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.

Eight 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, 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.
An overview of Metro Denver’s eight major industry clusters

- **AEROSPACE** – Colorado again achieved its acclaimed standing in 2012 as the second-largest space economy in the United States, behind California. The nine-county region is a center of excellence for space with 19,600 workers, ranking the region first out of the 50 largest metropolitan areas in total private aerospace employment concentration. In 2012, Gov. John Hickenlooper signed Senate Bill 12-035 to limit the liability for entities involved in spaceflight activities in the state. The legislation is an important first step in initiating commercial spaceflight in Colorado and will help expand the state’s commercial aerospace economy.

- **AVIATION** – Denver International Airport (DIA) is a major economic engine for the region’s aviation industry, which employs 15,910 workers. Positive job expansion in the region, with one-year growth of 6.4 percent compared with 2.1 percent nationally and three new nonstop international flights announced in 2012 create further momentum in this industry.

- **BIOSCIENCE** – More than 14,980 employees work at 600 bioscience companies in the nine-county region. The region has a notable advantage in the medical devices and diagnostics subcluster, ranking ninth in the country for employment concentration. The region’s 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 Life Science District and the adjacent Anschutz Medical Campus in Aurora.

- **BROADCASTING & TELECOMMUNICATIONS** – With 39,620 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 inter-relationship between fossil fuels and cleantech provides unique growth opportunities for this industry that employs 44,910 people at 2,970 companies in the region. The area ranks fourth for fossil fuels and seventh in cleantech employment concentration among the 50 largest metros. The U.S. Department of Energy’s National Renewable Energy Laboratory (NREL) in Golden is a prime asset. Colorado is estimated to have produced a record 40 million barrels of oil in 2012, driven by new wells—particularly in Colorado’s Niobrara formation.

- **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. Various associations and service firms support the region’s diverse financial services base of 13,020 companies and 87,740 employees. Five-year employment growth in the investments subcluster was 4.4 percent, compared to minus 4.7 percent nationally.

- **HEALTHCARE & WELLNESS** – With nearly 176,460 healthcare and wellness workers at 18,260 companies across the region, the healthcare and wellness cluster is one of the region’s fastest growing industry clusters and is a substantial contributor to the region’s overall economic productivity. Employment growth in the industry between 2007 and 2012 was 22.1 percent compared with 9.5 percent nationally.

- **INFORMATION TECHNOLOGY–SOFTWARE** – Colorado ranked third in the nation (for the fifth-consecutive year) for high-tech workers per capita in the nation according to TechAmerica Foundation’s Cyberstates 2011 report. A strong entrepreneurial spirit fuels this industry, employing 43,230 workers at 4,170 companies throughout the nine-county region.
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 culture of innovation and entrepreneurism.
- Proximity to quality colleges, research universities, and federal laboratories.
- Efficient access to an international airport.
- An overall better quality of life.

Competitive positioning to create jobs and investment

- **The ability to recruit and retain technical and scientific employees** – Of Colorado’s adult population, more than 36 percent have a bachelor’s degree or higher, making Colorado the third-most highly educated state in the country after Massachusetts and Maryland. (U.S. Census Bureau; 2011 American Community Survey)

- **Affordable business operating costs** – Colorado ranks fifth overall on Forbes’ 2012 “Best States for Business” list. Rankings are based on each state’s business costs and regulations, economy, labor supply, growth prospects, and quality of life. (Forbes, 2012)

- **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, 2012)

- **A culture of innovation and entrepreneurism** – Colorado’s ever-increasing reputation as one of the nation’s leading states for innovation soared even higher in 2012 when the U.S. Patent and Trademark Office chose Denver as one of four new satellite offices. Initially, the office will employ 130, growing to as many as 595 staff with a $439 million economic impact within five years. (U.S. Patent and Trademark Office; Metro Denver Economic Development Corporation, 2012)

A community’s economic development efforts should focus on industries in which the community has clear competitive advantages.
• **Proximity to quality colleges, research universities, and federal laboratories** – Colorado is a national leader for producing scientific and engineering talent, ranking among the top 10 states for science and engineering graduate students per 1,000 individuals ages 25 to 34 years old in 2009, in addition to ranking fourth in the number of scientists and engineers as a percent of the workforce in 2010. Colorado also has one of the highest concentrations of federally funded science and research laboratories in the nation. *(National Science Foundation, 2012; CO-LABS, 2012)*

• **Efficient access to an international airport** – Denver International Airport is the fifth-busiest airport in the nation and is 11th-busiest worldwide for passenger traffic. Denver’s central U.S. location allows travellers efficient access to both coasts, and efforts are underway to establish additional nonstop international flights. *(U.S. Bureau of Transportation Statistics, 2012; Airport Council International; Denver International Airport, 2012)*

• **An overall better quality of life** – Denver attracted the most relocating adults aged 25 to 34 of any large U.S. metropolitan area from 2008 to 2010. The Brookings Institution, which authored the study, noted that Denver and other top ranking areas are cities where young people can feel connected and have attachments to colleges or universities among highly educated residents. *(The Brookings Institution: U.S. Census Bureau, 2011 American Community Survey)*

**Marketing industries to promote regional job growth**

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, and most importantly, which factors are most important to companies analyzing a community for location or expansion.

Our latest analysis of 2012 data shows that employment in seven industries/subclusters grew last year (see accompanying Metro Denver Industries Employment Snapshot), with only the broadcasting and telecommunications industry posting a regional decline of 1.1 percent for the year (compared with a 3 percent national employment decrease). In 2010, only one subcluster in Metro Denver posted positive growth—cleantech—with a 7.1 percent employment increase. With the national recession now in the region’s rearview mirror, supporting a diversified industry base has served the region well during challenging economic times.

For additional information on Metro Denver’s major industry clusters, please contact 303.620.8092, info@metrodenver.org, or [www.metrodenver.org/industries](http://www.metrodenver.org/industries).
<table>
<thead>
<tr>
<th>Metro Denver Industries</th>
<th>Aerospace</th>
<th>Aviation</th>
<th>Bioscience</th>
<th>Broadcasting &amp; Telecommunications</th>
<th>Energy</th>
<th>Financial Services</th>
<th>Healthcare &amp; Wellness</th>
<th>IT-Software</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct Employment</td>
<td>19,600</td>
<td>15,910</td>
<td>10,280</td>
<td>4,710</td>
<td>39,620</td>
<td>26,160</td>
<td>18,750</td>
<td>38,520</td>
</tr>
<tr>
<td>Companies</td>
<td>110</td>
<td>600</td>
<td>330</td>
<td>270</td>
<td>2,730</td>
<td>1,550</td>
<td>1,420</td>
<td>3,860</td>
</tr>
<tr>
<td>Five-Year Employment Growth (2007-2012)</td>
<td>-2.1% (-2.5%)</td>
<td>1.1% (-1.7%)</td>
<td>15.0% (4.8%)</td>
<td>-11.7% (-5.8%)</td>
<td>-3.8% (-18.0%)</td>
<td>29.3% (14.3%)</td>
<td>36.8% (13.8%)</td>
<td>-16.1% (-14.0%)</td>
</tr>
<tr>
<td>One-Year Employment Growth (2012)</td>
<td>0.5% (0.9%)</td>
<td>6.4% (2.1%)</td>
<td>3.3% (1.6%)</td>
<td>1.2% (2.9%)</td>
<td>-1.1% (-3.0%)</td>
<td>9.3% (6.1%)</td>
<td>0.5% (3.9%)</td>
<td>1.1% (0.4%)</td>
</tr>
<tr>
<td>Direct Employment Concentration (2012)</td>
<td>1.0% (0.2%)</td>
<td>0.8% (0.7%)</td>
<td>0.5% (0.3%)</td>
<td>0.2% (0.3%)</td>
<td>2.1% (0.8%)</td>
<td>1.4% (1.1%)</td>
<td>1.0% (0.5%)</td>
<td>2.0% (1.4%)</td>
</tr>
<tr>
<td>Average Wage</td>
<td>$118,440</td>
<td>$46,710</td>
<td>$72,630</td>
<td>$99,010</td>
<td>$92,360</td>
<td>$110,280</td>
<td>$78,120</td>
<td>$64,570</td>
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<tr>
<td>Employment Concentration Ranking (among 50 largest metros)</td>
<td>1</td>
<td>14</td>
<td>9</td>
<td>23</td>
<td>6</td>
<td>4</td>
<td>7</td>
<td>9</td>
</tr>
</tbody>
</table>
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 12 industry clusters and subclusters. The following three variables are plotted:

- Average annual employment growth, 2007 to 2012; on the x-axis (horizontal);
- The industry's location quotient, 2012; on the y-axis (vertical); and
- Employment size of the industry, 2012; 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 light purple, indicating that they belong to the energy cluster.

