAS into the National Airspace System (NAS), which presents Colorado job growth and economic impact opportunities. The nine-county region's UAS assets and key project announcements in 2015 included:

- A collaborative effort involving six counties, the University of Colorado Boulder (CU-Boulder), and the nonprofit aerospace advocacy group—UAS Colorado—has paved the way for the launch and testing of two UAS in Colorado’s San Luis Valley. The FAA awarded two Certificates of Authorization (COA) for the aircraft to fly in an 8,000-square-mile air space in the San Luis Valley to heights of 15,000 feet. San Luis Valley’s Leach Airport in Center, Colorado, will be the primary operations hub for UAS testing in the valley, with participation by number of other airports scattered across the valley. CU-Boulder will test two types of UAS up to 15,000 feet, including a 120-pound UAS built by Lafayette-based Reference Technologies and a smaller UAS constructed by Boulder-based Black Swift Technologies.

- 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 engineers new mobile sensing systems, stimulates strategic discussions among leaders, increases public awareness of UAS, and educates and trains the next generation of engineers. As of 2015, RECUV has over 28 FAA COAs, more than any other U.S. university, for 12 different UAS with access to over 100,000 square miles of airspace. Deployments in 2015 took RECUV researchers across the globe. In May, RECUV teamed with researchers from the University of Nebraska-Lincoln and Texas Tech University. The consortium received a COA from the FAA to operate a Tempest drone over 54,000 square miles of the Texas and Oklahoma panhandles to better understand the origin and development of severe storms. In August, RECUV researchers deployed to Oliktok Point, Alaska to demonstrate how small, low-cost unmanned aerial vehicles (UAVs) can be used to study and measure the atmosphere in a harsh Arctic environment. In September, the National Science Foundation awarded RECUV a $1.9 million grant to develop autonomous aerial robotic systems that will enable new atmospheric science applications, including the behavior of severe storms. The aircraft can measure pressure, temperature, humidity, and wind velocity.

- 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.

- Westminster-based DigitalGlobe Inc., PrecisionHawk, Verizon, and Harris Corporation successfully completed the initial testing of high-performance airspace services for consumer and enterprise UAS. The companies integrated their technologies to serve as a pathway for UAS into the NAS.

- Denver-based Geotech Environmental Equipment Inc. acquired Golden-based LePtron Industrial Robotic Helicopters, Inc. and its UAS. The acquisition will allow Geotech to expand its worker safety and environmental monitoring devices for its military, police, fire, and search and rescue customers.
Fort Collins-based Remote GeoSystems Inc. unveiled its new video-mapping software for DJI Inspire 1 and Phantom 3 UAVs. The company’s software allows digital video data to be embedded onto a map from nearly any sensor on any drone, UAV, or UAS platform.

The U.S. Air Force Academy’s UAS program launched in 2009 as the first service academy to institute unmanned systems. The program’s cadet UAS instructor pilots work with the Expeditionary Survival and Evasion Training joint operations center to support cadets in the field, focusing on flight training and familiarization. Cadets also manage information gathered by the UAS and are trained in exercises involving identifying, planning, and carrying out missions. In 2015, the U.S. Air Force Academy signed a cooperative research and development agreement with Denver-based Aspect Robotics to help create commercially viable UAS and related technologies. The Academy will collaborate on new airframes, integration of sensors, and software development.

Aviation Workforce Profile

Many companies choose locations because of the available workforce. With nearly half of the nine-county region’s 3.7 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, 41.3 percent are college graduates and 90.5 percent have graduated from high school. The state has the nation’s second-most highly educated workforce as measured by the percentage of residents with a bachelor’s degree or higher.

The attractiveness of the region draws new residents through migration. The region’s population is expected to grow 59.9 percent from 2010 to 2040, driving a 36.3 percent increase in the region’s labor force over the same period. It is important to note the changing composition of the workforce supply as the baby boomers begin to retire, which will pose implications for businesses whose employee pool includes significant numbers of these workers.
The nine-county region’s aviation industry employs 16,880 people and includes a large pool of talented, well-educated, and highly skilled workers. The aviation cluster has a larger share of employees (72 percent) that are between the ages of 35 and 65 years and older, compared with the age distribution across all industries in the region (64.7 percent).

The aviation workforce supply consists of four main components: those currently working in the industry; those doing a similar type of job in some other industry; the unemployed; and those currently in the education pipeline. The Metro Denver and Northern Colorado 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**

The 2014 average annual salary for aviation employees in the nine-county region was $58,300, compared with the national average of $69,620. Total nine-county payroll in the aviation cluster exceeded $965 million in 2014.
institutions offering comprehensive curricula are located in the nine-county region. In addition, there are more than 100 private and religious accredited institutions and nearly 380 private occupational and technical schools offering courses in dozens of program areas throughout the state. 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.

- Colorado State University  
  www.colostate.edu
- Metropolitan State University of Denver  
  www.msudenver.edu
- University of Colorado: Boulder, Denver  
  www.cu.edu
- University of Denver  
  www.du.edu
- Colorado State University Global Campus  
  www.colostate.edu
- Red Rocks Community College  
  www.rrcc.edu
- Redstone College  
  www.redstone.edu
- Colorado School of Mines  
  www.mines.edu
- Regis University  
  www.regis.edu
- Front Range Community College  
  www frontrange.edu

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
   - Seven percent of the nation’s total passengers traveled through Denver International Airport (DEN) in 2014, making it the fifth-busiest airport in the nation. DEN also ranked 17th-busiest worldwide in 2014. (U.S. Bureau of Transportation Statistics, 2015; Airports Council International, 2015; and Denver International Airport, 2015)
   - Located on the 105th meridian, the nine-county region’s central location at the exact midpoint between Tokyo and Frankfurt positions the region favorably to serve growing world markets. Metro Denver is only 346 miles west of the geographic center of the continental United States, offering an excellent location for doing business with the entire nation. (Metro Denver Economic Development Corporation)
   - Encompassing 53 square miles of land, DEN is the largest airport site in North America and the second-largest international airport in the world by land size. (Denver International Airport, 2015)
   - The efficient layout of DEN’s six non-intersecting runways allows for multiple simultaneous aircraft movements, with six additional runways approved to meet future global demand. The airport has the ability to double its runways and facilities to serve 100 million passengers a year, with an additional 9,000 acres available for commercial development. (Denver International Airport, 2015)
   - DEN ranked as the eighth most-connected airport in the world in 2015 and seventh most-connected airport in North America. (OAG International, 2015)
   - DEN had the sixth-largest decline in average domestic airfare since the fourth quarter of 2000. The average domestic fare at DEN fell 40.4 percent between the fourth quarters of 2000 and 2014, while the average domestic fare declined 14.4 percent over the 14-year period. (U.S. Bureau of Transportation Statistics, 2015)
   - DEN ranked among the top-10 world’s best airports serving more than 50 million passengers and was recognized as the third-best airport in North America in 2015. DEN also ranked among the top-10 for the best airport staff in North America (second), the best regional airport in North America (second), the best domestic airport (fifth), and the world’s best regional airport (seventh). (Skytrax, 2015)
   - Colorado has the third-best economy in the nation and received accolades for its central location with strong aviation and telecommunications industries. (Business Insider, 2015)
   - 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. Aspen Distribution, Inc. operates the original site located near the former Stapleton Airport, and the second zone, WorldPort at DEN, is just minutes from DEN. The newest and largest zone geographically—Great Western Industrial Park in Windsor—connects to the Burlington Northern Santa Fe and Union Pacific rail lines via the Great Western Railway of Colorado. (City and County of Denver)
2. **Lower overall costs of doing business**

- Colorado's simplified corporate income tax structure based on single-factor apportionment allows companies to pay taxes based solely on their sales in the state. Along with few regulatory burdens, Colorado's corporate income tax rate of 4.63 percent is one of the lowest and most competitive tax structures in the nation. (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 employee in tax years between 2006 and 2023. (Colorado Department of Revenue)

- Legislation passed in 2014 supports Colorado’s business-friendly climate for aviation companies. The state 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 began a two-year phase out of its 3.62 percent sales and use tax on aviation parts in 2014. The exemption will bring new, high-paying aircraft maintenance jobs to Denver. (The City and County of Denver, 2014)

- The 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 No. 1 among Forbes’ 2015 “Best Places for Business and Careers.” Four other Colorado metropolitan areas were included on the list. The Fort Collins metro area ranked 10th, Boulder ranked 26th, Greeley ranked 33rd, and Colorado Springs ranked 37th. (Forbes, 2015)

- Colorado ranked fourth in CNBC's annual "Top States for Business" in 2015 and the state earned top-10 rankings in the categories that measure the economy (third), technology and innovation (fifth), access to capital (eighth), and quality of life (ninth). (CNBC, 2015)

- Colorado’s tax climate ranked eighth in the nation for entrepreneurship and small business. (Small Business & Entrepreneurship Council, 2015)

- Metro Denver office rental rates averaged $29.64 per square foot in the fourth quarter of 2015, making the region’s office market highly competitive with other major markets in the U.S. (CoStar Realty Information, The CoStar Office Report, 4Q 2015)

3. **Access to aviation-related training programs**

- The Aviation and Aerospace Science Department at Metropolitan State University of Denver (MSUD) is one of the largest and most advanced collegiate aviation programs in the country with programs tailored to meet workforce demands, and home to the state-of-the-art Robert K. Mock World Indoor Airport and Advanced Aviation and Aerospace Flight Simulation Training Lab.

- Opening in 2017, MSUD's new Aerospace and Engineering Sciences Building will revolutionize aerospace and advanced manufacturing education in Colorado by integrating aviation and aerospace-related programs into a state-of-the-art facility for training workers skilled in advanced aerospace design, manufacturing, and assembly.

- In 2015, MSUD collaborated with Irving, TX-based Envoy Air Inc.—a subsidiary of American Airlines—to launch a new aviation program that provides a direct pathway for students to earn flight hours needed to become an Envoy first officer while attending school. Under the agreement, students with a minimum of sophomore status will eventually progress to American Airlines when positions open.

- The nine-county region offers more than 20 flight training schools at Boulder Municipal Airport, Centennial Airport, Erie Municipal Airport, Fort Collins-Loveland Municipal Airport, Front Range Airport, and Rocky Mountain Metropolitan Airport. These schools provide pilot training, aviation instruction, and certification programs. (Metropolitan State University of Denver, 2015)

- MSUD and Aims Community College in Greeley are among 36 schools approved under the Federal Aviation Administration's Air Traffic Collegiate Training Initiative. (Federal Aviation Administration, 2015)

- Colorado-based Heli-Ops is one of the nation’s leading high altitude helicopter training centers and offers courses in 135 operations, Scenario Based Training facilitation, and advanced flight and Single Pilot Resource Management techniques. (Colorado Heli-Ops, 2015)

- Located adjacent to Rocky Mountain Metropolitan Airport, Redstone College offers programs in airframe and power plants (A&P) and avionics. Redstone is also one of the largest providers of newly licensed FAA A&P mechanics and offers students access to $7.5 million in training aids. (Redstone College)
4. An overall better quality of life
- Metro Denver ranked as the nation’s sixth-fittest metropolitan area in 2015. Denver’s access to the outdoors, high percentage of residents engaged in physical activity, and low obesity and diabetes rates contributed to its notable rank. (American College of Sports Medicine, 2015)
- Colorado’s extensive opportunities for outdoor recreation adventures and experiences support a healthy, active lifestyle. The state offers unlimited access to 22 million acres of national forests and expansive public lands, 42 state parks, more than 30 wilderness areas, and the highest concentration of 14,000-foot mountain peaks in the nation. (Colorado Tourism Office, 2015)
- Denver ranked seventh on the “2015 Best Large Cities to Live In.” Aurora (18th) was also named to the list. (WalletHub, 2015)
- Denver was named as the best city to live in the West in 2015, according to *MONEY Magazine*. The city was cited as a “mecca for millennials” with great access to recreation. Louisville ranked fourth and Erie ranked 13th among the best small towns to live in the U.S. (*MONEY Magazine*, 2015)
- FasTracks is a $7.4 billion project to build out Metro Denver’s entire mass transit system by 2019, adding 122 miles of rail rapid transit and extending existing routes. The expansion is the largest simultaneous transit build out in U.S. history and will make Metro Denver one of the top-five regions in the country in terms of miles of fixed rail.
- Metro Denver’s moderate temperatures, low humidity, and sunshine on almost 70 percent of the days each year provide an ideal climate for residents. (U. S. National Oceanic and Atmospheric Administration, National Climatic Data Center, 2015)

### Aviation Industry Cluster Definition

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<th>NAICS Description</th>
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<td>(P) Motorcycle, ATV, &amp; all other motor vehicle dealers</td>
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<td>Airports dealers</td>
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<td>Aircraft regulating agencies</td>
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<td>Aircraft regulating agencies</td>
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*(P) indicates that only part of the NAICS industry category is represented in the industry cluster definition.

Note: NEC indicates "not elsewhere classified."
AVIATION: Metro Denver and Northern Colorado Industry Cluster Profile

Aviation Industry Cluster Relationships

Support Industries
- Food Service
- Geospatial
- Government
- Hotels
- Maintenance
- Manufacturing
- Rail
- Security
- Trucking
- Warehousing

Technologies
- Flight Simulation
- GPS
- GIS
- Photonics
- Radar
- UAS

Infrastructure
- CO Airport Operators Assoc.
- CO Aviation Business Assoc.
- CO Pilots Assoc.
- CO Civil Air Patrol
- CO Dept. of Transportation – Aeronautics Division
- Metro Denver Aviation Coalition
- Metropolitan State University of Denver
- Redstone College of Aviation Tech
- Flight Training Schools

Client Industries
- Aerospace
- Air Ambulance
- Business Travelers
- Cargo/Couriers
- Distribution
- Firefighting
- Government
- Tourism/Consumers
- Warehousing

For additional information, contact us:

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BEVERAGE PRODUCTION:
Metro Denver and Northern Colorado Industry Cluster Profile

Industry Overview

The beverage production cluster plays an important role in the vitality of the nine-county Metro Denver and Northern Colorado region. Companies in the beverage production cluster manufacture malt beverages, wines, distilled liquors, bottled drinks, and ice products. The beverage production cluster supports business activities in several other industry sectors including agriculture, energy, and bioscience 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 region. Facilities include Ball Corporation's Metal Beverage Packaging Division in Golden, Wild Goose Canning Systems in Boulder, and the O-I glass manufacturing plant in Windsor.

The region has a long history as a leader in beverage production, particularly in America’s craft beer revolution. The MillerCoors Brewery in Golden was founded in Golden in 1873 by German brewery Adolph Coors and business partner and investor Jacob Schueler. His amber concoction, brewed with fresh Rocky Mountain water from 44 surrounding natural springs, became a favorite among locals earning its name “Miner’s Banquet.” Over the years, MillerCoors Brewery has become the largest single brewery in the world producing approximately 1.5 million gallons of beer per day with brands including Coors Banquet, Coors Light, Miller Genuine Draft, Miller Light, Blue Moon, and George Killian's Irish Red Lager.

Evolving consumer tastes and a focus on locally-sourced products have reshaped the beverage industry in recent years. Large producers have yielded significant market share as consumer preferences shift away from mass-market goods toward specialty beverages. As a result, consumers are opting for a growing variety of craft-style products due to their local flair, quality ingredients, and variety of style offerings. This trend is prominent in the brewing sector, where small microbreweries, microdistilleries, and craft labels have experienced strong growth despite declining sales in the mass market. Further, destination breweries are pairing the brewing experience with tourist attractions, and increasing members of suppliers and spinoff industries are driving growth in the region’s beverage production cluster.

The region's craft breweries and other entrepreneurial beverage companies are gaining market share and are attractive assets for acquisition from larger, mainstream companies. For example, Breckenridge Brewery was sold to Anheuser-Busch and will join The High End, Anheuser-Busch-InBev's unit of craft beer brands. The deal includes the new brewery and Farm House restaurant in Littleton, and the original brewpub and innovation center in the town of Breckenridge. Many craft brewers are expected to remain local and independent, while others will expand sales and increase interstate distribution.

The region is a leader in beverage production, which is concentrated along the Front Range. The region is home to one of the nation's largest herbal-tea manufacturers, Celestial Seasonings, and includes both large and small breweries, soft drink manufacturers, and numerous wineries and distilleries. According to the Brewers Association, Colorado ranked third in the nation for the number of craft breweries in 2014, with 235 including New Belgium Brewing Company, Odell Brewing Company, Oskar Blues Brewing, Avery Brewing Company, and many others. Colorado is home to more than 10 percent of the nation’s craft breweries and the state ranked first in the nation for output per capita. The state produced nearly 1.7 million barrels of craft brew, the third-highest production in the nation in 2014. Colorado’s craft breweries contributed $1.15 billion to the state’s economy in 2014. The state is expanding its international craft beer presence and exported more than 9,360 barrels of beer to international destinations, tripling the amount exported in 2012.

Almost every town along the Front Range celebrates its finest beverage and craft beer. The area between Denver, Boulder, and Fort Collins is often referred to as the “Napa Valley of Beer.” The national Brewer’s Association, located in Boulder, hosts the annual Great American Beer Festival (GABF) in Denver, which has been recognized by Guinness World Records as the largest commercial beer competition and beer festival in

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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.
BEVERAGE PRODUCTION:
Metro Denver and Northern Colorado Industry Cluster Profile

the world. GABF has a nearly $22 million annual economic impact to the City and County of Denver; the 34th annual event attracted 60,000 attendees and 750 U.S. breweries serving samples of about 3,500 beers in 2015. Coinciding with GABF, the Denver Beer Fest includes more than 200 beer tastings, beer-paired dinners, and nightly tapings throughout the city.

In addition to GABF, the region is home to numerous festivals supporting the craft beer industry. Imbibe LLC and the Colorado Brewers Guild hosted the second annual Sesh Fest at Sculpture Park in Denver. The session beer festival—beer that is roughly 5 percent alcohol by volume or less—featured 40 breweries offering low-alcohol beer styles, which supports the growing trend among craft beer drinkers. The 27th annual Colorado Brewers’ Festival in Fort Collins is the largest outdoor brewing festival in Colorado and one of the largest events of its kind in the nation, drawing more than 20,000 people. The event features over 100 Colorado beers, more than 50 Colorado breweries, live music, local vendors, and an interactive beer school with tastings and demonstrations. Another large festival, the Boulder Craft Beer Festival, hosts 26 local craft breweries.

Inspired by craft breweries, the region is also home to nearly 25 craft distilleries offering handcrafted rums, vodkas, whiskies, gins, and a variety of liquors. Many of the region’s distillers incorporate farm-fresh ingredients, practice sustainable farming methods, and use unique bottling methods. Stranahan’s Colorado Whiskey in Denver, the first microdistillery in Colorado, was one of the nation’s early craft whiskey distillers. Leopold Bros. is a family-owned and operated distillery in Denver and mills, mashes, and ferments all the grains in their spirits. The company has the largest traditional floor malting room of any distillery in the nation, where they malt Colorado barley onsite. Vapor Distillery in Boulder has the state’s largest copper pot still and manufactures award-winning spirits in small batches.

The region’s more than 50 wineries and meaderies have significant growth potential. While the state’s grape growing is concentrated along the Western Slope, the region’s winemakers often purchase grapes from vineyards in the Grand Valley and have grapes delivered to the winery during harvest to be crushed, pressed, and fermented onsite. Further, the region’s burgeoning wine industry generates significant economic activity annually for wine-based tourism and extends beyond Metro Denver and Northern Colorado, supporting economies outside the Front Range. Some of the region’s notable brands include The Infinite Monkey Theorem, Balistreri Vineyards, Redstone Meadery, and Mile High Winery. In the region, the Denver International Wine Festival in Broomfield showcases the largest selection of international and domestic wines of any grand tasting in the Rocky Mountain region. Proprietors and winemakers from around the world present more than 400 wines.

Craft cideries are also a growing trend in the region’s beverage industry. About a dozen cider makers operate in Colorado, with the majority operating along the Front Range. Like craft beer, consumers are attracted to the newer, bolder, and drier products. Denver-based Stem Ciders has more than tripled its production in the past two years and Denver-based Colorado Cider Co. increased production from 4,000 gallons in 2011 to 75,000 gallons in 2015.

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.

The nine-county region ranked third out of the 50 largest metro areas in beverage production employment concentration in 2015. With direct employment of about 8,640 beverage production employees, the region ranked fourth. About 86 percent of Colorado’s beverage production cluster employees work in the region.

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2 Employment concentration is the direct cluster employment in a region expressed as a percent of total employment in all industries in the same region. Employment concentration is calculated and ranked for the 50 largest metropolitan statistical areas (MSAs). Direct employment is the number of employees in the industry cluster in a region. No multiplier effects are included. Direct employment is estimated and ranked for the 50 largest MSAs.
BEVERAGE PRODUCTION:
Metro Denver and Northern Colorado Industry Cluster Profile

Beverage Production Employment and Company Profile, 2015

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<th>Nine-County Region</th>
<th>United States</th>
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<td>Direct employment, 2015</td>
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<td>Number of direct companies, 2015</td>
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<td>One-year direct employment growth, 2014-2015</td>
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<td>Five-year direct employment growth, 2010-2015</td>
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<td>Avg. annual direct employment growth, 2010-2015</td>
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<tr>
<td>Direct employment concentration</td>
<td>0.4%</td>
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</table>


Beverage Production Employment

The nine-county region’s beverage production employment (8,640 workers) rose 5.2 percent in 2015, compared with the previous year’s level, adding nearly 430 new jobs during the same period. National employment levels increased 5.1 percent over-the-year. The region employs 2.8 percent of the nation’s beverage production workforce. Between 2010 and 2015, the region’s beverage production employment rose 22.4 percent, compared with 19.7 percent at the national level. Beverage production companies employed 0.4 percent of the region’s total employment base, compared with a 0.2 percent employment concentration nationwide.

About 180 beverage production companies operated in the nine-county region in 2015. Nearly 45 percent of the region’s beverage production companies employed fewer than 10 people, while 3.9 percent employed 250 or more.
BEVERAGE PRODUCTION:
Metro Denver and Northern Colorado Industry Cluster Profile

Major Beverage Production Companies

- Allegro Coffee Company  
  [www.allegrocoffee.com](http://www.allegrocoffee.com)
- Anheuser-Busch InBev  
  [www.anheuser-busch.com](http://www.anheuser-busch.com)
- Avery Brewing Co.  
  [www.averybrewing.com](http://www.averybrewing.com)
- Breckenridge Brewery  
  [www.breckbrew.com](http://www.breckbrew.com)
- Celestial Seasonings  
  [www.celestialseasonings.com](http://www.celestialseasonings.com)
- Coca-Cola Company  
  [www.coca-cola.com](http://www.coca-cola.com)
- Dr. Pepper Snapple Group (7-Up Bottling)  
  [www.drpeppersnapplegroup.com](http://www.drpeppersnapplegroup.com)
- Eldorado Springs Water  
  [www.eldoradosprings.com](http://www.eldoradosprings.com)
- Meadow Gold Dairy  
  [www.meadowgold.com](http://www.meadowgold.com)
- MillerCoors  
  [www.millercoors.com](http://www.millercoors.com)
- Nestlé Waters North America  
  [www.nestle-watersna.com](http://www.nestle-watersna.com)
- New Belgium Brewing Company  
  [www.newbelgium.com](http://www.newbelgium.com)
- Niagara Bottling, LLC  
  [www.niagarawater.com](http://www.niagarawater.com)
- Odell Brewing Co.  
  [www.odellbrewing.com](http://www.odellbrewing.com)
- Oskar Blues Brewery  
  [www.oskarblues.com](http://www.oskarblues.com)
- Pepsi-Cola  
  [www.pepsico.com](http://www.pepsico.com)
BEVERAGE PRODUCTION:
Metro Denver and Northern Colorado Industry Cluster Profile

Major Beverage Production Companies Cont’d

- Fort Collins Brewery  
  [www.fortcollinsbrewery.com](http://www.fortcollinsbrewery.com)
- Stranahan’s Colorado Whiskey  
  [www.stranahans.com](http://www.stranahans.com)
- Left Hand Brewing Co.  
  [www.lefthandbrewing.com](http://www.lefthandbrewing.com)
- WhiteWave Foods  
  [www.whitewave.com](http://www.whitewave.com)

2015 Industry Highlights

Key Company Announcements

Numerous beverage producers expanded facilities and opened new locations in the region in 2015:

- Anheuser-Busch InBev will invest $45 million and will create 40 new, full-time manufacturing jobs at its Fort Collins brewery by 2018. The company plans to build a new canning line that will process 2,250 slim, 12-ounce cans per minute and will construct 25,000 square feet of warehouse space. Since 2011, more than $50 million has been invested in the Fort Collins brewery to add new capabilities, increase efficiencies, and sustain existing operations, including expansion of a brewhouse and fermentation cellar.
- Fort Collins-based New Belgium Brewing Co. broke ground on its $7 million expansion. The project will include office space, a tasting room, a beer garden, and an onsite healthcare facility for workers and their families.
- Mobb Mountain Distillers will open a new 1,000-square-foot production facility and tasting room in Fort Collins in 2016. The company’s products include single-malt whisky, rye dry gin, and rye white whisky.
- Upslope Brewing Company plans to open a new brewpub in Boulder in the fall of 2017. The company will use the new facility for experimental brewing, barrel aging, and will add a restaurant. The new brewpub will be located at the corner of 34th Street and Valmont Road, which will be part of the $180 million, 680,000-square-foot S’PARK development.
- Boulder-based FATE Brewing Co. will expand its capacity by moving into the former Avery Brewing Co. space. The company will increase production from 4,000 barrels a year to an additional 50,000 barrels, and will increase its fermentation capability by more than 80 percent.
- Skeye Brewing, Longmont’s eighth brewery, opened in June. The 3,600-square-foot space will include a seven-barrel brewhouse and a taproom.
- MillerCoors Blue Moon Brewing Co. will anchor a new, five-acre entertainment district in Denver’s River North neighborhood. The brewery will include a tasting room and will feature a two-barrel pilot system, which is slated for completion in 2016. Blue Moon Brewing Co. celebrated its 20th anniversary in 2015.
- New Belgium Brewing will open a 10-barrel, pilot brewery to make sour beers in The Source Hotel in Denver’s River North neighborhood in 2017. The brewery will operate on the ground floor of the hotel and will age its beer in barrels on the eighth-floor lounge, where it will operate a beer garden.
- Laws Whiskey House opened a second Denver facility to expand its operations. The distillery acquired 31,000 square feet at 13th and Cherokee streets to develop new products and age whisky beyond its current three-year profile.
- The historic Tivoli Brewing Co. and the Tivoli Distribution Company reopened in Denver after a 46-year hiatus. The new $7 million campus operation is the first full production brewery in the nation on a college campus and coincides with Metro State University of Denver’s new brewing degree programs. The facility includes a brewhery, taproom, and restaurant.
- TRVE Brewing opened its new production facility dedicated to sour and wild ales in Denver. The 5,000-square-foot Acid Temple includes a 10 barrel system, room for dozens of wooden barrels, and two 20-barrel stainless steel fermentation tanks.
- Crazy Mountain Brewing Co. opened its second Colorado location at the former Breckenridge Brewery headquarters in Denver. The 42,000-square-foot turn-key facility has the capacity to brew about 60,000 barrels of beer per year and includes a brewhouse, numerous fermentation tanks, and other infrastructure and equipment.
- Denver-based Renegade Brewing Co. opened a new production facility at The Yard on 1st and Santa Fe streets. The company’s capacity will increase from 15 barrels up to 60 barrels, with room to expand to 90 barrels.
- Pat’s Backcountry Beverages is expanding in Wheat Ridge into a 17,300-square-foot facility, allowing the company to more than double its employment base. The company develops microbrew concentrates and portable beverage carbonators for backpacking.
BEVERAGE PRODUCTION:
Metro Denver and Northern Colorado Industry Cluster Profile

- Golden-based Mountain Toad Brewing plans to build Toad Mesa, a 21,000-square-foot production and packaging facility in the Coors Technology Center. The facility will also include a small tasting room and beer garden. The project will bring 10 jobs and $800,000 in new capital investment to Jefferson County.
- El Rancho Brewing Company and Lariat Lodge Brewing opened in Evergreen. El Rancho Brewing opened in the historic El Rancho site and will include a 10-barrel brewing system and adjoining 500-seat restaurant. Lariat Lodge Brewing opened in the Evergreen Conference Center with a five-barrel brewing system and restaurant.

Destination Breweries

Several brewing companies in the nine-county region made major investments to become destination breweries, which offer a number of tourist attractions such as brewpubs, restaurants, special tours, gift shops, private event spaces, and beer gardens.

- Breckenridge Brewery opened its new $36 million, 12-acre headquarters facility in Littleton. The facility includes a brewhouse, barrel-aging room, pilot brewing system, tasting room, restaurant, and beer garden and will boost production from 120,000 barrels to 300,000 barrels each year.
- Boulder-based Avery Brewing Company opened a new $28 million facility in Gunbarrel. The new 67,000-square-foot facility is expandable up to 95,000 square feet for future projects and includes a taproom, a restaurant, gift shop, and outdoor patio.
- Great Divide Brewing Co. opened a new $38.2 million brewery in the River North neighborhood. The first phase of expansion includes a 65,000-square-foot bottling, canning, and kegging warehouse that could eventually produce up to 250,000 barrels of beer each year and a taproom. The second phase, which is slated for completion in 2017, will include a brewhouse, beer garden, and a skywalk to accommodate large tours. The brewery will operate alongside its current location in Denver’s Ballpark Neighborhood.

Beverage Production Suppliers

The region’s beverage production suppliers are expanding their businesses to meet the growing demand for high quality products.

- Fort Collins-based Limagrain Cereal Seeds launched a private barley breeding program in conjunction with Colorado farmers. The program aims to supply smaller brewers with a specific barley that is more robust than the typical grains aimed at larger brewers.
- Contract brewery Sleeping Giant opened a 70,000-square-foot production facility in Denver. The facility includes a 50-barrel brewhouse and 11 fermentation tanks, with the capacity to expand up to 175,000 barrels per year. Sleeping Giant produces beer for about a dozen craft breweries in Colorado and other western states.
- Inland Island Yeast Laboratories opened in Denver in 2014. The company is the fourth national yeast supplier and has about 300 strains, delivering twice the yeast cells as its competitors. Inland Island supplies three dozen local breweries and homebrew shops.
- One of the nation’s largest key suppliers for craft brewers, MicroStar Logistics, will relocate its headquarters from Greenwood Village to Denver’s River North neighborhood. The company will occupy 13,000 square feet of the new $30 million Gauge project.
- Lone Tree-based Keg Logistics received a major private equity investment that will allow the company to expand market reach and grow its business with existing craft brewers. Keg Logistics is the leading provider of keg leases to craft breweries around the world and has experienced accelerating annual growth for the last several years.

Academic and Education Announcements

The region’s higher education systems help prepare students for the beverage production industry with expanded academic program offerings.

- The Department of Chemistry and Biochemistry at the University of Northern Colorado began offering a new Brewing Laboratory Science program in 2015. The Program prepares students for work in the quality control and quality-assurance sector of beer brewing and offers an undergraduate certificate, a minor in Brewing Laboratory Science, and a laboratory program in a seven barrel microbrewery on campus.
BEVERAGE PRODUCTION:
Metro Denver and Northern Colorado Industry Cluster Profile

- Colorado State University (CSU) offers a Bachelor of Science in Fermentation Science and Technology. The major launched in 2013 and 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’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 tailors 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.
- New Belgium Brewing donated $1 million to CSU’s Fermentation Science and Technology program. The donation will be used to build the New Belgium Fermentation Science and Technology Laboratory that will house analytical, brewing, kitchen, and sensory-room space.
- Metropolitan State University of 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.
- Regis University launched 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 also will become certified beer judges through the national Beer Judge Certification Program.

Product Development and Market Expansions

The region’s beverage production companies developed new products and announced several market expansions in 2015:

- Denver-based The Infinite Monkey Theorem winery partnered with Whole Foods Market stores to sell its four canned wines in 10 states. The company will also partner with Target to sell its Dry Hopped Pear Cider cans to 360 stores in seven states.
- Denver-based Integrated Beverage Group acquired Oregon winery Stone Wolf Vineyards to help expand the reach of the company’s award-winning Rascal Pinot Noir, which is only available in limited markets. Integrated Beverage Group will provide innovative technology and distribution platforms for its collection of top wine brands.
- Boulder-based Celestial Seasonings launched several new lines of coffeehouse-style beverages. The brand’s new Celestial Lattes are available in both ready-to-drink bottles and concentrated formats, while new Celestial Teahouse Chai Teas are offered in traditional tea bags. The company also introduced its new Celestial Organics premium tea, which features nine new certified organic blends in two distinct lines: Herbal Teas and Teas for Wellness.

Industry Infrastructure Support

Numerous organizations in the nine-county region support the burgeoning beverage production industry.

- Boulder is home to the Brewers Association, a trade group dedicated to 1,900 small and independent brewers, focused on the promotion of craft beer and homebrewing. A division of the Brewers Association, the American Homebrewers Association (AHA), is a not-for-profit organization dedicated to promoting the homebrewers community for its more than 43,000 members. The AHA hosts the world’s largest international beer competition recognizing outstanding homebrewed beer, mead, and cider.
- Legislation passed in 2015 supports Colorado’s business-friendly climate for beverage companies. House Bill 1192 (2015) expanded the definition of entertainment districts in which restaurants and bars can share a common consumption area to include any other alcohol maker that operates a tap room. House Bill 1202 (2015) allows local licensing authorities to reissue licenses to alcoholic beverage sellers whose licenses have been expired less than six months, rather than restart the lengthy license renewal process. House Bill 1204 (2015) allows distilleries to apply for new licenses to operate pubs on their premises.
**Beverage Production Workforce Profile**

Many companies choose locations because of the available workforce. With nearly half of the nine-county region’s 3.7 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, 41.3 percent are college graduates and 90.5 percent have graduated from high school. The state has the nation’s second-most highly educated workforce as measured by the percentage of residents with a bachelor’s degree or higher.

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

*Source: U.S. Census Bureau, 2014 American Community Survey.*
The attractiveness of the region draws new residents through migration. The region’s population is expected to grow 59.9 percent from 2010 to 2040, driving a 36.3 percent increase in the region’s labor force over the same period. It is important to note the changing composition of the workforce supply as the baby boomers begin to retire, which will pose implications for businesses whose employee pool includes significant numbers of these workers.

The nine-county region’s beverage production industry employs 8,640 people and includes a large pool of talented, well-educated, and highly skilled workers. Compared with the age distribution across all industries in the region, the beverage production cluster has a larger share of employees in all age categories except the 16 to 24 years old and the 65 years and older categories.

The beverage production workforce supply consists of four main components: those currently working in the industry; those doing a similar type of job in some other industry; the unemployed; and those currently in the education pipeline. The Metro Denver and Northern Colorado 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.

**Wages**

The 2014 average annual salary for beverage production employees in the nine-county region was $60,520, compared with the national average of $52,550. Total nine-county payroll in the beverage production cluster exceeded $497 million in 2014.
Metro Denver and Northern Colorado Beverage Production Occupation & Salary Profile, 2015

<table>
<thead>
<tr>
<th></th>
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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>3,688</td>
<td>148</td>
<td>0</td>
<td>$26,770</td>
<td>$19,115</td>
<td>$21,632</td>
<td>$40,144</td>
<td>$55,536</td>
</tr>
<tr>
<td>2. Separating, filtering, clarifying, precipitating, &amp; still machine setters, operators, &amp; tenders</td>
<td>571</td>
<td>0</td>
<td>0</td>
<td>$48,710</td>
<td>$25,878</td>
<td>$33,634</td>
<td>$59,655</td>
<td>$68,231</td>
</tr>
<tr>
<td>4. Industrial machinery mechanics</td>
<td>3,078</td>
<td>87</td>
<td>0</td>
<td>$54,945</td>
<td>$30,762</td>
<td>$41,272</td>
<td>$66,067</td>
<td>$76,229</td>
</tr>
<tr>
<td>5. Retail salespersons</td>
<td>44,344</td>
<td>2,046</td>
<td>6</td>
<td>$23,042</td>
<td>$18,115</td>
<td>$19,537</td>
<td>$29,958</td>
<td>$43,441</td>
</tr>
<tr>
<td>6. Laborers &amp; freight, stock, &amp; material movers, hand</td>
<td>19,269</td>
<td>788</td>
<td>0</td>
<td>$23,288</td>
<td>$17,923</td>
<td>$19,818</td>
<td>$26,959</td>
<td>$33,034</td>
</tr>
<tr>
<td>7. Industrial truck &amp; tractor operators</td>
<td>4,209</td>
<td>210</td>
<td>0</td>
<td>$22,432</td>
<td>$17,886</td>
<td>$19,300</td>
<td>$29,958</td>
<td>$48,038</td>
</tr>
<tr>
<td>8. Driver/sales workers</td>
<td>4,704</td>
<td>87</td>
<td>3</td>
<td>$22,432</td>
<td>$17,886</td>
<td>$19,300</td>
<td>$29,958</td>
<td>$33,034</td>
</tr>
<tr>
<td>9. Farmworkers &amp; laborers, crop, nursery, &amp; greenhouse</td>
<td>2,270</td>
<td>100</td>
<td>0</td>
<td>$23,288</td>
<td>$17,923</td>
<td>$19,818</td>
<td>$26,959</td>
<td>$33,034</td>
</tr>
<tr>
<td>10. Heavy &amp; tractor-trailer truck drivers</td>
<td>15,816</td>
<td>840</td>
<td>0</td>
<td>$42,690</td>
<td>$30,191</td>
<td>$35,334</td>
<td>$51,550</td>
<td>$61,609</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 2015.3 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 nearly 380 private occupational and technical schools offering courses in dozens of program areas throughout the state. 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.