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

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

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

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

For example, cleantech had substantial employment growth from 2007 to 2012, 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 to the nation. While several of the region’s industry clusters and subclusters continue to recover from the recession—particularly banking and finance, insurance, pharmaceuticals, and broadcasting and telecommunications—the majority of the region’s industries reflect growing employment from 2007 to 2012 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.
AEROSPACE

Metro Denver and Northern Colorado Industry Cluster Profile

The aerospace cluster includes companies that develop products and systems for commercial, military, and space applications. Colorado’s aerospace companies provide a complete spectrum of research and development, design, and manufacture of guided missiles, space vehicles, satellites and other communications equipment, and navigation and detection instruments. Companies in the aerospace cluster also produce planetary spacecraft and launch systems and provide mission support.

With the nation’s second-largest aerospace economy, Colorado continues to lead the nation’s space industry with support from four military commands, eight major space contractors, National Aeronautics and Space Administration (NASA) research activities, and several universities involved in expansive space research. The state’s impressive aerospace infrastructure, technical workforce, and research assets contribute to Colorado’s position as a space industry leader. Colorado has 160 businesses classified as aerospace companies, and in total more than 400 companies and suppliers providing space-related products and services. Direct employment in the aerospace cluster totals 24,990 private sector workers and approximately 29,670 military personnel. These 54,660 workers in the aerospace cluster support an additional 112,000 workers in all industries throughout Colorado, bringing direct and indirect employment supported by the aerospace cluster to 166,660 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. The region’s 19,600 private sector aerospace workers represent about 78 percent of all aerospace workers in Colorado. The region’s 110 aerospace companies represent about 72 percent of the state’s total companies in the cluster.

The nine-county region serves as a hub for commercial spaceflight activity, mission operations, and launch services. Key project developments in 2012 included:

- NASA awarded Louisville-based Sierra Nevada Corporation an additional $212.5 million in August and an additional $10 million in December for the company’s development of the Dream Chaser Space System. The company has completed initial flight tests of the spacecraft near Rocky Mountain Metropolitan Airport.
- Sierra Nevada Corporation’s Space Systems Group plans to hire more than 50 workers at a new Louisville facility dedicated solely to the Dream Chaser spacecraft. The new building will house the spacecraft’s avionics systems, laboratories, and software.
- The Raytheon-built Global Positioning System Next Generation Operational Control System (GPS OCX) completed two major milestones in 2012. In August, the Raytheon team partnered with Lockheed Martin’s GPS III satellite team, to complete Exercise I, the first in a series of exercises to prepare the new GPS OCX and GPS III satellites for launch. In addition, the GPS OCX received a Milestone B approval by the Office of the Secretary of Defense, securing the program’s future in the U.S. Department of Defense’s (DoD) five year budget plan. The GPS OCX program employs more than 450 people on Raytheon’s Aurora Campus.
- Lockheed Martin Space Systems Company won a NASA contract to construct and operate NASA’s next Discovery mission. The Interior Exploration using Seismic Investigations, Geodesy, and Heat Transport (InSight) spacecraft will explore the interior.

of Mars and could provide scientists and engineers insight into terrestrial planet evolution. The InSight lander is expected to launch in 2016 and will reach Mars later the same year. The total cost of the mission is capped at $425M, excluding the launch vehicle and related services.

- Ball Aerospace & Technologies Corp. will host five payloads aboard the STPSat-3 spacecraft built for the U.S. Air Force (USAF). The spacecraft supports a variety of payloads and will include the USAF’s mission to measure plasma energies and densities, the Air Force Research Laboratory’s space phenomenology mission and its experiment to provide risk reduction through on-orbit testing, the Naval Research Laboratories mission to provide in-situ measurements of the plasma and neutral environments, and the NASA/National Oceanic and Atmospheric Administration (NOAA) mission to collect high-precision and accurate changes at the top of the Earth’s atmosphere when the spacecraft launches in 2013.

- NASA and the European Space Agency (ESA) partnered to develop the Orion capsule’s service modules for an unmanned test flight planned in 2017. The modules will provide Orion with basic supplies, propulsion, power, and life support. Lockheed Martin Space Systems Company designed Orion to carry astronauts into deep space and is on schedule for its first manned flight in 2021.

- Loveland-based Numerica Corp. partnered with the U.S. Air Force Academy to detect and catalogue all space objects orbiting Earth. The five contracts totaling more than $3 million will also improve predictability of space events and will help the Air Force track and protect satellites and space stations with Numerica’s high-tech algorithms.

- The Ball Aerospace & Technologies Corp. Suomi National Polar-orbiting Partnership (NPP) celebrated one year in orbit in October 2012. Under contract to NASA, Ball Aerospace built the Suomi NPP satellite, the Ozone Mapping and Profiler Suite (OMPS) instrument aboard the satellite, and conducted satellite testing prior to launch. Ball Aerospace is currently constructing the successor to Suomi NPP, the JPSS-1 satellite and its OMPS instrument for a 2017 launch.

- Following the 2011 launch of the Suomi-NPP satellite, the Raytheon built Joint Polar Satellite System Common Ground System (JPSS CGS) has been successfully providing command and control, mission management and data processing for the Suomi-NPP mission. With more than 400 employees on Raytheon’s Aurora Campus, the system is also supporting multiple domestic and international missions. Each day, JPSS CGS processes more than one terabyte of data.

- Centennial-based United Launch Alliance (ULA) won a $1.5 billion USAF contract for nine rocket launches. The company will use five Atlas V rockets and four Delta IV rockets that are expected to launch intelligence, GPS, and meteorological satellites by mid-2014. ULA also received approval of an EELV Program Quantity Buy Acquisition Memorandum from the DoD. The Memorandum provides the authority for the Air Force to negotiate a contract for a five-year commitment of 36 launch vehicle services with ULA.

- NASA awarded ULA a $446 million contract for rockets and launch-related services for two weather satellites that will be used by NOAA. The Geostationary Operational Environmental Satellite-R (GOES-R) and GOES-S series satellites will improve weather forecasting and tracking on earth. The satellites will be built by Jefferson County-based Lockheed Martin Space Systems Company and are scheduled to launch in 2015 and 2017.

- The USAF awarded ULA a $398 million contract for two satellite launches scheduled in late 2014. The ULA team will install an Air Force Mobile User Objective System-4 satellite built by Lockheed Martin on the Atlas V rocket, and launch a GPS satellite aboard a Delta IV rocket.


- Boulder-based Golden Spike Co. chose Northrop Grumman to design its private lunar lander vehicle to carry passengers to the moon. The company would charge approximately $1.5 billion for two passengers to fly to the moon and back and anticipates 15 to 25 flights in the first decade.
The nine-county region is a center of excellence for the research, development, testing, and integration of unmanned aircraft systems (UAS). With UAS representing a growing portion of the nation’s military budget, and commercial UAS operations set to expand rapidly, the U.S. Congress has encouraged development of six new pilot test sites for UAS integration into the National Airspace System (NAS). Colorado is harnessing the state’s abundant aerospace and defense-related resources to meet these needs. With a diversity of large, medium, and small aerospace companies, Colorado can deliver the expertise and collaboration necessary to support a UAS test range for federal, state, and private research operations. The state’s UAS assets also include:

- The Front Range Airport Authority, the Colorado Springs Regional Business Alliance, and the Metro Denver Economic Development Corporation formed an alliance to pursue an unmanned aircraft systems test range for Colorado to support the integration of unmanned vehicles into the NAS.
- The University of Denver’s Unmanned Systems Research Institute 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 Institute infrastructure includes: 20 Class I unmanned helicopters and quadrotors, six fixed-wing unmanned airplanes, 30 unmanned ground vehicles, FAA approved simulators, the ability to manufacture UAS frames, and complete UAS design and testing.
- The Research and Engineering Center for Unmanned Vehicles (RECUV) at the University of Colorado Boulder (CU-Boulder) is a university, government, and industry partnership dedicated to the development and application of unmanned vehicle systems. In March 2012, RECUV and Brigham Young University formed the Center for Unmanned Aircraft Systems (C-UAS) which combines university researchers and industry partners to conduct research on challenging issues facing the UAS industry. CU-Boulder holds a large number of FAA UAS-approved operating areas located predominantly in northeastern Colorado.
- The U.S. Geological Survey’s (USGS) National Unmanned Aircraft Systems (UAS) Project Office, located in Denver, leads and coordinates USGS efforts to promote and develop UAS technology for civil and domestic applications that 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.
- In December 2012, the Colorado Army National Guard broke ground on a new facility on Buckley Air Force Base in Aurora, Colorado. The 10,300-square-foot facility will house the Tactical Unmanned Aerial System for the Company B, Special Troops Battalion, which serves in direct support to the 86th Infantry Brigade Combat Team (Mountain), and is scheduled for completion in October 2013.

The nine-county region’s wealth of space industry assets also makes it a prime location for the growing commercial space and suborbital flight sector. In 2011, Colorado Gov. John Hickenlooper announced the state’s intent to pursue commercial spaceport designation, with Adams County’s Front Range Airport a likely site for Colorado’s first spaceport. Front Range Airport’s unique position as a spaceport is a result of its rural location, excess capacity, proximity to Denver International Airport (DIA), and accessibility to Metro Denver. Key Colorado Spaceport announcements and project developments in 2012 included:

- Legislation passed in 2012 limits the liability for public and private entities holding a Federal Aviation Administration (FAA) license for spaceflight activities. Senate Bill 12-035 is an important first step in initiating commercial spaceflight activities in Colorado, and will help expand the state’s commercial space economy.
- Adams County Economic Development and regional partners formed the Spaceport Colorado and Aeronautical Authority to provide administrative support for the Spaceport and the UAS effort in the state. The nonprofit will serve as an umbrella organization representing technical expertise and geographic locations around the state to respond to the FAA regarding the state’s application for a spaceport license, and other related industry opportunities.
- Front Range Airport signed a letter of intent with Utah-based Rocket Crafters Inc. for horizontal launch, dual-propulsion, and suborbital flight operations. The company plans to
perform flight vehicle testing of its Siderus and Cosmos Mariner between Spaceport Colorado and the proposed Neil Armstrong International Air & Space Center in Florida. Upon FAA spaceport license approval, Rocket Crafters could locate various training activities and mission control specialists at Spaceport Colorado.

- Front Range Airport will launch its bid for spaceport licensing after securing a FAA grant for $200,000 and funding commitments totaling more than $660,000 from strategic partners. The funding will allow the airport to conduct a feasibility study, which is the first step toward designating the proposed facility at the airport as a commercial spaceport and will outline the spaceport’s operating logistics including launching, landing, facility storage, and other details. Approval for spaceport designation may be granted as early as the end of 2013.

The nine-county region fosters an environment of innovation and collaboration among the aviation, aerospace, and cleantech industries.

- The Wings Over the Rockies Air and Space Museum unveiled plans for the Exploration of Flight facility at Centennial Airport. The Exploration of Flight will focus on the future of aerospace and aviation research and provide flight- and experience-based activities, including observation decks and a flight tower. Building completion is slated for mid-2015.

- Arapahoe County-based Bye Aerospace, Thornton-based Ascent Solar Technologies, Inc., and Alburquerque, N.M.-based Silent Falcon UAS Technologies announced plans to collaborate on various aircraft projects. Bye Aerospace is in the process of developing a new generation of UAV which will rely on Ascent’s thin-film solar photovoltaics and the company’s expertise in stored electric power and other technologies. The technologies will be used to power Silent Falcon’s solar-powered unmanned aircraft for extended reconnaissance and intelligence missions.

A number of industry partnerships and contract awards in 2012 fostered innovation and facilitated technology development, research, and design.

- NASA selected Ball Aerospace to work on an instrument that will monitor air quality from space. The spectrometer will measure ozone, aerosols, and other trace gases over North America and will be completed by 2017.

- NASA awarded two Colorado companies nearly $20 million to develop a U.S. space taxi for astronauts. Sierra Nevada Corporation and The Boeing Company will develop ways to meet NASA flight safety and performance rules for carrying astronauts during the contract’s first phase between January 2013 and May 2014.

- Ball Aerospace collaborated with the California-based B612 Foundation to construct and design an infrared space telescope that will track asteroid activity and other objects between the Earth’s surface and the sun at the company’s Boulder facility. The mission will create the most detailed solar system map yet, and will catalogue 90 percent of asteroid activity in the inner solar system. The Laboratory for Atmospheric & Space Physics (LASP) at CU-Boulder will operate the Sentinel telescope—the first-ever, privately-financed deep-space mission—that will launch in 2017.

- Ball Aerospace completed the construction and design for the James Webb Space Telescope’s (JWST) state-of-the-art surface mirrors. The telescope will be the most powerful and premier observatory space telescope ever sent into space and will replace the Hubble Space Telescope. The JWST is expected to launch in 2018.

- Fort Collins-based Scion UAS received a $3 million contract from the Naval Research Laboratory to supply unmanned helicopter systems for civilian and military applications and aerial surveys. The SA-400 Jackal system is a turbine-powered VTOL optionally-piloted vehicle (OPV) that can carry more than 100 pounds for more than five hours and can autonomously launch to and from a moving ship.

- Louisville-based Altius Space Machines signed a Space Act Agreement (SAA) with Virginia-based NASA Langley Research Center to develop and collaborate on compact long-reach space robotic manipulator systems for the Orion crew vehicle. The manipulator systems technologies can also be used for commercial space operations.

- Boulder-based Southwest Research Institute received a $500,000 NASA grant to build a device that can aid scientists in taking better measurements of the sun from space. The device will be paired with other sun-studying instruments and could launch in 2014.
• NASA selected Ball Aerospace to develop its S-Band phased array antenna for the next-generation U.S. Space Launch System (SLS). The sophisticated antenna will provide a high data rate downlink from launch through mission completion.

• In December 2011 the U.S. Missile Defense Agency awarded The Boeing Company and industry partner Northrop Grumman the development and sustainment contract for future work on the Ground-based Midcourse Defense element of the United States ballistic missile defense system. Boeing is the prime contractor, and a portion of the work will be performed in Colorado Springs.

The region’s major space contractors achieved major milestones in 2012 toward developing the next generation global positioning system (GPS) III satellites. Lockheed Martin is the GPS III prime contractor with partners ITT Exelis, General Dynamics, Infinity Systems Engineering, Honeywell, ATK, and other subcontractors. Key developments in 2012 included:

• Lockheed Martin Space Systems Company opened its new GPS III Processing Facility in Jefferson County. The facility includes 50,000 square feet of spacecraft assembly and testing areas, a production line for satellites, a clean-room high bay, and thermal vacuum chambers. The first satellite is scheduled to be available for launch in 2014.

• The U.S. DoD awarded Raytheon a $7.2 million contract for work on the Next Generation Operational Control System for GPS. The work will be completed in Aurora by the end of 2013.

• Lockheed Martin Space Systems Company received a $238.5 million USAF contract for the third and fourth GPS III satellites. Lockheed Martin previously won contracts for the first two satellites that the USAF is building to replace the current satellites and improve navigation accuracy and increase lifespan.

• The USAF awarded the Aurora-based division of Raytheon $27.4 million and Lockheed Martin Space Systems Company $21.5 million for Launch and Checkout Systems (LCS) designed to support the GPS III satellites. Raytheon serves as the prime contractor to develop the GPS Next Generation Operational Control System (OCX) in early 2010. The LCS allows GPS III satellites to launch early and provide checkout prior to the full GPS OCX delivery in 2015.

• ITT Exelis completed the acceptance testing of the navigation payload for the USAF’s GPS III Non-Flight Satellite Testbed (GNST) and shipped the unit to Lockheed Martin’s Jefferson County facility in November 2012 for integration and thermal vacuum testing. Lockheed Martin awarded ITT Exelis a $32 million contract in March 2012 to build the navigation payloads for the third and fourth GPS III space vehicles.

Other developments in the region’s aerospace cluster included:

• The National Geospatial-Intelligence Agency (NGA) extended its EnhancedView contract with Longmont-based DigitalGlobe for another year. The $3.5 billion, 10-year contract was signed by DigitalGlobe in 2010 and includes nine, one-year options exercisable by the NGA. Under the contract, DigitalGlobe will provide high-resolution satellite images to support defense and intelligence needs as well as humanitarian efforts using the WorldView-3 satellite which could launch in mid-2014.

• Longmont-based DigitalGlobe Inc. plans to acquire Herndon, Virginia-based GeoEye in a $900 million deal. Pending regulatory approval, the combined company will create more efficient and diversified earth imagery and geospatial products and will continue to be based in Longmont.

• Boulder-based Northrop Grumman Systems Corp. received a $31.2 million DoD contract to develop a joint tactical ground station system. The company will split the work between its Colorado Springs and Azusa, CA divisions where it will hire roughly 20 engineers and will complete the project by early 2014.

• Advanced positioning solutions and GPS technology company Trimble Navigation broke ground on its four-story, 125,000-square-foot research and development building in Westminster in 2012. The $22 million building will include the company’s existing divisions and could house up to 550 employees.

• Ball Aerospace opened a $25 million, 70,000-square-foot expansion of its Fisher Integration Facility in Boulder in 2012. The expansion will accommodate additional production of satellites and other spacecraft, while a portion will remain unfinished for the company’s new capabilities.
The region’s universities, research centers, and federal laboratories support the region’s thriving aerospace cluster, conduct leading-edge space research and develop innovative technologies, and help prepare the next generation of engineers and scientists.

- NASA selected CU-Boulder to participate in the 2013 Exploration Habitat (X-Hab) Academic Innovation Challenge. CU-Boulder will join four other universities to design habitat systems, explore technologies, and generate concept ideas for NASA’s next generation space systems.