- Colorado State University [www.colostate.edu](http://www.colostate.edu)
- Johnson & Wales University-Denver [www.jwu.edu](http://www.jwu.edu)
- University of Colorado Denver [www.ucdenver.edu](http://www.ucdenver.edu)
- Colorado Technical University-Greenwood Village [www.coloradotech.edu](http://www.coloradotech.edu)
- Metropolitan State University of Denver [www.msudenver.edu](http://www.msudenver.edu)
- University of Denver [www.du.edu](http://www.du.edu)
- DeVry University – Colorado [www.devry.edu](http://www.devry.edu)
- Red Rocks Community College [www.rrcc.edu](http://www.rrcc.edu)
- University of Northern Colorado [www.unco.edu](http://www.unco.edu)
- Front Range Community College [www.frontrange.edu](http://www.frontrange.edu)
- Regis University [www.regis.edu](http://www.regis.edu)
BEVERAGE PRODUCTION:
Metro Denver and Northern Colorado Industry Cluster Profile

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 was named the best beer city in America in 2015. The city’s hosting of the Great American Beer Festival, home brewing, brewery opening activity, and beer-drinking venues contributed to its high rank. (CNN, 2015)
   - Denver ranked second among the "10 Best Beer Cities" in 2014. Denver’s innovative and award-winning breweries and a high quality of life contributed to its notable ranking. (Livability.com, 2015)
   - Denver ranked as the ninth-best city for craft beer in 2015. *(Travel + Leisure, 2015)*
   - Colorado ranked among the top-five states for the number of craft distilleries in the nation. *(American Distilling Institute, 2015)*
   - Colorado is home to six of the 50 largest breweries in the U.S. *(Brewers Association, 2015)*
   - Oskar Blues Brewing in Longmont and Zephyr Brewing Co. in Denver ranked among the 2014 “Best American Craft Breweries A to Z.” Further, Boulder-based Avery Brewing Co. and Fort Collins-based New Belgium Brewing Co. ranked among the best 19 breweries to visit in the nation. *(Thrillist, 2015)*
   - Colorado’s grape-growing regions are the highest in the Northern Hemisphere and among the highest in the world. *(Colorado Wine Industry Development Board, 2015)*
   - The economic impact of Colorado’s wine industry totaled more than $144 million in 2013, supporting 1,670 direct and indirect jobs. The state is home to 108 wineries, with more than half along the Front Range. *(Colorado Wine Industry Development Board, 2015)*
   - Colorado is the crossroads of major Interstate highways (I-25, I-70, and I-76), and has numerous state and federal highways that serve a critical function in supporting interstate commerce. Colorado’s highways provide direct access to the east and west coasts, the Midwest, and the international borders of Canada and Mexico. *(Colorado Office of Economic Development and International Trade, 2015)*
   - Seven percent of the nation’s total passengers traveled through Denver International Airport (DEN) in 2014, making it the fifth-busiest airport in the nation. DEN also ranked 17th-busiest worldwide in 2014. *(U.S. Bureau of Transportation Statistics, 2015; Airports Council International, 2015; Denver International Airport, 2015)*

2. **An overall better quality of life**
   - Colorado is the leanest state with the nation’s lowest rate of adult obesity (21.3 percent). *(Trust for America’s Health, 2015; Robert Wood Johnson Foundation, 2015)*
   - Colorado has the highest rate of physical activity in the nation with more than 60 percent of the state’s adults participating in weekly moderate or vigorous physical activity. *(The Henry J. Kaiser Family Foundation, 2015)*
   - Denver was named as the best city to live in the West in 2015, according to *MONEY Magazine*. The city was cited as a “mecca for millennials” with great access to recreation. Louisville ranked fourth and Erie ranked 13th among the best small towns to live in the U.S. *(MONEY Magazine, 2015)*
   - FasTracks is a $7.4 billion project to build out Metro Denver’s entire mass transit system by 2019, adding 122 miles of rail rapid transit and extending existing routes. The expansion is the largest simultaneous transit build out in U.S. history and will make Metro Denver one of the top-five regions in the country in terms of miles of fixed rail.
   - Metro Denver’s moderate temperatures, low humidity, and sunshine on almost 70 percent of the days each year provide an ideal climate for residents. *(U.S. National Oceanic and Atmospheric Administration, National Climatic Data Center, 2015)*

3. **Low to moderate costs of doing business and a competitive tax structure**
   - Colorado’s simplified corporate income tax structure based on single-factor apportionment allows companies to pay taxes based solely on their sales in the state. Along with few regulatory burdens, Colorado’s corporate income tax rate of 4.63 percent is one of the lowest and most competitive tax structures in the nation. *(State of Colorado; The Tax Foundation)*
   - Colorado’s tax climate ranked eighth in the nation for entrepreneurship and small business. *(Small Business & Entrepreneurship Council, 2015)*
   - Colorado has the fifth-lowest beer excise tax (8 percent) in the nation. *(The Tax Foundation, 2015)*
Metro Denver ranked No. 1 among Forbes’ 2015 “Best Places for Business and Careers.” Four other Colorado metropolitan areas were included on the list. The Fort Collins metro area ranked 10th, Boulder ranked 26th, Greeley ranked 33rd, and Colorado Springs ranked 37th. (Forbes, 2015)

The Denver-Aurora-Broomfield metropolitan statistical area ranked first overall for economic development and job growth in the “Leading Locations for 2015” list. The Greeley and Boulder metro areas were also named to the list’s top-10. Areas recognized in the study have strong pro-business environments and a highly skilled workforce. (Area Development, 2015)

Denver ranked as the 10th-most business-friendly city in 2014 and had the third-best business climate among the nation’s 100 largest cities. (MarketWatch.com, 2015)

Colorado ranked as the No. 5 small-business-friendly state in the nation. Fort Collins and Boulder ranked among the top-10 cities nationally, earning “A” grades for overall friendliness. (Thumbtack.com, 2015; Ewing Marion Kauffman Foundation, 2015)

**Beverage Production Industry Cluster Definition**

<table>
<thead>
<tr>
<th>NAICS Code*</th>
<th>NAICS Description</th>
<th>SIC Code</th>
<th>SIC Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>311411</td>
<td>Frozen fruit, juice, &amp; vegetable mfg.</td>
<td>2037-02</td>
<td>Fruit juices</td>
</tr>
<tr>
<td>311421</td>
<td>Fruit &amp; vegetable canning</td>
<td>2033-0405</td>
<td>Vegetable juices: concentrated, hot pack</td>
</tr>
<tr>
<td>311421</td>
<td>Fruit &amp; vegetable canning</td>
<td>2033-0406</td>
<td>Vegetable juices: fresh</td>
</tr>
<tr>
<td>311421</td>
<td>Fruit &amp; vegetable canning</td>
<td>2033-0407</td>
<td>Vegetable juices: packaged in cans, jars, etc.</td>
</tr>
<tr>
<td>311511</td>
<td>Fluid milk mfg.</td>
<td>2026</td>
<td>Fluid milk</td>
</tr>
<tr>
<td>311514</td>
<td>Dry, condensed, &amp; evaporated dairy product mfg.</td>
<td>2026</td>
<td>Fluid milk</td>
</tr>
<tr>
<td>311920</td>
<td>Coffee &amp; tea mfg.</td>
<td>2095</td>
<td>Roasted coffee</td>
</tr>
<tr>
<td>311920</td>
<td>Coffee &amp; tea mfg.</td>
<td>2099-9917</td>
<td>Tea blending</td>
</tr>
<tr>
<td>311930</td>
<td>Flavoring syrup &amp; concentrate mfg.</td>
<td>2087-02</td>
<td>Beverage bases, concentrates, syrups, powders &amp; mixes</td>
</tr>
<tr>
<td>312111</td>
<td>Soft drink mfg.</td>
<td>2086</td>
<td>Bottled &amp; canned soft drinks</td>
</tr>
<tr>
<td>312112</td>
<td>Bottled water mfg.</td>
<td>2086</td>
<td>Bottled &amp; canned soft drinks</td>
</tr>
<tr>
<td>312113</td>
<td>Ice mfg.</td>
<td>2097</td>
<td>Manufactured ice</td>
</tr>
<tr>
<td>312120</td>
<td>Breweries</td>
<td>2082</td>
<td>Malt beverages</td>
</tr>
<tr>
<td>312130</td>
<td>Wineries</td>
<td>2084</td>
<td>Wines, brandy, &amp; brandy spirits</td>
</tr>
<tr>
<td>312140</td>
<td>Distilleries</td>
<td>2085</td>
<td>Distilled &amp; blended liquors</td>
</tr>
</tbody>
</table>

*(P) indicates that only part of the NAICS industry category is represented in the industry cluster definition.
BEVERAGE PRODUCTION:
Metro Denver and Northern Colorado Industry Cluster Profile

Beverage Production Industry Cluster Relationships

Support Industries
- Agriculture
- Bioscience
- Bottling
- Distribution
- Energy
- Manufacturing
- Packaging
- Retail
- Software
- Transportation
- Warehousing

Technologies
- Digital & Social Media
- Fermentation
- Mobile Computers & Printers
- Pasteurization
- Preservatives
- Process Computerization
- Refrigeration
- RFID
- Robotics
- Water Treatment

Infrastructure
- Brewers Association
- Colorado Beverage Association
- Colorado Brewers Guild
- Colorado Department of Agriculture
- Colorado Distillers Guild
- Colorado Wine Industry Development Board
- Rocky Mountain Cider Association
- Water Resources

Client Industries
- Businesses
- Consumers

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

Industry Overview

The nine-county Metro Denver and Northern Colorado region\(^1\) is the life science center for the Rocky Mountain region, with support from leading research institutions, scientific talent, and bioscience companies. The region’s entrepreneurial infrastructure and industry collaboration fosters innovation to create new bioscience technologies from the laboratory to the marketplace. The bioscience cluster is diverse in both size and scope, including companies that research, develop, and distribute products and services ranging from cutting-edge pharmaceuticals, medical devices, and diagnostics to veterinary supplies and chemical testing kits. The bioscience industry contributes to the growth and advancements of other industries including healthcare and wellness, energy, information technology, and agriculture in the region.

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. With nearly 15,230 bioscience workers in more than 670 companies, the bioscience cluster offers numerous opportunities in both academic and clinical discovery and contributes to the region’s overall economic productivity. 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 more than 1,070 workers in 110 companies in the region and grew 7.6 percent between 2010 and 2015, compared with a 1.1 percent increase nationwide.

The nine-county region is home to numerous public and private bioscience research and innovation assets, including:

- The Anschutz Medical Campus of the University of Colorado Denver (CU-Denver)
- National Jewish Health
- The Colorado Clinical and Translational Sciences Institute
- The Barbara Davis Center for Diabetes
- The Charles C. Gates Center for Regenerative Medicine and Stem Cell Biology
- The Rocky Mountain Lions Eye Institute
- The Linda Crnic Institute for Down Syndrome
- The Marion Downs Hearing Center
- The Eleanor Roosevelt Institute
- The Webb-Waring Center
- The Centers for Disease Control and Prevention’s National Center for Zoonotic, Vector-Borne, and Enteric Diseases in Fort Collins
- Colorado State University’s (CSU) Seed Laboratory and Animal Reproduction and Biotechnology Laboratory
- The BioFrontiers Institute at the University of Colorado Boulder (CU-Boulder)

The University of Colorado and CSU have created a collaboration of bioscience programs to coordinate bioscience research and commercialize innovative research technologies including the Colorado Institute for Drug, Device and Diagnostic Development (CID4), the Colorado Center for Drug Discovery (C2D2), the BioFrontiers Institute, the Center for Computational Biology, the Center for Translational Pharmacokinetics and Pharmacogenomics, and the Center for Pharmaceutical Biotechnology.

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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.
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.

The nine-county region ranked 11th out of the 50 largest metro areas for medical devices and diagnostics employment concentration in 2015. With direct employment in the medical devices and diagnostics subcluster of about 10,820 employees, the region ranked eighth. Eighth-four percent of Colorado’s medical devices and diagnostics employees work in the nine-county region.

Medical Devices and Diagnostics Employment and Company Profile, 2015

<table>
<thead>
<tr>
<th>Nine-County Region</th>
<th>United States</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct employment, 2015</td>
<td>10,820</td>
</tr>
<tr>
<td>Number of direct companies, 2015</td>
<td>340</td>
</tr>
<tr>
<td>One-year direct employment growth, 2014-2015</td>
<td>2.8%</td>
</tr>
<tr>
<td>Five-year direct employment growth, 2010-2015</td>
<td>10.0%</td>
</tr>
<tr>
<td>Avg. annual direct employment growth, 2010-2015</td>
<td>1.9%</td>
</tr>
<tr>
<td>Direct employment concentration</td>
<td>0.6%</td>
</tr>
</tbody>
</table>


Medical Devices and Diagnostics Employment

The nine-county region’s medical devices and diagnostics subcluster employment (10,820 workers) rose 2.8 percent in 2015, compared with the previous year’s level, adding 290 new jobs during the same period. National employment levels increased 2.4 percent over-the-year. The region employs 2.4 percent of the nation’s medical devices and diagnostics workforce. Between 2010 and 2015, the region’s medical devices and diagnostics employment rose 10 percent, compared with 4.3 percent at the national level. Medical devices and diagnostics companies employed 0.6 percent of the region’s total employment base, compared with a 0.3 percent employment concentration nationwide.

About 340 medical devices and diagnostics companies operated in the nine-county region in 2015. Approximately 65 percent of the region’s medical devices and diagnostics companies employed fewer than 10 workers, while 2.3 percent employed 250 or more.

Employment concentration is the direct cluster employment in a region expressed as a percent of total employment in all industries in the same region. Employment concentration is calculated and ranked for the 50 largest metropolitan statistical areas (MSAs). Direct employment is the number of employees in the industry cluster in a region. No multiplier effects are included. Direct employment is estimated and ranked for the 50 largest MSAs.
**Major Medical Devices and Diagnostics Companies**

- AlloSource  
  [www.allosource.org](http://www.allosource.org)
- Baxter Corporation  
  [www.baxter.com](http://www.baxter.com)
- Biodex  
  [www.biodex.com](http://www.biodex.com)
- Cochlear Americas  
  [www.cochlear.com/us](http://www.cochlear.com/us)
- GE Healthcare  
  [www3.gehealthcare.com](http://www3.gehealthcare.com)
- Hach Company  
  [www.hach.com](http://www.hach.com)
- Lake Region Medical (formerly Accellent)  
  [www.lakeregionmedical.com](http://www.lakeregionmedical.com)
- nSpire Health, Inc.  
  [www.nspirehealth.com](http://www.nspirehealth.com)
- Particle Measuring Systems  
  [www.pmeasuring.com](http://www.pmeasuring.com)
- Sharklet Technologies, Inc.  
  [www.sharklet.com](http://www.sharklet.com)
- SomaLogic, Inc.  
  [www.somalogic.com](http://www.somalogic.com)
- Sparton Medical Systems  
  [www.sparton.com](http://www.sparton.com)
- Surefire Medical Inc.  
  [www.surefiremedical.com](http://www.surefiremedical.com)
- Terumo BCT, Inc.  
  [www.terumobct.com](http://www.terumobct.com)
BIOSCIENCE: Metro Denver and Northern Colorado Industry Cluster Profile

Major Medical Devices and Diagnostics Companies Cont’d

- LivaNova PLC (formerly Sorin Group)  
  www.livanova.com
- Medtronic PLC  
  www.medtronic.com
- Water Pik, Inc.  
  www.waterpik.com
- Zimmer BioMet  
  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.

With direct employment in the pharmaceuticals and biotechnology subcluster of about 4,410 workers, the nine-county region ranked 17th out of the 50 largest metro areas in 2015. The region ranked 27th for pharmaceuticals and biotechnology employment concentration. About 94 percent of Colorado’s pharmaceuticals and biotechnology employees work in the nine-county region.

Pharmaceuticals and Biotechnology Employment and Company Profile, 2015

<table>
<thead>
<tr>
<th>Nine-County Region</th>
<th>United States</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct employment, 2015</td>
<td>4,410</td>
</tr>
<tr>
<td>Number of direct companies, 2015</td>
<td>330</td>
</tr>
<tr>
<td>One-year direct employment growth, 2014-2015</td>
<td>-4.3%</td>
</tr>
<tr>
<td>Five-year direct employment growth, 2010-2015</td>
<td>-6.8%</td>
</tr>
<tr>
<td>Avg. annual direct employment growth, 2010-2015</td>
<td>-1.4%</td>
</tr>
<tr>
<td>Direct employment concentration</td>
<td>0.2%</td>
</tr>
</tbody>
</table>


3 Direct employment is the number of employees in the industry cluster in a region. No multiplier effects are included. Direct employment is estimated and ranked for the 50 largest metropolitan statistical areas (MSAs). Employment concentration is the direct cluster employment in a region expressed as a percent of total employment in all industries in the same region. Employment concentration is calculated and ranked for the 50 largest MSAs.
Pharmaceuticals and Biotechnology Employment

The pharmaceuticals and biotechnology subcluster continues to change in response to a challenging regulatory environment and international demand pressures. As a result, some of the region’s companies have reduced employment and closed locations. The nine-county region’s pharmaceuticals and biotechnology subcluster employment (4,410 workers) declined 4.3 percent in 2015, compared with the previous year’s level. National employment levels rose 1.6 percent over-the-year.

About 330 pharmaceuticals and biotechnology companies operated in the nine-county region in 2015. Nearly 73 percent of the region’s pharmaceuticals and biotechnology companies employed fewer than 10 people, while 0.6 percent employed 250 or more.

Pharmaceuticals & Biotechnology Employment by County, 2015

- Boulder 28.7%
- Larimer 27.2%
- Broomfield 16.1%
- Denver 8.8%
- Jefferson 5.4%
- Arapahoe 4.7%
- Douglas 1.5%
- Weld 1.4%
- Adams 6.2%

Pharmaceuticals & Biotechnology Employment by Category, 2015

- Pharmaceutical Preparation Mfg. 50.5%
- Biotechnology Research & Development 32.5%
- Medicinal & Botanical Mfg. 11.4%
- Biological Product Mfg. 5.6%
- Pharmaceutical Preparation Mfg. 50.5%

Sources: Market Analysis Profile, 2015; Development Research Partners.
BIOSCIENCE: Metro Denver and Northern Colorado Industry Cluster Profile

Major Pharmaceuticals and Biotechnology Companies

- Array BioPharma Inc.
  www.arraybiopharma.com
- Colorado Serum Company
  www.colorado-serum.com
- Corden Pharma Colorado Inc.
  www.cordenpharma.com
- GlobelImmune, Inc.
  www.globelimmune.com
- Heska Corporation
  www.heska.com
- Pfizer Inc. (formerly Hospira, Inc.)
  www.pfizer.com
- Sandoz, Inc.
  www.sandoz.com
- Silvergate Pharmaceuticals
  www.silvergatepharma.com
- Spectrum Pharmaceuticals
  www.sppirx.com
- TOLMAR, Inc.
  www.tolmar.com

2015 Industry Highlights

Bioscience Research and Innovation Assets

Colorado’s bioscience cluster is anchored by the 578-acre Fitzsimons campus, which includes the adjacent Anschutz Medical Campus and the Fitzsimons Innovation Campus. The $5.2 billion project is one of the largest bioscience developments in the nation and encompasses more than six million square feet of corporate and bioresearch facility space for companies and firms focusing on the science and technology sectors. Located just 20 minutes from Denver International Airport and downtown Denver, the 184-acre Fitzsimons Innovation Campus is home to nearly 50 bioscience companies, offering the opportunity to locate in pre-built laboratories and furnished office space or build-to-suit space. The Bioscience Park Center is home to the BioBusiness Incubator and Accelerator facilities located within the campus, featuring turnkey facilities for research, business development, and product commercialization. The Bioscience East facility features new laboratory space, including biological and chemical fume hoods, fully-furnished offices, and a large dock area. In 2015, the Fitzsimons Redevelopment Authority and the University of Colorado’s bioengineering program opened the new Bioscience 2 building at the Anschutz Medical Campus. The 112,000-square-foot building includes the bioengineering program, as well as commercial space for established bioscience firms. Precision Biopsy was the first commercial company to move into the new Bioscience 2 building, which allows the company to expand from the pre-built lab in Bioscience 1 as they initiate a global commercialization strategy for its real-time tissue classification technology used in prostate biopsy procedures.

The Anschutz Medical Campus also includes facilities for University Physicians, Inc., and the Schools of Medicine, Nursing, Dental Medicine, Pharmacy, and Public Health. Located adjacent to the Anschutz Medical Campus is the U.S. Department of Veterans Affairs (VA) Eastern Colorado Healthcare System hospital and facilities. Construction began in 2011 on the new VA Hospital that will replace the existing facility in Denver and is slated for completion in early 2018. The award-winning Children’s Hospital Colorado is also adjacent to the campus.

Northern Colorado is a hub for accelerators and incubators that facilitate scientific collaboration and commercialization of new discoveries. Located in Colorado State University’s (CSU) Judson Harper Research Complex, the Research Innovation Center (RIC) serves as a vehicle to perform translational-stage research with the life sciences community and includes a state-of-the-art, wet research laboratory capable of manufacturing clinical-grade vaccines or biologics. 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. Headquartered in a 30,000-square-foot innovation center in Fort Collins, Innosphere also has satellite locations at CSU, INDUSTRY Denver, and the Colorado Center for Renewable Energy Economic Development in Golden to better serve entrepreneurs. Innosphere currently assists 39 entrepreneurial startups—including 11 bioscience companies—raise capital, assemble solid management teams, develop partners, and connect with academic and governmental institutions.

- Northern Colorado supports the region’s bioscience hub through the efforts of CSU, the University of Colorado Health (UCHealth), the cities of Fort Collins and Loveland, 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.
- CSU’s Flint Animal Cancer Center is an internationally recognized leader in clinical veterinary oncology and cancer research and is a flagship program for CSU’s College of Veterinary Medicine and Biomedical Sciences through its translational research.
CSU broke ground on new biology and chemistry research buildings. The $136 million facilities will add 200,000 square feet of teaching and research laboratories, an auditorium, classrooms, computer labs, student study spaces, and an academic advising center. The two buildings are slated for completion in the fall of 2017.

The University of Northern Colorado’s (UNC) College of Natural and Health Sciences received a $75,000 grant from the Colorado Department of Higher Education to increase recruitment, retention, and graduation rates of racial and ethnic minority students in science, technology, engineering and mathematics (STEM) fields. The grant will create a two-week summer program to allow up to 24 incoming minority students from local high schools to work with professionals in biomedical science fields.

**Key Company Announcements**

The nine-county region is home to a vibrant bioscience hub, with a critical mass of bioscience companies expanding their presence in 2015.

- AstraZeneca, a European biotechnology firm, purchased Amgen Inc.’s LakeCentre production facility in Boulder. The facility could be operational and licensed for commercial production by late 2017, providing additional capacity within the company’s biologics operations.
- Fort Collins-based TOLMAR Inc. plans to add 50 manufacturing, quality assurance, production, and facility maintenance positions at its facilities in Loveland and Windsor. The company recently secured additional warehouse space in Loveland and anticipates further staffing needs in 2016 and beyond.
- Bangalore, India-based Strand opened its U.S. headquarters at the Fitzsimons Innovation Campus. The new Strand site will employ 20 people and will develop Strand Advantage, a test that analyzes genomic change in solid tumors.
- Loveland-based Hach Company plans to build an 86,000-square-foot research and development center on its campus near the Fort Collins-Loveland Municipal Airport. The company will move 130 workers from its current facility to the new adjacent building, bringing 50 employees from Fort Collins and another 20 from out-of-state. As many as 20 new employees would be hired each year over the next six years, with an annual salary of $80,000.
- Boulder-based PanTheryx Inc. plans to hire 25 to 30 employees over the next year with the help of a new multicountry distribution deal with Dr. Reddy’s Laboratories Ltd. The 16-worker company produces a nutritional powder aimed at treating infectious diarrhea.
- Nuventra Pharma Sciences opened an office in Broomfield as part of the company’s expansion into industry hotspots. The company provides consulting services for companies in the pharmacology, pharmacokinetic, and pharmometric spaces as they work their way through clinical trials.
- Boulder Scientific Co. will build a 4,000-square-foot research and development laboratory within its Longmont office facility, which is slated for completion in mid-2016. The company will relocate some existing scientists to the laboratory, as well as new hires.

**Agricultural Biotechnology Announcements**

Northern Colorado is an ideal location for agricultural biotechnology companies to grow and expand.

- Cargill opened a new $10 million, 45,700-square-foot seed research and development facility in Fort Collins. The Specialty Seeds and Oils Innovation Center will employ 48 people and will house offices, laboratory space, a dedicated seed wing, seed storage space, and a training facility.
- Centennial-based Penford Corp. was sold to Illinois-based Ingredion Inc. The $340 million deal will build the company’s presence in nature-based hydrocolloid ingredients and will expand its manufacturing of specialty potato starches.

**Innovative Technologies and Regulatory Approvals**

The region’s bioscience companies launched cutting-edge technologies and received notable regulatory approvals to accelerate and support product commercialization.

- Fort Collins-based KromaTiD Inc. signed an agreement with Tokyo Future Style to distribute its proprietary dGHTM and Pinpoint FISHTM products and services throughout Japan. The products and services will provide Japanese customers with clear advantages in the fields of gene target discovery and mutation validation.
- Englewood-based Aytu BioScience, Inc. partnered with European distributors Eurobio, Una Health Limited, and THP Medical to offer the RedoxSYS™ Diagnostic System to prominent academic and pharmaceutical-based research centers. The RedoxSYS™ Diagnostic System is a diagnostic platform
BIOSCIENCE: Metro Denver and Northern Colorado Industry Cluster Profile

and robust research tool capable of measuring oxidation-reduction potential in the body in response to injury, illness, or stress.

- The U.S. Patent and Trademark Office issued a notice of allowance for Broomfield-based MicroBiome Therapeutics™ LLC’s patent application for the use of glyceollins to treat metabolic disorders, including diabetes and obesity, and their potential role in modulating the gastrointestinal microbiome. Glyceollin I, II, and III are molecular natural products made by soy plants under certain environmental conditions to help combat infectious organisms and other stressors.

- Ampio Pharmaceuticals received a U.S. Food and Drug Administration (FDA) Special Protocol Assessment for its Ampion™ treatment for knee osteoarthritis and began the second phase III pivotal trial of the drug. The assessment significantly reduces the risk of bringing a drug to market.

- Broomfield-based Accera Inc. began a clinical trial for its new drug to treat Alzheimer’s disease. Results from Accera’s first phase III trial of the drug, AC-1204, will start in 2016. If the results are promising, the company could file for a new FDA application in 2019 and the drug will be available as early as 2020.

- Broomfield-based Colibri Heart Valve LLC received a U.S. patent for a transcatheter heart valve that is implanted via a needle-puncture. With the patent, Colibri will expedite the development of a self-expanding heart-valve to complement its clinical-stage balloon expandable heart valve technology for aortic, mitral, and pulmonary applications.

- Westminster-based Cerapedics, Inc. received FDA approval for its i-FACTOR™ Peptide Enhanced Bone Graft for use in anterior cervical disectomy and fusion procedures in patients with degenerative cervical disc disease. i-FACTOR™ is the first bone graft to receive approval for use in the cervical spine and the only second premarket approved bone graft in the spine.

- Greenwood Village-based Silvergate Pharmaceuticals Inc. submitted two drugs to the FDA in 2015 and the company has another four to six compounds in development across multiple therapeutic areas. The company received FDA approval for Epaned® in 2014 for its treatment of symptomatic heart failure and the treatment of asymptomatic left ventricular dysfunction.

- Westminster-based ARCA biopharma, Inc. received FDA Fast Track designation for its Gencaro™ for the prevention of atrial fibrillation/atrial flutter. The designation facilitates the development and expedites the review of new drugs that are intended to treat serious or life-threatening conditions. The drug trials could be completed as early as 2016.

- Boulder-based Clovis Oncology Inc.’s two cancer drugs received breakthrough therapy designations by the FDA, which could allow for faster approval process. The company’s ovarian and non-small cell lung cancer drugs are in phase II and III of clinical trials.

- Centennial-based Cochlear Americas released their SmartSound iQ processing platform for use with the company’s Nucleus 6 sound processor. The technology automatically adapts to different sound environments to deliver a more comfortable listening experience and can be used with wireless connectivity, a first in the cochlear implant industry.

- Broomfield-based Corgenix worked with the World Health Organization and the FDA to design the first rapid-testing kit for the Ebola virus. ReEBOV Antigen Rapid Test Kit tests a few drops of blood using the same technology as at-home pregnancy tests to provide results in 15 minutes. The current standard of Ebola tests can take up to a day to return a diagnosis.

- Littleton-based S280 Prosthetics LLC developed a computerized puck that is placed in the socket of an artificial limb and acts as a vacuum to adhere the prosthesis to the leg. The technology is operated by the user through a smartphone app.

- The University of Colorado and Denver-based Mile High Ophthalmics LLC reached a licensing agreement to bring a new device designed to perform safer, more effective cataract surgery to the market. The VERUSTM Capsulorhexis Device enhances a surgeon’s ability to complete a perfectly round and centered opening in the capsule during cataract surgery.

- Lakewood-based Terumo BCT will begin clinical trials to test its Mirasol® Pathogen Reduction Technology (PRT) system. The non-toxic technology uniquely uses the properties of riboflavin and ultraviolet light to reduce infectious pathogen loads and inactivate residual white blood cells in blood products.

- Greenwood Village-based NanoSphere Health Sciences, LLC received patent-pending status for the company’s new nonsteroidal anti-inflammatory drug (NSAID). The company’s NSAIDs are the first to encapsulate prescription and over-the-counter NSAIDs as a method to treat and prevent inflammatory disorders, global inflammation, and pain. The NanoSphere NSAIDs are designed to be administered intraorally, intranasally, and transdermally.

- Aytu BioScience, Inc. acquired the rights to urinary tract infection drug Primsol, adding to the company’s portfolio of urology products. Aytu also purchased ProtaScint imaging agent for prostate cancer detection earlier in the year.
Boulder-based SomaLogic, Inc. established its first SOMAscan™ assay “Early Access” site outside of the United States at the University of Manitoba’s Centre for Proteomics and Systems Biology. The assay will provide researchers with unprecedented power for protein biomarker discovery, diagnostic development, and pharmaceutical discovery and development.

Several nine-county companies and institutions participated in a ground-breaking study to understand Duchenne biology and potential new approaches to diagnosis and treatment. Researchers at the University of Colorado Boulder and SomaLogic identified 44 proteins in the blood of patients with Duchenne muscular dystrophy using the SOMAscan™ assay. The biomarkers will be useful to researchers and clinicians to study physiological processes of this rare muscle disease, as well as monitor treatment progress and develop effective therapies.

Louisville-based GlobeImmune, Inc. granted exclusive rights to Summit, N.J.-based Celgene Corporation to license its cancer drug, Tarmogen®. The drug, which targets medullary thyroid cancer, is currently being evaluated in a clinical trial at the National Cancer Institute.

Boulder-based Array BioPharma Inc. and France-based Pierre Fabre Laboratories partnered to develop and commercialize Array’s two cancer-fighting drug candidates. Array will receive an upfront payment of $30 million and could receive up to $425 million if certain development and commercialization milestones are achieved.

Boulder-based MBio Diagnostics partnered with Warren, N.J.-based Roka Bioscience Inc. to develop field tests to detect food-borne illnesses. The product development and licensing agreement will combine MBio’s multiplex, point-of-care diagnostics technology with Roka’s food safety testing solutions.

**Industry Infrastructure Support**

The region’s organizations and professionals support the thriving bioscience industry.

- The Colorado Bioscience Association (CBSA) hosted the 2015 Rocky Mountain Life Science Investor and Partnering Conference, in collaboration with associations in Arizona, Montana, New Mexico, and Utah. Nearly 50 of the industry’s leading investors and strategic partners attended the Conference to connect and invest in the region’s emerging life science companies.

- The Colorado Office of Economic Development and International Trade (OEDIT) awarded its third round of grants for the Advanced Industries Accelerator Programs. The programs will 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. Colorado’s bioscience grant appropriations total $5.5 million per year within the Advanced Industries Grant Program, which also allows for infrastructure grants up to $500,000.

- 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 was established in 2004 to provide 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.

- Colorado PERA launched The Colorado Mile High Fund in 2012, 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 Denver Office of Economic Development offers the Denver Capital Matrix, a resource directory of over 400 funding sources for small business and entrepreneurs including traditional bank lending, venture capital firms, private equity firms, angel investors, mezzanine sources, and others that have funded Colorado businesses.

- The Innovation Center of the Rockies (ICR) collaborates with tech-transfer offices including the University of Colorado, the University of Denver, Colorado School of Mines, CSU, and the University of Wyoming to create one of the largest entrepreneurial networks in the nation. ICR also works closely with CSU Ventures to accelerate the creation of new businesses and continue building the state’s entrepreneurial ecosystem. Since 2005, ICR created 623 new jobs, raised $105.8 million, and created 19 new companies.
**Cross-Cluster Convergence**

The nine-county region promotes an environment of collaboration among the bioscience, aerospace, digital health, and IT-software industries.

- Metro Denver is an emerging digital health community. Founded in July 2012 by the Denver South Economic Development Partnership and Innovation Pavilion, Prime Health is a growing statewide community of 1,000+ health care executives, physicians, technologists, academics, entrepreneurs, and investors dedicated to improving health and lowering healthcare costs through the commercialization of digital health technologies. The Collaborative is a resource ecosystem for Digital Health—the convergence of the digital and genetics revolutions with bioscience, healthcare and wellness, and information technology-software. Colorado is home to more than 120 digital health companies. More information at [www.primehealthco.com/challenge](http://www.primehealthco.com/challenge).

- CSU received a $9 million grant from the National Aeronautics and Space Administration to build a facility that will research the effects of long-term exposure to space radiation. The facility will be the only one-of-its-kind in the world. CSU will renovate an existing gamma ray facility, which will mimic the long-term, low-dose-rate exposures to highly energetic radiation that astronauts would encounter on a multiyear mission to Mars.

**Venture Capital and Funding Awards**

The nine-county region’s bioscience companies received significant awards for innovative research and new product development.

- Boulder-based Nivalis Therapeutics Inc. secured more than $88 million in an initial public offering. The company will use the funding to develop a candidate therapy for cystic fibrosis and other diseases.
- Boulder-based miRagen Therapeutics Inc. raised $41 million in private financing to develop its two drug candidates. The company’s drug candidates are designed to target microRNAs that regulate gene expression and can serve as potential indicators of disease.
- ARCA biopharma, Inc. raised $37 million in private financing to support clinical development of bucindolol, potentially the first genetically-targeted treatment for atrial fibrillation.
- Aurora-based Precision Biopsy raised $33.6 million to accelerate the commercialization of its ClariCore biopsy system. The system is designed to provide real-time classification of prostate tissue during biopsy procedures to reduce complications and improve outcomes.
- Boulder-based Biodesix Inc. secured $19.6 million in funding to develop new cancer drugs and expand the commercialization of the VeriStrat and GeneStrat tests, as well as new product launches over the next two years.
- Westminster-based Surefire Medical Inc. raised $15 million in venture capital to fund international sales of its liver cancer treatment. The company is developing its Surefire Precision catheter as a primary medical device to treat liver cancer.
- Louisville-based AntriaBio Inc. raised $7 million to fund the initiation of phase I clinical studies for its basal insulin product. The AB101 is a potential once-weekly insulin for patients with type 1 and type 2 diabetes.
- Boulder-based Prima Temp Inc. raised $1.2 million to support development of its fertility-tracking sensor. The cervical ring device continuously monitors a woman’s core body temperature and wirelessly relays the information to an app on the user’s smartphone.

**Research and Development Awards**

Federal government research and development funding has fueled bioscience discoveries and advancements with potential commercial applications.

- Aurora-based Lohoca Research Corp. received a $6.5 million National Institutes of Health (NIH) grant to develop a medication to treat alcoholism. The company’s drug, Nezavist, aims to reduce cravings and relapse rates.
- Denver Health Medical Center received a five-year, $5 million grant from the NIH to develop a fast and reliable test to detect common bacteria directly from blood in less than three hours. The study will focus on detecting an antibiotic-resistant “super bug.”
- The U.S. Department of Agriculture awarded CSU a $2.25 million grant to study antibiotic resistance by tracking the genetic footprint of drug-resistant bacteria. The researchers will determine where infectious organisms originate and how they move through the food system and environment to people.
Bioscience: Metro Denver and Northern Colorado Industry Cluster Profile

- Boulder-based SuviCa Inc. received a $1.5 million National Cancer Institute grant to develop innovative treatments for cancer. The company will continue to develop SVC112, a compound that enhances the anti-tumor effects of radiation in animal models of human head and neck cancer.
- Boulder-based InDevR, Inc. received two National Institute of Allergy and Infectious Diseases (NIAID) grants totaling $1.3 million to develop an optical reader capable of rapidly determining hemagglutination assays. The company will also use the funding to develop a product that will deliver flu vaccines to market faster by streamlining quantification of hemagglutinin at all stages of vaccine development.
- Louisville-based GlobeImmune, Inc. and CSU received a $1 million NIAID award to develop a yeast-based immunotherapeutic Tarmogen® product. The product will prevent and treat the human Mycobacterium tuberculosis infection.
- Boulder-based High Precision Devices, Inc. received a National Institute of Standards and Technology Phase II SBIR grant to facilitate non-invasive cancer diagnosis. The company is utilizing MRI images to differentiate cancerous from non-cancerous cells and monitor the success of treatment without the need for biopsies.
- NIAID awarded Boulder BioTechnology, Inc. a Small Business Innovation Research grant to study the safety and effectiveness of BBT-015, a long-acting granulocyte, colony-stimulating factor analog for preventing death from acute radiation syndrome. NIAID also awarded Boulder BioTechnology and the Indiana School of Medicine the third year of a five year U01 Cooperative Research Grant. The grant will be used to study how blood cell growth factors can prevent death of lethally irradiated mice.

Mergers and Acquisitions

Bioscience companies in the nine-county region announced several mergers and acquisitions in 2015.

- Medtronic Inc. acquired Covidien for $49.9 billion, creating the largest medical device company in the world. Both companies have significant operations in Colorado, making the state the third-largest employment base for the combined company and will accelerate the company’s core strategies of therapy innovation, globalization, and economic value.
- Array BioPharma Inc. sold its chemistry, manufacturing, and controls business in Longmont to Accurus Lab Services of Minnesota. The company employs 33 workers at its 50,000-square-foot facility and the location will be known as Avista Pharma Solutions.
- Array BioPharma acquired two phase III oncology drug candidates from Swiss pharmaceutical company Novartis. The $85 million deal includes the MEK inhibitor binimetinib (MEK 162) and the BRAF inhibitor encorafenib (LGX818), which are used to inhibit cellular mutations that occur in cancers such as melanoma, colorectal, and thyroid.
- OPX Biotechnologies, a Boulder-based company, was acquired by Cargill. Under the agreement, the company will expand product offerings and increase the functionality of its bio-based products.
- Medtronic purchased Boulder-based Sophono and plans to integrate the company into Medtronic’s ear, nose & throat business. The acquisition will allow Medtronic to partner with more surgeons worldwide to help patients experience improved hearing and will support Sophono sales as part of the surgical technologies division within its restorative therapies business.
- Loveland-based Heska Corporation acquired international digital radiography and imaging technology company Cuattro Veterinary, LLC. The acquisition will expand Heska’s platform to launch its blood diagnostics and programs to international markets.
- Lakewood-based Mesa Laboratories Inc. purchased Michigan-based North Bay Bioscience LLC. The $11.25 million deal expands product offerings and captures additional margins for their dental sterilizer testing business.
- Englewood-based Aytu Bioscience Inc. acquired Vyrix Pharmaceuticals and Luoxis Diagnostics. The combined company will build a late-stage and commercial pipeline of therapeutics and diagnostics, including its lead therapeutic candidate Zertane™ and the RedoxSYS™ Diagnostic System for male infertility.