- NOAA extended its ongoing partnership for at least another five years with CU-Boulder’s Cooperative Institute for Research in Environmental Sciences (CIRES) and will receive up to $32 million annually. The partnership allows NOAA to study climate change and improve its weather modeling tools to predict how solar systems can interrupt navigation technologies and communication. CIRES is one of 18 NOAA institutes across the nation.

- Colorado State University (CSU) was among 10 universities selected to receive grants totaling $250,000 each to study early-stage space technologies designed to improve shielding from space radiation. The one-year grant will allow researchers at CSU to develop active radiation dosimeters for space applications.

- eSpace: The Center for Space Entrepreneurship is a partnership between CU-Boulder and Sierra Nevada Corporation’s Space Systems Group. eSpace provides entrepreneurial space companies the support to commercialize aerospace technologies and develop a diversified 21st century workforce to catalyze their growth.

- The MAVEN mission reached a critical milestone in 2012 toward its November 2013 launch. LASP completed and delivered the $20 million remote-sensing equipment to Lockheed Martin for installation, which included various instrument suites that will gather UV light, collect images, and assess solar wind and the ionosphere of the planet. The $670 million MAVEN mission will gather data about the Martian upper atmosphere and the planet’s potential for harboring life.

- The FAA established a Center of Excellence for Commercial Space Transportation, of which CU-Boulder is a key member. The Center focuses on four research areas including commercial human space flight, space commerce, space launch operations and traffic management, and launch vehicle systems. The Center is a partnership of government, industry, and academic institutions that will address current and future challenges of commercial space transportation.

- The Space Foundation is a Colorado Springs-based organization that supports all sectors of the space community across the globe. Founded in 1983, the Space Foundation is a leader in space activities, educational support, major space events, and space research and development. The Space Foundation also hosts the annual National Space Symposium, which is considered the premier forum for aerospace in the nation. The 28th National Space Symposium in 2012 had the best attendance, a brand new exhibit pavilion, and the greatest diversity of events in the symposium’s history. Symposium events included more than 100 speakers, inspiring awards, programs for New Generation young space professionals, and special programs and events for more than 800 local students and 150 teachers. In all, the symposium had representation from 22 countries.

In addition to research assets, the aerospace cluster also has the support of public-private partnerships. 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.

Military Bases

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.

- **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 base. The base also hosts the Colorado Air National Guard 120th Fighter Squadron and its F-16C fighters. In 2012, the Colorado Air National Guard expanded its Eastern Plains airspace from 1,500 square nautical miles to 4,000 square nautical miles into
the Cheyenne military operations airspace as a result of advancements in fighter-aircraft technology. The base contributed more than $1 billion to the local economy for the eighth consecutive year in 2011.

- **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 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), and the 302nd Airlift Wing (AFRC), 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 agencies activities.
  - **Schriever Air Force Base** is the home of the 50th Space Wing (SW) as well as the Space Innovation and Development Center (SIDC), the 310th Space Wing (AFRC), the Missile Defense Integration and Operations Center (MDIOC), the Joint Functional Component Command – Integrated Missile Defense (JFCC-IMD), and numerous tenant organizations. The 50th SW is responsible for the operation and support of more than 150 DoD satellites and installation support to 16 major tenant units with a workforce of more than 8,100 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. In fiscal year 2011, the Academy contributed nearly $1 billion to Colorado’s economy and draws more than 440,000 visitors annually. The Academy’s symbiotic relationship between research, education, and implementation is unique. In fact, the Academy’s 20 research centers and institutes dedicated to space, science, air, cleantech, space security, and Science, Technology, Engineering, and Mathematics (STEM) conduct more than $60 million in research annually.

**Military Aerospace Profile**

<table>
<thead>
<tr>
<th>Government Installation</th>
<th>Personnel</th>
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</thead>
<tbody>
<tr>
<td>Buckley Air Force Base</td>
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<tr>
<td>Peterson Complex*</td>
<td>9,680</td>
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<tr>
<td>U.S. Air Force Academy</td>
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<td>Schriever Air Force Base</td>
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</tr>
<tr>
<td><strong>Total Employment</strong></td>
<td><strong>29,670</strong></td>
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</tbody>
</table>

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

**Private Aerospace 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.

*With direct employment of 19,600 aerospace workers, the nine-county region ranked first in absolute employment in 2012.* The region also ranked first out of the 50 largest metro areas for private aerospace employment concentration.
Private Aerospace Employment

- The aerospace cluster directly employed about 19,600 people in the nine-county region in 2012.
- Aerospace companies employed 1 percent of the region’s total employment base, compared with a 0.2 percent employment concentration nationwide.
- Employment in the region’s aerospace cluster declined 2.1 percent from 2007 to 2012, compared with a 2.5 percent decline at the national level.
- The majority of the region’s aerospace employees manufactured search and navigation equipment (57 percent) and guided missiles and space vehicles (37 percent).
- About 95 percent of aerospace employees worked in Arapahoe (39 percent), Jefferson (30 percent), and Boulder (26 percent) Counties.

Wages
Total nine-county payroll in the aerospace cluster was more than $2.3 billion in 2011. The 2011 average annual salary for an aerospace worker in the region was $118,440, compared with the national average of $94,420.

**Denver-Aurora-Broomfield MSA Occupational Salaries, 2011 Annual Average**

- Atmospheric and Space Scientists: $103,740
- Aerospace Engineers: $103,120
- Software Developers, Systems Software: $96,950
- Industrial Engineering Technicians: $50,000
- Computer-Controlled Machine Tool Operators, Metal and Plastic: $41,930

Private Aerospace Companies

- Approximately 110 aerospace companies operated in the nine-county region in 2012.
- About 52 percent of the region’s aerospace companies employed fewer than 10 people, while 12.5 percent employed 250 or more.
- Nearly 77 percent of the region’s aerospace companies manufactured search and navigation equipment (38 percent), optical instruments and lenses (28 percent), and guided missiles and space vehicles (11 percent).
- About 73 percent of the aerospace companies in the region were located in Boulder, Arapahoe, and Jefferson Counties.

Major Aerospace Contractors

Eight of the country’s major space contractors have a significant presence in the nine-county region. 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 approximately 2,300 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 RF solutions for strategic, tactical and scientific applications. [www.ballaerospace.com](http://www.ballaerospace.com)

- **The Boeing Company** has more than 2,100 employees at several locations throughout Colorado with the largest concentrations in Arapahoe County and Colorado Springs. Core businesses include: Jeppesen, a key commercial aviation subsidiary; strategic missile defense systems, including Ground-based Midcourse Defense; space and intelligence and Global Positioning System support; and Boeing military aircraft at Fort Carson. Boeing spent $197 million with 291 Colorado suppliers in 2011. [www.boeing.com](http://www.boeing.com)

- **ITT Exelis** has offices in Aurora, Boulder, and Colorado Springs, together employing about 1,000 people. The Information Systems division 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 Geospatial Systems division is represented on the GPS OCX program. Exelis Visual Information Solutions (VIS) is a subsidiary of the company that falls under Exelis’ Geospatial Systems division, and provides software solutions and services for data and image analysis, visualization, image delivery and rapid development for commercial, research, and government markets. The Mission Systems division provides government, commercial, and international customers’ solutions in communications and information systems as well as base operations support services. [www.exelisinc.com](http://www.exelisinc.com)

- **Lockheed Martin** employs more than 8,800 people in Colorado. Of these workers, more than 5,200 workers 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 nearly 2,300 people throughout Colorado. [www.northropgrumman.com](http://www.northropgrumman.com)

• **Raytheon Company** employs about 2,600 people throughout the state, with the majority of employees concentrated 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 and growing presence in Colorado. 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. SNC employment in Colorado is approaching 700 with plans to add additional employees in the next few years. [www.sncorp.com](http://www.sncorp.com)

• **United Launch Alliance (ULA)** is a joint venture between Lockheed Martin’s Atlas and Boeing’s Delta launch divisions and celebrated its sixth year of operation in December 2012. ULA employs about 1,700 of its 3,600-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 66 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)
- **DigitalGlobe, Inc.** [www.digitalglobe.com](http://www.digitalglobe.com)
- **GeoEye, Inc.** [www.geoeye.com](http://www.geoeye.com)
- **IHS Aerospace & Defense** [http://aero-defense.ihs.com](http://aero-defense.ihs.com)
- **L-3 Communications** [www.l-3com.com](http://www.l-3com.com)
- **Merrick & Company** [www.merrick.com](http://www.merrick.com)
- **Research Electro-Optics, Inc.** [www.reoinc.com](http://www.reoinc.com)
- **Rocky Mountain Instrument Company** [www.rmico.com](http://www.rmico.com)
- **Science Applications International Corp.** [www.saic.com](http://www.saic.com)
- **SEAKR Engineering, Inc.** [www.seakr.com](http://www.seakr.com)
- **Surrey Satellite Technology US LLC** [www.sst-us.com](http://www.sst-us.com)
- **Trimble Rockies** [www.trimble.com](http://www.trimble.com)
- **UP Aerospace Inc.** [www.upaerospace.com](http://www.upaerospace.com)

### 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**
   - Of Colorado’s adult population, more than 36 percent has completed a bachelor's or higher-level degree, making Colorado the third-most highly educated state in the nation behind Massachusetts and Maryland. (U.S. Census Bureau, 2011 American Community Survey)
Colorado ranked 10th in the number of science and engineering graduate students per 1,000 individuals ages 25 to 34 years old in 2009. Universities such as the Colorado School of Mines, the University of Colorado Boulder (CU-Boulder), and Colorado State University (CSU) all offer competitive science and engineering doctorate programs and research facilities. (National Science Foundation, 2012)

Colorado ranked fourth in the number of scientists and engineers as a percent of the workforce in 2010. This measure points to a large pool of potential innovators in the state. (National Science Foundation, 2012)

Colorado ranked 12th in the number of patents issued per 1 million people in 2011. A high number of patents indicate a high level of innovation and the growing capacity for new products. (U.S. Patent and Trademark Office, 2012; U.S. Bureau of Economic Analysis, 2012)

The U.S. Department of Commerce’s United States Patent and Trademark Office will locate one of four new satellite offices in Denver due to the state’s expansive culture of innovation and entrepreneurism, ability to attract high-quality professionals and technical talent, high quality of life and low cost of living, and its vast transportation infrastructure. (U.S. Patent and Trademark Office, 2012)

Colorado had the fourth-highest rate of entrepreneurial activity in the nation in 2011, according to the Kauffman Index of Entrepreneurial Activity. The index measures the percentage of the adult, non-business owner population that starts new businesses. With 420 new business owners per 100,000 adults in the state, the state’s high ranking signals a flourishing entrepreneurial community with the ability to attract potential investors. (Ewing Marion Kauffman Foundation, 2012)

*Kiplinger’s Personal Finance* magazine ranked Denver among the top five “Best Cities for Young Adults.” Contributors identified “best” cities as those that have strong employment growth, a highly educated and tech-savvy population, and a reasonable cost of living. Denver received particular accolades for its invigorating outdoor culture, reasonable one-bedroom apartment rents, and a rosy employment outlook. (*Kiplinger’s Personal Finance*, 2012)

Denver ranked 11th among the nation’s “Top 15 Best Cities for Recent College Graduates,” according to a 2012 ranking by Apartments.com and CareerRookie.com. Contributors considered each city’s average rent, employment opportunities, and average entry-level salary. (Apartments.com, 2012; CareerRookie.com, 2012)

Metro Denver ranked first among the nation’s largest metropolitan areas for total population gain in the 25- to 34-year age group between 2008 and 2010, according to the Brookings Institution. The region’s stable economies, “cool” cities, and high-tech centers are drawing young adults. (The Brookings Institution, 2012)

Metro Denver is the nation’s fifth-smartest large metro area, according to news website The Daily Beast. The ranking reflects each metro’s share of adult population with bachelor’s or master’s degrees, cognitive performance in five areas, nonfiction book sales, and the concentration of libraries and universities. (*The Daily Beast*, 2012)

The Colorado Academy for the Development of STEM-related Careers—a partnership between the Metropolitan State University of Denver, the Colorado School of Mines, the Community College of Denver, and the Cherry Creek School District—is designed to position the state as a leader in scientific and technology education. The overall program ensures Colorado students from kindergarten to graduate level receive specialized training and certifications to connect targeted communities to job readiness and career enhancement, coordinate with state Workforce Centers, and assist in job placement.

2. Proximity to vendors and customers

Colorado ranked fourth in the nation for National Aeronautics and Space Administration (NASA) prime contracts in 2011. Of the state’s awards totaling more than $1.6 billion, major recipients included Lockheed Martin, Raytheon, and Sierra Nevada Corporation. The University of Colorado received the sixth-largest amount of research funding totaling more than $39 million among public educational institutions in 2011. (National Aeronautics and Space Administration, 2012)
The nine-county region’s aerospace cluster is anchored by eight large prime contractors: Ball Aerospace, The Boeing Company, ITT Exelis, Lockheed Martin, Northrop Grumman, Raytheon, Sierra Nevada Corporation, and United Launch Alliance.

Colorado is home 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 Air Force Station hosts the NORAD and USNORTHCOM Alternate Command Center and serves as a training site for crew qualification.

Prime contractors and military installations support more than 400 space-related businesses in Colorado. (Colorado Space Coalition, 2012)

The U.S. Department of Defense awarded Colorado a Procurement Technical Assistance Center (PTAC) in 2009. Based in Colorado Springs and with satellite offices in Aurora, Grand Junction, and Westminster, the Center provides assistance to businesses in marketing products and services to prime contractors and the federal, state, and local governments at no or nominal cost.

3. Proximity to colleges/universities

Two academic institutions in Colorado offer nationally ranked aerospace programs or degrees:

- CU Boulder’s aerospace engineering graduate program ranked among the top 15 in the nation, offering students strong space-related research programs, numerous aerospace-focused research centers, and membership in the U.S. Air Force Space Education Consortium. (U.S. News & World Report, 2012)

- The U.S. Air Force Academy in Colorado Springs ranked second among schools that do not offer doctoral degrees for its undergraduate aerospace engineering program and offers majors ranging from aeronautical engineering and space operations to computer science and astronomical engineering. (U.S. News & World Report, 2012; Colorado Space Coalition, 2012)

The University of Colorado system posted record research and development expenditures for science and engineering totaling nearly $722 million in fiscal year 2010. The university ranked 12th among the nation’s public universities for research and development awards and ranked fifth for federally funded research expenditures. (National Science Foundation, 2012)

CU-Boulder’s Department of Aerospace Engineering Sciences received nearly $22 million in research awards—the highest of any department on the CU-Boulder campus—in fiscal year 2012. (University of Colorado, 2012)

CU-Boulder’s Laboratory for Atmospheric and Space Physics—the only research institution that has designed and built space instruments for NASA that have launched to every planet in the solar system—is a full-cycle space institute that combines all aspects of space exploration and expertise including data analysis, education, mission operations, and engineering.

BioServe Space Technologies, a NASA-funded center in CU-Boulder’s Department of Aerospace Engineering Sciences, specializes in conducting microgravity life science research and designs and develops space flight hardware. Established in 1987, BioServe’s hardware is currently used on the International Space Station and the Space Shuttle mission. (University of Colorado, 2012)

eSpace: The Center for Space Entrepreneurship was established in 2009 as a partnership between the University of Colorado and Sierra Nevada Corporation’s Space Systems Group. The not-for-profit business incubator and workforce development organization is dedicated to supporting and creating new entrepreneurial space companies, commercializing aerospace technologies created within these companies, and developing the aerospace workforce to support them. Since its inception, the center has fostered a thriving entrepreneurial aerospace industry through three successful programs: eSpace Incubator, Straight to Space workforce initiative, and the Venture Design program.
The Colorado School of Mines’ 8th Continent Project is a comprehensive effort to integrate space technology and resources in the global economy. Developed in 2008, the project provides the infrastructure and resources to solve a variety of environmental challenges and links aerospace companies with investors, legal resources, and public relations assistance to develop the next generation of space business ventures.

Metropolitan State University of Denver’s Robert K. Mock World Indoor Airport is a large flight training and simulation laboratory that features the Advanced Aviation & Aerospace Flight Training program. The laboratory’s advanced AGI Corporation’s Satellite Toolkit software system simulates space missions and orbital dynamics.

CSU is nationally recognized for its programs and institutes dedicated to atmospheric science and research. CSU’s Cooperative Institute for Research in the Atmosphere (CIRA) was established in 1980 to serve as a nexus for multidisciplinary cooperation between university scientists and its ongoing partnership with the National Oceanic and Atmospheric Administration. Since its inception, CIRA has expanded and diversified its mission to coordinate with other federal agencies including NASA, the National Park Service, the U.S. Forest Service, the Federal Aviation Administration (FAA), the Environmental Protection Agency, and the U.S. Department of Defense. (Colorado State University, 2012)

Metropolitan State University of Denver’s Aviation and Aerospace Department is expanding its focus to include space commercialization and spaceport development in an effort to align its efforts with Spaceport Colorado. The Department is also working closely with Front Range Airport and could eventually serve as a space-pilot training facility for the Spaceport.

Three institutions in the nine-county region—CU-Boulder, the Colorado School of Mines, and the University of Denver—are members of the Universities Space Research Association, with graduate programs in space sciences or engineering.