Bioscience Grants and Incentive Programs

The State of Colorado launched several programs to advance new bioscience technologies from the laboratory toward commercialization and supports innovation, company formation, and job creation.

- Legislation passed in 2015 supported the region’s bioscience industry.
  - Senate Bill 71 (2015) created a pathway for the substitution of interchangeable biologic medicines. Senate Bill 71 will allow pharmacists to provide patients with generic drugs in place of name-brand biotechnology medicines and preserves patient access to accurate prescription...
information, maintains incentives for innovation, and promotes a competitive market for biological therapies.

- House Bill 1180 (2015) refunds sales and use tax for equipment used in R&D of medical devices or clean technology. House Bill 1180 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.

- Colorado offers various bioscience tax incentive programs to promote growth. The 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. Additionally, manufacturing equipment used in clean room operations is exempt from state sales tax.

- 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.

- Since 2006, the Bioscience Discovery Evaluation Grant Program (BDEGP) and Advanced Accelerator Program provided 285 grants totaling $36.7 million distributed to research institutions and early-stage bioscience companies. The economic impact of these programs has been significant, creating 46 new companies, 426 direct jobs, and $469.1 million in additional investment, leveraging the state’s investment 12.78 times the initial amount.

- Formed in 2009 through the BDEGP, CID4 accelerates life science discoveries and bridges the gap between research and successful product developments. The Institute serves universities, bioscience companies, academic groups, and professional associations by providing seed funding, active management, investor connections, and strategic consulting. When it launched, CID4 received $4.75 million in total funding for grants from the state of Colorado and the Fitzsimons Redevelopment Authority. As of 2015, CID4 invested more than $2 million in nine portfolio companies.

### Bioscience Workforce Profile

Many companies choose locations because of the available workforce. With nearly half of the nine-county region’s 3.7 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, 41.3 percent are college graduates and 90.5 percent have graduated from high school. The state has the nation’s second-most highly educated workforce as measured by the percentage of residents with a bachelor’s degree or higher.

<table>
<thead>
<tr>
<th>Educational Attainment</th>
<th>Percentage</th>
</tr>
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<tbody>
<tr>
<td>Less than 9th Grade</td>
<td>4.3%</td>
</tr>
<tr>
<td>9th to 12th Grade, No Diploma</td>
<td>5.2%</td>
</tr>
<tr>
<td>High School Graduate (includes equivalency)</td>
<td>20.4%</td>
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<tr>
<td>Associate Degree</td>
<td>7.6%</td>
</tr>
<tr>
<td>Bachelor’s Degree</td>
<td>25.8%</td>
</tr>
<tr>
<td>Graduate or Professional Degree</td>
<td>15.5%</td>
</tr>
<tr>
<td>Other</td>
<td>21.3%</td>
</tr>
</tbody>
</table>

Source: U.S. Census Bureau, 2014 American Community Survey.
The attractiveness of the region draws new residents through migration. The region’s population is expected to grow 59.9 percent from 2010 to 2040, driving a 36.3 percent increase in the region’s labor force over the same period. It is important to note the changing composition of the workforce supply as the baby boomers begin to retire, which will pose implications for businesses whose employee pool includes significant numbers of these workers.

Medical Devices and Diagnostics Workforce Profile

Age Distribution
The nine-county region’s medical devices and diagnostics subcluster employs 10,820 people and includes a large pool of talented, well-educated, and highly skilled workers. The medical devices and diagnostics subcluster has a larger share of employees (74.7 percent) that are between the ages of 35 and 64 years old, compared with the age distribution of all industries across the nine-county region (59.7 percent).

The medical devices and diagnostics workforce supply consists of four main components: those currently working in the industry; those doing a similar type of job in some other industry; the unemployed; and those currently in the education pipeline. The Metro Denver and Northern Colorado 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
The 2014 average annual salary for medical devices and diagnostics subcluster workers in the nine-county region was $75,880, compared with $82,040 nationwide. Total payroll in the region’s medical devices and diagnostics subcluster reached nearly $799 million in 2014, an increase of 7.2 percent over-the-year.
# BioScience: Metro Denver and Northern Colorado Industry Cluster Profile

## Metro Denver & Northern Colorado Medical Devices & Diagnostics Occupation & Salary Profile, 2015

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<tbody>
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<td>1. Electromechanical equipment assemblers</td>
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<td>3. Electrical &amp; electronic equipment assemblers</td>
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<td>$32,677</td>
<td>$20,592</td>
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<td>4. Team assemblers</td>
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<td>0</td>
<td>$27,789</td>
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<td>7. Mechanical engineers</td>
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<td>$83,741</td>
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<td>$66,560</td>
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<td>8. Software developers, applications</td>
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<td>374</td>
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<td>$62,046</td>
<td>$78,749</td>
<td>$120,474</td>
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<tr>
<td>9. Inspectors, testers, sorters, samplers, &amp; weighers</td>
<td>3,714</td>
<td>20</td>
<td>0</td>
<td>$39,562</td>
<td>$22,277</td>
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<td>$66,331</td>
</tr>
<tr>
<td>10. General &amp; operations managers</td>
<td>30,063</td>
<td>1,514</td>
<td>5,777</td>
<td>$109,117</td>
<td>$51,397</td>
<td>$72,862</td>
<td>$171,538</td>
<td>$248,331</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 2015.3 Class of Worker.

## Pharmaceuticals and Biotechnology Workforce Profile

### Age Distribution

The nine-county region’s pharmaceuticals and biotechnology subcluster employs 4,410 people and includes a large pool of talented, well-educated, and highly skilled workers. The pharmaceuticals and biotechnology subcluster has a larger share of employees (74.8 percent) that are between the ages of 35 and 64 years old, compared with the age distribution of all industries across the nine-county region (59.7 percent).

The pharmaceuticals and biotechnology workforce supply consists of four main components: those currently working in the industry; those doing a similar type of job in some other industry; the unemployed; and those currently in the education pipeline. The Metro Denver and Northern Colorado 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

Total nine-county payroll in the pharmaceuticals and biotechnology subcluster exceeded $472 million in 2014. The 2014 average annual salary for pharmaceuticals and biotechnology employees in the region was $102,550, compared with the national average of $128,820. Further, the region’s wages increased 5.5 percent over-the-year, compared with a national increase of 7.4 percent.
BIOSCIENCE: Metro Denver and Northern Colorado Industry Cluster Profile

Metro Denver and Northern Colorado Pharmaceuticals and Biotechnology Occupation & Salary Profile, 2015

<table>
<thead>
<tr>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Chemists</td>
<td>1,589</td>
<td>81</td>
<td>281</td>
<td>$73,590</td>
<td>$39,749</td>
<td>$51,168</td>
<td>$101,005</td>
<td>$124,155</td>
</tr>
<tr>
<td>2. Packaging &amp; filling machine operators &amp; tenders</td>
<td>3,688</td>
<td>148</td>
<td>0</td>
<td>$26,770</td>
<td>$19,115</td>
<td>$21,632</td>
<td>$40,144</td>
<td>$55,536</td>
</tr>
<tr>
<td>3. Biological technicians</td>
<td>2,229</td>
<td>74</td>
<td>0</td>
<td>$43,888</td>
<td>$31,429</td>
<td>$35,755</td>
<td>$55,869</td>
<td>$68,640</td>
</tr>
<tr>
<td>4. Business operations specialists, all other</td>
<td>33,049</td>
<td>705</td>
<td>42</td>
<td>$72,259</td>
<td>$38,646</td>
<td>$51,958</td>
<td>$95,805</td>
<td>$124,238</td>
</tr>
<tr>
<td>5. Natural sciences managers</td>
<td>1,119</td>
<td>29</td>
<td>2,950</td>
<td>$124,010</td>
<td>$88,962</td>
<td>$105,102</td>
<td>$149,614</td>
<td>$192,795</td>
</tr>
<tr>
<td>6. Medical scientists, except epidemiologists</td>
<td>1,267</td>
<td>35</td>
<td>700</td>
<td>$59,342</td>
<td>$38,771</td>
<td>$45,386</td>
<td>$78,790</td>
<td>$103,314</td>
</tr>
<tr>
<td>7. Chemical equipment operators &amp; tenders</td>
<td>443</td>
<td>23</td>
<td>0</td>
<td>$40,747</td>
<td>$26,562</td>
<td>$33,010</td>
<td>$51,501</td>
<td>$63,398</td>
</tr>
<tr>
<td>8. Biochemists &amp; biophysicists</td>
<td>479</td>
<td>24</td>
<td>153</td>
<td>$63,170</td>
<td>$38,626</td>
<td>$47,590</td>
<td>$91,520</td>
<td>$142,480</td>
</tr>
<tr>
<td>9. Inspectors, testers, sorters, samplers, &amp; weighers</td>
<td>3,714</td>
<td>20</td>
<td>0</td>
<td>$39,562</td>
<td>$22,277</td>
<td>$30,014</td>
<td>$52,832</td>
<td>$66,331</td>
</tr>
<tr>
<td>10. Microbiologists</td>
<td>430</td>
<td>29</td>
<td>101</td>
<td>$60,258</td>
<td>$39,894</td>
<td>$49,504</td>
<td>$80,392</td>
<td>$102,690</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 2015.3 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 nearly 380 private occupational and technical schools offering courses in dozens of program areas throughout the state. 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](http://highered.colorado.gov).

- Colorado School of Mines [www.mines.edu](http://www.mines.edu)
- DeVry University – Colorado [www.devry.edu](http://www.devry.edu)
- University of Denver [www.du.edu](http://www.du.edu)
- Colorado State University [www.colostate.edu](http://www.colostate.edu)
- Metropolitan State University of Denver [www.msudenver.edu](http://www.msudenver.edu)
- University of Northern Colorado [www.unco.edu](http://www.unco.edu)
- Colorado State University Global Campus [www.colostate.edu](http://www.colostate.edu)
- Regis University [www.regis.edu](http://www.regis.edu)
- University of Colorado: Anschutz Medical Campus Boulder, Denver [www.cu.edu](http://www.cu.edu)
- Colorado Technical University-Greenwood Village [www.coloradotech.edu](http://www.coloradotech.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 has 10 higher education institutions with bioscience programs. Biological sciences graduate programs at the University of Colorado Boulder (CU-Boulder), Colorado State University (CSU), and
the University of Colorado Denver ranked within the nation’s top-100 in 2014. (U.S. News & World Report, 2014)

- Colorado ranked ninth for the number of science, engineering, and health graduate students per 1,000 individuals ages 25 to 34 years old in 2013. (National Science Foundation, 2015)
- Colorado ranked fifth for the number of scientists and engineers as a share of all occupations in 2014. (National Science Foundation, 2015)
- Colorado ranked as the second-most entrepreneurial state, with nearly $18 million in venture capital funding per 100,000 people and 2.81 small businesses per 100 people. (NerdWallet, 2015)
- The U.S. Department of Commerce’s United States Patent and Trademark Office located one of four new satellite offices in Denver, the first permanent office west of the Mississippi, due to the state’s expansive culture of innovation and entrepreneurism. (U.S. Patent and Trademark Office, 2015)
- CU-Boulder and the University of Denver ranked among “America’s Most Entrepreneurial Universities.” (Forbes, 2015)
- The Denver-Aurora-Broomfield metropolitan statistical area ranked first overall for economic development and job growth in the “Leading Locations for 2015” list. The Greeley and Boulder metro areas were also named to the list’s top-10. Areas recognized in the study have strong pro-business environments and a highly skilled workforce. (Area Development, 2015)
- Metro Denver ranked as the fourth-best metro area for science, technology, engineering, and mathematics (STEM) professionals in 2015. Metro Denver ranked fourth for the projected number of STEM jobs needed in 2018 and seventh for openings per capita for STEM graduates. (WalletHub, 2015)
- Boulder ranked as the third-best metro area for college graduates in STEM fields in 2015. Boulder boasts 140 STEM employees per 1,000 jobs and the area’s annual mean wage for STEM jobs was $91,100. (NerdWallet, 2015)

2. Affordable operating costs

- Bioscience companies can recruit affordable, productive employees as the nine-county average wage for bioscience workers is slightly below the national average.
- Denver ranked as the 11th-best market for life sciences real estate with about 4 million square feet of rentable laboratory space in the 2015 Life Science Outlook. (Jones Lang LaSalle, 2015)
- 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's simplified corporate income tax structure based on single-factor apportionment allows companies to pay taxes based solely on their sales in the state. Along with few regulatory burdens, Colorado's corporate income tax rate of 4.63 percent is one of the lowest and most competitive tax structures in the nation. (State of Colorado; The Tax Foundation)
- Colorado's tax climate ranked eighth in the nation for entrepreneurship and small business. (Small Business & Entrepreneurship Council, 2015)
- Metro Denver ranked No. 1 among Forbes' 2015 “Best Places for Business and Careers.” Four other Colorado metropolitan areas were included on the list. The Fort Collins metro area ranked 10th, Boulder ranked 26th, Greeley ranked 33rd, and Colorado Springs ranked 37th. (Forbes, 2015)
- Denver ranked as the 10th-most business-friendly city in 2014 and had the third-best business climate among the nation's 100 largest cities. (MarketWatch.com, 2015)
- Colorado ranked as the No. 5 small-business-friendly state in the nation. Fort Collins and Boulder ranked among the top-10 cities nationally, earning “A” grades for overall friendliness. (Thumbtack.com, 2015; Ewing Marion Kauffman Foundation, 2015)

4. Access to financial resources to fund research and development

- Colorado offers several public and private sources of business funding including the Certified Capital Companies Program, the Colorado 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 four venture firms currently investing in bioscience: Boulder Ventures, Lightstone Ventures, Morgenthaler Ventures, and Tango/HCV.
- Colorado ranked fourth in the nation for Small Business Innovation Research (SBIR) grants per worker. The state received more than 230 grants totaling $92.4 million, or $38.20 grants per worker compared with the U.S. average of $14.97. (U.S. Small Business Administration, 2015; U.S. Bureau of Labor Statistics, 2015)
bioscience: metro denver and northern colorado industry cluster profile

- CSU research expenditures reached $317.2 million in fiscal year 2015 and ranked sixth among 14 peer institutions in federal research and development expenditures. (Colorado State University, 2015)
- The University of Colorado ranked among the nation’s top-25 institutions in total National Institutes of Health funding reaching $167.3 million in fiscal year 2014. (National Institutes of Health, 2015)

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

- The Advanced Industries (AI) Accelerator Programs includes four types of grants and a global business support program to promote growth and sustainability in Colorado’s advanced industries, including advanced manufacturing, aerospace, bioscience, electronics, energy and natural resources, infrastructure engineering, and technology and information. These industries account for nearly 30 percent of the state’s wage earnings and nearly 35 percent of the state’s total exports. (The Colorado Office of Economic Development and International Trade, 2015)
- Startup Colorado is a regional initiative to increase the breadth and depth of the entrepreneurial ecosystem across Colorado’s Front Range. The initiative focuses on increasing connections among entrepreneurs and mentors, improving access to entrepreneurial education, and building a more vibrant entrepreneurial community. (Startup Colorado, 2015)
- 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.

Bioscience Industry Cluster Definition

<table>
<thead>
<tr>
<th>NAICS Code*</th>
<th>NAICS Description</th>
<th>SIC Code</th>
<th>SIC Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>325413</td>
<td>In-vitro diagnostic substance mfg.</td>
<td>2835</td>
<td>Diagnostic substances</td>
</tr>
<tr>
<td>333249</td>
<td>Other industrial machinery mfg.</td>
<td>3559-9922</td>
<td>Pharmaceutical machinery</td>
</tr>
<tr>
<td>334510</td>
<td>Electromedical &amp; electrotherapeutic apparatus mfg.</td>
<td>3845</td>
<td>Electromedical equipment</td>
</tr>
<tr>
<td>334516</td>
<td>Analytical laboratory instrument mfg.</td>
<td>3826</td>
<td>Analytical instruments</td>
</tr>
<tr>
<td>334517</td>
<td>Irradiation apparatus mfg.</td>
<td>3844</td>
<td>X-ray apparatus &amp; tubes</td>
</tr>
<tr>
<td>339112</td>
<td>Surgical &amp; medical instrument mfg.</td>
<td>3841</td>
<td>Surgical &amp; medical instruments</td>
</tr>
<tr>
<td>339113</td>
<td>Surgical appliance &amp; supplies mfg.</td>
<td>3821</td>
<td>Laboratory apparatus &amp; furniture</td>
</tr>
<tr>
<td>339113</td>
<td>Surgical appliance &amp; supplies mfg.</td>
<td>3842</td>
<td>Orthopedics, prosthetics, &amp; surgical appl.</td>
</tr>
<tr>
<td>339114</td>
<td>Dental equip. &amp; supplies mfg.</td>
<td>3843</td>
<td>Dental equipment &amp; supplies</td>
</tr>
<tr>
<td>325411</td>
<td>Medicinal &amp; botanical mfg.</td>
<td>2833</td>
<td>Medicinals &amp; botanicals</td>
</tr>
<tr>
<td>325412</td>
<td>Pharmaceutical preparation mfg.</td>
<td>2834</td>
<td>Pharmaceutical preparations</td>
</tr>
<tr>
<td>325414</td>
<td>Biological product (except diagnostic) mfg.</td>
<td>2836</td>
<td>Biological products except diagnostic</td>
</tr>
<tr>
<td>541711</td>
<td>Research &amp; development in biotechnology</td>
<td>8731-01</td>
<td>Biological research</td>
</tr>
<tr>
<td>541711</td>
<td>Research &amp; development in biotechnology</td>
<td>8731-9902</td>
<td>Medical research (commercial)</td>
</tr>
<tr>
<td>541711</td>
<td>Research &amp; development in biotechnology</td>
<td>8733-01</td>
<td>Noncommercial biological research org.</td>
</tr>
</tbody>
</table>

*(P) indicates that only part of the NAICS industry category is represented in the industry cluster definition.
Bioscience Industry Cluster Relationships

Technologies
- Bioinformatics
- Biopharma
- Genetic Engineering
- Nanotechnology
- Nutraceuticals

Support Industries
- Agriculture
- Broadcasting and Telecommunications
- Government
- Hardware
- Manufacturing
- Software

Bioscience
- Medical Devices & Diagnostics
- Pharmaceuticals & Biotechnology

Client Industries
- Agriculture
- Healthcare
- Consumers
- Energy

Infrastructure
- Fitzsimons Innovation Campus
- Colorado Science + Technology Park at Fitzsimons
- Anschutz Medical Campus
- Colorado BioScience Association
- Colorado Photonics Industry Association
- Colorado State University
- National Jewish Health
- University of Colorado
- Other Research Institutions

For additional information, contact us:

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

Industry Overview

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

Businesses in the nine-county Metro Denver and Northern Colorado region rely on fast download and upload speeds to compete in the digital economy. Further, expanded wireless broadband access and new mobile technologies provide increased productivity, the creation of new innovative businesses, cost-effective connections in rural areas, and the ability to telework, or work at home while connected by information technology. The region’s focus on transportation alternatives, combined with significant corporate headquarters and advanced telecommunications infrastructure, provide an ideal environment for teleworking. In fact, Colorado has the highest percentage of telecommuters in the nation. About 6.9 percent of Colorado residents telecommute full time, outpacing the national average by 2.6 percentage points, according to a FlexJobs’ 2015 report analyzing U.S. Census data.

The nine-county region is home to numerous broadcasting and telecommunications assets, including:

- **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.

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

- **Subscription TV** - Metro Denver is the birthplace of the cable television industry and is home to a significant concentration of broadcasting and telecommunications companies including Time Warner Cable, Comcast, DISH Network, and others. The Cable Center, located on the University of Denver campus, provides education, training, and research in all aspects of cable telecommunications.

- **Voice and Data Services** - Metro Denver businesses and households have access to numerous providers that offer landline and wireless phone services and high-speed Internet service. The region has more than 30 long-distance providers for intraLATA calls, or long distance calls within a local access transport area (LATA). Metro Denver’s extensive fiber optic network allows the flow of voice and data traffic at lower prices.

- **WiFi** - 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. Several organizations offer telework consulting services for employers in the region including the Downtown Denver Partnership, 36 Commuting Solutions, Transportation Solutions, the Denver Regional Council of Governments, and Smart Commute Metro North.

Several strategic initiatives to expand Colorado’s broadband infrastructure are underway. Colorado has a five-year strategic plan to enable statewide broadband connectivity by partnering with the private sector to assure availability to all Coloradans. Further, the Colorado Broadband Data and Development Program was created via a grant from the National Telecommunications and Information Administration for broadband mapping and planning. Colorado received funding to continue the assessment of broadband deployment across the state, engage in planning and outreach activities to promote broadband adoption and enhance broadband opportunities.

---

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.
broadband market information, enable the development of a statewide address data maintenance program, create a statewide task force to provide interactive learning opportunities for K-12 public schools, and increase government transparency through the development of a portal for the discovery of and access to state data.

Several municipalities in the nine-county region are expanding their fiber-optic broadband networks. Longmont is building a Gigabit City that will provide 17 miles of expanded broadband services to more than 37,000 city facilities, businesses, and residents by 2016. Every business and resident in Longmont will have access to the affordable, fiber-based gigabit services. The city of Boulder has expanded free WiFi to public spaces and Connect Boulder is working to enhance broadband services throughout the community.

A number of county governments and local communities use digital technologies and expanded information technology networks to serve their population and streamline operations. The City and County of Denver ranked seventh in the more than 250,000 population category, the city of Fort Collins ranked third in the 125,000 to 249,999 population, and the cities of Boulder and Westminster ranked among the top-five in the 75,000 to 124,999 population category in the “2015 Digital Cities Survey.” Compiled by e.Republic’s Center for Digital Government and Digital Communities, the survey recognized cities that provided exemplary digital service to their residents and highlighted the areas’ best practices.

Telecommunications carriers invested in high-performance wireless and wired infrastructure across the region, offering high-capacity network connectivity, reliability, speed, and coverage for residents and businesses. Since 2012, AT&T has invested $325 million to enhance wireless networks across the region, including 38 wireless upgrades, network capacity, and Internet upgrades in Denver. The company activated 14 new, long-term evolution network (LTE) sites, including South Santa Fe Drive, West 9th Avenue, East 13th Avenue, Lincoln Street, and the Pepsi Center. CenturyLink Inc. began offering Internet speeds of 1 gigabit per second to 16,600 small businesses in Aurora, Boulder, and Fort Collins, which was previously only available in Denver to large businesses. T-Mobile upgraded hardware and software at its towers in the Front Range to improve indoor and rural quality. The company added 700 megahertz technology, which travels farther and through concrete better than existing higher signals of 850 and 1,900. The upgrade is available to customers in nearly 30 Colorado locations.

**Broadcasting and Telecommunications Economic Profile**

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.

*The nine-county region ranked sixth out of the 50 largest metro areas for broadcasting and telecommunications employment concentration in 2015.* With direct employment of about 41,970 broadcasting and telecommunications employees, the region ranked ninth, up one position from the previous year. About 87 percent of Colorado’s broadcasting and telecommunications cluster employees work in the region.

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1 Employment concentration is the direct cluster employment in a region expressed as a percent of total employment in all industries in the same region. Employment concentration is calculated and ranked for the 50 largest metropolitan statistical areas (MSAs). Direct employment is the number of employees in the industry cluster in a region. No multiplier effects are included. Direct employment is estimated and ranked for the 50 largest MSAs.
Broadcasting and Telecommunications Employment

The nine-county region’s broadcasting and telecommunications employment (41,970 workers) decreased 0.8 percent in 2015, compared with the previous year’s level. National employment levels increased 1 percent over-the-year. About 3.4 percent of the nation’s broadcasting and telecommunications employment is located in the region.

Approximately 2,560 broadcasting and telecommunications companies operated in the nine-county region in 2015. About 78 percent of the region’s broadcasting and telecommunications companies employed fewer than 10 people, while 0.9 percent employed 250 or more.
BROADCASTING AND TELECOMMUNICATIONS:
Metro Denver and Northern Colorado Industry Cluster Profile

Major Broadcasting and Telecommunications Companies

- Alcatel-Lucent
  www.alcatel-lucent.com
- AT&T Inc.
  www.att.com
- Avaya Inc.
  www.avaya.com
- BI Incorporated
  www.bi.com
- Birch Communications
  www.birch.com
- BT Conferencing, Inc.
  www.btconferencing.com
- CenturyLink, Inc.
  www.centurylink.com
- Charter Communications Inc.
  www.charter.com
- iHeartMedia, Inc.
  www.iheartmedia.com
- Integra Telecom, Inc.
  www.integratelecom.com
- Jones/NCTI, Inc.
  www.jonesncti.com
- Level 3 Communications, Inc.
  www.level3.com
- Liberty Media Corp.
  www.libertymedia.com
- Sprint Corp.
  www.sprint.com
- Starz
  www.starz.com
- T-Mobile
  www.t-mobile.com

Sources: Market Analysis Profile, 2015; Development Research Partners.
Major Broadcasting and Telecommunications Companies Cont’d

- Comcast Corp.  
  www.xfinity.com
- DIRECTV, Inc.  
  www.directv.com
- DISH Network  
  www.dish.com
- EchoStar Corp.  
  www.echostar.com
- Google  
  www.google.com
- Verizon  
  www.verizon.com
- XO Communications, LLC  
  www.xo.com
- WildBlue Communications, Inc.  
  www.wildblue.com
- Zayo Group  
  www.zayo.com

2015 Industry Highlights

Key Company Announcements

The nine-county region is a center of technology and innovation, attracting and growing broadcasting and telecommunications companies. Notable company announcements in 2015 included:

- Alphabet Inc., Google’s new parent company, broke ground on its 4.3-acre campus in Boulder, which includes three, 100,000-square-foot buildings at 30th and Pearl streets. Construction began on Phase 1 of the Boulder Campus, which includes the first two buildings and is slated to open in early 2017. Phase 1 will accommodate up to 1,000 people and Phase 2 will add space for 500 employees. The company’s Boulder workforce of 340 employees are dispersed throughout the city and will be consolidated into the site in early 2017.
- Comcast Corp. plans to expand in Metro Denver with the addition of new locations. The company leased 300,000 square feet of office space at East Panorama Circle in Centennial and will add 300 or more employees to the area. The new space will create a campus environment for the western U.S. division home and will expand the company’s business services group and customer care operations. Comcast also opened a 22,000-square-foot location in downtown Denver for about 200 employees, adding to the 400 Comcast workers in Denver. The location will serve as home for Comcast’s wholesale cable and broadband sales teams.
- Boulder-based Zayo Group’s colocation business, zColo, opened a new 19,000-square-foot data center in downtown Denver. The new center will provide customers with interconnectivity options and the ability to access Zayo’s fiber-optic network. This is the third data center the company has opened in Metro Denver.
- Charter Communications Inc. completed its $25.5 million research and development facility in Douglas County. The 85,000-square-foot facility includes about 50,000 square feet of office space and 25,000 square feet of state-of-the-art data center space; and will create 55 jobs with an average salary of $92,727.
- Jones/NCTI will relocate from the Jones International University campus in Centennial to Littleton in early 2016. The cable and broadband technician training company will also change its name to NCTI.

Expanded Broadband and Network Improvements

The nine-county region’s broadcasting and telecommunications companies expanded bandwidth, increased Internet speeds, and launched new products in 2015.

- Broomfield-based Level 3 Communications, Inc. signed two bilateral interconnection agreements with AT&T and Verizon for its IP networks. Under the agreement, customers will experience improved efficiency, additional capacity, and new interconnection locations between the networks.
- Comcast Corp. began offering 2 gigabit per second (Gbps) residential Internet service to customers in Metro Denver, Colorado Springs, and eastern Colorado. The Gigabit Pro service speeds are 100 to 200 times faster than typical 10 to 20 megabits per second (Mbps). The company also increased its Internet speeds for two of its most popular plans in Colorado for no additional cost. The Performance Pro plan increased download speeds from 50 Mbps to 75 Mbps and Blast Pro increased speeds from 105 Mbps to 150 Mbps.
BROADCASTING AND TELECOMMUNICATIONS:
Metro Denver and Northern Colorado Industry Cluster Profile

- Comcast Business invested $10 million to expand its new high-speed Internet and fiber-optic Ethernet service options to Metro Denver customers. The fiber-based Ethernet network is capable of delivering speeds up to 10 Gbps to customers in downtown Denver, Aurora, Englewood, Castle Rock, and Wheat Ridge, among others. The expanded network will offer more technology options for many industries located in the initial expansion areas, and will provide access to a comprehensive portfolio of advanced communications services to help them improve productivity and scale their operations.
- Denver-based ReadyTalk launched a web-based video and audio chat product targeting small businesses. FoxDen is a free, fast-to-start video and audio program for up to 10 participants that can be launched from an Internet browser or any Android or iOS device.
- Denver-based Layer3 TV raised $51 million to support the launch of its virtual pay-TV service, bringing its total funding to $80 million. The company moved to Denver in 2014 and plans to hire up to 321 workers over the next several years.

Merger and Acquisition Activity

Companies in the nine-county region announced several mergers and acquisitions in 2015.

- Level 3 Communications, Inc. acquired Internet security firm Black Lotus to expand the company’s product offerings and cybersecurity capabilities. The merger adds Distributed Denial of Service (DDoS) scrubbing centers, proxy-based mitigation services for application layer attacks, and behavioral analytics technology to Level 3’s portfolio.
- Zayo Group LLC acquired Englewood data center and cloud service company Latisys Holdings. The $675 million acquisition was the company’s second-largest in its history and will increase Zayo’s data center sites to 45 across the U.S. Latisys’s collection business will become part of zColo, and is expected to increase that division’s revenue by 80 percent to $183 million.
- Boulder-based Zayo Group acquired Canada’s fourth-largest telecommunications company, Allstream Inc., for $321 million. Zayo will gain nearly 5,600 miles of metro fiber in Toronto, Montreal, Vancouver, Ottawa, and Calgary that connects about 3,300 buildings. The company will also gain 12,427 miles of long-haul fiber networking connecting all major Canadian markets.
- Zayo Group purchased Dublin, Ireland-based Viatel in a $102 million deal. Under the acquisition, Zayo will gain 5,200 miles of fiber-optic network in eight European countries, 12 metropolitan area networks in Europe, seven data centers, and 81 buildings connected to Viatel’s network. Zayo will also acquire new undersea fiber lines connecting London to Amsterdam and London to Paris.
- Centennial-based Evolution Digital LLC purchased Chicago, Ill.-based i-Velozity LLC. The company will add 30 software engineers and will help its cable operator partners deliver video-on-demand services over IP to set-top boxes and other connected devices, as well as tablets, smartphones, and gaming consoles.
- Comcast Corp. acquired Denver-based This Technology and plans to make the new company part of its expanding lower downtown hub for Internet video technology development. Comcast plans to integrate This Technology’s 63 employees into its video IP engineering and research technology team that has 250 lower downtown employees.
- Entercom Communications Corp. acquired Lincoln Financial Media Co. for $105 million. Both companies operate several Denver-area radio stations.
- Greenwood Village-based ViaWest acquired Boulder-based AppliedTrust Engineering. With the deal, ViaWest will broaden its portfolio of services and capabilities.
Broadcasting and Telecommunications Workforce Profile

Many companies choose locations because of the available workforce. With nearly half of the nine-county region’s 3.7 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, 41.3 percent are college graduates and 90.5 percent have graduated from high school. The state has the nation’s second-most highly educated workforce as measured by the percentage of residents with a bachelor’s degree or higher.

The attractiveness of the region draws new residents through migration. The region’s population is expected to grow 59.9 percent from 2010 to 2040, driving a 36.3 percent increase in the region’s labor force over the same period. It is important to note the changing composition of the workforce supply as the baby boomers begin to retire, which will pose implications for businesses whose employee pool includes significant numbers of these workers.

The nine-county region’s broadcasting and telecommunications industry employs 41,970 people and includes a large pool of talented, well-educated, and highly skilled workers. The broadcasting and telecommunications cluster has a larger share of employees (57.7 percent) that are between the ages of 35 and 54 years and older, compared with the age distribution of all industries across the nine-county region (43.9 percent).

The broadcasting and telecommunications workforce supply consists of four main components: those currently working in the industry; those doing a similar type of job in some other industry; the unemployed; and those currently in the education pipeline. The Metro Denver and Northern Colorado 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**

The 2014 average annual salary for broadcasting and telecommunications employees in the nine-county region was $106,060, compared with $82,490 nationwide. Total payroll for the broadcasting and telecommunications cluster in the region reached nearly $4.5 billion in 2014.

### Metro Denver and Northern Colorado Broadcasting and Telecommunications Occupation & Salary Profile, 2015

<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. Telecommunications equipment installers &amp; repairers, except line installers</td>
<td>3,452</td>
<td>191</td>
<td>6</td>
<td>$65,874</td>
<td>$38,376</td>
<td>$54,454</td>
<td>$72,301</td>
<td>$76,253</td>
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<tr>
<td>2. Customer service representatives</td>
<td>34,814</td>
<td>6,150</td>
<td>0</td>
<td>$32,302</td>
<td>$22,776</td>
<td>$26,811</td>
<td>$40,456</td>
<td>$49,566</td>
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<td>3. Sales representatives, services, all other</td>
<td>18,011</td>
<td>1,155</td>
<td>45</td>
<td>$53,997</td>
<td>$24,086</td>
<td>$35,422</td>
<td>$80,683</td>
<td>$118,872</td>
</tr>
<tr>
<td>4. Business operations specialists, all other</td>
<td>33,049</td>
<td>705</td>
<td>42</td>
<td>$72,259</td>
<td>$38,646</td>
<td>$51,958</td>
<td>$95,805</td>
<td>$124,238</td>
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<td>5. Electronics engineers, except computer</td>
<td>4,149</td>
<td>75</td>
<td>398</td>
<td>$95,971</td>
<td>$61,714</td>
<td>$75,109</td>
<td>$122,616</td>
<td>$147,950</td>
</tr>
<tr>
<td>6. Software developers, applications</td>
<td>19,367</td>
<td>374</td>
<td>724</td>
<td>$98,467</td>
<td>$62,046</td>
<td>$78,749</td>
<td>$120,474</td>
<td>$145,434</td>
</tr>
<tr>
<td>7. Network &amp; computer systems administrators</td>
<td>8,341</td>
<td>494</td>
<td>844</td>
<td>$81,682</td>
<td>$51,418</td>
<td>$64,792</td>
<td>$98,155</td>
<td>$117,333</td>
</tr>
<tr>
<td>8. Telecommunications line installers &amp; repairers</td>
<td>1,172</td>
<td>61</td>
<td>6</td>
<td>$46,114</td>
<td>$28,933</td>
<td>$35,963</td>
<td>$57,699</td>
<td>$67,558</td>
</tr>
<tr>
<td>10. Computer user support specialists</td>
<td>11,027</td>
<td>924</td>
<td>728</td>
<td>$52,707</td>
<td>$34,611</td>
<td>$41,995</td>
<td>$67,766</td>
<td>$85,405</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 2015.3 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 nearly 380 private occupational and technical schools offering courses in dozens of program areas throughout the state. 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)
- Metropolitan State University of Denver [www.msudenver.edu](http://www.msudenver.edu)
- University of Colorado: Boulder, Denver [www.cu.edu](http://www.cu.edu)
- Colorado State University Global Campus [www.colostate.edu](http://www.colostate.edu)
- Red Rocks Community College [www.rccc.edu](http://www.rccc.edu)
- University of Denver [www.du.edu](http://www.du.edu)
- Front Range Community College [www frontrange.edu](http://www frontrange.edu)
- Regis University [www.regis.edu](http://www.regis.edu)
- University of Northern Colorado [www.unco.edu](http://www.unco.edu)
BROADCASTING AND TELECOMMUNICATIONS:
Metro Denver and Northern Colorado Industry Cluster Profile

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**
   - Seven percent of the nation’s total passengers traveled through Denver International Airport (DEN) in 2014, making it the fifth-busiest airport in the nation. DEN also ranked 17th-busiest worldwide in 2014. (U.S. Bureau of Transportation Statistics, 2015; Airports Council International, 2015; and Denver International Airport, 2015)
   - Metro Denver’s unique geographic location in the Mountain time zone makes it the largest region in the U.S. to offer one-bounce satellite uplinks that provide real-time connections to six out of seven continents in one business day. (Metro Denver Economic Development Corporation)
   - Located on the 105th meridian, the nine-county region’s central location at the exact midpoint between Tokyo and Frankfurt positions the region favorably to serve growing world markets. Metro Denver is only 346 miles west of the geographic center of the continental United States, offering an excellent location for doing business with the entire nation. (Metro Denver Economic Development Corporation)
   - The Boulder MSA had the fourth-highest rate of broadband Internet adoption among major U.S. metro areas in 2014. The Fort Collins MSA ranked 12th and the Denver-Aurora-Broomfield MSA ranked 30th. (The Brookings Institution, 2015)
   - Denver ranked among the top-five safest cities for natural disasters in 2014. (HomeownersInsurance.com, 2014)

2. **A large concentration of high-quality technology workers and entrepreneurial talent**
   - Of Colorado’s adult population, more than 38 percent has completed a bachelor’s or higher-level degree, making Colorado the second-most highly educated state in the nation behind Massachusetts. (U.S. Census Bureau, 2014 American Community Survey)
   - Colorado ranked third in the nation for its technology employment concentration (9.2 percent) in 2014. The state had the ninth-largest employment base in the telecommunications services industry, ranked third for the tech industries’ contribution to the state’s economy, and ranked eighth for average high-tech wage. Colorado had the ninth-highest wage differential in the nation, with tech workers earning 100 percent more than the average private-sector worker. (CompTIA, *Cyberstates 2015: The Definitive State-by-State Analysis of the U.S. High-Technology Industry*, 2015)
   - Colorado ranked as the second-most entrepreneurial state, with nearly $18 million in venture capital funding per 100,000 people and 2.81 small businesses per 100 people. (NerdWallet, 2015)
   - Colorado has the third-best economy in the nation and received accolades for its central location with strong aviation and telecommunications industries. (*Business Insider*, 2015)
   - Boulder and Fort Collins ranked among the top-10 of “America’s Most Innovative Tech Hubs” in 2015. Boulder had the highest startup density at six times the national average and Fort Collins benefited from innovators at Colorado State University. (NerdWallet, 2015)
   - Metro Denver has the fifth-highest startup activity among the 40 largest metro areas in the 2015 *Kauffman Index: Startup Activity*, with 177.8 startups less than a year old and 370 people out of 100,000 adults becoming entrepreneurs each month. (Ewing Marion Kauffman Foundation, 2015)
   - Boulder ranked third in the nation for millennial entrepreneurs in 2015. The city received accolades for its original TechStars accelerator program and hosts its own Startup Week. (Thumbtack, 2015)
   - Metro Denver ranked as the fourth-best metro area for science, technology, engineering, and mathematics (STEM) professionals in 2015. Metro Denver ranked fourth for the projected number of STEM jobs needed in 2018 and seventh for openings per capita for STEM graduates. (WalletHub, 2015)
   - Denver ranked as the fourth-best city to become an entrepreneur. Denver was ranked for its attractive financing options and low business costs. (Investopedia, 2015)
   - Boulder was named the seventh-best startup city in the nation. The city boasts six times the national average of high-tech startups. (*Popular Mechanics*, 2015)

3. **Low to moderate costs of doing business**
   - Colorado ranked fifth on *Forbes’ 2015 “Best States for Business and Careers”* list. The state received its highest rankings for labor supply (first overall), economic climate (fourth overall), growth prospects (sixth overall), and quality of life (ninth overall). (*Forbes*, 2015)
**Broadcasting and Telecommunications:**

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

- Metro Denver ranked No. 1 among *Forbes'* 2015 “Best Places for Business and Careers.” Four other Colorado metropolitan areas were included on the list. The Fort Collins metro area ranked 10th, Boulder ranked 26th, Greeley ranked 33rd, and Colorado Springs ranked 37th. (*Forbes*, 2015)
- Metro Denver office rental rates averaged $29.64 per square foot in the fourth quarter of 2015, making the region’s office market highly competitive with other major markets in the U.S. (*CoStar Realty Information, The CoStar Office Report, 4Q 2015*)

4. **A pro-business environment and competitive tax structure**
   - Colorado’s simplified corporate income tax structure based on single-factor apportionment allows companies to pay taxes based solely on their sales in the state. Along with few regulatory burdens, Colorado’s corporate income tax rate of 4.63 percent is one of the lowest and most competitive tax structures in the nation. (State of Colorado; The Tax Foundation)
   - The Denver-Aurora-Broomfield metropolitan statistical area ranked first overall for economic development and job growth in the “Leading Locations for 2015” list. The Greeley and Boulder metro areas were also named to the list’s top-10. Areas recognized in the study have strong pro-business environments and a highly skilled workforce. (*Area Development*, 2015)
   - Denver ranked as the 10th-most business-friendly city in 2014 and had the third-best business climate among the nation’s 100 largest cities. (MarketWatch.com, 2015)
   - Colorado’s tax climate ranked eighth in the nation for entrepreneurship and small business. (Small Business & Entrepreneurship Council, 2015)
   - Colorado ranked fourth in both innovation and entrepreneurship, and high-tech performance. The state also ranked among the top-10 states for economic performance and talent pipeline. (National Chamber Foundation, 2015)
   - Colorado ranked as the No. 5 small-business-friendly state in the nation. Fort Collins and Boulder ranked among the top-10 cities nationally, earning “A” grades for overall friendliness. (*Thumbtack.com, 2015; Ewing Marion Kauffman Foundation, 2015*)

5. **An overall better quality of life**
   - Denver was named as the best city to live in the West in 2015, according to *MONEY Magazine*. The city was cited as a “mecca for millennials” with great access to recreation. Louisville ranked fourth and Erie ranked 13th among the best small towns to live in the U.S. (*MONEY Magazine, 2015*)
   - Colorado has the highest rate of physical activity in the nation with more than 60 percent of the state’s adults participating in weekly moderate or vigorous physical activity. (The Henry J. Kaiser Family Foundation, 2015)
   - Colorado’s extensive opportunities for outdoor recreation adventures and experiences support a healthy, active lifestyle. The state offers unlimited access to 22 million acres of national forests and expansive public lands, 42 state parks, more than 30 wilderness areas, and the highest concentration of 14,000-foot mountain peaks in the nation. (Colorado Tourism Office, 2015)
   - Denver ranked seventh on the “2015 Best Large Cities to Live In.” Aurora (18th) was also named to the list. (*WalletHub, 2015*)
   - FasTracks is a $7.4 billion project to build out Metro Denver’s entire mass transit system by 2019, adding 122 miles of rail rapid transit and extending existing routes. The expansion is the largest simultaneous transit build out in U.S. history and will make Metro Denver one of the top-five regions in the country in terms of miles of fixed rail.
### Broadcasting and Telecommunications Industry Cluster Definition

<table>
<thead>
<tr>
<th>NAICS Code*</th>
<th>NAICS Description</th>
<th>SIC Code</th>
<th>SIC Description</th>
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<tbody>
<tr>
<td>334210</td>
<td>Telephone apparatus mfg.</td>
<td>3661</td>
<td>Telephone &amp; telegraph apparatus</td>
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<td>334220</td>
<td>Radio &amp; television broadcasting &amp; wireless communications equipment mfg.</td>
<td>3663</td>
<td>Radio &amp; tv communications equipment</td>
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<td>334290</td>
<td>Other communications equipment mfg.</td>
<td>3669</td>
<td>Communications equipment, NEC</td>
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<td>335921</td>
<td>Fiber optic cable mfg.</td>
<td>3357</td>
<td>Drawing &amp; insulating of nonferrous wire</td>
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<tr>
<td>335929</td>
<td>Other communication &amp; energy wire mfg.</td>
<td>3357</td>
<td>Drawing &amp; insulating of nonferrous wire</td>
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<td>515111</td>
<td>Radio networks</td>
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<td>Radio broadcasting stations</td>
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<td>Radio broadcasting stations</td>
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<td>Television broadcasting</td>
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<td>Television broadcasting stations</td>
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<td>4841</td>
<td>Cable &amp; other pay television services</td>
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<td>Wired telecommunications carriers</td>
<td>4813</td>
<td>Telephone communication except radio</td>
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<td>Wired telecommunications carriers</td>
<td>4822</td>
<td>Telegraph &amp; other communications</td>
</tr>
<tr>
<td>517110</td>
<td>Wired telecommunications carriers</td>
<td>4841</td>
<td>Cable &amp; other pay television services</td>
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<td>517110</td>
<td>Wired telecommunications carriers</td>
<td>7375</td>
<td>Information retrieval services</td>
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<td>Radiotelephone communication</td>
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<tr>
<td>517210</td>
<td>Wireless telecommunications carriers (except satellite)</td>
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<td>Satellite telecommunications</td>
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<td>Information retrieval services</td>
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<td>Radiotelephone communication</td>
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<td>Telephone communication except radio</td>
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<td>517919</td>
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<td>7375</td>
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<td>519130</td>
<td>Internet publishing &amp; broadcasting &amp; web search portals</td>
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<td>Communication services</td>
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<td>561499</td>
<td>All other business support services</td>
<td>7389-1004</td>
<td>Teleconferencing services</td>
</tr>
</tbody>
</table>

*(P) indicates that only part of the NAICS industry category is represented in the industry cluster definition.

Note: NEC indicates "not elsewhere classified."
Broadcasting and Telecommunications Industry Cluster Relationships

Technologies
- WiFi – Wireless Fidelity
- Fiber Optic Networks
- VoIP – Voice over Internet Protocol
- Nanotechnology
- Internet
- Photonics

Support Industries
- Aerospace
- Computer Storage
- Fiber Optics
- Geospatial
- Photonics
- Software

Infrastructure
- CO Technology Partners
- One-Bounce Satellite Location
- High-Speed Digital Network
- CO Telecom Association
- CO Photonics Industry Association
- CU-Telecom Systems Lab
- CTA-Colorado Technology Association
- DU Center for Technology Innovation

Client Industries
- Aerospace
- Aviation
- Bioscience
- Energy
- Financial Services
- Healthcare
- Software
- Consumers
- Businesses

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

ENERGY: Metro Denver and Northern Colorado Industry Cluster Profile

Industry Overview

Colorado’s energy industry has been an integral part of the state’s economy throughout its history, providing a strong foundation of both traditional and alternative energy. The state is a leader in the energy industry and is rich with energy resources including fossil fuels (coal, oil, and natural gas) and both renewable energy resources (solar, wind, and biofuels) and energy efficiency technologies, also known as cleantech. Significant intellectual capital, world-class research institutions, a business-friendly environment, and industry collaboration drive energy job growth and fuel innovation. Further, Colorado’s progressive policy initiatives, such as the first voter-led renewable energy standard in the nation and new financial incentives, support the state’s balanced energy economy.

This report evaluates the energy industry in the nine-county Metro Denver and Northern Colorado region in two subclusters: (1) cleantech and (2) fossil fuels. With 54,720 energy workers in approximately 3,140 companies in 2015, the nine-county region continues to position itself as a leader in the energy industry. Combined, the 74,720 direct energy workers earning nearly $7 billion in the state support an additional 188,890 indirect workers earning $10.2 billion in all industries throughout the state. In total, the energy industry in Colorado supports 263,610 workers in all industries earning $17.2 billion annually.

Colorado’s fossil fuel extraction has traditionally taken place in western Colorado; however, many companies have Front Range-refining and production facilities and corporate offices in Metro Denver. Like many other recent oil and gas plays in the nation, technological advances in horizontal drilling and hydraulic fracturing techniques allow for greater production in the Niobrara shale formation within the Denver-Julesburg Basin along the Front Range. These advances have drawn significant attention from oil and gas companies, providing substantial economic benefits including capital investment, high-wage job creation, and export possibilities.

Cluster Definition and Methodology

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.

Cleantech Economic Profile

The cleantech subcluster includes companies that produce and conserve energy using wind, solar, biomass, fuel cells, hydroelectric resources, and green transportation technologies. Companies that manufacture renewable energy equipment, storage, and power transformers, and businesses that provide engineering and other support services are also included. The subcluster includes energy research companies that provide
laboratory testing, scientific and technical consulting services, and institutional research related to the environment, natural resources, and energy. The cleantech subcluster consists of 29, six-digit North American Industry Classification System (NAICS) codes.

The nine-county region ranked fifth out of the 50 largest metro areas in cleantech employment concentration in 2015. With direct employment of 21,600 workers, the region ranked sixth out of the 50 largest metro areas. About 86 percent of Colorado’s cleantech employment was located in the region.

### Cleantech Employment and Company Profile, 2015

<table>
<thead>
<tr>
<th></th>
<th>Nine-County Region</th>
<th>United States</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct employment, 2015</td>
<td>21,600</td>
<td>828,240</td>
</tr>
<tr>
<td>Number of direct companies, 2015</td>
<td>1,550</td>
<td>58,010</td>
</tr>
<tr>
<td>One-year direct employment growth, 2014-2015</td>
<td>8.5%</td>
<td>4.9%</td>
</tr>
<tr>
<td>Five-year direct employment growth, 2010-2015</td>
<td>23.7%</td>
<td>19.7%</td>
</tr>
<tr>
<td>Avg. annual direct employment growth, 2010-2015</td>
<td>4.3%</td>
<td>3.7%</td>
</tr>
<tr>
<td>Direct employment concentration</td>
<td>1.1%</td>
<td>0.6%</td>
</tr>
</tbody>
</table>


### Cleantech Employment

The nine-county region’s cleantech employment (21,600 workers) rose 8.5 percent in 2015 compared with the previous year’s level, adding more than 1,690 new jobs during the same period. National employment levels also grew over-the-year, rising 4.9 percent, representing an additional 39,030 jobs. Nearly 3 percent of the nation’s cleantech employment is located in the region. Between 2010 and 2015, the region’s cleantech employment rose 23.7 percent compared with a 19.7 percent increase nationwide. Cleantech companies employed 1.1 percent of the region’s total employment base, compared with a 0.6 percent employment concentration nationwide.

About 1,550 cleantech companies operated in the nine-county region in 2015, rising 2.8 percent over the prior year. Approximately 79 percent of these companies employed fewer than 10 people, while 0.9 percent employed 250 or more.

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2 Employment concentration is the direct cluster employment in a region expressed as a percent of total employment in all industries in the same region. Employment concentration is calculated and ranked for the 50 largest metropolitan statistical areas (MSAs). Direct employment is the number of employees in the industry cluster in a region. No multiplier effects are included. Direct employment is estimated and ranked for the 50 largest MSAs.
Cleantech Overview

Collaboration among the nine county region’s research universities, industry, educational institutions, and public agencies provide foundational research and education for new cleantech innovations and technological development. The Colorado Energy Research Collaboratory (Collaboratory) and the Colorado Cleantech Industry Association (CCIA) are two prime examples.

The Collaboratory integrates cutting-edge research with industry expertise to accelerate the transfer of energy technologies into the marketplace through its four research centers: the Colorado Center for Biorefining and Bioproducts (C2B2), the Center for Revolutionary Solar Photoconversion (CRSP), the Center for Research and Education in Wind (CREW), and the Carbon Management Center. Since its launch in 2007, the Collaboratory has shown a 9:1 return on investment using state funding of nearly $6.3 million to leverage federal and private-sector dollars totaling $56.2 million, and has helped attract several companies to Colorado.

The CCIA, an industry association dedicated entirely to cleantech, provides advocacy, capacity building, and education and training to the cleantech sector. CCIA is one of the first, regional cleantech organizations to partner with Advanced Energy Economy, a national trade association representing the advanced energy industry. The Energy Fellows Institute, a CCIA program, is the nation’s first program to educate experienced entrepreneurs and executives in the technology sectors of cleantech.
Colorado’s federal laboratories, universities, and scientific and research assets support the state’s world-class energy cluster. The state has one of the highest per-capita concentrations of federal research facilities in the nation, which foster innovation and stimulate technology transfer between companies and local educational facilities. Colorado’s 30 federal laboratories generate over $2.3 billion in annual economic impact to the state.

Among the state’s federally funded research laboratories, the National Renewable Energy Laboratory (NREL), a Golden-based federally funded research laboratory, is a vital asset to the state’s energy and natural resources industry. NREL is the U.S. Department of Energy’s (DOE) only laboratory committed to the research, development, commercialization, and deployment of renewable energy and energy efficiency. NREL’s $135 million, 182,000-square-foot Energy Systems Integration Facility (ESIF) was named R&D Magazine’s 2014 “Laboratory of the Year” as a first-of-its-kind facility. NREL added 31 new Cooperative Research and Development Agreements (CRADAs) in fiscal year 2014, totaling 166 active CRADAs, the highest in the DOE system. In fiscal year 2014, NREL held 195 licensing agreements, resulting in the transfer of new technologies for commercialization. NREL’s research resulted in 440 U.S. patents in the clean energy industry. In 2014, NREL contributed $700.7 million to Colorado’s economy and accounted for more than 4,120 direct and indirect jobs. Since 2002, the 327-acre campus also received more than $4.3 billion in funding and garnered more than 200 awards and honors for its programs and scientific research. Notable NREL announcements in 2015 included:

- NREL and Idaho National Laboratory successfully demonstrated the capability to connect grid simulations at their two laboratories for real-time interaction via the Internet. This new inter-lab capability enables the modeling of power grids in greater detail by allowing software and equipment anywhere in the world to establish a real-time connection to the unique facilities and capabilities available within DOE’s national laboratory complex.
- NREL awarded $6.5 million to five new partnerships to address the challenge of enabling the electric grid to handle increasing amounts of renewable energy. NREL will manage the Integrated Network Testbed for Energy Grid Research and Technology Experimentation and all of the teams will test their technologies in NREL’s ESIF.

**Cleantech Company Announcements**

The nine-county region is a leader in cleantech energy policies and technologies. Notable announcements in 2015 included:

- Greenwood Village-based Cool Planet Energy Systems’ CoolTerra™ product received the Gold 2015 Edison Award. CoolTerra™ is an innovative solution for agriculture, water conservation, and climate sustainability that sequesters atmospheric carbon to retain water and fertilizer in the root zone of crops, enabling growers to increase agricultural yields and conserve water in drought-prone regions.
- Colorado received $3.2 million in U.S. Department of Agriculture grants to develop a way to transform the flood irrigation farmers use to grow crops into hydropower. The project will be used to divert water more efficiently and generating electricity by pressurizing flows of agricultural water.

**Solar Energy**

The nine-county region’s abundant solar resources have created new opportunities in electricity generation, research and development, and manufacturing. Notable solar announcements in 2015 included:

- Sunrun Inc., the second-biggest installer of residential solar power panels in Colorado, will create a national corporate office in downtown Denver. The San Francisco-based company will add up to 800 jobs.
- Boulder-based juwi Inc. and Platte River Power Authority will build a 22 MW solar facility near Wellington. The 185-acre project will provide electricity to consumers in Longmont, Estes Park, Fort Collins, and Loveland, and will be completed in 2016.
- Two new photovoltaic solar farms were constructed in Weld County that will provide power for Poudre Valley Rural Electric Association. The 8 MW Valley View Solar and the Skylar Solar projects will generate enough power to support about 1,300 homes.
- Denver-based SunShare and NRG Energy built one of the nation’s largest-operating, community solar portfolios including four solar gardens in Metro Denver and one in Colorado Springs. The project will generate approximately 350 million kilowatt-hours of energy over 20 years, enough to power 1,600 homes.
ENERGY: Metro Denver and Northern Colorado Industry Cluster Profile

- SunShare contracted with the City and County of Denver to power 16 city-owned buildings with solar energy from Community Solar Gardens. The project is expected to save the city $6 million over the 20-year contract period.
- The Metro Denver Economic Development Corp. named Panasonic Enterprise Solutions a “Deal of the Year” award winner at its 2015 Annual Meeting in recognition of its new hub for business solutions and technology center near Denver International Airport (DEN). The new facility will produce large-scale audio-visual displays and solar panels and could employ up to 400 workers.
- Microgrid Energy, a developer and installer of solar projects based in St. Louis, expanded with a new office in Denver. The Microgrid team plans to expand staffing and resources to handle the demand of incoming projects and site visits.
- SolarTAC plans to break ground on a $1.5 million expansion of its existing outdoor laboratory at its 74-acre campus in Aurora. The new SolarTAC Accelerator aims to reduce costs for startup energy companies that want to test their products on a full-power grid and is slated for completion in the fall of 2016.
- Fort Collins-based Ampt LLC raised $25 million in new funding to expand production and accelerate sales of its string optimizer used in commercial and utility scale photovoltaic systems.
- Adams, Boulder, and Denver counties partnered to launch Solar Benefits Colorado, a first-of-its-kind discount program for home solar panels or electric cars. The program offers homeowners an estimated 15 percent discount on solar rooftop systems and more than $8,000 off the cost of a Nissan Leaf.
- Xcel Energy selected three companies to supply nearly 30 MW of solar power across nine Colorado counties. The companies will build 16 projects via Xcel’s Solar Rewards Community programs.

Wind Energy

Wind energy is an important economic driver in the nine-county region’s cleantech industry. Wind energy has grown rapidly in the region as a result of decreasing costs and technological advancements. According to Environmental Entrepreneurs, Colorado’s wind energy sector generated nearly $5 billion in direct investment in 2014. Key wind company announcements and new project developments in 2015 included:

- Vestas Wind Systems will add at least 750 new workers to its Brighton and Windsor facilities. The company plans to hire between 500 and 600 people for its Windsor plant and 150 for its Brighton plant. Vestas will expand its Windsor plant by 100,000 square feet and will add two more production lines.
- NREL and Clemson University partnered to advance large-scale turbine drivetrain designs and improve integration of wind farms into the electrical grid. Under the CRADA, the partners will share staff, resources, and capabilities in the operation and development of testing facilities.
- Brooklyn, N.Y.-based United Wind will open a new office in Denver. The company provides leased wind turbines for commercial and residential customers.

Biofuels and Bioenergy

The nine-county region’s biofuels and bioenergy companies develop cutting-edge technologies that support this growing renewable energy sector. Notable bioenergy announcements in 2015 included:

- FedEx Corp. signed an agreement with Fort Collins-based Red Rock Biofuels LLC to purchase 3 million gallons of low-carbon, renewable jet fuel for eight years. The blended product will be used for FedEx’s first delivery expected in 2017.
- Englewood-based Gevo Inc. signed an agreement with Alaska Airlines to purchase Gevo’s renewable jet fuel and will fly the first-ever commercial flight on alcohol-to-jet fuel (ATJ). The demonstration flight will occur after Gevo receives American Society for Testing and Materials International certification for its ATJ, which can be integrated into existing distribution infrastructure and onto commercial aircraft.
- Colorado State University (CSU) is one of 10 institutions participating in a $13.8 million DOE project to improve sorghum as a sustainable biofuel source. The five-year project will study sorghum’s ability to produce the bulk of the nation’s starch-based ethanol production, as well as cellulosic feedstock for second-generation ethanol.
- Fort Collins-based Red Rock Biofuels merged with Massachusetts-based Joule Unlimited to enhance the company's bio-refinery platform. The merger will help accelerate the company’s development and commercialization of carbon-neutral fuels.
**Cross-Cluster Convergence**

The nine-county region promotes collaboration and growth opportunities across industries such as cleantech, aviation, and IT-software.

- Fort Collins-based Woodward Inc. signed two partnership agreements in 2015. The company partnered with GE Aviation to develop fuel systems for GE's large commercial aircraft engine lines. Woodward will develop, supply, design, and service fuel systems for the GE90, GEnx, GE9X, and all future large commercial engines developed by GE Aviation. Under the second agreement with France-based Aircelle, Woodward will manufacture hardware for the new Airbus A330neo. Woodward will design, develop, and manufacture a suite of locking and feedback actuators, flex shafts, and drive units.
- Boulder-based Simple Energy Inc. and Xcel Energy Inc. partnered to offer a "smart" thermostat marketplace to residential customers. Simple Energy offers the energy platform to share information and access energy conservation for the thermostats, which can connect via WiFi to a mobile device to allow a resident to remotely control a home’s temperature.

**Research and Education Announcements**

The consortium of the nine-county region’s universities, research centers, and supportive energy programs provide a synergistic climate for the state’s thriving energy cluster.

- Colorado State University (CSU) received a number of sustainability awards in 2015.
  - The DOE awarded CSU its new Postsecondary Sustainability Award through its Green Ribbons Schools program. The program recognizes institutions for their exemplary efforts to reduce environmental impact and utility costs, and ensure green career pathways.
  - CSU is the first institution in the world to earn a Sustainability Tracking, Assessment & Rating System Platinum rating in recognition of its sustainability achievements. CSU offers more than 960 sustainability-related courses and more than 90 percent of academic departments are engaged in sustainability research.
  - The U.S. Environmental Protection Agency awarded CSU Professor of Chemistry Eugene Chen the 2015 Presidential Green Chemistry Challenge Academic Award for his landmark clean chemistry technology. Dr. Chen developed green condensation reactions for renewable chemicals, fuels, and bioplastics.

**Green Transportation**

Colorado is dedicated to providing green transportation opportunities that reduce greenhouse gas emissions and lower energy costs. Alternative fuel vehicles, such as natural gas vehicles (NGV) and electric vehicles (EV), diversify the fuel mix and use fuels produced in Colorado. The state continues to grow its fleet of NGV from 3 to 225 and has passed some of the highest tax credits in the nation for NGVs and EVs. EV charging stations have also become more commonplace, with nearly 150 EV charging stations in Colorado. The state also hosts 36 public and private compressed natural gas (CNG) fueling stations in 22 cities. Notable green transportation announcements in 2015 included:

- United Parcel Service Inc. will build a CNG fueling station in Denver. The station will support the purchase and planned deployment of 1,400 new CNG vehicles over the next year.
- DEN plans to add 10 additional EV charging stations at its public parking garages, doubling the total available for airport passengers. The 240-volt stations are AC Level 2 chargers that provide up to 20 miles of range per hour.
- Loveland-based Lightning Hybrids secured its largest order to supply 35 hydraulic hybrid systems to Massachusetts-based Kessling Transit. The company employs 40 people, which is up from the 15 employees at the start of the year.
- Longmont-based UQM Technologies Inc. signed a supply agreement with China-based ITL Efficiency Corporation to provide electric propulsion systems for shuttle buses, delivery trucks, and transit buses. UQM will make the systems in Colorado through 2017 and plans to produce them in China in 2018.
ENERGY: Metro Denver and Northern Colorado Industry Cluster Profile

Major Cleantech Companies

- Abengoa Solar
  www.abengoasolar.com
- AECOM
  www.aecom-urs.com
- ARCADIS
  www.arcadis.com
- Ascent Solar Technologies, Inc.
  www.ascentsol.com
- Chicago Bridge & Iron Company
  www.cbi.com
- Cool Planet Energy Systems
  www.coolplanet.com
- GE Energy
  www.ge-energy.com
- Gevo Inc.
  www.gevo.com
- juwi Inc.
  www.juwi.com
- Lightning Hybrids, Inc.
  www.lightninghybrids.com
- Namasté Solar
  www.namastesolar.com
- RavenBrick, LLC
  www.ravenwindow.com
- RES Americas, Inc.
  www.res-americas.com
- Senvion USA Corp.
  www.repower.com
- SMA America, LLC
  www.sma-america.com
- SolarCity
  www.solarcity.com
- Sundrop Fuels, Inc.
  www.sundropfuels.com
- Tetra Tech Inc.
  www.tetratech.com
- UQM Technologies, Inc.
  www.uqm.com
- Vestas
  www.vestas.com
- Woodward
  www.woodward.com
- juwi
  www.juwi.com
- Lightning Hybrids, Inc.
  www.lightninghybrids.com
- Namasté Solar
  www.namastesolar.com
- RavenBrick, LLC
  www.ravenwindow.com
- RES Americas, Inc.
  www.res-americas.com
- Senvion USA Corp.
  www.repower.com
- SMA America, LLC
  www.sma-america.com
- SolarCity
  www.solarcity.com
- Sundrop Fuels, Inc.
  www.sundropfuels.com
- Tetra Tech Inc.
  www.tetratech.com
- UQM Technologies, Inc.
  www.uqm.com
- Vestas
  www.vestas.com
- Woodward
  www.woodward.com

Major Renewable Energy Government and Research Facilities

- CO Department of Natural Resources
  www.cdnr.us
- CO Department of Public Health & Environment
  www.colorado.gov/cdphe
- CO Department of Regulatory Agencies
  www.colorado.gov/dora
- Colorado Energy Office
  www.colorado.gov/energy
- Colorado Energy Research Collaboratory
  www.coloradocollaboratory.org
- Colorado Energy Research Institute
  www.ceri-mines.org
- JILA
  www.jila.colorado.edu
- National Center for Atmospheric Research
  www.ncar.ucar.edu
- National Institute of Standards & Technology
  www.nist.gov
- National Renewable Energy Laboratory
  www.nrel.gov
- U.S. Bureau of Reclamation
  www.usbr.gov
- U.S. Dept. of Energy, Golden Field Office
  www.energy.gov/eere
- U.S. Environmental Protection Agency
  www.epa.gov
- U.S. Geological Survey
  www.usgs.gov
- Western Area Power Administration
  www.wapa.gov

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.
The nine-county region ranked fourth out of the 50 largest metro areas for fossil fuels employment concentration in 2015. With direct employment in fossil fuels of about 33,120 workers, the region ranked fourth. As of 2015, 67 percent of Colorado’s fossil fuels employees work in the region.

Fossil Fuels Employment and Company Profile, 2015

<table>
<thead>
<tr>
<th></th>
<th>Nine-County Region</th>
<th>United States</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct employment, 2015</td>
<td>33,120</td>
<td>1,829,870</td>
</tr>
<tr>
<td>Number of direct companies, 2015</td>
<td>1,590</td>
<td>66,820</td>
</tr>
<tr>
<td>One-year direct employment growth, 2014-2015</td>
<td>2.8%</td>
<td>-1.9%</td>
</tr>
<tr>
<td>Five-year direct employment growth, 2010-2015</td>
<td>48.7%</td>
<td>16.3%</td>
</tr>
<tr>
<td>Avg. annual direct employment growth, 2010-2015</td>
<td>8.3%</td>
<td>3.1%</td>
</tr>
<tr>
<td>Direct employment concentration</td>
<td>1.7%</td>
<td>1.2%</td>
</tr>
</tbody>
</table>


Fossil Fuels Employment

The nine-county region’s fossil fuels employment (33,120 workers) rose 2.8 percent in 2015 compared with the previous year’s level, adding 900 new jobs during the period. National employment levels declined over-the-year, decreasing 1.9 percent. Employment growth in 2015 is due, in part, to the fossil fuels infrastructure projects already underway and companies’ ongoing compliance with the Clean Air Clean Jobs Act. While many of the region’s service companies and operators trimmed payrolls and shifted operations to locations outside of Colorado in response to the decline in oil prices, employment growth in companies providing generation, transmission, and distribution of energy resources, engineering services, and fossil fuels support services has also helped to offset employment declines.

About 2 percent of the nation’s fossil fuels employment is located in the nine-county region. Between 2010 and 2015, the region’s fossil fuels employment rose 48.7 percent, compared with a 16.3 percent increase nationwide. Fossil fuels companies employed 1.7 percent of the state’s total employment base, compared with a 1.2 percent employment concentration nationwide.

About 1,590 fossil fuels companies operated in the nine-county region in 2015, rising 5.6 percent over the prior year. Nearly 62 percent of these companies employed fewer than 10 people, while 0.9 percent employed 250 or more.

3 Employment concentration is the direct cluster employment in a region expressed as a percent of total employment in all industries in the same region. Employment concentration is calculated and ranked for the 50 largest metropolitan statistical areas (MSAs). Direct employment is the number of employees in the industry cluster in a region. No multiplier effects are included. Direct employment is estimated and ranked for the 50 largest MSAs.
Fossil Fuels Overview

Colorado offers a diverse selection of natural resources and fossil fuel-rich basins, elevating the state’s status as a powerhouse producer of coal, natural gas, and crude oil. 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 Weld County. Colorado’s active wells totaled nearly 53,630 as of December 2015, with 42 percent of total active wells located in Weld County.

Colorado’s Niobrara shale formation—located in northeast Colorado’s rich Denver-Julesburg Basin (DJ Basin) and extending into parts of adjacent Wyoming, Nebraska, and Kansas—has led to substantial economic benefits including job creation, infrastructure development, export possibilities, and technological development. The 7,000-foot-deep geographic layer could hold more than 4 billion barrels of recoverable oil reserves.

Pipeline and Rail Construction

Rail and pipeline shipments of crude oil from the Rocky Mountain region have increased steadily over the last several years as oil production from Niobrara has risen. Oil transported out of the Rocky Mountain region to the Gulf Coast increased 33,800 percent over the last five years, or 359 barrels per day between 2010 and 2014. Additionally, 19 percent of the region’s production—or one in five barrels of oil—is transported to...
market by rail. Several pipeline and rail projects were underway in the Rocky Mountain region in 2015 to increase capacity:

- The White Cliffs Twin Pipeline—which extends from Platteville, Colorado to Cushing, Oklahoma—expanded to handle up to 215,000 barrels per day. The expansion project will also boost horsepower, modify existing pumps, and add stations.
- NGL Energy Partners LP will increase the capacity of its Grand Mesa crude pipeline to 200,000 barrels per day. Grand Mesa will include more than 550 miles of pipeline, multiple truck injection bays, additional storage, and at least two origination points near Lucerne and Kersey in Weld County by 2016.
- Magellan Midstream Partners LP and Plains All American Pipeline LP partnered to build, own, and operate a 600-mile crude oil pipeline to ship oil from the DJ Basin to storage facilities in Cushing, Oklahoma. The Saddlehorn Pipeline will be operational in 2016 and will have a capacity of 200,000 barrels per day.
- Denver-based ARB Midstream LLC partnered with Houston-based Hi-Crush Partners LP to build and operate a $70 million rail hub near Evans. The rail hub will transport sand used in hydraulic fracturing operations and crude oil to refineries. The 225-acre site will have storage capacity for 200,000 barrels of crude oil with room to expand to 400,000 barrels.

Fossil Fuels Company Announcements

A global oversupply in oil has driven prices down from June 2014 highs above $100 a barrel to under $40 a barrel in December 2015. Even though the decline in global oil prices has impacted oil and gas development strategies over the last year, a number of company developments and new projects were announced in 2015:

- FMC Technologies, Inc. opened a new $11.9 million “super-base” facility in Brighton to serve customers in the DJ Basin. The center will house three of the company’s service divisions and the company plans to further expand operations and add more than 50 jobs over the next five years. The project includes construction of a 50,000-square-foot building at the company’s 20-acre site.
- Anadarko Petroleum Corp. built its Central Oil Stabilization Facility, which is a complex of steel pipes, storage tanks, and tall towers that span 69 acres near Greeley. The facility will be capable of processing 125,000 barrels of crude oil, natural gas, and natural gas liquids pumped out of the ground.
- Antero Resources will expand its Denver headquarters, leasing 37,000 square feet in a mixed-use development underway at 16th and Wewatta streets. Antero plans to move into the building in early 2017.
- Denver-based PDC Energy Inc. will relocate 160 employees from its Evans office to a newly renovated Greeley site. The 8.8-acre site will include storage and warehouse space for gas valves, fittings, and small oil field equipment.
- Xcel Energy completed construction at its Cherokee Generating Station in Adams County. The $534 million project converted three generating units to natural gas as a result of the $1 billion Clean Air Clean Jobs Act program approved in 2010 to cut air pollution by closing and retrofitting Xcel’s coal-fired plants. A fourth unit at the plant will be converted from coal to natural gas in 2017.
- Bill Barrett Corp. plans to add a second drilling rig and will drill 11 new wells in the DJ Basin. The new oil and gas wells will have extended reach lateral bores of about 9,500 feet.
- Platteville-based Synergy Resources Corp. plans to open a corporate office in downtown Denver. The company hired four executives and cited the region’s growing oil and gas workforce as a key factor in the new office location.
- Canada-based Packers Plus Energy Services Inc. plans to open a new 59,137-square-foot manufacturing facility in Louisville. The company manufactures multi-stage completion systems for technically challenging oil and gas wells and will occupy the industrial space by early 2016.
- Evolution Midstream LLC, a Denver-based provider of midstream services to oil and gas producers in North America, formed via a $300 million equity commitment from EnCap Flatrock Midstream. The company will provide natural gas gathering, processing, treating, and compression, and crude oil gathering, transportation, and marketing.
- Synergy Resources Corp. purchased oil wells and leases in the Wattenberg Field for $78 million from K.P. Kauffman Company Inc. Synergy Resources Corp. plans to open a corporate office in Denver at 1625 Broadway.
- Oil and gas firm Warren Resources Inc. will move its corporate headquarters from New York to its existing Denver office. The move will be completed by March 2016 and will support the company’s Marcellus, Wyoming, and California business units.
Merger and Acquisition Activity

Fossil fuels companies in the nine-county region announced several mergers and acquisitions in 2015.

- Marathon Petroleum Corp. acquired Denver-based MarkWest Energy Partner LP in a $10 billion deal. The merger will increase investment and development opportunities and will create the fourth-largest natural gas processing company in the nation.
- Canada Pension Plan Investment Board and Denver-based The Broe Group will acquire Encana Oil & Gas Inc.’s oil and gas assets in the DJ Basin. The $900 million deal includes 51,000 acres and more than 1,600 wells, which produces an average of 52 million cubic feet of natural gas and 14,800 barrels of oil per day.
- Denver-based First River Energy LLC purchased San Antonio, TX-based Texas Gathering Co. LLC. The merger will grow First River’s market share and expand its customer base.

Cross-Cluster Convergence

The nine-county region promotes collaboration and growth opportunities across industries such as fossil fuels, aerospace, and IT-software.

- Xcel Energy received approval from the Federal Aviation Administration to operate small, unmanned aircraft systems to inspect its electricity transmission and distribution lines, power plants, renewable energy facilities, substations, and other equipment. The technology will increase electricity system reliability, reduce costs, and improve emergency response times.
- Broomfield-based PetroDE partnered with Anadarko Petroleum Corp. to integrate cloud-based decision engine technology into its workflow. PetroDE will provide cloud-based oil and natural-gas analytics, providing Anadarko clients the ability to rapidly mine, visualize, analyze, and share multiple data sources in order to make time-sensitive decisions to direct resources.

Major Fossil Fuels Companies

- Anadarko Petroleum Corporation
  www.anadarko.com
- Antero Resources
  www.anteroresources.com
- BP America
  www.bp.com
- Bill Barrett Corp.
  www.billbarrettcorp.com
- Black Hills Corporation
  www.blackhillscorp.com
- Cimarex Energy
  www.cimarex.com
- ConocoPhillips Co.
  www.conocophillips.com
- Crossfire LLC
  www.crossfire-llc.com
- DCP Midstream
  www.dcpmidstream.com
- Encana Corporation
  www.encana.com
- Halcón Resources Corp.
  www.halconresources.com
- Halliburton
  www.halliburton.com
- InfraSource, Inc.
  www.infrasourceus.com
- Intermountain Rural Electric Association
  www.irea.coop
- Noble Energy, Inc.
  www.nobleenergyinc.com
- Northern Pipeline Construction
  www.gonpl.com
- PDC Energy, Inc.
  www.pdce.com
- Sabine Oil & Gas Corp. (formerly Forest Oil)
  www.sabineoil.com
- Schlumberger Ltd.
  www.slb.com
- Shell Exploration and Production
  www.shell.com
- SM Energy Co.
  www.sm-energy.com
- Suncor Energy Inc.
  www.suncor.com
- Superior Energy Services Co.
  www.superiorenenergy.com
- TransMontaigne Inc.
  www.transmontaigne.com
- Tri-State Generation & Transmission Assoc.
  www.tristategt.org
- United Power
  www.unitedpower.com
- Westmoreland Coal Company
  www.westmoreland.com
- Whiting Petroleum Corp.
  www.whiting.com
**ENERGY: Metro Denver and Northern Colorado Industry Cluster Profile**

**Major Fossil Fuels Companies Cont’d**

- Kinder Morgan  
  [www.kindermorgan.com](http://www.kindermorgan.com)  
- MarkWest Energy Partners, L.P.  
  [www.markwest.com](http://www.markwest.com)  
- Williams  
  [www.co.williams.com](http://www.co.williams.com)  
- Xcel Energy  
  [www.xcelenergy.com](http://www.xcelenergy.com)

**Energy Workforce Profile**

Many companies choose locations because of the available workforce. With nearly half of the nine-county region’s 3.7 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, 41.3 percent are college graduates and 90.5 percent have graduated from high school. The state has the nation’s second-most highly educated workforce as measured by the percentage of residents with a bachelor’s degree or higher.