CU-Boulder is the only university outside of the Naval Postgraduate School to have two astronaut alumni on its faculty. Former astronauts Jim Voss and Joe Tanner serve as faculty in the Department of Aerospace Engineering Sciences and bring 43 years of combined experience at NASA, including nine spaceflights and more than eight months of total time in space. (University of Colorado, 2012)

CU-Boulder has several hundred faculty, support staff, and undergraduate and graduate students involved in space exploration and space-related research, including mission operations, scientific data analysis, and designing, building, and controlling space instruments. (University of Colorado, 2012)

The University of Colorado has one of the highest alumni participation rates among universities in the NASA space program and receives about $50 million annually for space research. Of the 20 University of Colorado astronaut alumni, 16 have flown on 40 NASA space shuttle missions as of 2012. (University of Colorado, 2012)

4. **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)

- The Tax Foundation ranked Colorado’s combined state and local tax burden 19th lowest in the nation in 2010. The percentage of a Coloradan’s income paid to state and local taxes represented 9.1 percent of resident per capita income, compared with 9.9 percent of national per capita income. (The Tax Foundation, 2012)

- Colorado has the eighth-best economic outlook in the nation, according to the 2012 ALEC-Laffer State Economic Competitiveness Index. The index examined each state’s tax structure and spending to demonstrate how public policy shapes economic growth. The state’s sustainable approach to public spending and its low regulatory and tax burdens contributed to its high ranking. (American Legislative Exchange Council, 2012)
5. Pro-business and flexible state and local governments

- Metro Denver office rental rates averaged $25.68 per square foot in the fourth quarter of 2012, making the region’s office market highly competitive with other major markets in the U.S. (CoStar Realty Information, The CoStar Office Report, Q4 2012)

- Colorado ranked as the eighth-best state for business, according to CNBC’s annual study. The ranking reflected states’ composite scores on 43 metrics in 10 broad categories ranging from quality of life and business friendliness to the cost of doing business and transportation and infrastructure. Colorado earned top-10 rankings in the categories that measure access to capital (fourth), workforce (fifth), quality of life (eighth), technology and innovation (eighth), and business friendliness (eighth). (CNBC, 2012)

- Colorado has the nation’s 10th-best tax climate for small businesses and entrepreneurs, according to the Small Business & Entrepreneurship Council’s “Business Tax Index 2012.” The index evaluates state taxes on property, sales, income, capital gains, and other factors to determine each tax system’s overall cost to small business. (Small Business & Entrepreneurship Council, 2012)

- Forbes ranked Metro Denver fifth among the 25 “Best Places for Business and Careers” in 2012, which assessed the nation’s largest metropolitan areas on the costs of doing business, projected economic growth, and educational attainment. Four other Colorado metropolitan areas ranked among the top 50. The Fort Collins metro area ranked third overall, Boulder ranked 27th, Colorado Springs ranked 42nd, and Greeley ranked 46th. (Forbes, 2012)

- Colorado is a top state for entrepreneurship and innovation, according to the U.S. Chamber of Commerce and the National Chamber Foundation’s Enterprising States report. Colorado ranked eighth as the next boom state positioned to grow and prosper, second for its high-tech business concentration, third for its business creation rate, and fifth in science, technology, engineering, and mathematics job concentration. (National Chamber Foundation, 2012)

- Legislation passed in 2012 will help expand the state’s aerospace economy. Senate Bill 12-035 limited the liability for public and private entities holding a Federal Aviation Administration license for spaceflight activities. The new law is an important first step in initiating commercial spaceflight activities in the state.

- President Obama signed into law the Fiscal Year 2013 National Defense Authorization Act, which includes a provision to reduce export restrictions on certain satellites and components not deemed highly sensitive, and helps aerospace companies stay competitive globally while maintaining national security interests. The provision, much-welcomed by the aerospace industry, was championed in the Senate by Colorado Senator Michael Bennet, and in the House by Colorado Representatives Mike Coffman, Diana DeGette, Ed Perlmutter, and Jared Polis.

- The Innovation Center of the Rockies (ICR) and CSU Ventures partnered in 2012 to accelerate the creation of new businesses and continue building the state’s entrepreneurial ecosystem of university research, venture capital, and industry leadership. The partnership will facilitate and develop the intellectual properties necessary in the aerospace cluster and expand ICR’s network of organizations to commercialize technologies funded by the Small Business Innovation Research grants.

- Launched in 2011, the Colorado Innovation Network (COIN) is a private, public, and academic collaboration designed to foster new technology development across the state’s existing and emerging industries. COIN aims to connect innovation leaders and inventors to solutions and ideas through which they can foster innovation and is part of Gov. John Hickenlooper’s economic development plan, Blueprint Colorado.

- 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 improving access to entrepreneurial education, encouraging new company creation, increasing connections among entrepreneurs and mentors, and building a more vibrant entrepreneurial community. (Startup Colorado, 2012)
**Aerospace Cluster Definition**

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<th>NAICS Code</th>
<th>NAICS Description</th>
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<td>Space simulation chambers, metal plate mfg.</td>
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<td>Decontaminating &amp; cleaning of missile or satellite parts mfg.</td>
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<td>334220</td>
<td>Radio &amp; television broadcasting &amp; wireless communications equipment mfg.</td>
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<tr>
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<td>336419</td>
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<td>3769</td>
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<td>3842-0113</td>
<td>Space suits mfg.</td>
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<td>Aircraft &amp; space vehicle supplies &amp; parts - wholesale trade</td>
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<td>Space propulsion units &amp; parts – wholesale trade</td>
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<td>Missile tracking by telemetry or photography</td>
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<td>927110</td>
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<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."
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
www.metrodenverGIS.org

Colorado Space Coalition
1445 Market Street
Denver, CO 80202-1790
303.620.8133
e-mail: info@spacecolorado.org
www.spacecolorado.org
AVIATION

Metro Denver and Northern Colorado Industry Cluster Profile

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. With more than 75 commercial reliever and general aviation airports throughout the state, the nine-county Metro Denver and Northern Colorado region supports a strong foundation for the aviation cluster that includes nearly 600 businesses.

Denver International Airport (DIA) is the cornerstone of the nine-county region’s aviation cluster and is a vital and major catalyst for economic growth. DIA averaged nearly 1,740 flight operations and roughly 144,800 passengers every 24 hours in 2011, making it the fifth-busiest airport in the nation and 11th busiest in the world. In 2011, the airport celebrated 16 years of operation and handled nearly 53 million passengers, up 1.7 percent from 2010, and set several records for monthly passenger traffic. This was the fourth year in DIA history that the airport’s yearly passenger traffic exceeded 50 million. Consequently, DIA is preparing for expansion over the next five to 15 years that will include the new south terminal and conference center hotel, new gates on existing concourses, improvements to the existing baggage and train systems, expanded parking areas and security, and a public transit center that will accommodate a rail line connecting DIA with downtown's Denver Union Station. DIA’s year-to-date passenger traffic total in November 2012 reached nearly 49 million, a 0.6 increase over the same 11-month period in 2011.

DIA is planning for the infrastructure needed to attract businesses and keep airport development organized. DIA and the City and County of Denver unveiled plans for Airport City Denver, a large, mixed-use development consisting of six individual districts that could occupy land the airport does not need for expansion. The first district, Airport City Center, would include a cluster of hotels, stores, and office buildings near DIA. Another district, Airport City Gateway, would include parking structures, an automobile and RV mall, and several transit-oriented developments. Airport City Tech would house companies focused on cleantech, aerospace, and bioscience, while Airport City Agro would support food and biofuels manufacturing. Airport City Logistics would offer warehousing and distribution space, and Airport City Aero would focus on military and aviation uses.

DIA moved forward with a series of projects in 2012:

- Construction began on the South Terminal Redevelopment Program that will transform the area directly south of Jeppesen Terminal. The $500 million project will include a new onsite 519-room Westin hotel and conference center, a station for the 23-mile commuter rail line that will connect DIA with Denver Union Station, an open-air plaza above the station providing connections to the main terminal, and upgrades to the airport’s existing train and baggage systems. The hotel is expected to generate $2 million annually for the City and County of Denver and will create 200 permanent employment positions when completed. The project is slated for completion by 2015.
- The Federal Aviation Administration (FAA) awarded DIA $7 million to repair the airport’s north-south runway. The runway improvements will begin in 2013 and will include lighting upgrades, panel replacements, and widening of the runway shoulders. The grant is part of the FAA Reauthorization Bill signed into law in early 2012 and will help fund more than 20 percent of the total $30 million project.

1 The nine-county Metro Denver and Northern Colorado region consists of Adams, Arapahoe, Boulder, Broomfield, Denver, Douglas, Jefferson, Larimer, and Weld Counties.
• DIA will move its parked car passenger waiting area across Peña Boulevard to an area near the Conoco gas station. The new waiting area will include 160 parking places, a food court and courtyard area, and indoor flight information monitors.