The attractiveness of the region draws new residents through migration. The region’s population is expected to grow 59.9 percent from 2010 to 2040, driving a 36.3 percent increase in the region’s labor force over the same period. It is important to note the changing composition of the workforce supply as the baby boomers begin to retire, which will pose implications for businesses whose employee pool includes significant numbers of these workers.

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

- Less than 9th Grade: 4.3%
- 9th to 12th Grade, No Diploma: 5.2%
- High School Graduate (includes equivalency): 20.4%
- Some College, No Degree: 21.3%
- Associate Degree: 7.6%
- Bachelor’s Degree: 25.8%
- Graduate or Professional Degree: 15.5%
- 9th to 12th Grade, No Diploma: 5.2%

*Source: U.S. Census Bureau, 2014 American Community Survey.*

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

*Source: Colorado Division of Local Government, State Demography Office.*
Cleantech Workforce Profile

Age Distribution

The nine-county region’s cleantech industry employs 21,600 people and includes a large pool of talented, well-educated, and highly skilled workers. The age distribution of workers in the cleantech subcluster is similar to the age distribution across all industries. However, the cleantech subcluster has a larger share of employees (71.4 percent) that are between the ages of 35 and 65 years and older, compared with the age distribution of all industries across the nine-county region (64.7 percent).

The cleantech workforce supply consists of four main components: those currently working in the industry; those doing a similar type of job in some other industry; the unemployed; and those currently in the education pipeline. The Metro Denver and Northern Colorado Cleantech Occupation & Salary Profile below includes the 10 largest cleantech occupations in the nine-county 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

The 2014 average annual salary for cleantech employees was $76,610 in the nine-county region, compared with the national average of $76,940. The nine-county region’s cleantech payroll exceeded $1.5 billion in 2014.

Metro Denver and Northern Colorado Cleantech Occupation & Salary Profile, 2015

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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Electricians</td>
<td>12,311</td>
<td>348</td>
<td>863</td>
<td>$45,149</td>
<td>$28,565</td>
<td>$34,454</td>
<td>$58,135</td>
<td>$69,980</td>
</tr>
<tr>
<td>2. Business operations specialists, all other</td>
<td>33,049</td>
<td>705</td>
<td>42</td>
<td>$72,259</td>
<td>$38,646</td>
<td>$51,958</td>
<td>$95,805</td>
<td>$124,238</td>
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<tr>
<td>3. Plumbers, pipefitters, &amp; steamfitters</td>
<td>7,093</td>
<td>46</td>
<td>393</td>
<td>$46,238</td>
<td>$29,856</td>
<td>$35,277</td>
<td>$57,349</td>
<td>$66,890</td>
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<td>4. Engineers</td>
<td>33,634</td>
<td>1,284</td>
<td>3,549</td>
<td>$94,827</td>
<td>$59,821</td>
<td>$74,901</td>
<td>$120,266</td>
<td>$146,640</td>
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<td>5. Secretaries &amp; administrative assistants, except legal, medical, &amp; executive</td>
<td>47,380</td>
<td>643</td>
<td>70</td>
<td>$36,754</td>
<td>$23,566</td>
<td>$29,494</td>
<td>$45,323</td>
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<td>6. Physical scientists</td>
<td>9,463</td>
<td>342</td>
<td>1,238</td>
<td>$87,381</td>
<td>$51,064</td>
<td>$66,373</td>
<td>$116,958</td>
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<td>8. Office clerks, general</td>
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<td>2,450</td>
<td>0</td>
<td>$34,322</td>
<td>$20,740</td>
<td>$26,091</td>
<td>$45,813</td>
<td>$57,934</td>
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<td>9. General &amp; operations managers</td>
<td>30,063</td>
<td>1,514</td>
<td>5,777</td>
<td>$109,117</td>
<td>$51,394</td>
<td>$72,862</td>
<td>$171,538</td>
<td>$248,331</td>
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<td>10. First-line supervisors of construction trades &amp; extraction workers</td>
<td>10,897</td>
<td>328</td>
<td>1,347</td>
<td>$58,224</td>
<td>$38,042</td>
<td>$47,228</td>
<td>$72,095</td>
<td>$85,891</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 2015.3 Class of Worker.
Fossil Fuels Workforce Profile

Age Distribution
The nine-county region’s fossil fuels industry employs 33,120 people and includes a large pool of talented, well-educated, and highly skilled workers. The fossil fuels subcluster has a larger share of employees (90.3 percent) that are between the ages of 25 and 64 years old, compared with the age distribution across all industries (82.4 percent).

The fossil fuels workforce supply consists of four main components: those currently working in the industry; those doing a similar type of job in some other industry; the unemployed; and those currently in the education pipeline. The Metro Denver and Northern Colorado Fossil Fuels Occupation & Salary Profile below includes the 10 largest fossil fuels 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 fossil fuels subcluster are among the highest across all industry clusters. The 2014 average annual salary for a fossil fuels worker in the nine-county region was $110,070, compared with the national average of $98,660. The nine-county region’s fossil fuels payroll exceeded $3.5 billion in 2014.
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 nearly 380 private occupational and technical schools offering courses in dozens of program areas throughout the state. 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 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

- Emily Griffith Technical College
  www.emilygriffith.edu

- Regis University
  www.regis.edu

- Colorado State University
  www.colostate.edu

- Front Range Community College
  www.frontrange.edu

- University of Colorado: Boulder, Denver
  www.cu.edu

- Colorado State University Global Campus
  www.colostate.edu

- Jones International University
  www.jiuc.edu

- University of Denver
  www.du.edu

- Ecotech Institute
  www.ecotechinstitute.com

- Metropolitan State University of Denver
  www.msudenver.edu

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

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

- **Coal** - Colorado produced more than 24 million short tons of coal, or 2.5 percent of the nationwide supply in 2013. Colorado was the 11th-most productive coal mining state and borders Wyoming, the nation’s largest producer of coal. (U.S. Department of Energy, Energy Information Administration, 2014)

- **Natural Gas** - Colorado ranked sixth among natural-gas producing states, accounting for 6.3 percent of U.S. natural gas production. The state also had the nation’s largest reserve of coalbed methane and accounts for about one-fourth of Colorado’s natural gas production. (U.S. Department of Energy, Energy Information Administration, 2015)
  - The Rockies Express Pipeline (REX) is a 1,679-mile interstate natural gas pipeline system that extends from the Piceance Basin in Colorado to Clarington, Ohio with a capacity of 1.8 billion cubic feet per day. REX is undergoing an expansion that will increase east-to-west delivery of natural gas from Ohio to markets in the Midwest, Gulf Coast, and Southeast. (U.S. Department of Energy, Energy Information Administration, 2015; Tallgrass Energy, 2015)

- **Oil** - Colorado ranked as the nation’s seventh-largest oil producer in 2014, producing a record 94.4 million barrels of crude oil. Colorado ranked seventh in the number of active rotary rigs as of October 2015, and Colorado had the seventh-highest proven oil reserves in the nation totaling 1,170 million barrels in 2013. (U.S. Department of Energy, Energy Information Administration, 2015; Baker Hughes, 2015)
  - Colorado is home to two of the 100 largest oil fields and nine of the nation’s 100 largest natural gas fields. (U.S. Department of Energy, Energy Information Administration, 2015)

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

- **Wind** - Colorado ranked seventh in the nation for wind power generation capacity installed and ranked 10th for total installed wind power capacity as of September 2015. Nearly 14 percent of all in-state electricity production was generated with wind. (U.S. Department of Energy, Energy Information Administration, 2015; American Wind Energy Association, 2015)

- **Biomass** - Colorado has extensive biomass potential. Roughly 25 percent of the state’s 24 million acres of forestland have a high or moderate potential for future biomass production, with a typical yield in the Front Range of four to 10 dry tons of woody biomass per acre per year. (Colorado State Forest Service, 2015)
ENERGY: Metro Denver and Northern Colorado Industry Cluster Profile

- **Solar** - Colorado ranked ninth in the nation for total installed solar capacity in 2014 with 430 MW. (Solar Energy Industries Association, 2015)
  - Metro Denver ranked fifth among the top-10 largest U.S. metro areas for solar power system installations. Denver has 6.22 solar power systems per capita, compared with the U.S. average of 2.26. (BuildZoom, 2015)
  - Denver ranked eighth among the top-20 largest U.S. cities for installed solar photovoltaic (PV) capacity and ranked No. 7 for solar PV capacity generated per capita in 2014. (Environment America Research & Policy Center, 2015)

- **Water** - With a combined installed capacity of 1,162 megawatts (MW), Colorado’s more than 60 hydropower facilities generate roughly 1 million MW-hours of electricity annually. (Colorado Energy Office, 2015)

- Metro Denver ranked 11th in clean technology leadership in 2015 and ranked among the top-10 for clean building usage and cleantech investment, innovation, and workforce. (Clean Edge, Inc., 2015)

- Denver ranked sixth among the top-10 U.S. cities for green commercial space. Nearly half of all leasable office space in Denver was classified as either ENERGY STAR® or Leadership in Energy and Environmental Design (LEED)-certified. (CBRE Group, 2015; Maastricht University, 2015)

- Metro Denver ranked among the top-10 U.S. metropolitan areas with the greatest number of ENERGY STAR® certified buildings in 2014. (U.S. Environmental Protection Agency, 2015)


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

1. **The ability to recruit and retain senior management and scientific talent**
   - Of Colorado’s adult population, more than 38 percent has completed a bachelor’s or higher-level degree, making Colorado the second-most highly educated state in the nation behind Massachusetts. (U.S. Census Bureau, 2014 American Community Survey)
   - Colorado ranked ninth in the nation for the number of science, engineering, and health doctorate holders as a percent of the workforce. (National Science Foundation, 2015)
   - Colorado ranked ninth in the nation for solar jobs per capita, with over 4,200 solar jobs concentrated in installation and manufacturing. (The Solar Foundation, 2015)
   - Colorado ranked first for wind manufacturing jobs and was among the top-three states for wind-related employment. (American Wind Energy Association, 2015)
   - Colorado ranked seventh in the nation for the number of new clean energy jobs created in 2014, with more than 1,580 new clean energy jobs announced during the year. (Environmental Entrepreneurs, 2015)
   - Metro Denver ranked as the fourth-best metro area for science, technology, engineering, and mathematics (STEM) professionals in 2015. Metro Denver ranked fourth for the projected number of STEM jobs needed in 2018 and seventh for openings per capita for STEM graduates. (WalletHub, 2015)
   - Boulder ranked as the third-best metro area for college graduates in STEM fields in 2015. Boulder boasts 140 STEM employees per 1,000 jobs and the area’s annual mean wage for STEM jobs was $91,100. (NerdWallet, 2015)

2. **Proximity to energy-related higher education programs and research centers**
   - Colorado ranked ninth for the number of science, engineering, and health graduate students per 1,000 individuals ages 25 to 34 years old in 2013. (National Science Foundation, 2015)
   - Colorado School of Mines 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, 2015)
   - Colorado is home to Education Corporation of America’s Ecotech Institute, the world’s only college entirely focused on training students for careers in cleantech. (Ecotech Institute, 2015)
   - Launched in 2007, the Colorado Center for Biorefining and Bioproducts (C2B2) is a joint research center of the Colorado Energy Research Collaboratory. C2B2 advances the study and development of biomass for biofuel and biorefining applications. (Colorado Center for Biorefining and Bioproducts, 2015)
   - The Colorado State University (CSU) Energy Institute is the central, unifying hub of scholarly excellence in energy-related research, education, and outreach. Headquartered at CSU’s new Powerhouse Energy Campus, the Institute aims to increase collaboration with industry and
governmental partners to solve energy problems and create new research and educational opportunities. (Colorado State University, 2015)

- The Solar Technology Acceleration Center (SolarTAC) in Aurora is the largest test facility for solar technologies in the U.S. (The Solar Technology Acceleration Center, 2015)

3. Access to the research of a broad collection of federal laboratories and private R&D activities

- Key federal offices located in the nine-county region include the National Center for Atmospheric Research; the Office of Surface Mining Reclamation and Enforcement; the U.S. Bureau of Land Management; the U.S. Bureau of Ocean Energy Management, Regulation and Enforcement; the U.S. Bureau of Reclamation; the U.S. Forest Service; the U.S. Department of Energy; the U.S. Environmental Protection Agency; the U.S. Geological Survey; and the Western Area Power Administration.

- Firms with fossil fuel energy R&D programs include Anadarko Petroleum, BP America, Encana, Noble Energy, Shell Exploration & Production, and Suncor Energy.

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

- Legislation passed in 2015 refunds sales and use tax for equipment used in R&D of medical devices or clean technology. House Bill 1180 (2015) 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.

- The Colorado Energy Coalition (CEC) is a consortium of leaders and stakeholders dedicated to strengthening the business climate in Colorado supporting all sectors of the energy industry. The CEC’s mission is to brand Colorado as the Balanced Energy Capital of the West. (Metro Denver EDC, 2015)

- The Colorado Clean Energy Cluster (CCEC) is an economic development organization dedicated to growing clean energy jobs and aims to expand the clean energy sector through innovative and entrepreneurial projects and initiatives. CCEC’s initiatives include FortZED, the International Cleantech Network, C3E, and Net Zero Water. (The Colorado Clean Energy Cluster, 2015)

- The Advanced Industries (AI) Accelerator Programs includes four types of grants and a global business support program to promote growth and sustainability in Colorado’s advanced industries, including advanced manufacturing, aerospace, bioscience, electronics, energy and natural resources, infrastructure engineering, and technology and information. These industries account for nearly 30 percent of the state’s wage earnings and nearly 35 percent of the state’s total exports. (The Colorado Office of Economic Development and International Trade, 2015)

**Energy Industry Cluster Definition**

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<th>SIC Code</th>
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<td>(P) Geophysical surveying &amp; mapping services</td>
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**Cleantech**

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<tr>
<td>NAICS Code*</td>
<td>NAICS Description</td>
<td>Energy Industry Cluster Definition Cont’d</td>
<td>SIC Code</td>
</tr>
<tr>
<td>-------------</td>
<td>-------------------</td>
<td>------------------------------------------</td>
<td>----------</td>
</tr>
<tr>
<td>314994</td>
<td>Rope, cordage, twine, tire cord, &amp; tire fabric mills</td>
<td>2296-03 Cord &amp; fabric for reinforcing fuel cells</td>
<td></td>
</tr>
<tr>
<td>325180</td>
<td>Other basic inorganic chemical mfg.</td>
<td>2819-06 Fuels &amp; radioactive compounds</td>
<td></td>
</tr>
<tr>
<td>325193</td>
<td>Ethyl alcohol mfg.</td>
<td>2869-0104 Ethyl alcohol, ethanol</td>
<td></td>
</tr>
<tr>
<td>333414</td>
<td>Heating equipment (except warm air furnaces) mfg.</td>
<td>3433-9904 Solar heaters &amp; collectors</td>
<td></td>
</tr>
<tr>
<td>333611</td>
<td>Turbine &amp; turbine generator set units mfg.</td>
<td>3511 Turbines &amp; turbine generator sets</td>
<td></td>
</tr>
<tr>
<td>334413</td>
<td>Semiconductor &amp; related device mfg.</td>
<td>3674-0305 Photovoltaic devices, solid state</td>
<td></td>
</tr>
<tr>
<td>334413</td>
<td>Semiconductor &amp; related device mfg.</td>
<td>3674-0306 Solar cells</td>
<td></td>
</tr>
<tr>
<td>334512</td>
<td>Automatic environmental control mfg. for residential, commercial, &amp; appliance use</td>
<td>3822 Environmental controls</td>
<td></td>
</tr>
<tr>
<td>334515</td>
<td>Instrument mfg. for measuring &amp; testing electricity &amp; electrical signals</td>
<td>3825-0305 Electrical power measuring equipment</td>
<td></td>
</tr>
<tr>
<td>334515</td>
<td>Instrument mfg. for measuring &amp; testing electricity &amp; electrical signals</td>
<td>3825-0306 Energy measuring equipment, electrical</td>
<td></td>
</tr>
<tr>
<td>334519</td>
<td>Other measuring &amp; controlling device mfg.</td>
<td>3829-0218 Solarimeters</td>
<td></td>
</tr>
<tr>
<td>335311</td>
<td>Power, distribution, &amp; specialty transformer mfg.</td>
<td>3612 Power, distribution, &amp; specialty transformers</td>
<td></td>
</tr>
<tr>
<td>335312</td>
<td>Motor &amp; generator mfg.</td>
<td>3621-03 Control equipment for electric buses &amp; locomotives</td>
<td></td>
</tr>
<tr>
<td>335312</td>
<td>Motor &amp; generator mfg.</td>
<td>3621-9909 Windmills, electric generating</td>
<td></td>
</tr>
<tr>
<td>335911</td>
<td>Storage battery mfg.</td>
<td>3691 Storage batteries</td>
<td></td>
</tr>
<tr>
<td>335999</td>
<td>All other misc. electrical equipment &amp; component mfg.</td>
<td>3629-0102 Electrochemical generators (fuel cells)</td>
<td></td>
</tr>
<tr>
<td>336111</td>
<td>Automobile mfg.</td>
<td>3711-0104 Cars, electric, assembly of</td>
<td></td>
</tr>
<tr>
<td>336390</td>
<td>Other motor vehicle parts mfg.</td>
<td>3799-0302 Cars, off-highway: electric</td>
<td></td>
</tr>
<tr>
<td>423720</td>
<td>Plumbing &amp; heating equipment &amp; supplies (hydronics) merchant wholesalers</td>
<td>5074-0208 Heating equipment &amp; panels, solar</td>
<td></td>
</tr>
<tr>
<td>482111</td>
<td>Line-haul railroads</td>
<td>4011-9901 Electric railroads</td>
<td></td>
</tr>
<tr>
<td>541380</td>
<td>Testing laboratories</td>
<td>8734-00 Testing laboratories</td>
<td></td>
</tr>
<tr>
<td>541380</td>
<td>Testing laboratories</td>
<td>8734-9902 Calibration &amp; certification</td>
<td></td>
</tr>
<tr>
<td>541620</td>
<td>Environmental consulting services</td>
<td>8748-9905 Environmental consultant</td>
<td></td>
</tr>
<tr>
<td>541620</td>
<td>Environmental consulting services</td>
<td>8999-07 Earth science services</td>
<td></td>
</tr>
<tr>
<td>541620</td>
<td>Environmental consulting services</td>
<td>8999-09 Scientific consulting</td>
<td></td>
</tr>
<tr>
<td>541690</td>
<td>Other scientific &amp; technical consulting services</td>
<td>8748-9904 Energy conservation consultant</td>
<td></td>
</tr>
<tr>
<td>541712</td>
<td>Research &amp; development in the physical, engineering, &amp; life sciences (except biotechnology)</td>
<td>8731-03 Natural resource research</td>
<td></td>
</tr>
<tr>
<td>541712</td>
<td>Research &amp; development in the physical, engineering, &amp; life sciences (except biotechnology)</td>
<td>8733-9902 Research institute</td>
<td></td>
</tr>
<tr>
<td>924110</td>
<td>Administration of air &amp; water resource &amp; solid waste management programs</td>
<td>9511-00 Air, water, &amp; solid waste management</td>
<td></td>
</tr>
</tbody>
</table>

*(P) indicates that only part of the NAICS industry category is represented in the industry cluster definition.

**The NAICS codes are reviewed every five years for potential revisions to reflect new and emerging industries and to allow for industry changes. In 2012, NAICS code 221119 was reclassified into five new industries to distinguish solar (221114), wind (221115), geothermal (221116), biomass (221117), and other electric (221118) power generation. As a result, 221119 was removed from fossil fuels and reclassified into cleantech. Data is limited or not yet available for these five new industries.

Note: NEC indicates "not elsewhere classified."
Energy Industry Cluster Relationships

Technologies
- Bioconversion
- Biofuels
- Electric Motors
- Ethanol
- Fuel Cells
- Geographic Information Systems
- Nanotechnology
- Photonics
- Photovoltaics

Support Industries
- Agriculture
- Beverage Production
- Bioscience
- Geospatial
- Government
- Software
- Transportation

Energy
- Fossil Fuels
- Cleantech

Infrastructure
- CO Clean Energy Cluster
- CO Cleantech Industry Assoc.
- CO Energy Research Institute
- CO-LABS
- CO Mining Association
- CO Renewable Energy Collaboratory
- CO School of Mines
- CO Petroleum Association
- Conservation and Gas Tech. Institute
- Federal Laboratories-NIST, NCAR
- National Renewable Energy Laboratory
- Solar Thermal Alliance of Colorado

Client Industries
- Defense/Security
- Utilities
- Manufacturing
- Transportation
- Consumers
- Businesses

For additional information, contact us:

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

Colorado Energy Coalition
1445 Market Street
Denver, CO 80202-1790
303.620.8092
e-mail: info@metrodenver.org
www.metrodenver.org/cec

Industry Overview

The nine-county Metro Denver and Northern Colorado region is the major financial center between Los Angeles and Chicago. Downtown Denver's financial district along 17th Street is known as the “Wall Street of the West.” The region’s central location with global access helps financial services companies expand their competitive edge and capitalize on a highly skilled workforce, pro-business environment, low costs, and world-class infrastructure.

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 securities and commodities trade, real estate investment trusts (REITS), and portfolio management. The insurance subcluster consists of insurance carriers and brokerages.

Denver is home to a branch of the Federal Reserve Bank and is the location of one of only six U.S. Mints. The Denver Mint is the single largest producer of coins in the world and manufactures all denominations of circulating coins, coin dies, the Denver “D” portion of the annual uncirculated coin sets, and commemorative coins authorized by the U.S. Congress. The Denver Mint stores gold and silver bullion and produced nearly 6.8 billion coins in 2014. The Denver die manufacturing division implemented new robotic lathe technology that decreased processing time of dies from 2.5 days to 75 minutes in 2014. Members of the division were awarded the prestigious Rittenhouse Medal of Excellence Award. Additionally, the Denver Mint also produced the world’s first curved clad coin in 2014, which is composed of 92 percent copper.

Professional Associations

A variety of trade associations and service firms support the region’s diverse financial services industry base of nearly 13,800 companies and about 97,000 employees.

- The Colorado Bankers Association is a key industry partner (www.coloradobankers.org) representing all Colorado banks and provides government relations, community relations, educational and training services, and bank insurance.

- The Colorado Association of Mortgage Professionals (www.coamp.org) is a nonprofit trade group representing Colorado’s financing professionals specializing in origination of residential and commercial mortgages and offers professional development opportunities and member certification support.

- The Colorado Association of Insurance and Financial Advisors represents the state’s insurance agents, financial advisors, multiline agents, and other advisors, offering more than 50 programs and products to enhance skills and business services (www.naifacolorado.org).

- Established in 2014, the Colorado Investment Services Coalition (CISC) is an advocacy group for Colorado’s large employers in investment management and advisory services. The Coalition’s mission is to develop the talent pipeline for financial services companies expanding in the region, and to provide a public policy voice on issues of common interest. CISC members’ goal is to educate and inform policymakers on industry-related issues at the state and federal level that is conducive to industry growth and job creation in Colorado.

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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.
FINANCIAL SERVICES: Metro Denver and Northern Colorado Industry Cluster Profile

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.

The nine-county region ranked 10th out of the 50 largest metro areas in banking and finance employment concentration in 2015. With direct employment in banking and finance of 38,140 workers, the region ranked 11th. About 77 percent of Colorado’s banking and finance industry employees work in the region.

### Banking and Finance Employment and Company Profile, 2015

<table>
<thead>
<tr>
<th></th>
<th>Nine-County Region</th>
<th>United States</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct employment, 2015</td>
<td>38,140</td>
<td>2,578,940</td>
</tr>
<tr>
<td>Number of direct companies,</td>
<td>3,130</td>
<td>218,440</td>
</tr>
<tr>
<td>One-year direct employment</td>
<td>-0.7%</td>
<td>-0.3%</td>
</tr>
<tr>
<td>Five-year direct employment</td>
<td>-0.8%</td>
<td>0.3%</td>
</tr>
<tr>
<td>Avg. annual direct employment</td>
<td>-0.2%</td>
<td>0.1%</td>
</tr>
<tr>
<td>Direct employment concentration</td>
<td>2.0%</td>
<td>1.7%</td>
</tr>
</tbody>
</table>


Banking and Finance Employment

The nine-county region’s banking and finance employment (38,140 workers) declined 0.7 percent in 2015, compared with the previous year’s level. Similarly, national employment levels declined 0.3 percent over-the-year. The financial industry continues to undergo unprecedented structural change. The banking and financial subcluster is contending with increasing challenges, including post-crisis regulations, industry consolidation, rising compliance and security costs, and increased competition. Further, automation and technological solutions have created efficiencies and reduced employment in the industry.

About 3,130 banking and finance companies operated in the nine-county region in 2015. Approximately 68 percent of the region’s banking and finance companies employed fewer than 10 people, while 0.6 percent employed 250 or more.

---

2 Employment concentration is the direct cluster employment in a region expressed as a percent of total employment in all industries in the same region. Employment concentration is calculated and ranked for the 50 largest metropolitan statistical areas (MSAs). Direct employment is the number of employees in the industry cluster in a region. No multiplier effects are included. Direct employment is estimated and ranked for the 50 largest MSAs.
**Major Banking and Finance Companies**

- ADS Alliance Data Systems  
  [www.alliancedata.com](http://www.alliancedata.com)
- American Financing Corp.  
  [www.americanfinancing.net](http://www.americanfinancing.net)
- Bank of the West  
  [www.bankofthewest.com](http://www.bankofthewest.com)
- BBVA Compass Bank  
  [www.bbvacompass.com](http://www.bbvacompass.com)
- Bellico Credit Union  
  [www.bellco.org](http://www.bellco.org)
- Citywide Banks  
  [www.citywidebanks.com](http://www.citywidebanks.com)
- CoBank  
  [www.cobank.com](http://www.cobank.com)
- KeyBank  
  [www.key.com](http://www.key.com)
- Markit On Demand  
  [www.markit.com](http://www.markit.com)
- National Bank Holdings Corp.  
  [www.nationalbankholdings.com](http://www.nationalbankholdings.com)
- Nelnet  
  [www.nelnet.com](http://www.nelnet.com)
- Nordstrom Credit  
  [www.nordstrom.com](http://www.nordstrom.com)
- On Deck Capital  
  [www.ondeck.com](http://www.ondeck.com)
- Public Service Credit Union  
  [www.pscu.org](http://www.pscu.org)
Major Banking and Finance Companies Cont’d

- Colorado Business Bank  
  www.cobizbank.com
- Colorado Housing and Finance Authority  
  www.chfainfo.com
- Colorado State Bank and Trust  
  www.csbt.com
- Elavon  
  www.elavon.com
- FirstBank Holding Company  
  www.efirstbank.com
- First Data Corporation  
  www.firstdata.com
- Guaranty Bank and Trust  
  www.guarantybankco.com
  www.chase.com
- Pulte Mortgage  
  www.pultemortgage.com
- Specialized Loan Servicing LLC  
  www.sls.net
- U.S. Bank  
  www.usbank.com
- Urban Lending Solutions  
  www.urban-ls.com
- Vectra Bank Colorado  
  wwwvectrabank.com
- VISA Debit Processing Services  
  www.visadps.com
- Wells Fargo Bank Colorado  
  www.wellsfargo.com
- Western Union  
  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.

The nine-county region ranked 12th out of the 50 largest metro areas in investments employment concentration in 2015. With direct employment of 26,070 investment workers, the region ranked 12th. About 85 percent of Colorado’s banking and finance industry employees work in the region.

<table>
<thead>
<tr>
<th>Investments Employment and Company Profile, 2015</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Nine-County Region</strong></td>
</tr>
<tr>
<td>Direct employment, 2015</td>
</tr>
<tr>
<td>Number of direct companies, 2015</td>
</tr>
<tr>
<td>One-year direct employment growth, 2014-2015</td>
</tr>
<tr>
<td>Five-year direct employment growth, 2010-2015</td>
</tr>
<tr>
<td>Avg. annual direct employment growth, 2010-2015</td>
</tr>
<tr>
<td>Direct employment concentration</td>
</tr>
</tbody>
</table>


---

1 Employment concentration is the direct cluster employment in a region expressed as a percent of total employment in all industries in the same region. Employment concentration is calculated and ranked for the 50 largest metropolitan statistical areas (MSAs). Direct employment is the number of employees in the industry cluster in a region. No multiplier effects are included. Direct employment is estimated and ranked for the 50 largest MSAs.
FINANCIAL SERVICES: Metro Denver and Northern Colorado Industry Cluster Profile

Investments Employment

The nine-county region’s investments employment (26,070 workers) rose 7 percent in 2015, compared with the previous year’s level, adding nearly 1,700 new jobs during the same period. National employment levels also grew over-the-year, rising 2.5 percent, representing an additional 33,870 jobs. About 1.9 percent of the nation’s investments employment is located in the region. Between 2010 and 2015, the region’s investments employment rose 17.6 percent, compared with 8 percent at the national level. Investment companies employed 1.3 percent of the region’s total employment base, compared with a 0.9 percent national employment concentration.

About 7,120 investment companies operated in the nine-county region in 2015. Approximately 94 percent of the region’s investment companies employed fewer than 10 people, while 0.1 percent employed 250 or more.
Major Investment Companies

- AIMCO  
  www.aimco.com
- ALPS  
  www.alpsinc.com
- Atlantic Trust  
  www.atlantictrust.com
- Bank of America Merrill Lynch  
  www.ml.com
- Charles Schwab & Co.  
  www.schwab.com
- Edward Jones  
  www.edwardjones.com
- Fidelity Investments  
  www.fidelity.com
- Great West Financial Empower  
  www.empower-retirement.com
- Janus Capital Group  
  www.janus.com
- Lipper Analytical Services  
  www.lipperweb.com
- Marsico Funds  
  www.marsicofunds.com
- Morgan Stanley  
  www.morganstanley.com
- Oppenheimer Funds  
  www.oppenheimerfunds.com
- PENSCO Trust Company  
  www.pensco.com
- Personal Capital  
  www.personalcapital.com
- RBC Wealth Management  
  www.rbcwm.com
- Redwood Trust  
  www.redwoodtrust.com
- Scottrade  
  www.scottrade.com
- TIAA-CREF  
  www.tiaa-cref.org
- Transamerica Capital  
  www.transamerica.com
- Walker & Dunlop (formerly Johnson Capital)  
  www.walkerdunlop.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.

*With direct employment in the insurance subcluster of about 32,750 workers, the nine-county region ranked 13th out of the 50 largest metro areas in 2015*. The region ranked 19th for insurance employment concentration. About 77 percent of Colorado’s insurance subcluster employment was located in the region.

<table>
<thead>
<tr>
<th>Insurance Employment and Company Profile, 2015</th>
<th>Nine-County Region</th>
<th>United States</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct employment, 2015</td>
<td>32,750</td>
<td>2,555,330</td>
</tr>
<tr>
<td>Number of direct companies, 2015</td>
<td>3,520</td>
<td>242,650</td>
</tr>
<tr>
<td>One-year direct employment growth, 2014-2015</td>
<td>3.8%</td>
<td>3.5%</td>
</tr>
<tr>
<td>Five-year direct employment growth, 2010-2015</td>
<td>11.6%</td>
<td>10.3%</td>
</tr>
<tr>
<td>Avg. annual direct employment growth, 2010-2015</td>
<td>2.2%</td>
<td>2.0%</td>
</tr>
<tr>
<td>Direct employment concentration</td>
<td>1.7%</td>
<td>1.7%</td>
</tr>
</tbody>
</table>


*Direct employment is the number of employees in the industry cluster in a region. No multiplier effects are included. Direct employment is estimated and ranked for the 50 largest metropolitan statistical areas (MSAs). Employment concentration is the direct cluster employment in a region expressed as a percent of total employment in all industries in the same region. Employment concentration is calculated and ranked for the 50 largest MSAs.*

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FINANCIAL SERVICES: Metro Denver and Northern Colorado Industry Cluster Profile

Insurance Employment

The nine-county region’s insurance employment (32,750 workers) rose 3.8 percent in 2015, compared with the previous year’s level, adding nearly 1,200 new jobs during the same period. National employment levels rose 3.5 percent between 2014 and 2015. About 1.3 percent of the nation’s insurance employment is located in the region. Between 2010 and 2015, the region’s insurance employment rose 11.6 percent, compared with a 10.3 percent increase at the national level. Insurance companies employed 1.7 percent of the region’s total employment base, compared with the same employment concentration nationwide.

About 3,520 insurance companies operated in the nine-county region in 2015. Approximately 87 percent of the region’s insurance companies employed fewer than 10 people, while 0.5 percent employed 250 or more.
FINANCIAL SERVICES: Metro Denver and Northern Colorado Industry Cluster Profile

Major Insurance Companies

- 2-10 Home Buyers Warranty Corp.  
  www.2-10.com
- Allied Insurance  
  www.alliedinsurance.com
- Allstate Insurance  
  www.allstate.com
- American Family Insurance  
  www.amfam.com
- Anthem Blue Cross and Blue Shield  
  www.anthem.com
- CNA Surety Corp.  
  www.cnasurety.com
- Farmers Insurance  
  www.farmers.com
- Great-West Financial  
  www.greatwest.com
- IMA Financial Group  
  www.imacorp.com
- Jackson National Life Insurance Co.  
  www.jackson.com
- Kaiser Permanente  
  www.kaiserpermanente.org
- Land Title Guarantee Company  
  www.ltgc.com
- Liberty Mutual  
  www.libertymutual.com
- Lockton Companies  
  www.lockton.com
- New York Life  
  www.newyorklife.com
- Northwestern Mutual  
  www.northwesternmutual.com
- Optum  
  www.optum.com
- Pinnacol Assurance  
  www.pinnacol.com
- State Farm Insurance  
  www.statefarm.com
- United Healthcare  
  www.uhc.com
- USI Colorado, LLC  
  www.usi.biz
- Voya Financial  
  www.voya.com

2015 Industry Highlights

Key Company Announcements

The region’s entrepreneurial atmosphere, high quality of life, and strategic location attracts and grows talented financial services firms. Key company announcements in 2015 included:

- Metro Denver will be Charles Schwab Corp.’s largest employment center in two years. The company opened a new $230 million, 47-acre campus in Lone Tree’s RidgeGate development in 2014 and plans to move a significant number of employees from its San Francisco, Calif.-based headquarters to Metro Denver over the next several years. The company will eventually employ about 4,000 people in Colorado.
- Fidelity Investments will expand its Greenwood Village workforce by 300 employees by 2018. The company acquired 30,000 square feet of office space to be added to its existing 100,000-square-foot space and will invest $5 million to expand its facility.
- Transamerica Corp. moved from the Denver Tech Center to downtown Denver. The relocation will double the size of the company’s Denver office space and double the size of its local workforce to 650 employees.
- OnDeck Capital Inc., a New York-based financial services company, leased 72,000 square feet of space in downtown Denver. The company plans to add 400 high-paying jobs over the next 8 years.
- CoBank opened its 11-story headquarters building in Greenwood Village. The 245,000-square-foot facility is home to 600 employees and includes office space and ground floor retail.
- FirstBank will add 127,000 square feet of space to its Jefferson County headquarters and will add about 250 positions to its main campus. When the addition is completed, there will be about 900 employees working in Jefferson County with another 70 employees in the next year.
- Longmont-based BC Service will build a new 40,000-square-foot building in the Clover Business Park. The company plans to expand their employment base over the next two years.
- MDS Securities LLC, the retail securities brokerage division of Pennsylvania-based MDS Energy Development, opened a new headquarters in Denver. The company cited the city as an important financial hub that draws significant talent as motivation for its move.
FINANCIAL SERVICES: Metro Denver and Northern Colorado Industry Cluster Profile

- Credit service company Alliance Data will expand its Westminster service center by 52,500 square feet and will add 450 customer care representatives over the next three years. The company’s expansion could house up to 1,000 employees and will be completed by 2016.
- American Financing Corp. leased a 52,000-square-foot office building in Aurora that will accommodate up to 320 employees. The mortgage company plans to hire 100 employees who will be licensed in multiple states.
- San Francisco-based PENSCO Trust Co. relocated its trust company charter to Denver. The move expanded the company’s service hours and more than doubled the company’s size. With 130 employees in Denver, Colorado represents the company’s largest employee base.
- Northwestern Mutual Life Insurance Co. expanded its Denver operations, leasing 32,000 square feet of office space as a result of increased demand for comprehensive financial planning. More than 100 employees will move to the expanded office space, with room for 40 additional financial advisors.
- Kaiser Permanente will relocate its National Claims Administration team from Aurora to Englewood and will hire 75 new workers over the next year. The facility in the Gateway Plaza at Meridian will house nearly 250 existing claims processing employees, with staff reaching 400 by 2017.
- Insurance brokerage firm Holmes Murphy & Associates opened an office in Greenwood Village. The firm, headquartered in West Des Moines, Iowa, purchased assets from the construction and surety bond division of Willis of Colorado. The company is among the top-100 insurance brokers in the U.S.
- Greeley-based Shirazi Benefits LLC opened a satellite office in Fort Collins. The insurance agency, which specializes in group employee benefits and estate and business planning, plans to add staff.
- Bank of America opened its second Metro Denver retail store in the Highlands Ranch Tower Center South. The branch will feature banking, lending services, retirement planning, small business banking, and will have a team for product and service needs.
- Wells Fargo & Co. opened its sixth downtown Denver branch between Union Station and Coors Field. The new location will be open six days a week with an ATM and night drop for business.
- First National Denver will move its Denver headquarters into lower downtown and will have space for up to 43 workers. The company has 10 Metro Denver branch locations.
- Salisbury, Md.-based Credit Plus Inc. will open its third U.S. office in Loveland. The company provides credit information services to the mortgage industry and will hire additional employees.

Merger and Acquisition Activity

Financial services companies announced several mergers and acquisitions in the nine-county region in 2015:

- Southwest Bancorp Inc. acquired First Commercial Bancshares Inc. in a $41.7 million deal. Under the agreement, Southwest will manage three First Commercial Bank branches in Denver and more than $200 million in deposits.
- Golden-based Red Rocks Capital LLC sold to Denver-based ALPS Holdings Inc. The $65 million deal will expand ALPS’ asset offerings and alternative investment products.
- Boulder-based Premier Members Federal Credit Union purchased Boulder Valley Credit Union. The combined company will manage $820 million in assets. With about 65,000 members and 17 branches in Metro Denver, it will have more than 200 employees.
- Two of Colorado’s largest health insurers—Anthem Inc. and Cigna Corp.—plan to merge. The $54.2 billion deal will create the nation’s largest health insurer by enrollment, with about 53 million insured U.S. customers and 957,000 enrollees in Colorado. The proposed merger, subject to regulatory and shareholder approvals, is expected to close in 2016.

Academic and Education Announcements

The region’s universities and research institutions offer first-class educational resources to engage students and prepare the future financial services workforce.

- The Leeds School of Business at the University of Colorado Boulder and Charles Schwab Corp. created a five-year partnership to develop a Certified Financial Planner (CFP) program. The program will fund scholarships, create coursework, and assist with exam preparation. The program is expected to attract more than 80 students and will fill the need for more CFP’s in the region.
- Regis University opened its College of Business and Economics in the fall of 2015. The new college combined existing business programs, resulting in a more centralized college offering more than 25 degree options, additional learning models, and programs.
- The College of Business at Colorado State University launched its new Master of Business Administration (MBA) with a specialization in Financial Risk Management. The 32-credit program is the
only one of its kind in Colorado and prepares students for a variety of careers in investment analysis, portfolio management, corporate finance, and financial risk management.

- BankWork$™ will launch in Denver to train young adults from low income and minority communities for careers in the financial services industry. The eight-week training program will place about 125 graduates into Metro Denver banking positions including tellers, customer service representatives, and personal bankers. The program also offers job interview practice, job placement assistance, and ongoing coaching and mentoring to assist with career advancement.

Venture Capital and Investment Activity

The region’s vibrant business environment and low operational costs attracts and retains national and international talent. Forbes’ 2015 Global 2000 list included fourteen companies headquartered in the region, the 2014 Fortune 500 list included 9 companies with revenues totaling more than $95.6 billion, and Inc. 500’s fastest-growing private companies list included 13 local companies.

These growing companies, in combination with the region’s competitive environment, attract significant capital and investment opportunities. According to Pricewaterhouse Coopers’ MoneyTree Report, Colorado companies in the financial services industry attracted seven deals totaling $19.3 million during the past five years. Across all industries, more than 490 Colorado deals valued at a combined $3.4 billion closed during the same period.

Cross-Cluster Convergence

The nine-county region promotes an environment of collaboration among the financial services and IT-software industries.

- Denver-based Oildex, a service of Transzap Inc., acquired Automatic Data Processing, Inc.’s Procedure-to-Pay business and its OpenInvoice product line, combining the two leading technology providers in the growing financial supply chain automation sector. The combined company will have more than 1,100 customers, 50,000 vendor suppliers, and will process more than 20 million invoices per year.
- Galvanize-based Spex launched its software platform that allows insurance adjusters to use a mobile app on their iOS devices and coordinate the results via a web-based tool. The app allows users to take photos, prepare field sketches, use aerial photos, and add notations to video and audio. The app then uploads the data in real-time to make claims processing more accurate and efficient.

Industry Infrastructure Support

A number of associations and organizations unite the region’s active venture investors, angel investors, entrepreneurs, and firms.

- The Rocky Mountain Venture Capital Association (www.rockymountainvca.com) represents entrepreneurs, venture capitalists, and service providers in the Rocky Mountain Region and holds a bi-annual “Venture Capital in the Rockies” conference to showcase emerging companies and further venture funding in the region (www.vcintherockies.com). The organization also hosts a variety of networking and funding opportunities including VC’s Unplugged, PITCH Unplugged, and collaborations with leading conferences such as Invest Southwest and Colorado Venture Summit.
- The Rockies Venture Club (www.rockiesventureclub.org), a nonprofit organization that encourages entrepreneurship in the region by connecting entrepreneurs, service professionals, investors, and venture capitalists, offers workshops, training, and capital conferences for its members. The organization hosts the annual Angel Capital Summit and the Colorado Capital Conference that connects investors with entrepreneurial companies seeking funding.
- The Rocky Mountain MicroFinance Institute (RMMFI) is a nonprofit organization serving the needs of community entrepreneurs to foster growth in Colorado. RMMFI combines affordable and accessible business development services and flexible microloans to help entrepreneurs create economic self-sufficiency through business ownership (www.rmmfi.org).
- The Denver Office of Economic Development released the fourth edition of its Denver Capital Matrix, a resource directory of funding sources for Denver’s small businesses and entrepreneurs. The matrix identifies approximately 400 funding sources including traditional bank lending, venture capital firms, private equity firms, angel investors, mezzanine sources, investment banking institutions, and others that have funded Colorado businesses (www.denvergov.org).
Financial Services Workforce Profile

Many companies choose locations because of the available workforce. With nearly half of the nine-county region’s 3.7 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, 41.3 percent are college graduates and 90.5 percent have graduated from high school. The state has the nation’s second-most highly educated workforce as measured by the percentage of residents with a bachelor’s degree or higher.

The attractiveness of the region draws new residents through migration. The region’s population is expected to grow 59.9 percent from 2010 to 2040, driving a 36.3 percent increase in the region’s labor force over the same period. It is important to note the changing composition of the workforce supply as the baby boomers begin to retire, which will pose implications for businesses whose employee pool includes significant numbers of these workers.
FINANCIAL SERVICES: Metro Denver and Northern Colorado Industry Cluster Profile

Banking and Finance Workforce Profile

Age Distribution

The nine-county region’s banking and finance subcluster employs 38,140 people and includes a large pool of talented, well-educated, and highly skilled workers. The age distribution of workers in the banking and finance subcluster is concentrated in the younger age brackets. In fact, the banking and finance subcluster has a larger share of employees (52.8 percent) that are between the ages of 25 and 44 years old, compared with the age distribution of all industries across the nine-county region (44.8 percent).

The banking and finance workforce supply consists of four main components: those currently working in the industry; those doing a similar type of job in some other industry; the unemployed; and those currently in the education pipeline. The Metro Denver and Northern Colorado 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

The 2014 average annual salary for a banking and finance worker in the nine-county region was $73,860, compared with the national average of $73,080. Total payroll for the banking and finance subcluster in the region exceeded $2.8 billion in 2014.

Metro Denver and Northern Colorado Occupation & Salary Profile, 2015

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</thead>
<tbody>
<tr>
<td>1. Tellers</td>
<td>4,909</td>
<td>343</td>
<td>1</td>
<td>$27,144</td>
<td>$21,320</td>
<td>$23,400</td>
<td>$31,408</td>
<td>$37,315</td>
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<td>2. Loan officers</td>
<td>3,908</td>
<td>246</td>
<td>356</td>
<td>$71,219</td>
<td>$25,979</td>
<td>$48,110</td>
<td>$96,616</td>
<td>$139,069</td>
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<td>4. Customer service representatives</td>
<td>34,814</td>
<td>6,150</td>
<td>0</td>
<td>$32,302</td>
<td>$22,776</td>
<td>$26,811</td>
<td>$40,456</td>
<td>$49,566</td>
<td></td>
</tr>
<tr>
<td>3. Securities, commodities, &amp; financial services sales agents</td>
<td>7,814</td>
<td>18</td>
<td>0</td>
<td>$47,341</td>
<td>$29,786</td>
<td>$35,838</td>
<td>$83,886</td>
<td>$148,554</td>
<td></td>
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<td>5. Loan interviewers &amp; clerks</td>
<td>2,802</td>
<td>85</td>
<td>1</td>
<td>$45,240</td>
<td>$30,451</td>
<td>$38,293</td>
<td>$51,667</td>
<td>$61,714</td>
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<td>6. First-line supervisors of office &amp; administrative support workers</td>
<td>15,753</td>
<td>1,052</td>
<td>134</td>
<td>$55,827</td>
<td>$32,989</td>
<td>$43,430</td>
<td>$71,032</td>
<td>$89,357</td>
<td></td>
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<tr>
<td>7. Financial managers</td>
<td>5,105</td>
<td>98</td>
<td>426</td>
<td>$134,160</td>
<td>$81,827</td>
<td>$106,226</td>
<td>$177,923</td>
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<tr>
<td>8. Business operations specialists, all other</td>
<td>33,049</td>
<td>705</td>
<td>42</td>
<td>$72,259</td>
<td>$38,646</td>
<td>$51,958</td>
<td>$95,805</td>
<td>$124,238</td>
<td></td>
</tr>
<tr>
<td>9. Bookkeeping, accounting, &amp; auditing clerks</td>
<td>22,706</td>
<td>1,030</td>
<td>314</td>
<td>$38,334</td>
<td>$24,128</td>
<td>$30,555</td>
<td>$47,611</td>
<td>$57,678</td>
<td></td>
</tr>
<tr>
<td>10. Accountants &amp; auditors</td>
<td>28,700</td>
<td>1,066</td>
<td>748</td>
<td>$69,576</td>
<td>$42,494</td>
<td>$52,936</td>
<td>$90,917</td>
<td>$116,251</td>
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</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 2015.3 Class of Worker.
Investments Workforce Profile

Age Distribution

The nine-county region’s investments subcluster employs 26,070 people and includes a large pool of talented, well-educated, and highly skilled workers. The investments subcluster has a larger share of employees (70 percent) that are between the ages of 35 and 64 years old, compared with the age distribution of all industries across the nine-county region (59.7 percent).

The investments workforce supply consists of four main components: those currently working in the industry; those doing a similar type of job in some other industry; the unemployed; and those currently in the education pipeline. The Metro Denver and Northern Colorado 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. The 2014 average annual salary for an investments worker in the nine-county region was $193,710, compared with the national average of $204,780. The region’s investment subcluster payroll exceeded $4.7 billion in 2014.

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</thead>
<tbody>
<tr>
<td>1. Securities, commodities, &amp; financial services sales agents</td>
<td>7,814</td>
<td>18</td>
<td>0</td>
<td>$47,341</td>
<td>$29,786</td>
<td>$35,838</td>
<td>$83,886</td>
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<td>2. Personal financial advisors</td>
<td>3,879</td>
<td>56</td>
<td>356</td>
<td>$74,110</td>
<td>$45,032</td>
<td>$59,883</td>
<td>$100,318</td>
<td>$156,770</td>
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<tr>
<td>3. Accountants &amp; auditors</td>
<td>28,700</td>
<td>166</td>
<td>748</td>
<td>$69,576</td>
<td>$42,494</td>
<td>$52,936</td>
<td>$90,917</td>
<td>$116,251</td>
</tr>
<tr>
<td>5. Secretaries &amp; administrative assistants, except legal, medical, &amp; executive</td>
<td>47,380</td>
<td>643</td>
<td>70</td>
<td>$36,754</td>
<td>$23,566</td>
<td>$29,494</td>
<td>$45,323</td>
<td>$53,747</td>
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<tr>
<td>7. Executive secretaries &amp; executive administrative assistants</td>
<td>9,677</td>
<td>1,497</td>
<td>178</td>
<td>$52,520</td>
<td>$38,210</td>
<td>$43,680</td>
<td>$61,818</td>
<td>$74,152</td>
</tr>
<tr>
<td>8. Business operations specialists, all other</td>
<td>33,049</td>
<td>705</td>
<td>42</td>
<td>$72,259</td>
<td>$38,646</td>
<td>$51,958</td>
<td>$95,805</td>
<td>$124,238</td>
</tr>
<tr>
<td>9. Customer service representatives</td>
<td>34,814</td>
<td>6,150</td>
<td>0</td>
<td>$32,302</td>
<td>$22,776</td>
<td>$26,811</td>
<td>$40,456</td>
<td>$49,566</td>
</tr>
<tr>
<td>10. Computer &amp; information systems managers</td>
<td>5,233</td>
<td>453</td>
<td>1,345</td>
<td>$140,296</td>
<td>$94,994</td>
<td>$115,149</td>
<td>$173,014</td>
<td>$283,317</td>
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</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 2015.3 Class of Worker.
**Insurance Workforce Profile**

**Age Distribution**

The nine-county region’s insurance subcluster employs 32,750 people and includes a large pool of talented, well-educated, and highly skilled workers. The insurance subcluster has a larger share of employees (70.8 percent) that are between the ages of 35 and 64 years old, compared with the age distribution of all industries across the nine-county region (59.7 percent).

The insurance workforce supply consists of four main components: those currently working in the industry; those doing a similar type of job in some other industry; the unemployed; and those currently in the education pipeline. The Metro Denver and Northern Colorado 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 nine-county payroll in the insurance subcluster increased 7.8 percent over-the-year, totaling over $2.2 billion in 2014. The 2014 average annual salary for insurance employees in the region was $71,240, compared with the national average of $81,870.

**Metro Denver and Northern Colorado Insurance Occupation & Salary Profile, 2015**

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<tbody>
<tr>
<td>1. Insurance sales agents</td>
<td>10,085</td>
<td>139</td>
<td>0</td>
<td>$44,886</td>
<td>$23,691</td>
<td>$30,826</td>
<td>$63,128</td>
<td>$95,098</td>
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<td>2. Customer service representatives</td>
<td>34,814</td>
<td>6,150</td>
<td>0</td>
<td>$32,302</td>
<td>$22,776</td>
<td>$26,811</td>
<td>$40,456</td>
<td>$49,566</td>
</tr>
<tr>
<td>3. Claims adjusters, examiners, &amp; investigators</td>
<td>3,863</td>
<td>67</td>
<td>0</td>
<td>$65,603</td>
<td>$43,430</td>
<td>$53,560</td>
<td>$79,914</td>
<td>$94,078</td>
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<td>4. Business operations specialists, all other</td>
<td>33,049</td>
<td>705</td>
<td>42</td>
<td>$72,259</td>
<td>$38,646</td>
<td>$51,958</td>
<td>$95,805</td>
<td>$124,238</td>
</tr>
<tr>
<td>5. Insurance claims &amp; policy processing clerks</td>
<td>1,539</td>
<td>45</td>
<td>0</td>
<td>$43,243</td>
<td>$32,843</td>
<td>$36,587</td>
<td>$50,731</td>
<td>$59,155</td>
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<tr>
<td>7. Insurance underwriters</td>
<td>1,010</td>
<td>37</td>
<td>0</td>
<td>$70,242</td>
<td>$44,429</td>
<td>$54,558</td>
<td>$91,187</td>
<td>$112,445</td>
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<tr>
<td>8. Accountants &amp; auditors</td>
<td>28,700</td>
<td>166</td>
<td>748</td>
<td>$69,576</td>
<td>$42,949</td>
<td>$52,936</td>
<td>$90,197</td>
<td>$116,251</td>
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<tr>
<td>9. First-line supervisors of non-retail sales workers</td>
<td>15,753</td>
<td>1,052</td>
<td>134</td>
<td>$55,827</td>
<td>$32,989</td>
<td>$43,430</td>
<td>$71,032</td>
<td>$89,357</td>
</tr>
<tr>
<td>10. Software developers, applications</td>
<td>19,367</td>
<td>374</td>
<td>724</td>
<td>$98,467</td>
<td>$62,046</td>
<td>$78,497</td>
<td>$120,474</td>
<td>$145,434</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 2015.3 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 nearly 380 private occupational and technical schools offering courses in dozens of program areas throughout the state. 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 is 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)
- Red Rocks Community College (www.rrcc.edu)
- University of Northern Colorado (www.unco.edu)
- Colorado State University Global Campus (www.colostate.edu)
- Regis University (www.regis.edu)
- University of Phoenix-Colorado (www.phoenix.edu)
- Front Range Community College (www.frontrange.edu)
- University of Colorado: Boulder, Denver (www.cu.edu)
- Metropolitan State University of Denver (www.msudenver.edu)
- The Daniels College of Business at the University of Denver (DU) ranked 53rd for part-time Master of Business Administration (MBA) programs and the Leeds School of Business at the University of Colorado Boulder (CU-Boulder) ranked 71st for full-time graduate business programs. (Bloomberg Businessweek, 2015)
- Colorado Technical University was named among the “Top Tier of Online MBA Programs” in 2015. (International Graduate Forum, 2015)
- The Daniels College of Business at DU and the College of Business at Colorado State University (CSU) were named to The Princeton Review's "Best 296 Business Schools" in 2015. CSU ranked among the top-five, best-administered programs and DU ranked among the top-five green MBA programs. (The Princeton Review, 2015)
- The College of Business at CSU ranked among the top-100 “Best Online MBA Programs” in 2015. (U.S. News & World Report, 2015)
- The Business School at the University of Colorado Denver (CU-Denver) is the largest accredited graduate school of business in the Rocky Mountain West. The school’s Association to Advance Collegiate Schools of Business accreditation places the Business School in the top-5 percent of business programs worldwide. (The University of Colorado Denver, 2014)
- The Leeds School of Business at CU-Boulder ranked among the nation’s top-100 full-time MBA programs in 2015. CU-Boulder, CU-Denver, and DU were recognized among the top-100 part-time MBA programs. (U.S. News & World Report, 2015)
- The Monfort College of Business at the University of Northern Colorado is the first and only business program in the U.S. to receive a presidential award for excellence, the Baldrige National Quality Award. (University of Northern Colorado, 2015)
Denver ranked as the third-best city for college graduates, with millennials (ages 20-34) representing 26 percent of the total population. (Rent.com, 2015)

2. An overall better quality of life
- Denver was named as the best city to live in the West in 2015, according to *MONEY Magazine*. The city was cited as a "mecca for millennials" with great access to recreation. Louisville ranked fourth and Erie ranked 13th among the best small towns to live in the U.S. (*MONEY Magazine*, 2015)
- Metro Denver ranked as the nation’s sixth-fittest metropolitan area in 2015. Denver’s access to the outdoors, high percentage of residents engaged in physical activity, and low obesity and diabetes rates contributed to its notable rank. (American College of Sports Medicine, 2015)
- Colorado’s extensive opportunities for outdoor recreation adventures and experiences support a healthy, active lifestyle. The state offers unlimited access to 22 million acres of national forests and expansive public lands, 42 state parks, more than 30 wilderness areas, and the highest concentration of 14,000-foot mountain peaks in the nation. (Colorado Tourism Office, 2015)
- Denver ranked seventh on the “2015 Best Large Cities to Live In.” Aurora (18th) was also named to the list. (WalletHub, 2015)
- FasTracks is a $7.4 billion project to build out Metro Denver’s entire mass transit system by 2019, adding 122 miles of rail rapid transit and extending existing routes. The expansion is the largest simultaneous transit build out in U.S. history and will make Metro Denver one of the top-five regions in the country in terms of miles of fixed rail.

3. Low to moderate costs of doing business
- Metro Denver office rental rates averaged $29.64 per square foot in the fourth quarter of 2015, making the region’s office market highly competitive with other major markets in the U.S. (CoStar Realty Information, The CoStar Office Report, 4Q 2015)
- Colorado’s initial registration fees for broker-dealers ($60) and sales representatives ($12) are the lowest in the nation. (State of Colorado, Division of Securities)

4. A pro-business environment and competitive tax structure
- Colorado’s simplified corporate income tax structure based on single-factor apportionment allows companies to pay taxes based solely on their sales in the state. Along with few regulatory burdens, Colorado’s corporate income tax rate of 4.63 percent is one of the lowest and most competitive tax structures in the nation. (State of Colorado; The Tax Foundation)
- Colorado’s general Insurance Premium Tax is lower than taxes in 16 other states. The state’s Insurance Premium Tax is generally 2 percent, but businesses with a home or regional office in Colorado are only taxed 1 percent. (National Association of Insurance Commissioners, 2009)
- Legislation passed in 2015 established the Colorado Title Insurance Commission within the Colorado Division of Insurance. The Commission will propose, advise, and recommend rules for title insurance administration and will improve regulation of title insurance entities. (Colorado Division of Insurance, 2015)
- Colorado’s tax climate ranked eighth in the nation for entrepreneurship and small business. (Small Business & Entrepreneurship Council, 2015)
- Metro Denver ranked No. 1 among *Forbes*’ 2015 “Best Places for Business and Careers.” Four other Colorado metropolitan areas were included on the list. The Fort Collins metro area ranked 10th, Boulder ranked 26th, Greeley ranked 33rd, and Colorado Springs ranked 37th. (*Forbes*, 2015)
- Colorado ranked as the No. 5 small-business-friendly state in the nation. Fort Collins and Boulder ranked among the top-10 cities nationally, earning “A” grades for overall friendliness. (Thumbtack.com, 2015; Ewing Marion Kauffman Foundation, 2015)

5. A central location and easy global access
- Seven percent of the nation’s total passengers traveled through Denver International Airport (DEN) in 2014, making it the fifth-busiest airport in the nation. DEN also ranked 17th-busiest worldwide in 2014. (U.S. Bureau of Transportation Statistics, 2015; Airports Council International, 2015; and Denver International Airport, 2015)
- Metro Denver’s unique geographic location in the Mountain time zone makes it the largest region in the U.S. to offer one-bounce satellite uplinks that provide real-time connections to six out of seven continents in one business day. (Metro Denver Economic Development Corporation)
- Located on the 105th meridian, the nine-county region’s central location at the exact midpoint between Tokyo and Frankfurt positions the region favorably to serve growing world markets. Metro Denver is only 346 miles west of the geographic center of the continental United States, offering an
excellent location for doing business with the entire nation. (Metro Denver Economic Development Corporation)

- Denver ranked among the top-five safest cities for natural disasters in 2014. (HomeownersInsurance.com, 2014)

### Financial Services Industry Cluster Definition

<table>
<thead>
<tr>
<th>NAICS Code</th>
<th>NAICS Description</th>
<th>SIC Code</th>
<th>SIC Description</th>
</tr>
</thead>
</table>
| Banking and Finance
| 521110 | Monetary authorities | 6011 | Federal reserve banks |
| 522110 | Commercial banking | 6021 | National commercial banks |
| 522110 | Commercial banking | 6022 | State commercial banks |
| 522110 | Commercial banking | 6029 | Commercial banks, NEC |
| 522110 | Commercial banking | 6081 | Foreign bank & branches & agencies |
| 522120 | Savings institutions | 6035 | Federal savings institutions |
| 522120 | Savings institutions | 6036 | Savings institutions, except federal |
| 522130 | Credit unions | 6061 | Federal credit unions |
| 522130 | Credit unions | 6062 | State credit unions |
| 522190 | Other depository credit intermediation | 6022 | State commercial banks |
| 522210 | Credit card issuing | 6021 | National commercial banks |
| 522210 | Credit card issuing | 6022 | State commercial banks |
| 522210 | Credit card issuing | 6141 | Personal credit institutions |
| 522210 | Credit card issuing | 6153 | Short-term business credit institutions, except agricultural |
| 522220 | Sales financing | 6141 | Personal credit institutions |
| 522220 | Sales financing | 6153 | Short-term business credit institutions, except agricultural |
| 522220 | Sales financing | 6159 | Misc. business credit institutions |
| 522291 | Consumer lending | 6141 | Personal credit institutions |
| 522292 | Real estate credit | 6111 | Federal & federally sponsored credit agencies |
| 522292 | Real estate credit | 6159 | Misc. business credit institutions |
| 522292 | Real estate credit | 6162 | Mortgage bankers & loan correspondents |
| 522293 | International trade financing | 6081 | Foreign bank & branches & agencies |
| 522293 | International trade financing | 6082 | Foreign trade & international banks |
| 522293 | International trade financing | 6111 | Federal & federally sponsored credit agencies |
| 522293 | International trade financing | 6159 | Misc. business credit institutions |
| 522294 | Secondary market financing | 6111 | Federal & federally sponsored credit agencies |
| 522294 | Secondary market financing | 6159 | Misc. business credit institutions |
| 522298 | All other nondepository credit intermediation | 6019 | Central reserve depository, NEC |
| 522298 | All other nondepository credit intermediation | 6081 | Foreign bank & branches & agencies |
| 522298 | All other nondepository credit intermediation | 6082 | Foreign trade & international banks |
| 522298 | All other nondepository credit intermediation | 6111 | Federal & federally sponsored credit agencies |
| 522298 | All other nondepository credit intermediation | 6141 | Personal credit institutions |
| 522298 | All other nondepository credit intermediation | 6159 | Misc. business credit institutions |
| 522310 | Mortgage & nonmortgage loan brokers | 6163 | Loan brokers |
| 522320 | Financial transactions processing, reserve, & clearinghouse activities | 6099 | Functions related to deposit banking |
| 522320 | Financial transactions processing, reserve, & clearinghouse activities | 6153 | Short-term business credit institutions, except agricultural |
| 522320 | Financial transactions processing, reserve, & clearinghouse activities | 7389-09 | Financial services |
| 522390 | Other activities related to credit intermediation | 6099 | Functions related to deposit banking |
| 522390 | Other activities related to credit intermediation | 6162 | Mortgage bankers & loan correspondents |
| 561450 | Credit bureaus | 7323 | Credit reporting services |

### Insurance

- 524113 | Direct life insurance carriers | 6311 | Life insurance |
- 524113 | Direct life insurance carriers | 6321 | Accident & health insurance |
- 524114 | Direct health & medical insurance carriers | 6321 | Accident & health insurance |
- 524114 | Direct health & medical insurance carriers | 6324 | Hospital & medical service plans |
## Financial Services Industry Cluster Definition Cont’d

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<thead>
<tr>
<th>NAICS Code</th>
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<td>524210</td>
<td>Insurance agencies &amp; brokerages</td>
<td>6411</td>
<td>Insurance agents, brokers, &amp; service</td>
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<td>Trusts, NEC</td>
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<td>Offices of bank holding companies</td>
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<td>Offices of other holding companies</td>
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<td>Holding companies, NEC</td>
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</table>

**Note:** NEC indicates "not elsewhere classified."
Financial Services Industry Cluster Relationships

**Technologies**
- Internet
- High-Speed
- Infrastructure

**Support Industries**
- Software
- Telecommunications
- Healthcare
- Call Centers
- Professional Services

**Financial Services**
*Banking and Finance*
*Insurance*
*Investments*

**Infrastructure**
- Angel Networks
- CO Assoc. of Mortgage Professionals
- CO Bankers Assoc.
- CO Investment Services Coalition
- CO Venture Capital Assoc.
- Rocky Mtn. Venture Capital Assoc.
- RMMI

**Client Industries**
- Consumers
- Businesses
- Government

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 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 nine-county Metro Denver and Northern Colorado region1 offers a robust culture of health and wellness. The region is home to one of the fittest populations in the nation and has one of the nation’s lowest rates of adult obesity due to its active lifestyle and access to the outdoors. The region is a premier healthcare and wellness hub, with support from regional hospitals, institutes of excellence, and academic medical centers. The region’s health services serve not only surrounding areas of Colorado, but several western states ranging from Montana to New Mexico. Further, cutting-edge research and development facilities, unparalleled talent, and technological advancements propel the region’s vibrant healthcare and wellness industry with nearly 202,550 workers in more than 19,450 companies.

One of the key characteristics of the healthcare and wellness industry is its resiliency to economic cycles, which continues to drive job growth as a result of several key trends. Colorado’s health insurance landscape is undergoing rapid change and an estimated 500,000 Coloradans are expected to gain insurance through the Affordable Care Act. This will also drive further collaboration and cooperation among various healthcare and wellness facilities across the region for specialized services, research, workforce, and facilities. Aging and population growth continue to drive demand for health services. By 2040, Colorado’s population ages 65 and older is projected to double to 1.5 million. This demographic shift toward an older population with the aging of the baby boomer generation will generate economic activity based on increased demand for health services. Further, the digital healthcare infrastructure has greatly improved the way patient care is delivered and compensated.

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 includes 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 included. 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.

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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.
HEALTHCARE AND WELLNESS:
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With direct employment of 202,550 healthcare and wellness workers, the nine-county region ranked 13th out of the 50 largest metro areas in 2015. The region ranked 30th for healthcare and wellness employment concentration. About 72 percent of Colorado’s healthcare and wellness cluster employees worked in the region.

Healthcare and Wellness Employment and Company Profile, 2015

<table>
<thead>
<tr>
<th>Nine-County Region</th>
<th>United States</th>
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<tbody>
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<td>Direct employment, 2015</td>
<td>202,550</td>
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<tr>
<td>Number of direct companies, 2015</td>
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<td>One-year direct employment growth, 2014-2015</td>
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<td>Five-year direct employment growth, 2010-2015</td>
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<td>Avg. annual direct employment growth, 2010-2015</td>
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</tr>
<tr>
<td>Direct employment concentration</td>
<td>10.4%</td>
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</table>


Healthcare and Wellness Employment

The nine-county region’s healthcare and wellness employment (202,550 workers) rose 5.5 percent in 2015, compared with the previous year’s level, adding 10,570 new jobs during the same period. National employment levels also grew over-the-year, rising 2.9 percent. About 1.2 percent of the nation’s healthcare and wellness employment is located in the region. Between 2010 and 2015, the region’s healthcare and wellness employment rose 22.6 percent, compared with 9.7 percent growth at the national level.

About 19,450 healthcare and wellness companies operated in the nine-county region in 2015. Approximately 82 percent of the region’s healthcare and wellness companies employed fewer than 10 people, while 0.5 percent employed 250 or more.

2 Direct employment is the number of employees in the industry cluster in a region. No multiplier effects are included. Direct employment is estimated and ranked for the 50 largest metropolitan statistical areas (MSAs). Employment concentration is the direct cluster employment in a region expressed as a percent of total employment in all industries in the same region. Employment concentration is calculated and ranked for the 50 largest MSAs.
Major Healthcare Companies

- American Medical Response [www.amr.net](http://www.amr.net)
- Banner Health [www.bannerhealth.com](http://www.bannerhealth.com)
- Boulder Community Health [www.bch.org](http://www.bch.org)
- Centura Health [www.centura.org](http://www.centura.org)
- Children’s Hospital Colorado [www.childrenscolorado.org](http://www.childrenscolorado.org)
- Comfort Dental [www.comfortdental.com](http://www.comfortdental.com)
- Craig Hospital [www.craighospital.org](http://www.craighospital.org)
- HSS Inc. [http://hss-us.com](http://hss-us.com)
- Kaiser Permanente Colorado [www.kaiserpermanente.org](http://www.kaiserpermanente.org)
- Kindred Healthcare, Inc. [www.kindredhealthcare.com](http://www.kindredhealthcare.com)
- InnovAge [www.myinnovage.org](http://www.myinnovage.org)
- Life Care Centers of America [www.lcca.com](http://www.lcca.com)
- National Jewish Health [www.nationaljewish.org](http://www.nationaljewish.org)
- Platte Valley Medical Center [www.pvmc.org](http://www.pvmc.org)
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Metro Denver and Northern Colorado Industry Cluster Profile

Major Healthcare Companies Cont’d

- DaVita Inc.
  www.davita.com
- Denver Health and Hospital Authority
  http://denverhealth.org
- HCA-HealthONE LLC
  www.healthonecare.com
- HealthGrades, Inc.
  www.healthgrades.com
- Quest Diagnostics
  www.questdiagnostics.com
- Rocky Mountain Poison & Drug Center
  www.rmpdc.org
- SCL Health System
  www.sclhealthsystem.org
- University of Colorado Health
  www.uchealth.org

Major Wellness Companies

- 24 Hour Fitness
  www.24hourfitness.com
- Better Bodies Fitness Centers
  www.betterbodiescolorado.com
- CorePower Yoga
  www.coredpoweryoga.com
- Gaiam, Inc.
  www.gaiam.com
- Massage Envy
  www.massageenvy.com
- Natural Grocers by Vitamin Cottage
  www.naturalgrocers.com
- Rudi’s Organic Bakery
  www.rudisbakery.com
- SlimGenics, LLC
  www.slimgenics.com

Major Healthcare and Wellness Foundations and Community-Based Organizations

- A.V. Hunter Trust Inc.
  http://avhuntertrust.org
- Anschutz Family Foundation
  www.anschutzfamilyfoundation.org
- Arapahoe House
  www.arapahoehouse.org
- Aurora Mental Health Center
  www.aumhc.org
- Belle Bonfils Memorial Blood Center
  www.bonfils.org
- Caring for Colorado Foundation
  www.caringforcolorado.org
- Catholic Health Initiatives
  www.catholichealthinit.org
- Children’s Hospital Colorado Foundation
  www.childrenscoloradofoundation.org
- Clinica Family Health Services
  www.clinica.org
- Colorado Behavioral Healthcare Council
  www.cbhc.org
- Colorado Community Health Network
  www.cchn.org
- The Colorado Health Foundation
  www.coloradohealth.org
- The Colorado Trust
  www.coloradotrust.org
- Colorado Visiting Nurse Association
  www.vnacolorado.org
- Community First Foundation
  www.communityfirstfoundation.org
- The Denver Health Foundation
  www.denverhealthfoundation.org
- The Denver Hospice
  www.thedenverhospice.org
- El Pomar Foundation
  wwwelpomar.org
- Helen K. & Arthur E. Johnson Foundation
  www.johnsonfoundation.org
- Kenneth King Foundation
  www.kennethkingfoundation.org
- Jefferson Center for Mental Health
  www.jeffersonmentalhealth.org
- Jewish Family Service of Colorado
  http://jewishfamilyservice.org
- LiveWell Colorado
  http://livewellcolorado.org
- Mental Health Center of Denver
  www.mhcd.org
- Mental Health Partners
  www.mhpcolorado.org
- North Colorado Health Alliance
  www.northcoloradohealthalliance.org
- Rose Community Foundation
  www.rcfdenver.org
- Western Dairy Association
  www.westerndairyassociation.org
HEALTHCARE AND WELLNESS:
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Major Healthcare and Wellness Government and Research Facilities

- CO Department of Agriculture
  www.colorado.gov/ag
- CO Department of Human Services
  www.colorado.gov/CDHS
- CO Department of Public Health & Environment
  www.cdphe.state.co.us
- Tri-County Health Department
  www.tchd.org
- University of CO Anschutz Medical Campus
  www.ucdenver.edu
- U.S. Dept. of Agriculture
  www.usda.gov
- U.S. Dept. of Health & Human Services Health Resources & Services Admin.
  www.hrsa.gov
- U.S. Dept. of Veterans Affairs
  www.va.gov

2015 Industry Highlights

Anschutz Medical Campus and Fitzsimons Innovation Campus

The nine-county region is a leading healthcare and wellness hub due to its internationally renowned clinical systems, state-of-the-art amenities, and robust workforce. The healthcare and wellness cluster is anchored by the 578-acre Fitzsimons campus, which includes the adjacent Anschutz Medical Campus and the Fitzsimons Innovation Campus. The $5.2 billion project will be the largest medical-related redevelopment in the nation and the world’s only complete new research, education, and patient care complex. The campus is home to the schools and colleges of Medicine, Nursing, Dental Medicine, Pharmacy, and Public Health. With two world-class research hospitals—the University of Colorado Hospital (UCH) and Children’s Hospital Colorado—the campus will total 18 million square feet and employ more than 44,000 people at full buildout. The Anschutz Medical Campus also includes facilities for University Physicians, Inc., the University of Colorado Cancer Center, the Barbara Davis Center for Childhood Diabetes, the Eleanor Roosevelt Institute, and the Webb-Waring Center.

A number of facilities on the campus expanded in 2015:

- Located adjacent to the Anschutz Medical Campus is the U.S. Department of Veterans Affairs (VA) Eastern Colorado Healthcare System hospital and facilities. The VA’s hospital and facilities in Aurora house the VA Schizophrenia Research Center—one of three in the VA system nationwide—and the Mental Illness Research, Education, and Clinical Centers, and conduct research on best practices and care coordination for veterans. Construction began in 2011 on a new VA Hospital that will replace the existing facility in Denver and is slated for completion in early 2018. The new 1.2 million-square-foot VA Hospital will include a spinal-cord injury center and community living center. At buildout, the VA Hospital is expected to employ about 2,000 people and serve nearly 83,000 veterans annually.

- The University of Colorado Health (UCHealth) Eye Center on the Anschutz Medical Campus, one of the largest eye centers in the nation, expanded from 48,000 square feet to 135,000 square feet. The UCHealth Eye Center includes three dedicated operating rooms, an eyeglass retail shop, a full-service ocular diagnostics and imaging center, as well as a complete suite for LASIK and other vision-correction procedures. The center is home to 67 faculty members and can accommodate more than 100,000 patients per year.

- UCH opened the Center for Lungs and Breathing and will provide services ranging from lung transplants to allergies and asthma treatments. The new center will employ 15 physicians and will occupy 10,000 to 12,000 square feet of expanded clinical space divided among cancer, allergy, and ear, nose, and throat programs.

- The University of Colorado Anschutz Depression Center received $10 million from the Helen and Arthur E. Johnson Foundation to fund mental health programs. The center will be renamed the Helen and Arthur E. Johnson Depression Center, which aims to raise awareness to the severe impact of depression and suicidal tendencies.

Northern Colorado Healthcare Assets

UCHealth provides evidence-based healthcare and wellness services in Colorado, Nebraska, and Wyoming and includes UCH in Aurora, Poudre Valley Hospital (PVH) in Fort Collins, Medical Center of the Rockies in Loveland, Mountain Crest Behavioral Healthcare Center, Greeley Emergency and Surgery Center, and other clinics and outpatient services.

Located 50 miles north of Denver, the North Colorado Medical Center (NCMC) in Greeley is rated nationally among the top 1 percent of hospitals for clinical quality. NCMC’s specialties in cardiology, pulmonary,
HEALTHCARE AND WELLNESS:  
Metro Denver and Northern Colorado Industry Cluster Profile

gastroenterology, and critical care are among the top in the nation. NCMC serves as a regional medical center with community-based and specialty services covering southern Wyoming, western Nebraska, western Kansas, and northeastern Colorado. Designated as a Level II Trauma Center, NCMC offers patients state-of-the-art technology such as iCare and a telehealth program.

The McKee Medical Center, an acute-care hospital serving the Loveland community, is a leader in healthcare innovation through its latest cancer treatments and offers a full range of inpatient and outpatient services, and is a regional center for robotic surgery. McKee Medical Center also offers an intelligent obstetrics program, a computerized system designed to reduce the chances of complications during labor and delivery.

Northern Colorado’s medical facilities expanded in 2015 to accommodate increased patients and demand for services.

- Banner Fort Collins Medical Center opened in April and will employ 190 doctors, nurses, and administrative staff. The $86 million medical center is part of a 28-acre campus that features an emergency department, a 22-bed inpatient unit, labor and delivery rooms, medical imaging, surgical services, and laboratory services. Banner Health could add two patient towers at the site that can house up to 144 beds.
- UCHealth opened its 24-hour emergency center at its Harmony Campus in Fort Collins. The $12.3 million, 16,580-square-foot emergency center includes 12 private exam rooms, computerized tomography, ultrasound, basic X-ray services, a retail pharmacy, and an outpatient laboratory.
- UCHealth and Colorado State University (CSU) partnered to build a 150,000-square-foot medical center at College Avenue and Prospect Road. CSU’s $59 million on-campus medical center will house the student health services’ CSU Health Network, the Columbine Systems Center for Healthy Aging, an UCHealth primary care clinic, and imaging and occupational health services. The facility is slated for completion in late 2016.
- Construction is underway at PVH to replace the oldest section of the hospital with a two-story, 113,000-square-foot medical building. PVH will also expand its high-level neonatal intensive care unit and emergency room to meet project patient demand. The building will also add a helicopter landing pad and a new parking lot. Demolition of the old building is underway and will continue into 2016 with new construction.
- Banner Health completed a $10.7 million expansion and renovation project at its Cancer Institute in Greeley. The center doubled its treatment space, increased patient suites for infusion therapy and chemotherapy treatment, and added a second linear accelerator for radiation treatment.
- UCHealth opened its new Clinical Education and Innovation Center at its Marina Health Campus in Windsor. The $1 million expansion includes space for clinical education, classrooms, and will merge UCHealth’s clinical training resources in one place.
- Rose Medical Center plans to offer specialty medical services in Loveland in early 2016. The hospital leased 2,333 square feet near Banner Health’s McKee Medical Center and will open a health center with five examination rooms.
- Neighbors Health Systems plans to build an emergency care center in Greeley. The 8,400-square-foot, 24-hour emergency care center will include treatment for trauma injuries, cardiology, imaging, and laboratory services.