A number of airlines and aviation companies expanded in the nine-county region in 2012.

• Frontier Airlines—now fully restructured under parent company Republic Airways Holdings—moved its corporate headquarters from Indianapolis back to Denver. The company brought some of its staff including its president and CEO and new senior management team, and plans are underway to transfer more jobs back to Denver.

• Dallas-based Southwest Airlines opened its ninth nationwide crew base in Denver. The office and lounge facility could serve up to 800 pilots and flight attendants, with the majority choosing to live in Metro Denver.

• Low-cost carrier Spirit Airlines returned to DIA and began offering nonstop daily flights to Las Vegas, Chicago, Dallas, Fort Lauderdale, and Phoenix, with additional service to Detroit scheduled for early 2013. The company will also offer connections to 29 additional cities throughout the U.S., Caribbean, and Latin America.

• Medical transportation company Air Methods Corp. opened a state-of-the-art training facility for its aviation, maintenance, and clinical staff in Aurora. The 14,000-square-foot facility includes advanced simulation rooms, office space, and classrooms. The aviation portion of the facility is equipped with an Air Methods-specific cockpit and includes a Eurocopter EC 135 advanced aviation-training device for scenario-based pilot training and interview assessment.

The expansion of flights to international destinations remains a high priority for DIA and many carriers announced plans in 2012 to offer new flights abroad.

• United Airlines will offer daily nonstop flights between DIA and Narita Airport in Tokyo beginning in March 2013. The flights will be operated by United on one of its new Boeing 787 Dreamliners and will offer connections to more than 20 destinations in Asia, will create new jobs, and have more than a $130 million annual state economic impact. The long-awaited flight will be Denver’s only nonstop commercial air service to Asia and will showcase Denver in the global marketplace. Denver was one of eight cities selected to receive advance domestic service for United’s Dreamliner aircraft before its international debut.

• Mexico-based Volaris Airlines began nonstop service between DIA and Mexico City in late 2012. The low-cost carrier—DIA’s sixth foreign flag airline—will create new jobs and could generate a $9.4 million annual economic impact to the state economy.

• Icelandair began nonstop service between Denver and its hub, Reykjavik, Iceland, in May 2012 with four weekly flights. The carrier will add two additional weekly nonstop flights beginning in May 2013 to support high demand.

• Southwest Airlines and AirTran Airways will offer daily nonstop flights between DIA and SJD Los Cabos International Airport in Baja California, Mexico beginning in March 2013.

The nine-county region is a center of excellence for the research, development, testing, and integration of unmanned aircraft systems (UAS). With UAS representing a growing portion of the nation’s military budget, and commercial UAS operations set to expand rapidly, the U.S. Congress has encouraged development of six new pilot test sites for UAS integration into the National Airspace System (NAS). Colorado is harnessing the state’s abundant aerospace and defense-related resources to meet these needs. With a diversity of large, medium, and small aerospace companies, Colorado can deliver the expertise and collaboration necessary to support a UAS test range for federal, state, and private research operations. The state’s UAS assets also include:

• The Front Range Airport Authority, the Colorado Springs Regional Business Alliance, and the Metro Denver Economic Development Corporation formed an alliance to pursue an unmanned aircraft systems test range for Colorado to support the integration of unmanned vehicles into the NAS.

• The University of Denver’s Unmanned Systems Research Institute 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 Institute infrastructure includes: 20 Class I unmanned helicopters and quadrotors, six
fixed-wing unmanned airplanes, 30 unmanned ground vehicles, FAA approved simulators, the ability to manufacture UAS frames, and complete UAS design and testing.

- The Research and Engineering Center for Unmanned Vehicles (RECUV) at the University of Colorado Boulder (CU-Boulder) is a university, government, and industry partnership dedicated to the development and application of unmanned vehicle systems. In March 2012, RECUV and Brigham Young University formed the Center for Unmanned Aircraft Systems (C-UAS) which combines university researchers and industry partners to conduct research on challenging issues facing the UAS industry. CU-Boulder holds a large number of FAA UAS-approved operating areas located predominantly in northeastern Colorado.

- The U.S. Geological Survey’s (USGS) National Unmanned Aircraft Systems (UAS) Project Office, located in Denver, leads and coordinates USGS efforts to promote and develop UAS technology for civil and domestic applications that 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.

- In December 2012, the Colorado Army National Guard broke ground on a new facility on Buckley Air Force Base in Aurora, Colorado. The 10,300-square-foot facility will house the Tactical Unmanned Aerial System for the Company B, Special Troops Battalion, which serves in direct support to the 86th Infantry Brigade Combat Team (Mountain), and is scheduled for completion in October 2013.

The nine-county region’s wealth of space industry assets also makes it a prime location for the growing commercial space and suborbital flight sector. In 2011, Colorado Gov. John Hickenlooper announced the state’s intent to pursue commercial spaceport designation, with Adams County’s Front Range Airport a likely site for Colorado’s first spaceport. Front Range Airport’s unique position as a spaceport is a result of its rural location, excess capacity, proximity to Denver International Airport (DIA), and accessibility to Metro Denver. Key Colorado Spaceport announcements and project developments in 2012 included:

- Legislation passed in 2012 limits the liability for public and private entities holding a Federal Aviation Administration (FAA) license for spaceflight activities. Senate Bill 12-035 is an important first step in initiating commercial spaceflight activities in Colorado, and will help expand the state’s commercial space economy.

- Adams County Economic Development and regional partners formed the Spaceport Colorado and Aeronautical Authority to provide administrative support for the Spaceport and the UAS effort in the state. The nonprofit will serve as an umbrella organization representing technical expertise and geographic locations around the state to respond to the FAA regarding the state’s application for a spaceport license, and other related industry opportunities.

- Front Range Airport signed a letter of intent with Utah-based Rocket Crafters Inc. for horizontal launch, dual-propulsion, and suborbital flight operations. The company plans to perform flight vehicle testing of its Siderus and Cosmos Mariner between Spaceport Colorado and the proposed Neil Armstrong International Air & Space Center in Florida. Upon FAA spaceport license approval, Rocket Crafters could locate various training activities and mission control specialists at Spaceport Colorado.

- Front Range Airport will launch its bid for spaceport licensing after securing a FAA grant for $200,000 and funding commitments totaling more than $660,000 from strategic partners. The funding will allow the airport to conduct a feasibility study, which is the first step toward designating the proposed facility at the airport as a commercial spaceport and will outline the spaceport’s operating logistics including launching, landing, facility storage, and other details. Approval for spaceport designation may be granted as early as the end of 2013.

The nine-county region continues to leverage common strengths between industries such as aviation, aerospace, and software to advance innovation and collaboration.

- Englewood-based Jeppesen collaborated with the FAA and other stakeholders to design area navigation with required navigation performance to improve efficiencies at DIA. The 24-month project is based on the foundation of the FAA’s NextGen modernization
program, Europe’s SESAR programs, and other future air traffic management concepts that will reduce pilot and controller workload, improve runway performance, reduce aircraft noise, and improve aircraft fuel burn.

- DIA will implement a new GPS-like technology to track planes on the airport’s grounds. DIA will be the nation’s seventh airport to start using the Sensis Aerobahn technology and the technology will improve airline safety and increase efficiency. The $2.4 million technology improves taxi delays, decreases runway incursions, and allows planes to continue operations in low-visibility conditions.

- The Wings Over the Rockies Air and Space Museum unveiled plans for the Exploration of Flight facility at Centennial Airport. The Exploration of Flight will focus on the future of aerospace and aviation research and provide flight- and experience-based activities, including observation decks and a flight tower. Building completion is slated for mid-2015.

- Broomfield-based Aircell partnered with Frontier Airlines to launch its in-flight wireless entertainment system that streams video content to passengers’ personal devices. The company also offers its service to more than 1,600 commercial aircraft including Delta Air Lines, AirTran Airways, and select Air Canada, Alaska Airlines, American Airlines, United Airlines, and US Airway flights.

Metro Denver’s airports receive significant support from the region, especially from the Metro Denver Aviation Coalition (MDAC) and the Colorado Department of Transportation’s (CDOT) Division of Aeronautics. MDAC is an industry affiliate of the Metro Denver Economic Development Corporation (Metro Denver EDC) 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 DIA and Metro Denver’s three reliever and five general aviation airports. 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.

**Nine-County Region Airport Information**

The nine-county region’s commercial, reliever, and general aviation airports are major economic catalysts, generate significant economic benefits, and support hundreds of jobs. The diverse system of airports helps to lead, sustain, and diversify the region’s economy and contributes to the quality of life enjoyed by visitors, residents, and businesses. The state’s largest airport—Denver International Airport—generates more than $22 billion for the region annually. Combined, the nine-county region’s airports contribute nearly $24 billion to the region’s economy annually, according to CDOT’s Division of Aeronautics.