Major Metro Denver Project Updates and Facility Expansions

A number of major nine-county region hospital projects and facility expansions were either completed or moved forward in 2015.

- UCHealth broke ground on a new $125 million hospital in Longmont. The UCHealth Longs Peak Hospital is slated to open in late 2016 or early 2017 and will have 50 to 75 inpatient beds, an intensive care unit, operating rooms, an emergency department, advanced cardiology services, and a birth center.
- Construction began on the first skilled rehabilitation facility in Louisville. The $12 million Flatirons Health and Rehabilitation will employ 76 people and will provide short-term skilled nursing and physical, occupational, and speech-therapy services. The project is slated for completion in the spring of 2016.
- Boulder Community Health and the University of Colorado (CU) opened the CU Sports Medicine and Performance Center at Folsom Field. The Center includes specialty care services and features a flume pool, physiological swim testing, and the latest MRI technology. Future plans include research.
opportunities for students, professional degree programs in integrated medicine, training camps, and events.

- SCL Health began construction on a 60,000-square-foot community hospital and medical office facility in Northglenn. The facility also includes inpatient beds, laboratory and imaging services, and surgical amenities. The project will create 100 jobs and is expected to be completed in the fall of 2016.
- SCL Health Community Hospital opened in Westminster in the fall of 2015. The 37,080-square-foot facility includes an operating room, triage area, and 10 patient beds with services ranging from emergency medical care and inpatient care to surgical procedures and diagnostic services. Three additional community hospitals in Metro Denver are slated to open in 2016.
- Centura Health’s St. Anthony North Health Campus opened in Westminster in March. The $177 million, 350,000-square-foot facility includes a Level III trauma center and emergency department, an ambulatory surgery center with inpatient surgery capabilities, a women’s health center, an outpatient diagnostics and treatment center, and inpatient beds.
- UCHealth and Adeptus Health Inc. broke ground on a 55-bed general hospital in Broomfield. The 80,000-square-foot UCHealth Broomfield Hospital will include an emergency room, inpatient surgical services, and outpatient services. The facility could employ 150 people and is slated for completion in mid-2016.
- Centura Health opened two of four new hybrid emergency/urgent care centers in Arvada and Golden. The centers will be the first in the state to offer lower-level urgent care 24/7. Two more locations in Parker and Frederick will open in June 2016 and are expected to treat 80 patients a day.
- DaVita HealthCare Partners Inc. will build a new $190 million facility across from its existing headquarters in downtown Denver that will house up to 1,200 workers. The building will be completed in October 2018 and will add 800 workers to the Denver area.
- Panorama Orthopedics and Spine Center opened in Highlands Ranch and will serve as an all-in-one athletic facility. The two-story, 13,500-square-foot medical clinic and physical therapy center includes an indoor turf field, full-sized basketball court, and an MRI machine.

Key Company Announcements

Notable healthcare and wellness company expansions and announcements in 2015 included:

- Life Time Fitness Inc. will relocate its athletic events and media division from Minnesota to Louisville. The move includes the relocation of 57 jobs from the Minnesota facility, of which 25 are employee relocations and the remaining are positions that need to be filled.
- Active Brands AS, a Norwegian-based company that sells winter sports apparel, opened its North American headquarters in Denver. The company opened with 10 operational, marketing, and sales employees.
- California-based Club Pilates opened two locations in Metro Denver and plans to open as many as 18 more. The first location opened in Cherry Creek in late 2014 and the second location opened in Lakewood in 2015.
- Natural Grocers by Vitamin Cottage opened two new locations in Metro Denver. The first location opened in Wheat Ridge in May, followed by a second location which opened in Denver in October.
- The Colorado Athletic Club will open its eighth Front Range location in lower downtown Denver. The 38,000-square-foot facility will feature specialized studios, group fitness classes, a café, functional and personal training, and state-of-the-art strength and cardio equipment.
- Meier Skis relocated from Glenwood Springs to Denver and plans to double its space. A manufacturer of skis made from beetle-killed pine and aspen trees, the company will add workers at its new 6,000-square-foot facility.
- CycleBar, a boutique indoor cycling franchise, opened a 3,300-square-foot studio in Greenwood Village in December. The Studio will have 55 Schwinn AC Carbon Blue indoor bicycles with computers that monitor and store users’ fitness levels. Two more franchises are expected to open in Highlands Ranch and Lone Tree in 2016.
- Lafayette-based Door to Door Organics Inc. raised $4.1 million in new equity funding. The funding will help the company accelerate expansion into new markets.
- Boulder-based Naropa University plans to open a new massage therapy school in Boulder. Naropa will replace the former Boulder College of Massage Therapy to continue the city’s legacy of an internationally renowned center for training and certifying massage therapists.
HEALTHCARE AND WELLNESS:
Metro Denver and Northern Colorado Industry Cluster Profile

Health Tourism Announcements

The nine-county region is a growing center for health tourism, leveraging world-class healthcare facilities, expanding healthcare delivery models, advanced technologies, and specialized medical services.

- UCH is the only American Burn Association-verified facility in the Rocky Mountain Region and can attract and care for individuals with the most severe burns or skin conditions in the region. In 2015, UCH doubled its capacity to meet growing demand by offering increased services, adding 19 beds, two tub rooms, and an inpatient care clinic.
- The Colorado Center for Reproductive Medicine (CCRM) received private financing to grow its footprint nationwide and plans to acquire smaller clinics. 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. CCRM is internationally recognized for success rates and scientific achievements in the field of reproductive endocrinology.
- Craig Hospital received $1.1 million from The Daniels Fund to expand its medical center and purchase new adaptive equipment. The hospital plans to use a large portion of the gift to fund part of its $90 million building and renovation project. The hospital is adding about 85,000 square feet and renovating portions of the existing facility.
- UCH performed a groundbreaking, double-organ transplant for the second time in 2015. The heart and kidney transplant was the first dual surgery ever performed in Colorado and will help expand UCH’s reputation as a regional center for complex care.
- Porter Adventist Hospital’s Joint Replacement Center is the top facility of its kind in Colorado. The facility performs more than 1,800 knee and hip replacements each year, attracting patients from all over the Rocky Mountain region. The Center offers a joint replacement-only hospital wing and state-of-the-art orthopedic operating suites.
- HealthONE’s Presbyterian/St. Luke’s Medical Center launched a new liver transplant program with a transplant team of eight physicians. The expansion of the medical center’s transplant program, which has performed kidney transplants for more than three decades, will give the center the opportunity to change lives of many more patients waiting for a transplant.
- HCA-HealthONE opened a clinical trials facility at Denver’s Sarah Cannon Research Institute for testing experimental cancer treatments. The facility is the global cancer enterprise of HCA that could treat up to 500 people a year, going through roughly 70 different clinical trials within the next 10 years.
- 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. Roughly 30 percent of National Jewish’s patients come from out-of-state to receive pulmonology care.

Major Collaborations and Partnership Activity

Several healthcare and wellness partnerships and collaborations were announced in 2015. The year was also marked with notable acquisitions and mergers.

- National Jewish Health and Rocky Mountain Hospital for Children collaborated to provide diagnostic and treatment services for children with respiratory, allergic, and immune system disorders. National Jewish Health for Kids will provide services on-site at the Rocky Mountain Hospital for Children.
- Platte Valley Medical Center signed a letter of intent to develop a formal relationship with SCL Health System. The agreement would allow Platte Valley to continue operating as a separate facility with its own administration. The affiliation will increase patient loads and improve Platte Valley Medical Center service to the Brighton area.
- Centura Health and DaVita HealthCare Partners launched a joint venture called FullWell. FullWell will equip providers of Centura’s Colorado Health Neighborhoods with immediate access to data analytics and will utilize tools to help engage, inform, and empower customers to actively manage and maintain their health. The joint venture will improve information systems, team-based care coordination, and financial incentives for better health outcomes.
- UCH and the Denver Broncos partnered to encourage improved health throughout the Rocky Mountain region. The Broncos training facility in Arapahoe County will be renamed the UCH Training Center and UCH will be a founding partner of the Broncos Health & Wellness Expo, participating in breast cancer awareness events, health screenings for Broncos fans, and will have marketing opportunities inside and outside Sports Authority Field at Mile High.
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- Longmont United Hospital joined the Centura Health network and plans to integrate the hospital and its affiliated physician practice groups into the Centura system over the next two years. Under the agreement, Centura Health has committed to investing in Longmont United’s growth and development, including capital for facilities and information technology. Longmont United will work to identify any gaps in health and wellness that exist in the community.
- Boulder Brands was purchased by New Jersey-based Pinnacle Foods Inc. for $975 million. Pinnacle Foods will retain Boulder Brands’ 43,000-square-foot downtown Boulder headquarters.

Cross-Cluster Convergence

The nine-county region promotes an environment of collaboration among the digital health, healthcare and wellness, aerospace, and IT-software industries.

- Metro Denver is an emerging digital health community. Founded in July 2012 by the Denver South Economic Development Partnership and Innovation Pavilion, Prime Health is a growing statewide community of 1,000+ health care executives, physicians, technologists, academics, entrepreneurs, and investors dedicated to improving health and lowering healthcare costs through the commercialization of digital health technologies. The Collaborative is a resource ecosystem for Digital Health—the convergence of the digital and genetics revolutions with bioscience, healthcare and wellness, and information technology-software. Colorado is home to more than 120 digital health companies. More information at www.primehealthco.com/challenge.
- The Catalyst Health-Tech Innovation project will be a collaborative hub for health-technology businesses pursing innovation in mobile and wearable technology, digital health enterprise platforms, smart device technologies, and related fields in the River North district. The campus will include 300,000 square feet of office and retail space, with the first phase slated for completion in late 2017.
- Boomtown aims to discover and support promising HealthTech startups. The accelerator has graduated more than 30 companies and its partnership with the Colorado Permanente Medical Group provides valuable access to resources, expertise, and a validation for its HealthTech teams.
- Denver-based Welltok partnered with Centura Health and IBM’s Watson supercomputing to create a virtual health coach that utilizes artificial intelligence to help people with heart conditions lead healthier lives. The CaféWell Concierge application will be offered to 6,000 heart failure and cardiac rehabilitation patients from Centura Health’s clinics and patients will track steps recommended by their doctor to improve their health such as specific exercises and personalized nutrition recommendations.
- Recondo Technology received a patent for its Recondo Bot Technology called ReconBot®. The patented technology is at the core of Recondo’s patient resolution cloud platform that enables Recondo clients to receive enriched actionable data from over 850 healthcare payers.
- Broomfield-based Novum Concepts unveiled its BioPhone Field application suite that allows first responders to send images and video securely from the field to emergency room staff. The application alerts the receiving hospital of incoming patients, which allows the hospital to provide improved patient care and saves registration time. Lafayette’s Good Samaritan ER is the first healthcare facility to use the technology.

Industry Infrastructure Support

Numerous foundations and organizations in the nine-county region support the burgeoning healthcare and wellness industry.

- Colorado hosted the fifth annual USA Pro Cycling Challenge in the summer of 2015. The 605-mile route through nine host cities from Steamboat Springs to Denver generated $100 million in economic impact for the state. Riders from 16 international, professional teams took place in the race, attracting 1 million spectators and visitors.
- Colorado’s northeastern plains communities hosted the fourth annual Pedal The Plains bicycle tour in 2015. More than 1,000 registered cyclists participated in the event to celebrate the agricultural roots and frontier heritage of the state’s Eastern Plains. The three-day ride covered more than 150 miles and showcased the host communities of Julesburg, Holyoke, and Sterling.
- Flat 14ers is an initiative to encourage children, families, teachers, and community members to increase their levels of physical activity by climbing virtual 14,000-foot mountain peaks (14ers). The online tracking system provides individuals an easy and fun way to become active and stay active by converting minutes of physical activity such as running, playing basketball, cycling, or walking into
steps toward reaching the summit of a 14er. The initiative is part of the Tri-County Health Department’s Communities Putting Prevention to Work Grant with partners including school districts, parks and recreation agencies in Adams, Arapahoe, and Douglas Counties, CBS4, America On the Move, and Children’s Hospital Colorado.

- Great Outdoors Colorado (GOCO) launched a five-year initiative to inspire youth to reconnect with the outdoors. The first-of-its-kind “Inspire Initiative” will launch in five pilot communities, providing funding for places, programs, and pathways that will give youth and their families meaningful experiences in the outdoors. Communities will partner with GOCO to build or enhance parks, school play yards, and other outdoor destinations including trails.

- The Colorado Health Foundation (CHF) is one of the largest health-focused foundations in the country, providing grants to nonprofits with the focus on encouraging healthy living. Located in Denver, CHF works to increase accessibility to quality healthcare, provides graduate medical education to increase the healthcare workforce, and works with foundation partners to address health issues in Colorado. CHF hosts the annual Colorado Health Symposium that is one of the leading national health policy conferences in the nation.

- Gov. John Hickenlooper launched the Colorado Outdoor Recreation Industry Office to support and advance the state’s recreational opportunities and future health of the state. The office will provide a central point of contact, advocacy, resources, and support for the diverse constituents, businesses, communities, and groups that rely on the ongoing health of the outdoor recreation industry.

- The Colorado Trust was formed in 1985 as a dedicated foundation to advance the health and well-being of Coloradans. The Trust collaborates with individuals, organizations, and communities across the state to expand health coverage and improve the healthcare system. Through grant support, the Trust is dedicated to achieving access to healthcare for all Coloradans.

### Healthcare and Wellness Workforce Profile

Many companies choose locations because of the available workforce. With nearly half of the nine-county region’s 3.7 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, 41.3 percent are college graduates and 90.5 percent have graduated from high school. The state has the nation’s second-most highly educated workforce as measured by the percentage of residents with a bachelor’s degree or higher.

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

Source: U.S. Census Bureau, 2014 American Community Survey.
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The attractiveness of the region draws new residents through migration. The region’s population is expected to grow 59.9 percent from 2010 to 2040, driving a 36.3 percent increase in the region’s labor force over the same period. It is important to note the changing composition of the workforce supply as the baby boomers begin to retire, which will pose implications for businesses whose employee pool includes significant numbers of these workers.

The nine-county region’s healthcare and wellness industry cluster employs 202,550 people and includes a large pool of talented, well-educated, and highly skilled workers. 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 category.

The healthcare and wellness workforce supply consists of four main components: those currently working in the industry; those doing a similar type of job in some other industry; the unemployed; and those currently in the education pipeline. The Metro Denver and Northern Colorado 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**

The 2014 average annual salary for a healthcare and wellness worker in the nine-county region was $55,790, compared with the national average of $55,140. Total payroll for the healthcare and wellness cluster in the region exceeded $10.7 billion in 2014.
HEALTHCARE AND WELLNESS:
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Metro Denver and Northern Colorado Healthcare and Wellness Occupation & Salary Profile, 2015

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<td>1. Registered nurses</td>
<td>32,909</td>
<td>282</td>
<td>2,079</td>
<td>$70,429</td>
<td>$51,459</td>
<td>$59,301</td>
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<td>2. Personal care aides</td>
<td>17,026</td>
<td>520</td>
<td>154</td>
<td>$21,320</td>
<td>$17,784</td>
<td>$19,427</td>
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<td>3. Home health aides</td>
<td>14,600</td>
<td>432</td>
<td>181</td>
<td>$25,771</td>
<td>$19,490</td>
<td>$21,819</td>
<td>$32,448</td>
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<td>4. Nursing assistants</td>
<td>12,908</td>
<td>1,009</td>
<td>1,591</td>
<td>$28,766</td>
<td>$22,693</td>
<td>$25,438</td>
<td>$33,654</td>
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<td>5. Business operations specialists, all other</td>
<td>33,049</td>
<td>705</td>
<td>42</td>
<td>$72,259</td>
<td>$38,646</td>
<td>$51,958</td>
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<td>6. Receptionists &amp; information clerks</td>
<td>15,940</td>
<td>2,136</td>
<td>0</td>
<td>$29,786</td>
<td>$19,885</td>
<td>$24,315</td>
<td>$36,379</td>
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<td>7. Medical assistants</td>
<td>7,319</td>
<td>340</td>
<td>259</td>
<td>$34,965</td>
<td>$24,315</td>
<td>$29,890</td>
<td>$41,392</td>
<td>$48,173</td>
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<td>8. Medical secretaries</td>
<td>6,131</td>
<td>301</td>
<td>1,368</td>
<td>$33,883</td>
<td>$26,166</td>
<td>$29,307</td>
<td>$38,314</td>
<td>$44,242</td>
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<tr>
<td>10. Fitness trainers &amp; aerobics instructors</td>
<td>5,985</td>
<td>66</td>
<td>207</td>
<td>$40,664</td>
<td>$19,739</td>
<td>$27,186</td>
<td>$55,349</td>
<td>$67,018</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 2015.3 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 nearly 380 private occupational and technical schools offering courses in dozens of program areas throughout the state. 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.

- American Sentinel University
  [www.americansentinel.edu](http://www.americansentinel.edu)

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

- Southwest Acupuncture College
  [www.acupuncturecollege.edu](http://www.acupuncturecollege.edu)

- Colorado School of Traditional Chinese Medicine
  [www.cstcm.edu](http://www.cstcm.edu)

- Pima Medical Institute – Denver Campus
  [www.pmi.edu](http://www.pmi.edu)

- University of Colorado: Anschutz Medical Campus, Boulder, Denver,
  [www.cu.edu](http://www.cu.edu)

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

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

- University of Northern Colorado
  [www.unco.edu](http://www.unco.edu)

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

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

- Institute of Taoist Education and Acupuncture, Inc.
  [http://itea.edu](http://itea.edu)

- Rocky Vista University
  [www.ryu.edu](http://www.ryu.edu)
HEALTHCARE AND WELLNESS:
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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 is the leanest state with the nation’s lowest rate of adult obesity (21.3 percent). (Trust for America’s Health, 2015; Robert Wood Johnson Foundation, 2015)
   • Colorado has the highest rate of physical activity in the nation with more than 60 percent of the state’s adults participating in weekly moderate or vigorous physical activity. (The Henry J. Kaiser Family Foundation, 2015)
   • Colorado ranked as the eighth-healthiest state in the nation and had the lowest rates of obesity, physical inactivity, and diabetes. (United Health Foundation, 2015)
   • Metro Denver ranked as the nation’s sixth-fittest metropolitan area in 2015. Denver’s access to the outdoors, high percentage of residents engaged in physical activity, and low obesity and diabetes rates contributed to its notable rank. (American College of Sports Medicine, 2015)
   • Colorado’s extensive opportunities for outdoor recreation adventures and experiences support a healthy, active lifestyle. The state offers unlimited access to 22 million acres of national forests and expansive public lands, 42 state parks, more than 30 wilderness areas, and the highest concentration of 14,000-foot mountain peaks in the nation. (Colorado Tourism Office, 2015)
   • Prime recreation opportunities abound in Metro Denver with access to the nation’s largest public parks system, 11 world-class ski resorts within 100 miles, and more than 850 miles of paved bike trails. (Metro Denver Economic Development Corporation)
   • Colorado residents had the sixth-highest well-being in the nation and ranked most favorably for physical well-being and relationship to community. (Gallup-Healthways, 2015)
   • Douglas County ranked as the second-healthiest county in Colorado. Boulder (fourth) was also included in the top-10. (University of Wisconsin Population Health Institute, 2015)
   • Colorado ranked among the top-10 states for healthy aging and scored among the top-10 on three of the six healthy aging indicators. The state’s older adults had the second-highest rate of physical activity and had low rates of activity limitations. (Colorado Health Foundation, 2015)
   • Colorado’s nearly 350 organically-certified farmers, ranchers, and food processors account for approximately 10 percent of overall U.S. sales of organic products. Colorado ranked as the nation’s fourth-largest producer of organic wheat and ranked second in organic millet production. (Colorado Department of Agriculture, 2015)

2. The ability to recruit and retain a healthy, skilled, and productive workforce
   • Healthy employees average 38 fewer unhealthy days per year and cost an average of $4,000 less each year in healthcare costs than unhealthy employees. (Gallup-Healthways Well-Being Index, 2015; University of Michigan Health Management Research Center, 2015)
   • Every dollar invested in Colorado employer-sponsored wellness programs provides a minimum return of $2.50 and improved health outcomes for the state’s workforce. (The State of Health: Colorado’s Commitment to Become the Healthiest State, 2013)
   • Colorado ranked as the second-best state for nurses in 2015. The state ranked among the top-10 states for the most nursing job openings per capita, the highest average annual salaries for nurses, the largest share of nursing homes, and the average number of hours worked. (WalletHub, 2015)
   • Of Colorado’s adult population, more than 38 percent has completed a bachelor’s or higher-level degree, making Colorado the second-most highly educated state in the nation behind Massachusetts. (U.S. Census Bureau, 2014 American Community Survey)
   • Denver ranked as the third-best city for college graduates, with millennials (ages 20-34) representing 26 percent of the total population. (Rent.com, 2015)
   • Metro Denver ranked among the top-10 major metros for college graduates and received accolades for its vibrant millennial population and strong labor market. Fort Collins ranked second among small metro areas. (American Institute for Economic Research, 2015)
   • The Colorado Rural Health Center’s Colorado Provider Recruitment program focuses on expanding the primary care workforce throughout Colorado’s rural and urban underserved healthcare communities. More than 1,050 providers contracted with the Colorado Provider Recruitment program in 2014. (Colorado Rural Health Center, 2015)
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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 pediatrics (fifth), family medicine (seventh), and rural medicine (ninth) also ranking high. The School of Medicine ranked 35th for research. (*U.S. News & World Report*, 2015)
- Two Metro Denver institutions ranked among the nation’s “Best Online Graduate Nursing Programs.” Loretto Heights School of Nursing at Regis University ranked 82nd and American Sentinel in Aurora ranked 98th. (*U.S. News & World Report*, 2015)
- Argosy University-Denver launched its new Bachelor of Science in Nursing degree program in 2015. The one-year program is designed for licensed registered nurses who have earned either a diploma or an associate’s degree in nursing to build upon pre-licensure nursing coursework.
- The University of Colorado Denver and Red Rocks Community College are Metro Denver’s only institutions with accredited entry-level physician assistant programs. (Colorado Health Institute, 2015)
- The University of Colorado School of Medicine offers programs in dental medicine, medicine, nursing, pharmacy, and public health and 11.3 million square feet of newly built training facilities for future health professionals. (University of Colorado, 2015)
- The College of Nursing at the University of Colorado was the birthplace of the first nurse practitioner program in the world and first school nurse program in the U.S. in 1965. (University of Colorado, 2015)
- The Colorado School of Public Health (CSPH) is the first accredited and only collaborative school of public health in the Rocky Mountain region. In 2015, CSPH launched the Lifecourse Epidemiology of Adiposity and Diabetes (LEAD) center—the first of its kind regionally—to investigate the causes and approaches to preventing obesity and diabetes. (The Colorado School of Public Health, 2015)
- The University of Colorado School of Pharmacy ranked fourth out of 72 academic pharmacy schools in total NIH funding, while the School of Medicine ranked among the nation’s top-25 institutions reaching $167.3 million in fiscal year 2014. (National Institutes of Health, 2015)

4. A regional health hub, with expanding medical and wellness tourism opportunities

- HealthGrades awarded several honors to hospitals in the nine-county region in 2015. Seven earned the 2015 Distinguished Hospital Award for Clinical Excellence, three were named among “America’s 100 Best Hospitals,” and five received awards for Outstanding Patient Experience. (HealthGrades, Inc., 2015)
- Thirteen Metro Denver hospitals received “A” grades in hospital safety, seven received a “B” grade, and four received a “C” grade. In a separate state ranking, Colorado ranked ninth for hospital safety. (The Leapfrog Group, 2015)
- Rose Medical Center (Denver), Poudre Valley Hospital (Fort Collins), and North Colorado Medical Center (Greeley) were named to Truven Health Analytics “100 Top Hospitals” in 2015. (Truven Health Analytics, 2015)
- National Jewish Health is the leading respiratory hospital in the nation and is the only facility in the world dedicated exclusively to groundbreaking medical research and treatment of patients with respiratory, cardiac, immune, and related disorders. (National Jewish Health, 2015)
- Seven Metro Denver hospitals have achieved Magnet® designation for excellence in nursing. (American Nurses Credentialing Center, 2015)
- The University of Colorado Hospital ranked among 10 academic medical centers in the nation to receive the University HealthSystem Consortium Quality Leadership Award in 2015. (University HealthSystem Consortium, 2015)
- Children’s Hospital Colorado (CHC) ranked among the top-five, best children’s hospitals in the nation with six of its specialty areas among the nation’s top-10 in their respective categories. CHC was also named to the *U.S. News’ Honor Roll*, ranked fifth on *Parents* magazine’s top children’s hospitals in the nation, and was named the winner of the 2015 American Hospital Association-McKesson Quest for Quality Award. (*U.S. News & World Report*, 2015; *Parents*, 2013; American Hospital Association, 2015)
- Eight Metro Denver hospitals were ranked among the 2015-2016 “Best Hospitals.” UCH was named as the top facility in Metro Denver and ranked nationally in 11 specialties. (*U.S. News & World Report*, 2015)
- 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. RMHC cares for infants, children, and teenagers across a six-state region. (Rocky Mountain Hospital for Children, 2015)
5. An overall better quality of life
- Denver was named as the best city to live in the West in 2015, according to *MONEY Magazine*. The city was cited as a “mecca for millennials” with great access to recreation. Louisville ranked fourth and Erie ranked 13th among the best small towns to live in the U.S. (*MONEY Magazine*, 2015)
- Boulder ranked fourth on the 2015 list of the “Top 100 Best Places to Live.” Fort Collins (24th), Lakewood (34th), and Westminster (75th) were also named to the list. (Livability.com, 2015)
- Denver ranked sixth among “America’s 10 Best Cities for Retirement” in 2015. Denver’s abundant outdoor recreation opportunities and low taxes contributed to its favorable rank. (Bankrate.com, 2015)
- FasTracks is a $7.4 billion project to build out Metro Denver’s entire mass transit system by 2019, adding 122 miles of rail rapid transit and extending existing routes. The expansion is the largest simultaneous transit build out in U.S. history and will make Metro Denver one of the top-five regions in the country in terms of miles of fixed rail.

### Healthcare and Wellness Industry Cluster Definition

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<tr>
<th>NAICS Code*</th>
<th>NAICS Description</th>
<th>SIC Code</th>
<th>SIC Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>315220 (P)</td>
<td>Men's &amp; boys' cut &amp; sew apparel mfg.</td>
<td>2329-01</td>
<td>Men's &amp; boys' sportswear &amp; athletic clothing</td>
</tr>
<tr>
<td>315240 (P)</td>
<td>Women's, girls', &amp; infants' cut &amp; sew apparel mfg.</td>
<td>2339-03</td>
<td>Women's &amp; misses' athletic clothing &amp; sportswear</td>
</tr>
<tr>
<td>336991 (P)</td>
<td>Motorcycle, bicycle, &amp; parts manufacturing</td>
<td>3751-02</td>
<td>Bicycles &amp; related parts</td>
</tr>
<tr>
<td>339115 (P)</td>
<td>Ophthalmic goods mfg.</td>
<td>3851</td>
<td>Ophthalmic goods (except intraocular lenses)</td>
</tr>
<tr>
<td>339116</td>
<td>Dental laboratories</td>
<td>8072</td>
<td>Dental laboratories</td>
</tr>
<tr>
<td>339920</td>
<td>Sporting &amp; athletic goods mfg.</td>
<td>3949</td>
<td>Sporting &amp; athletic goods, NEC</td>
</tr>
<tr>
<td>423450</td>
<td>Medical, dental, &amp; hospital equip. &amp; supplies merchant wholesalers</td>
<td>5047</td>
<td>Medical, dental &amp; hospital equip. &amp; supplies (merchant wholesalers except those selling medical, dental, and hospital equipment and supplies via retail method)</td>
</tr>
<tr>
<td>423460</td>
<td>Ophthalmic goods merchant wholesalers</td>
<td>5048</td>
<td>Ophthalmic goods, NEC</td>
</tr>
<tr>
<td>423910 (P)</td>
<td>Sporting &amp; recreational goods &amp; supplies merchant wholesalers</td>
<td>5091</td>
<td>Sporting &amp; recreation goods</td>
</tr>
<tr>
<td>424210 (P)</td>
<td>Drugs &amp; druggists sundries merchant wholesalers</td>
<td>5122-0310</td>
<td>Vitamins &amp; minerals</td>
</tr>
<tr>
<td>424340 (P)</td>
<td>Footwear merchant wholesalers</td>
<td>5139-9902</td>
<td>Footwear, athletic</td>
</tr>
<tr>
<td>424490 (P)</td>
<td>Other grocery &amp; related products merchant wholesalers</td>
<td>5149-06</td>
<td>Organic &amp; diet food</td>
</tr>
<tr>
<td>446191</td>
<td>Food (health) supplement stores</td>
<td>5499-01</td>
<td>Health &amp; dietetic food stores</td>
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<tr>
<td>532291</td>
<td>Home health equipment rental</td>
<td>7352</td>
<td>Medical equipment rental</td>
</tr>
<tr>
<td>532292</td>
<td>Recreational goods rental</td>
<td>7999-9911</td>
<td>Recreation equipment rental</td>
</tr>
<tr>
<td>611620</td>
<td>Sports &amp; recreation instruction</td>
<td>7999-11</td>
<td>Instruction schools, camps, &amp; services</td>
</tr>
<tr>
<td>611710 (P)</td>
<td>Educational support services</td>
<td>8299-9910</td>
<td>Meditation therapy</td>
</tr>
<tr>
<td>621111</td>
<td>Offices of physicians (except mental health specialists)</td>
<td>8011</td>
<td>Offices &amp; clinics of doctors of medicine</td>
</tr>
<tr>
<td>621111</td>
<td>Offices of physicians (except mental health specialists)</td>
<td>8031</td>
<td>Offices &amp; clinics of doctors of osteopathy</td>
</tr>
<tr>
<td>621112</td>
<td>Offices of physicians, mental health specialists</td>
<td>8011</td>
<td>Offices &amp; clinics of doctors of medicine</td>
</tr>
<tr>
<td>621112</td>
<td>Offices of physicians, mental health specialists</td>
<td>8031</td>
<td>Offices &amp; clinics of doctors of osteopathy</td>
</tr>
<tr>
<td>621210</td>
<td>Offices of dentists</td>
<td>8021</td>
<td>Offices &amp; clinics of dentists</td>
</tr>
<tr>
<td>621310</td>
<td>Offices of chiropractors</td>
<td>8041</td>
<td>Offices &amp; clinics of chiropractors</td>
</tr>
<tr>
<td>621320</td>
<td>Offices of optometrists</td>
<td>8042</td>
<td>Offices &amp; clinics of optometrists</td>
</tr>
<tr>
<td>621330</td>
<td>Offices of mental health practitioners (except physicians)</td>
<td>8049</td>
<td>Offices &amp; clinics of health practitioners, NEC</td>
</tr>
<tr>
<td>621340</td>
<td>Offices of physical, occupational speech therapists, audiologists</td>
<td>8049</td>
<td>Offices &amp; clinics of health practitioners, NEC</td>
</tr>
<tr>
<td>621391</td>
<td>Offices of podiatrists</td>
<td>8043</td>
<td>Offices &amp; clinics of podiatrists</td>
</tr>
<tr>
<td>621399</td>
<td>Offices of all other miscellaneous health practitioners</td>
<td>8049</td>
<td>Offices &amp; clinics of health practitioners, NEC</td>
</tr>
<tr>
<td>621410</td>
<td>Family planning centers</td>
<td>8093</td>
<td>Specialty outpatient facilities, NEC</td>
</tr>
<tr>
<td>621410</td>
<td>Family planning centers</td>
<td>8093</td>
<td>Specialty outpatient facilities, NEC</td>
</tr>
<tr>
<td>621420</td>
<td>Outpatient mental health &amp; substance abuse centers</td>
<td>8093</td>
<td>Specialty outpatient facilities, NEC</td>
</tr>
<tr>
<td>621491</td>
<td>HMO medical centers</td>
<td>8093</td>
<td>Offices &amp; clinics of doctors of medicine</td>
</tr>
<tr>
<td>621492</td>
<td>Kidney dialysis centers</td>
<td>8092</td>
<td>Kidney dialysis centers</td>
</tr>
<tr>
<td>NAICS Code*</td>
<td>NAICS Description</td>
<td>SIC Code</td>
<td>SIC Description</td>
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<td>------------</td>
<td>--------------------------------------------------------</td>
<td>----------</td>
<td>------------------------------------------------------</td>
</tr>
<tr>
<td>621493</td>
<td>Freestanding ambulatory surgical &amp; emergency centers</td>
<td>8011</td>
<td>Offices &amp; clinics of doctors of medicine</td>
</tr>
<tr>
<td>621498</td>
<td>All other outpatient care centers</td>
<td>8093</td>
<td>Specialty outpatient facilities, NEC</td>
</tr>
<tr>
<td>621511</td>
<td>Medical laboratories</td>
<td>8071</td>
<td>Medical laboratories</td>
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<tr>
<td>621512</td>
<td>Diagnostic imaging centers</td>
<td>8071</td>
<td>Medical laboratories</td>
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<tr>
<td>621610</td>
<td>Home health care services</td>
<td>8082</td>
<td>Home health care services</td>
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<tr>
<td>621910</td>
<td>Ambulance Services</td>
<td>4119-9902</td>
<td>Ambulance service</td>
</tr>
<tr>
<td>621991</td>
<td>Blood &amp; organ banks</td>
<td>8099</td>
<td>Health &amp; allied services, NEC</td>
</tr>
<tr>
<td>621999</td>
<td>All other misc. ambulatory health care services</td>
<td>8099</td>
<td>Health &amp; allied services, NEC</td>
</tr>
<tr>
<td>622110</td>
<td>General medical &amp; surgical hospitals</td>
<td>8062</td>
<td>General medical &amp; surgical hospitals</td>
</tr>
<tr>
<td>622110</td>
<td>General medical &amp; surgical hospitals</td>
<td>8069</td>
<td>Specialty hospitals, except psychiatric</td>
</tr>
<tr>
<td>622210</td>
<td>Psychiatric &amp; substance abuse hospitals</td>
<td>8063</td>
<td>Psychiatric hospitals</td>
</tr>
<tr>
<td>622210</td>
<td>Psychiatric &amp; substance abuse hospitals</td>
<td>8069</td>
<td>Specialty hospitals, except psychiatric</td>
</tr>
<tr>
<td>622310</td>
<td>Specialty (except psychiatric &amp; substance abuse)</td>
<td>8069</td>
<td>Specialty hospitals, except psychiatric</td>
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<td>623110</td>
<td>Nursing care facilities (skilled nursing facilities)</td>
<td>8051</td>
<td>Skilled nursing care facilities</td>
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<tr>
<td>623110</td>
<td>Nursing care facilities (skilled nursing facilities)</td>
<td>8052</td>
<td>Intermediate care facilities</td>
</tr>
<tr>
<td>623110</td>
<td>Nursing care facilities (skilled nursing facilities)</td>
<td>8059</td>
<td>Nursing &amp; personal care facilities, NEC</td>
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<tr>
<td>623210</td>
<td>Residential intellectual &amp; developmental disability</td>
<td>8052</td>
<td>Intermediate care facilities</td>
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<tr>
<td>623311</td>
<td>Continuing care retirement communities</td>
<td>8051</td>
<td>Skilled nursing care facilities</td>
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<tr>
<td>623311</td>
<td>Continuing care retirement communities</td>
<td>8052</td>
<td>Intermediate care facilities</td>
</tr>
<tr>
<td>623311</td>
<td>Continuing care retirement communities</td>
<td>8059</td>
<td>Nursing &amp; personal care facilities, NEC</td>
</tr>
<tr>
<td>624190</td>
<td>Other individual &amp; family services</td>
<td>8322-0400</td>
<td>Rehabilitation services</td>
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<tr>
<td>624190</td>
<td>Other individual &amp; family services</td>
<td>8322-0500</td>
<td>Family counseling services</td>
</tr>
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<td>624190</td>
<td>Other individual &amp; family services</td>
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<td>Family (marriage counseling)</td>
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<tr>
<td>624190</td>
<td>Other individual &amp; family services</td>
<td>8322-0600</td>
<td>General counseling services</td>
</tr>
<tr>
<td>624190</td>
<td>Other individual &amp; family services</td>
<td>8322-0601</td>
<td>Community center</td>
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<tr>
<td>624190</td>
<td>Other individual &amp; family services</td>
<td>8322-0602</td>
<td>Helping hand service (Big Brother, etc.)</td>
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<td>624190</td>
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<td>8322-0603</td>
<td>Multi-service center</td>
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<td>624190</td>
<td>Other individual &amp; family services</td>
<td>8322-0608</td>
<td>Self-multi service center</td>
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<td>624190</td>
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<td>8322-08</td>
<td>Substance abuse counseling</td>
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<td>8322-9901</td>
<td>Meal delivery program</td>
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<td>Physical fitness facilities</td>
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<td>Fitness &amp; recreational sports centers</td>
<td>7999-9910</td>
<td>Recreation center</td>
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<td>713990</td>
<td>All other amusement &amp; recreation industries</td>
<td>7999-9912</td>
<td>Recreation services</td>
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<td>812191</td>
<td>Diet &amp; weight reducing centers</td>
<td>7299-0102</td>
<td>Diet center, without medical staff</td>
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<td>812199</td>
<td>Other personal care services</td>
<td>7299-0200</td>
<td>Massage parlor &amp; steam bath services</td>
</tr>
<tr>
<td>812199</td>
<td>Other personal care services</td>
<td>7299-0201</td>
<td>Massage parlor</td>
</tr>
<tr>
<td>813212</td>
<td>Voluntary health organizations</td>
<td>8399-9906</td>
<td>Health systems agency</td>
</tr>
<tr>
<td>813319</td>
<td>Other social advocacy organizations</td>
<td>8399-9905</td>
<td>Health &amp; welfare council</td>
</tr>
<tr>
<td>923120</td>
<td>Administration of public health programs</td>
<td>9431</td>
<td>Administration of public health programs</td>
</tr>
</tbody>
</table>

*(P) indicates that only part of the NAICS industry category is represented in the industry cluster definition.

Note: NEC indicates "not elsewhere classified."
HEALTHCARE AND WELLNESS:
Metro Denver and Northern Colorado Industry Cluster Profile

Healthcare and Wellness Industry Cluster Relationships

Technologies
- Bioinformatics
- Biotechnology
- Chronic Disease Management Devices
- Electronic Health Records
- Genomics
- Interactive Gaming
- Nuclear Medicine
- Physiological & Remote Monitoring Devices
- Radiology
- Robotics
- Stem Cells
- Telehealth
- Telemedicine

Support Industries
- Agriculture
- Aviation
- Bioscience
- Construction
- Education
- Financial Services-Insurance
- Government
- Hardware
- Legal
- Manufacturing
- Medical and Wellness Tourism
- Philanthropy
- Retail
- Software
- Sports and Recreation
- Telecommunications

Client Industries
- Bioscience
- Businesses
- Consumers
- Schools

Infrastructure
- Fitzsimons Innovation Campus
- Colorado Science + Technology Park at Fitzsimons
- Anschutz Medical Campus
- Children’s Hospitals
- Business Incubators and R&D Facilities
- Referral Facilities
- Academic Research Institutions
- General Medical and Specialty Care Hospitals
- Research and Teaching Hospitals
- Primary Care Hospitals
- Nonprofit and Foundation Organizations
- Outreach Organizations
- Telehealth Networks
- School-Based Health Clinics
- Resorts and Sports Complexes
- Professional Healthcare and Wellness Organizations
- Sports and Training Facilities
- Public Health Schools and Organizations
- Nutrition, Fitness, and Weight Mgmt. Centers
- Poison and Drug Centers
- Specialty Outpatient Clinics
- Health Information Organizations
- Medical Specialty Schools
- Mental Health & Substance Abuse Clinics
- Counseling & Rehabilitation Centers

For additional information, contact us:

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Economic Development Corporation
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Denver, CO 80202-1790
303.620.8092
email: info@metrodenver.org
www.metrodenver.org

Industry Overview

The information technology (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 146,800 information technology workers in the state representing more than 12,000 software, Internet, hardware, telecommunications, and related technology companies.

Colorado is a hotbed of innovation activity, fueled by a talented IT workforce, modern infrastructure, and an entrepreneurial spirit. Colorado ranked third in tech-worker concentration, with 9.2 percent of the state’s private sector workforce employed in technology firms, according to the CompTIA’s Cyberstates 2015 report. Colorado also ranked third for the tech industries’ contribution to the state’s economy, eighth for average high-tech wage, and had the ninth-highest wage differential in the nation. Further, Colorado had the fourth-highest startup activity in the nation in the 2015 Kauffman Index: Startup Activity and is a top-five state for entrepreneurship and innovation. According to TechAmerica Foundation’s most recent Cybersities report, Boulder ranked third in tech-worker concentration, while Denver ranked 17th with nearly 9 percent of private-sector workers employed in technology firms. Denver also ranked 13th for average high-tech wage.

The nine-county Metro Denver and Northern Colorado region\(^1\) is the nation’s premier startup hub and entrepreneurial ecosystem for high-tech innovation and development. The region’s collaborative culture, business-friendly environment, and cutting-edge workforce attract startups and entrepreneurs. In 2015, Investopedia ranked Denver as the fourth-best city to become an entrepreneur and ranked as the third-best city for tech startups and workers in the nation by SelfStorage.com. Further, Popular Mechanics named Boulder the seventh-best startup city in the nation, with six times the national average of high-tech startups and ranked as the nation’s best place to start a business in 2015, according to NerdWallet. Boulder and Fort Collins ranked among the top-10 of “America’s Most Innovative Tech Hubs” and Metro Denver, Boulder, and Fort Collins were also ranked among the top-10 metropolitan areas for female entrepreneurs in 2015 by NerdWallet. According to the 2015 Kauffman Index of Entrepreneurial Activity, Metro Denver had the fifth-highest startup activity, with 177.8 startups less than a year old and 370 new business owners per 100,000 adults.

\(^1\) 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.
INFORMATION TECHNOLOGY-SOFTWARE:  
Metro Denver and Northern Colorado Industry Cluster Profile

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 and hosting, computer facilities management services, and computer systems design services.

The nine-county region ranked ninth out of the 50 largest metro areas in software employment concentration in 2015. With direct employment of about 48,610 software employees, the region ranked 12th. About 81 percent of Colorado’s software cluster employees work in the region.

### Software Employment and Company Profile, 2015

<table>
<thead>
<tr>
<th>Nine-County Region</th>
<th>United States</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct employment, 2015</td>
<td>48,610</td>
</tr>
<tr>
<td>Number of direct companies, 2015</td>
<td>4,810</td>
</tr>
<tr>
<td>One-year direct employment growth, 2014-2015</td>
<td>4.5%</td>
</tr>
<tr>
<td>Five-year direct employment growth, 2010-2015</td>
<td>19.6%</td>
</tr>
<tr>
<td>Avg. annual direct employment growth, 2010-2015</td>
<td>3.6%</td>
</tr>
<tr>
<td>Direct employment concentration</td>
<td>2.5%</td>
</tr>
</tbody>
</table>


Software Employment

The nine-county region’s software employment (48,610 workers) rose 4.5 percent in 2015, compared with the previous year’s level, adding more than 2,110 new jobs during the same period. National employment levels also grew over-the-year, rising 6.7 percent. About 1.6 percent of the nation’s software employment is located in the region. Between 2010 and 2015, the region’s software employment rose 19.6 percent, compared with 30.2 percent at the national level. Software companies employed 2.5 percent of the region’s total employment base, compared with a 2.1 percent national employment concentration.

About 4,810 software companies operated in the nine-county region in 2015. Nearly 83 percent of the region’s software companies employed fewer than 10 people, while 0.5 percent employed 250 or more.

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2 Employment concentration is the direct cluster employment in a region expressed as a percent of total employment in all industries in the same region. Employment concentration is calculated and ranked for the 50 largest metropolitan statistical areas (MSAs). Direct employment is the number of employees in the industry cluster in a region. No multiplier effects are included. Direct employment is estimated and ranked for the 50 largest MSAs.
INFORMATION TECHNOLOGY-SOFTWARE: 
Metro Denver and Northern Colorado Industry Cluster Profile

Major Software Companies

- Alteryx, Inc. 
  www.alteryx.com
- CA Technologies (formerly Rally Software) 
  www.ca.com
- CGI Group Inc. 
  www.cgi.com
- CIBER, Inc. 
  www.ciber.com
- Cisco Systems, Inc. 
  www.cisco.com
- Coalfire Systems, Inc. 
  www.coalfire.com
- Constant Contact, Inc. 
  www.constantcontact.com
- Datavail Corp. 
  www.datavail.com
- McKesson Technology Solutions 
  www.mckesson.com
- Oracle Corporation 
  www.oracle.com
- Pearson eCollege 
  www.ecollege.com
- Ping Identity 
  www.pingidentity.com
- Qualfon (formerly Center Partners) 
  www.qualfon.com
- Quark Software Inc. 
  www.quark.com
- Recondo Technology 
  www.recondotech.com
- SendGrid 
  www.sendgrid.com

IT-Software Employment by County, 2015

- Denver 20.2%
- Arapahoe 20.0%
- Jefferson 19.2%
- Boulder 19.2%
- Broomfield 7.4%
- Douglas 8.0%
- Larimer 6.2%
- Weld 0.8%

Sources: Market Analysis Profile, 2015; Development Research Partners.

IT-Software Employment by Category, 2015

- Custom Computer Programming Services 41.2%
- Other Computer-Related Services 17.2%
- Computer Integrated Systems Design 14.8%
- Data Processing & Preparation 14.3%
- Software Publishing 11.6%
- Computer Facilities Management 0.8%

Sources: Market Analysis Profile, 2015; Development Research Partners.

IT-Software Employment by County, 2015

- Denver 20.2%
- Arapahoe 20.0%
- Jefferson 19.2%
- Boulder 19.2%
- Broomfield 7.4%
- Douglas 8.0%
- Larimer 6.2%
- Weld 0.8%

Sources: Market Analysis Profile, 2015; Development Research Partners.
2015 Industry Highlights

Key Company Announcements

Notable IT-software company expansions and announcements in 2015 included:

- Gusto, formerly ZenPayroll, Inc., opened a Denver office and will initially hire 100 employees with plans to hire 1,000 people as the company grows. Denver will be the main hub for the company’s customer service team near Union Station. Denver’s business climate, employee and business retention rates, and hub for recent college graduates were key factors in its location decision. Gusto raised $50 million more in venture capital funding at a company valuation of more than $1 billion.
- Iowa-based Businessolver, a benefits administration software and services technology company, plans to hire 100 IT professionals and customer service representatives in Denver. The company cited Denver’s talented workforce as a key factor to expand its existing presence.
- Boulder-based SolidFire plans to relocate its corporate headquarters from Pearl Street to PearlWest in 2016 to accommodate its growing cloud computing services. The data storage company will be the anchor tenant, leasing 62,000 square feet to house up to 400 employees.
- Envison Inc. relocated its headquarters from Louisville to a larger 21,000-square-foot facility in Superior. The company provides cloud-based video surveillance services for customers and plans to hire 30 additional sales and technical positions.
- San Francisco, Calif.-based Recurly Inc. opened an office in Boulder. The company created the leading pay-as-you-go subscription billing management platform. The new location will have 30 employees and attributed the new location to the area’s local talent and complementary tech-centric environment.
- SnapLogic, a California-based cloud-software company, opened a new office in Boulder. The company plans to hire about eight sales representatives and will fill technical research and development positions.
INFORMATION TECHNOLOGY-SOFTWARE:
Metro Denver and Northern Colorado Industry Cluster Profile

- TransFirst LLC, one of the nation’s largest secure-payment processors, plans to hire 100 employees at its Broomfield and Aurora locations. The company provides processing services to more than 200,000 merchants, financial institutions, and other partners.
- Portugal-based Morphis will open its North American headquarters in Boulder in 2016. The legacy-to-cloud software firm could hire up to 50 employees within two years.
- Westminster-based Coalfire Systems Inc. plans to expand its local offices and hire additional workers. Coalfire provides companies with Software-as-a-Service (SaaS) to manage cyber risk and provide cybersecurity solutions.
- Seattle-based Apptio Inc. plans to open an office in Denver. The company’s new office will recruit talent to develop its IT planning products.
- The Trade Desk, a Ventura, Calif.-headquartered technology firm, plans to expand in Boulder and will lease 13,000 square feet of a new development in downtown Boulder. The company will also add almost 30 new employees, mostly software engineers.
- Louisville-based startup TermScout plans to expand its sale force and further scale its technology. The sales intelligence software company also plans to add workers to support its growing presence.
- Four Winds Interactive, a digital software developer, plans to relocate to the ARTHotel building at 12th and Broadway streets in Denver to expand the company. The company, which provides a software platform for developing, deploying, and managing digital communications networks on digital signs, interactive kiosks, web, and mobile devices, employs 280 workers at its Denver headquarters and plans to add workers.
- Denver-based Arts & Analytics Inc. partnered with the Denver Center for Performing Arts to provide predictive analytics software using its PatronLink360 platform. Leveraging big data and cloud-based marketing, the software enables producers, presenters, agencies, or venues to quickly interpret audience or donor demographic data with a click of a button.

Venture Capital and Investment Activity

The nine-county region is a major technology hub, attracting significant capital and investments to strengthen its startup ecosystem. According to Pricewaterhouse Coopers’ MoneyTree Report, Colorado companies in the IT-software industry have attracted nearly $2.3 billion in venture capital in nearly 440 deals, representing 34.7 percent of the total amount invested across all industries in the state and 42.8 percent of all deals over the last 10 years. In 2015, the IT-software industry captured nearly 73 percent of the venture capital invested across all industries in the state and was the second-highest year of venture capital investments in the IT-software industry since 1995. Between 2011 and 2015, venture capital investments in the IT-software industry rose almost 165 percent, compared with a 18.4 percent increase across all industries in the state.

- Alteryx, an Irvine, Calif.-based data analytics company, received $85 million in venture capital funding that will help drive expansion of its project management and technology-development hub in Broomfield. The company plans to add 100 employees.
- Broomfield-based Datavail Corp. received $47 million in private funding to fuel the company’s expansion. The database services company plans to triple the size of its business in the next five years and will hire additional staff.
- Ibotta raised $40 million to triple its office space and increase its workforce. The company plans to relocate and hire 200 to 300 people in three years. Ibotta employs nearly 100 people in Denver.
- Two Metro Denver startups raised a combined $27.25 million in venture capital investment to fuel growth. Denver-based ProtectWise closed on a $17 million investment round to fund its new Cloud Network DVR that provides real-time and automated retroactive network security and threat detection analysis. Boulder-based startup Kapost raised $10.25 million to expand to 100 employees by 2016.
- Denver-based Aventura closed a $14 million Series C funding round to accelerate product development and expand sales, marketing, business development, and customer support. The company provides next-generation healthcare workflow optimization software.
- Boulder-based Occipital Inc. raised $13 million to advance its Structure Sensor platform and accelerate its spatial computing products. The mobile computer vision applications company’s Structure Sensor is the first three-dimensional sensor for mobile devices.
- Denver-based WellTok Inc. raised $12 million to refine and debut its CaféWell Health Optimization Platform. The web-based preventative healthcare management program integrates and collects data from health applications and wearables such as MapMyFitness and FitBit.
- Boulder-based VictorOps Inc. raised $10.6 million to help the startup double its size to 90 employees over the next 18 months. The company’s software platform helps development operations teams at SaaS companies manage and remediate software system alerts and outages in real-time.
FullContact, a Denver-based tech company, raised $10 million in an investment round led by Boulder’s Foundry Group and Chicago’s Baird Capital. FullContact, a Boulder TechStars startup accelerator, moved to Denver and has grown to 52 employees.

Denver-based Cloud Elements LLC raised $5 million in venture capital to fuel company growth. The company provides a technology platform for software developers to pair applications with cloud computing systems.

Denver-based virtual computer technologies producer Dizzion raised $3.9 million to double its staffing levels in 2015. The company creates virtual computer desktop services for medium-sized and large businesses and maintains desktop software.

Denver-based Tectonic raised $2 million to fuel company growth and advance its capabilities in cloud computing, strategic consulting, marketing technology, and analytics. The company helps mid-size to enterprise clients strategically integrate and modernize cloud technology for big data environments, service, sales, and marketing.

Boulder-based TapInfluence Inc. raised $1.5 million to expand its workforce. The company will add executive positions and plans to double in size, adding 40 jobs over the next year.

Denver-based NextHealth Technologies secured $1 million to support the company’s expansion. NextHealth leased additional space and plans to grow from 15 to 60 technical development workers within three years. The company is a healthcare analytics and services provider that leverages big data and prescriptive analytics to recommend, manage, and optimize consumer engagement.

Augur Technologies, a Boulder-based startup that has developed a device-recognition platform used by web-security and ad technology companies, received $912,000 in seed round funding and plans to double its employee base by the middle of 2016.

Industry Infrastructure Support

The consortium of supportive programs, organizations, and professional associations provide a synergistic climate for the region’s thriving IT-software industry.

Several cities in the nine-county region hosted startup weeks including Denver, Boulder, Fort Collins, and Longmont. Denver hosted the fourth-annual Denver Startup Week in September 2015, which showcased the entrepreneurs, employees, and startup companies fueling innovation in the region. Hosted by the Downtown Denver Partnership and the Colorado Technology Association (CTA), the 2015 event attracted 12,000 registrants and over 900 companies to more than 230 events to celebrate great companies, innovation, and ideas in the region. Boulder Startup Week and Fort Collins Startup Week kicked off in May 2015, with more than 150 events, startup job fairs, and entrepreneurship mentoring. The inaugural Startup Longmont celebrated the city’s booming entrepreneurial zone. With more than 100 speakers and over 45 events, Startup Longmont was the largest business event ever held in the city.

KPMG LLP opened a new high-tech work environment called Ignition Center in Denver. The center is modeled after leading technology parks and business incubators around the world that feature dedicated, project-focused workspaces designed for information sharing, collaboration, and increasing efficiencies. The new facility will bring 125 jobs to the city in areas including data science, enterprise architecture, application programming, solution development, and IT integration.

Techweek, the nation’s leading technology conference and festival, plans to launch in Denver. The event attracts more than 28,000 attendees and includes an all-day hackathon, a fashion-tech show, workshops, panels, and a hiring fair. Techweek also hosts the Launch Championship in which entrepreneurs compete for more than $50,000 in cash and prizes.

Boulder startup accelerator TechStars is a three-month program that provides up to $18,000 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. TechStars Ventures unveiled its third and newest fund in 2015 to invest $150 million in Seed and Series A investments, largely in companies in the technology startup accelerator bootcamps that Boulder-based TechStars hosts in the U.S. and Europe. TechStars is supported by more than 75 different venture capital firms and angel investors. After graduating from TechStars, companies average more than $1.6 million in outside venture capital.

TiE-Rockies was founded in 2001 to inspire, foster, and support entrepreneurship in the Rocky Mountain region. TiE-Rockies provides more than 100 events per year, an ongoing mentoring program, the TRIP Funding Program, and other various programs, initiatives, workshops, seminars, and networking opportunities to local entrepreneurs.
INFORMATION TECHNOLOGY-SOFTWARE:
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- 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 launch over 1,550 companies in six years.
- Denver became one of 11 cities in the nation to join the White House initiative, Startup in a Day, to streamline the process of finding and applying for necessary permits and licenses over a 24-hour period for entrepreneurs. In addition, the initiative includes a $1.5 million competition that will award $50,000 prizes to 25 communities around the nation that adopt the Startup in a Day goals and online tools.
- 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 region is home to numerous coworking spaces that foster creativity and innovation.

- Galvanize, a technology coworking and office space for digital startups, is helping to attract new businesses and foster entrepreneurship. The concept combines venture capital, flexible workspace, and an experimental engineering and business school called gSchool. Galvanize opened its sixth campus in Fort Collins in 2015 and includes 100 members in 33 companies building their businesses in the campus’ two-story facility. The campus will house numerous startups, offer educational programs such as Galvanize Full Stack, and will host community meetups and events.
- INDUSTRY Denver opened its 153,000-square-foot complex in 2015. The project is the nexus of creativity and technology in downtown Denver and includes shared office space and amenities. Several IT-software companies such as Uber, Roxyimt, Zenman, and Spotzer Media Group have leased more than 50,000 square feet of creative and coworking office space.
- Denver’s Cole neighborhood is the site of a new innovation coworking space called STRIDE. The 150,000-square-foot project will serve as the second incarnation of INDUSTRY Denver and will provide incubators, innovation laboratories, outdoor spaces, and large meeting and conference facilities. The first phase of the project is expected to open in spring 2016.
- Shift Workspaces, a collaborative office space provider, plans to invest $30 million to expand its campus in Alamo Placita and open two new locations. The addition of 71,300 square feet will be in the Golden Triangle and the old Cathedral High School in Uptown. By early 2016, Shift’s footprint will grow by more than 4 ½ times its current size.
- A public-private partnership between the City and County of Denver, the Downtown Denver Partnership, and the CTA opened in 2015 and is called the Commons on Champa. The 20,000-square-foot facility serves as a gathering place for startups and entrepreneurs and is the new headquarters for the CTA. The campus includes a 200-person event venue, conference rooms with cutting-edge technology, and offers a speaker series, classes, mentoring for entrepreneurs, and industry meetups.

Academic and Education Announcements
The region’s universities and research institutions offer first-class educational resources to engage students and prepare the future IT-software workforce.

- Colorado was selected among 21 regions by the Obama Administration as pilot areas for improving technology workforce development through a public-private partnership called the TechHire program. The program aims to expand the opportunities available to train people in technology skills such as computer programming to broaden worker recruiting efforts among local companies. Further, TechHire will partner with universities, community colleges, and nontraditional programs such as online training and computer coding bootcamps. The program predicts 21 percent employment growth over 10 years or the addition of 21,636 IT jobs in Colorado.
- The University of Colorado Boulder’s Silicon Flatirons Center for Law, Technology, and Entrepreneurship will launch a pilot Entrepreneurs in Residence program in the fall of 2016. The program will bring national and international business leaders to help students pursue their ventures and learn the startup process. Resident entrepreneurs will spend 20 hours per week on campus and will receive a stipend up to $25,000 per academic year.
- Galvanize partnered with several organizations to offer educational opportunities to women in IT-software. Galvanize and IBM are working to help support diversity in technology fields, data science, and data engineering. The Galvanize Data Science program will help attract female participants to Galvanize programs, ranging from tuition assistance and mentorship to internships and

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employment opportunities. Women participating in Galvanize programs will have access to advanced analytics technology and a wide spectrum of software solutions. Galvanize also teamed with Glassbreakers to offer scholarships for women learning to code computer programs. Galvanize’s coding classes have 35 percent female enrollment.

- The Markle Foundation and the state of Colorado launched Rework America Connected to link state employers and educators with individuals seeking job opportunities through a digitized platform. The technology—created by LinkedIn, Arizona State University, and edX—offers tools and resources to individuals at all skill levels in an effort to develop a more qualified workforce. Colorado is the first state to participate in the program.

- A new after-school enrichment program for middle and high school students called the Silicon STEM Academy launched in Denver. The program provides hands-on training and experience in computer programming, engineering, and digital media. Silicon STEM is partnering with Metro Denver businesses to create apprenticeships and curriculum that aligns with the skills needed to fill future jobs in the industry.

- The National Science Foundation awarded Colorado State University (CSU) a $2 million, five-year grant to improve engineering and computer sciences education. The project—Revolutionizing Roles to Reimagine Integrated Systems of Engineering Formation—will replace the traditional approach of teaching one subject per course with knowledge integration modules, in which multiple fields are taught simultaneously. CSU is one of six schools to receive the funding and will transform the way faculty are evaluated and rewarded.

- Metro Denver is home to a growing number of coding schools, coding bootcamps, and programs to train software developers.
  - General Assembly, an international software coding and design school, will open its 10th U.S. campus in Denver. The company plans to start with three classrooms in a WeWork coworking space at 15th and Wewatta streets, offering drop-in, part-time, and full-time classes by May 2016.
  - The DaVinci Institute relocated its coding school and think tank from Louisville to Westminster. The new space also hosts a collaborative work space and offices for startups. The DaVinci Coders is one of the nation’s top-rated programmer training centers for the coding profession.
  - 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 19-week coding school and software bootcamp aimed at training web developers and software programmers.
  - Denver-based SeedPaths is an 8-week bootcamp that teaches job seekers to become entry-level and junior-level software developers.
  - Boulder’s Techtonic Academy was founded in 2002 to provide software and mobile application development to a diverse customer base. Techtonic Academy is a unique training program that equips disconnected youth and military veterans with software development skills and new career paths through training, mentoring, and hands-on project work.

**Cross-Cluster Convergence**

The nine-county region promotes an environment of collaboration among the digital health, aerospace, financial services, and IT-software industries.

- Metro Denver is an emerging digital health community. Founded in July 2012 by the Denver South Economic Development Partnership and Innovation Pavilion, Prime Health is a growing statewide community of 1,000+ health care executives, physicians, technologists, academics, entrepreneurs, and investors dedicated to improving health and lowering healthcare costs through the commercialization of digital health technologies. The Collaborative is a resource ecosystem for Digital Health—the convergence of the digital and genetics revolutions with bioscience, healthcare and wellness, and information technology-software. Colorado is home to more than 120 digital health companies. More information at [www.primehealthco.com/challenge](http://www.primehealthco.com/challenge).

- The Catalyst Health-Tech Innovation project will be a collaborative hub for health-technology businesses pursing innovation in mobile and wearable technology, digital health enterprise platforms, smart device technologies, and related fields in the River North district. The campus will include 300,000 square feet of office and retail space, with the first phase slated for completion in late 2017.

- Agibotix, a company that provides unmanned aerial vehicles and drone imaging and analysis for precision agriculture, plans to relocate to a larger 3,500-square-foot facility at Boulder Municipal Airport. The company doubled the size of its workforce to 20 employees over the last two and a half months.
INFORMATION TECHNOLOGY-SOFTWARE:
Metro Denver and Northern Colorado Industry Cluster Profile

- Greenwood Village-based DN2K partnered with Moline, Ill.-based Deere & Co. to develop a cloud platform to provide precision agriculture, analyze agricultural data, and assist farmers with growing decisions. SageInsights will offer increased automation, collaboration, and operational efficiency.
- Denver-based Oildex, a service of Transzap Inc., acquired Automatic Data Processing, Inc.’s Procedure-to-Pay business and its OpenInvoice product line, combining the two leading technology providers in the growing financial supply chain automation sector. The combined company will have more than 1,100 customers, 50,000 vendor suppliers, and will process more than $20 million invoices per year.
- Galvanize-based Spex launched its software platform that allows insurance adjusters to use a mobile app on their iOS devices and coordinate the results via a web-based tool. The app allows users to take photos, prepare field sketches, use aerial photos, and add notations to video and audio. The app then uploads the data in real-time to make claims processing more accurate and efficient.

Merger and Acquisition Activity

Several mergers and acquisitions in the region’s IT-software industry drove company growth and expanded product offerings in 2015.

- Zillow Inc. completed its $2.5 billion acquisition of online real estate rival Trulia Inc. Trulia will operate under the Zillow Group Inc. and will continue to employ 285 workers at its Centennial office.
- Boulder-based SolidFire Inc. and Sunnyvale, Calif.-based NetApp plan to merge. The $870 million deal will strengthen NetApp’s all-flash array capabilities and will help the company streamline datacenter operations. The proposed merger, subject to regulatory and shareholder approvals, is expected to close in mid-2016.
- Rally Software Development Corp., based in Boulder, sold to New York-based CA Technologies. The $480 million deal will integrate Rally’s Agile development software and services with offerings that complement and expand CA’s strengths in development operations and management cloud services. Rally employs 280 workers in Boulder and downtown Denver and doubled its space in Boulder to accommodate up to 350 employees.
- Longmont-based Eagle Mountain Technology (EMT) was purchased by California Eastern Laboratories (CEL). CEL manufactures wireless solutions and hardware, while EMT provides embedded software and mobile application design. CEL plans to open a new office in the area to accommodate expansion.
- Denver-based Accuvant and Overland Park, Kan.-based FishNet Security Inc. merged and created a new cyber security company, Optiv Security. The new company is headquartered in Denver and will employ more than 100 workers in the area.
- Centennial-based NexusTek Inc. and Denver-based Illumen merged to broaden their customer base, expand product offerings, and open additional U.S. locations. The combined company services 500 Metro Denver clients.
- Denver-based Cologix Inc. purchased Cedar Knolls, N.J.-based Net Access, LLC to expand its service offerings and provide an alternative to colocation options in new markets. With its 10th acquisition, Cologix will add over 700 new customers and gain three data facilities in northern New Jersey.
- California-based Model N, Inc. purchased Denver-based Channelinsight Inc., a software development company. Channelinsight employs 50 workers in Denver and Model N plans to hire seven additional workers in Denver and will transfer five workers from its out-of-state offices.
Software Workforce Profile

Many companies choose locations because of the available workforce. With nearly half of the nine-county region’s 3.7 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, 41.3 percent are college graduates and 90.5 percent have graduated from high school. The state has the nation’s second-most highly educated workforce as measured by the percentage of residents with a bachelor’s degree or higher.

The attractiveness of the region draws new residents through migration. The region’s population is expected to grow 59.9 percent from 2010 to 2040, driving a 36.3 percent increase in the region’s labor force over the same period. It is important to note the changing composition of the workforce supply as the baby boomers begin to retire, which will pose implications for businesses whose employee pool includes significant numbers of these workers.

The nine-county region’s software industry cluster employs 48,610 people and includes a large pool of talented, well-educated, and highly skilled workers. 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.

The software workforce supply consists of four main components: those currently working in the industry; those doing a similar type of job in some other industry; the unemployed; and those currently in the education pipeline. The Metro Denver and Northern Colorado 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
Total payroll for the software industry cluster in the nine-county region exceeded $4.8 billion in 2014. The 2014 average annual salary for software cluster employees in the region was $103,890, compared with $107,610 nationwide.

Metro Denver and Northern Colorado Software Occupation & Salary Profile, 2015

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</thead>
<tbody>
<tr>
<td>1. Software developers, applications</td>
<td>19,367</td>
<td>374</td>
<td>724</td>
<td>$98,467</td>
<td>$62,046</td>
<td>$78,749</td>
<td>$120,474</td>
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<td>2. Software developers, systems software</td>
<td>9,863</td>
<td>192</td>
<td>795</td>
<td>$103,002</td>
<td>$66,789</td>
<td>$83,554</td>
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<td>3. Computer user support specialists</td>
<td>11,027</td>
<td>924</td>
<td>728</td>
<td>$52,707</td>
<td>$34,611</td>
<td>$41,995</td>
<td>$67,766</td>
<td>$85,405</td>
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<td>4. Computer systems analysts</td>
<td>8,260</td>
<td>422</td>
<td>1,270</td>
<td>$83,262</td>
<td>$56,368</td>
<td>$67,371</td>
<td>$107,640</td>
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<td>5. Computer programmers</td>
<td>3,749</td>
<td>360</td>
<td>535</td>
<td>$82,410</td>
<td>$52,562</td>
<td>$65,187</td>
<td>$98,155</td>
<td>$115,315</td>
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<td>6. Network &amp; computer systems administrators</td>
<td>8,341</td>
<td>494</td>
<td>844</td>
<td>$81,682</td>
<td>$51,418</td>
<td>$64,792</td>
<td>$98,155</td>
<td>$117,333</td>
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<tr>
<td>7. Sales representatives, services, all other</td>
<td>18,011</td>
<td>1,155</td>
<td>45</td>
<td>$53,997</td>
<td>$24,086</td>
<td>$35,422</td>
<td>$80,683</td>
<td>$118,872</td>
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<td>8. Business operations specialists, all other</td>
<td>33,049</td>
<td>705</td>
<td>42</td>
<td>$72,259</td>
<td>$38,646</td>
<td>$51,958</td>
<td>$95,805</td>
<td>$124,238</td>
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<tr>
<td>9. Computer &amp; information systems managers</td>
<td>5,233</td>
<td>453</td>
<td>1,345</td>
<td>$140,296</td>
<td>$94,994</td>
<td>$115,149</td>
<td>$173,014</td>
<td>$283,317</td>
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<tr>
<td>10. Computer occupations, all other</td>
<td>6,427</td>
<td>1,087</td>
<td>1,220</td>
<td>$91,666</td>
<td>$52,478</td>
<td>$69,888</td>
<td>$113,797</td>
<td>$136,282</td>
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</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 2015.3 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 nearly 380 private occupational and technical schools offering courses in dozens of program areas throughout the state. 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.

- Colorado Christian University
  www.ccu.edu
- Front Range Community College
  www.frontrange.edu
- Regis University
  www.regis.edu
- Colorado State University
  www.colostate.edu
- Metropolitan State University of Denver
  www.msudenver.edu
- University of Colorado: Boulder, Denver
  www.cu.edu
- Colorado State University Global Campus
  www.colostate.edu
- Red Rocks Community College
  www.rrcc.edu
- University of Denver
  www.du.edu
INFORMATION TECHNOLOGY-SOFTWARE:
Metro Denver and Northern Colorado Industry Cluster Profile

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

The region is a top information technology location offering:

1. **The ability to attract and retain high-quality IT professionals and technical talent**
   - Of Colorado’s adult population, more than 38 percent has completed a bachelor’s or higher-level degree, making Colorado the second-most highly educated state in the nation behind Massachusetts. (U.S. Census Bureau, 2014 American Community Survey)
   - Colorado had the nation’s seventh-largest employment base in the software publishing industry in 2014 and ranked among the top-15 states for IT services and computer systems design employment. The state’s average high-tech wage ($101,800) was nearly double that of the average private-sector worker. (CompTIA, *Cyberstates 2015: The Definitive State-by-State Analysis of the U.S. High-Tech Industry*, 2015)
   - The University of Colorado Boulder and the University of Denver ranked among “America’s Most Entrepreneurial Universities.” (Forbes, 2015)
   - Boulder ranked as the third-best metro area for college graduates in science, technology, engineering and mathematics (STEM) fields in 2015. Boulder boasts 140 STEM employees per 1,000 jobs and the area’s annual mean wage for STEM jobs was $91,100. (NerdWallet, 2015)
   - Boulder ranked third in the nation for millennial entrepreneurs in 2015. The city received accolades for its original TechStars accelerator program and hosts its own Startup Week. (Thumbtack, 2015)
   - Metro Denver ranked among the top-10 major metros for college graduates and received accolades for its vibrant millennial population and strong labor market. Fort Collins ranked second among small metro areas. (American Institute for Economic Research, 2015)
   - Denver ranked as the sixth-best city for IT professionals in 2015. The ranking noted Denver has particularly high demand for application developers and UX/UI designers. (InformationWeek, 2015)
   - The Boulder metropolitan statistical area (MSA) was named to the top-10 list of “Best Places for Tech Jobs” in 2015. (NerdWallet, 2015)
   - Boulder County ranked third among “America’s Next Tech Hubs” in 2015. Boulder had 23.4 tech companies per capita and 84.3 tech employees per capita. (MSN.com, 2015)
   - Denver and Boulder ranked among the top-10 emerging technology centers in the nation in 2015. The city’s access to skilled tech employees contributed to its high rank. (Jones Lang LaSalle, 2015)

2. **Direct access to a large and growing customer base**
   - Colorado ranked fourth in the nation for Small Business Innovation Research (SBIR) grants per worker. The state received more than 230 grants totaling $92.4 million, or $38.20 grants per worker compared with the U.S. average of $14.97. (U.S. Small Business Administration, 2015; U.S. Bureau of Labor Statistics, 2015)
   - Colorado has the fourth-highest startup activity in the nation in the 2015 *Kauffman Index: Startup Activity*, with nearly 175 startups less than a year old and 350 people out of 100,000 adults becoming entrepreneurs each month. (Ewing Marion Kauffman Foundation, 2015)
   - Colorado had the seventh-highest venture capital investments per $1,000 of gross domestic product in 2014. (PricewaterhouseCoopers, *MoneyTree Report*, 2015; Bureau of Economic Analysis, 2014)

3. **Low to moderate costs of doing business and a competitive tax structure**
   - Colorado’s simplified corporate income tax structure based on single-factor apportionment allows companies to pay taxes based solely on their sales in the state. Along with few regulatory burdens, Colorado’s corporate income tax rate of 4.63 percent is one of the lowest and most competitive tax structures in the nation. (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’s tax climate ranked eighth in the nation for entrepreneurship and small business. (Small Business & Entrepreneurship Council, 2015)
Metro Denver and Northern Colorado Industry Cluster Profile

- Metro Denver ranked No. 1 among Forbes’ 2015 “Best Places for Business and Careers.” Four other Colorado metropolitan areas were included on the list. The Fort Collins metro area ranked 10th, Boulder ranked 26th, Greeley ranked 33rd, and Colorado Springs ranked 37th. (Forbes, 2015)

4. An overall better quality of life
- Denver was named as the best city to live in the West in 2015, according to MONEY Magazine. The city was cited as a “mecca for millennials” with great access to recreation. Louisville ranked fourth and Erie ranked 13th among the best small towns to live in the U.S. (MONEY Magazine, 2015)
- Colorado has the highest rate of physical activity in the nation with more than 60 percent of the state’s adults participating in weekly moderate or vigorous physical activity. (The Henry J. Kaiser Family Foundation, 2015)
- Colorado’s extensive opportunities for outdoor recreation adventures and experiences support a healthy, active lifestyle. The state offers unlimited access to 22 million acres of national forests and expansive public lands, 42 state parks, more than 30 wilderness areas, and the highest concentration of 14,000-foot mountain peaks in the nation. (Colorado Tourism Office, 2015)
- Boulder ranked fourth on the 2015 list of the “Top 100 Best Places to Live.” Fort Collins (24th), Lakewood (34th), and Westminster (75th) were also named to the list. (Livability.com, 2015)
- The Boulder MSA ranked as the best metro area to live and work. Residents in Boulder make an average of $53,670, with 22 percent making over $100,000 and an average business income of $3.3 million. (Powerlytics, 2015)
- FasTracks is a $7.4 billion project to build out Metro Denver’s entire mass transit system by 2019, adding 122 miles of rail rapid transit and extending existing routes. The expansion is the largest simultaneous transit build out in U.S. history and will make Metro Denver one of the top-five regions in the country in terms of miles of fixed rail.
- Metro Denver’s moderate temperatures, low humidity, and sunshine on almost 70 percent of the days each year provide an ideal climate for residents. (U.S. National Oceanic and Atmospheric Administration, National Climatic Data Center, 2015)

Information Technology-Software Industry Cluster Definition

<table>
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<th>NAICS Code</th>
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<td>334614</td>
<td>Software reproducing</td>
<td>7372</td>
<td>Prepackaged software</td>
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</tr>
<tr>
<td>518210</td>
<td>Data processing, hosting &amp; related services</td>
<td>7374</td>
<td>Data processing</td>
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<tr>
<td>541511</td>
<td>Custom computer programming services</td>
<td>7371</td>
<td>Custom computer programming services</td>
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<tr>
<td>541512</td>
<td>Computer systems design services</td>
<td>7373</td>
<td>Computer integrated systems design</td>
</tr>
<tr>
<td>541513</td>
<td>Computer facilities management services</td>
<td>7376</td>
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<tr>
<td>541519</td>
<td>Other computer related services</td>
<td>7379</td>
<td>Computer related services NEC</td>
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</tbody>
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Note: NEC indicates “not elsewhere classified.”
Information Technology-Software Industry Cluster Relationships

Technologies
- Cloud Computing
- Internet
- High-Speed Infrastructure

Client Industries
- Aerospace
- Aviation
- Bioscience
- Energy
- Finance
- Geospatial
- Healthcare
- Telecommunications
- Security/Defense
- Businesses
- Consumers

Support Industries
- Computer Hardware
- Computer Storage
- Telecommunications

Infrastructure
- CO Technology Partners
- Colorado School of Mines-Computer Engineering Department
- CompTIA
- CTA-COLORADO Technology Association
- CU-Software Engineering Research Lab
- DU Center for Tech. Innovation

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