**Denver International Airport (DIA)**

DIA is a state-of-the-art facility owned and operated by the City and County of Denver. Located approximately 24 miles northeast of downtown Denver, DIA is the primary airport serving the nine-county region and the state of Colorado. DIA has more than 30,000 badged employees who work for the City and County of Denver, the airlines, security companies, the federal government, rental car companies, food and beverage concessions, cargo companies, and other airport-related business partners.

DIA accommodates more than 50 million passengers each year with six runways, three concourses, 103 gates, and 47 regional aircraft positions. Additionally, the airport occupies 53 square miles which allow for longer runways and future expansion. DIA’s sixth runway—the longest commercial runway in North America—opened in 2003 and can accommodate an increased number of international flights. In total, 16 commercial carriers offer scheduled nonstop service from Denver to more than 170 domestic and international destinations. DIA serves as 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. Nine cargo airlines and 14 major and national airlines provide an extensive freight network between Denver and other cities, which offers close proximity to I-70, one of the country’s primary east/west commerce routes. Additionally, the airport’s air cargo and mail facilities comprise 375,000 square feet in five buildings south of the airfield, with room to expand. DIA handled 547
million pounds of cargo in 2011, and of the 2011 shipments, about 94 percent were freight and express while 6 percent were classified as airmail.

DIA is a recognized leader in sustainability efforts and was the first airport in the nation to receive ISO 14001 Environmental Management System certification in 2004. The airport is also a Gold Member of the Colorado Department of Public Health and Environment’s Environmental Leadership Program. The airport is reducing its carbon footprint. Output from the airport’s three solar arrays make the airport the state’s largest distributed generation photovoltaic energy producer, and could be a zero-waste facility by 2020. Further, the airport currently recycles or reuses more than 20 different materials, including 70 percent of collected aircraft deicing fluids. The airport also has one of the largest compressed natural gas fleets in the country and maintains nearly 320 alternatively-fueled vehicles, including 205 buses, sweepers, and other vehicles, and 113 electric and hybrid-electric vehicles. Alternative vehicles represent roughly 32 percent of the airport’s total fleet.

Reliever Airports

Three reliever airports—those designated by the FAA to relieve traffic at commercial airports and general aviation airports, and provide other aviation services—are strategically located throughout the nine-county region. These airports are among the fastest growing in the country and represent a vital part of Colorado aviation industry’s future economic growth and vitality.

- **Centennial Airport** is the major local reliever airport for DIA and one of the premier business airports in the United States. Services such as Flight for Life, law enforcement, medical flights, flight schools, and aircraft maintenance services are based at the airport. Centennial Airport is an international facility with a 24-hour U.S. Customs Office, 24/7 FAA-staffed control tower, and all-weather capability. Located near the Denver Tech Center and 22 other business parks, the airport is only 13 miles from downtown Denver. Centennial Airport has four award-winning Fixed Base Operators providing all customer service needs to small aircraft and jets alike. The airport has three runways that range from 4,800 feet to 10,000 feet in length, including a CAT I ILS, and no flight delays. Centennial Airport is also a secure gateway to Reagan National Airport and it has the most decorated snow and ice control team in the Americas. In 2012, the airport opened the Rare Air Hangar—one of the largest facilities on the airport grounds totaling nearly 40,000 square feet of hangar and office space—as part of the airport’s approved Master Plan. Sierra Nevada Corporation will also occupy two new hangars at SunBorne and will be located just southeast of Signature Flight Support. The airport also completed construction of a new Taxiway D that will reduce runway occupancy time and provide future access to airport developments.

- **Front Range Airport**, located six miles southeast of DIA, is the region’s only reliever airport without major residential areas nearby, making it both remote and convenient. At just under 4,000 acres, Front Range is the largest reliever airport in the region, and includes 1,000 acres for aviation and aerospace development. Additionally, a 6,300-acre business park is planned for development to support airport-related commercial and business activities. Front Range Airport has the nation’s tallest general aviation tower, which controls two full-precision runways and associated taxiway and ramp system. The Colorado Department of Transportation Division of Aeronautics is located at Front Range Airport in a state-owned building. In 2012, Front Range began the process of obtaining spaceport designation, and anticipates the issue of a license for horizontal launch by the end of 2013.

- **Rocky Mountain Metropolitan Airport** (RMMA), located between downtown Denver and Boulder, is the second-busiest general aviation airport in the state, averaging more than 143,000 operations each year. RMMA offers an Instrument Landing System and a user-fee designated U.S. Customs Office available 24 hours a day. Home to the U.S. headquarters of Pilatus Business Aircraft and HeliQwest, the airport is adjacent to the Interlocken Business Park and Westmoor Technology Park, and houses corporate aviation facilities, flight schools, and government offices. RMMA completed a new Airport Master Plan Update in 2009 and the airport is undergoing an environmental assessment to ascertain the impact of extending the runway safety area. In 2012, the airport celebrated the opening of a new $23.7 million Air Traffic Control Tower and air charter
service Stellar Air began operations. The company’s four airplanes will offer a lower-cost option and could generate $2 million in revenue during its first year of operation.

General Aviation Airports
Colorado’s general aviation airports form a cohesive system for commerce and air travel needs. Five general aviation airports are located in the nine-county region:

- Boulder Municipal Airport
- Erie Municipal Airport
- Fort Collins–Loveland Municipal Airport

- Greeley–Weld County Airport
- Longmont Municipal Airport

Key developments in the region’s general aviation airports included:

- Longmont Municipal Airport constructed the remaining half of its second taxiway. The airport received $1.5 million to complete 2,400 linear feet of Taxiway B that services the south end of the airport. The airport’s approved Airport Master Plan identified ongoing general maintenance improvements, additional hangar space, and the installation of a new fixed base operator over the next few years.
- The Erie Municipal Airport received $550,000 in FAA and state grants to begin a new Airport Master Plan Study, runway repairs, and updated signs. The airport also received $150,000 from a $15.6 million U.S. Department of Transportation (USDOT) grant package for infrastructure improvements.
- USDOT awarded the Fort Collins-Loveland Municipal Airport a $221,500 grant to be the nation’s first airport to test a "wingless" flight model. The program allows travelers to check bags, go through security screening, and take a bus directly to their concourse at DIA. The program could be replicated nationwide and serve as a model for other airports.

Aviation Economic Profile

The aviation cluster consists of 41, 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 about 15,910 aviation employees, the nine-county region ranked 11th out of the 50 largest metro areas in absolute employment in 2012. The region ranked 14th for aviation employment concentration. About 77 percent of Colorado’s aviation cluster employees worked in the region.

<table>
<thead>
<tr>
<th>Nine-County Region</th>
<th>U.S.</th>
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<tr>
<td>Direct Employment, 2012</td>
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<tr>
<td>Number of Direct Companies, 2012</td>
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<td>One-Year Direct Employment Growth, 2011-2012</td>
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<td>Five-Year Direct Employment Growth, 2007-2012</td>
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<tr>
<td>Avg. Annual Direct Employment Growth, 2007-2012</td>
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<tr>
<td>Direct Employment Concentration</td>
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Aviation Employment

- The aviation cluster directly employed about 15,910 people in the nine-county region in 2012.
- Aviation companies employed 0.8 percent of the region’s total employment base, compared with a 0.7 percent employment concentration nationwide.
- The region’s aviation cluster was severely impacted by the most recent economic recession and employment declined between 2009 and 2011. However, significant carrier expansions such as Southwest Airlines new crew base at DIA led to robust employment gains in 2012.

- Employment in the region’s aviation cluster increased 1.1 percent from 2007 to 2012, compared with a 1.7 percent decline at the national level.
- About 73 percent of the region’s aviation cluster employees worked in scheduled and nonscheduled air transportation, which includes both passenger and freight services. Airports and other facilities that provide flight support and related services employed another 15 percent.
- Nearly 88 percent of the region’s aviation employees worked in the City and County of Denver (78 percent) and in Arapahoe County (10 percent).

Wages

The 2011 average annual salary for aviation employees in the nine-county region was $46,710, compared with the national average of $64,060. Total nine-county payroll in the aviation cluster reached nearly $699 million in 2011.

Denver-Aurora-Broomfield MSA Occupational Salaries, 2011 Annual Average

<table>
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<td>Commercial Pilots</td>
<td>$90,010</td>
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<tr>
<td>Airline Pilots, Copilots, and Flight Engineers</td>
<td>$75,720</td>
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<td>Aircraft Mechanics and Service Technicians</td>
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<td>Aircraft Cargo Handling Supervisors</td>
<td>$50,670</td>
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<td>Avionics Technicians</td>
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<tr>
<td>Aircraft Structure, Surfaces, Rigging, and Systems Assemblers</td>
<td>$43,520</td>
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Aviation Companies

- About 600 aviation companies operated in the nine-county region in 2012.
- Approximately 81 percent of the region’s aviation companies employed fewer than 10 people, while 0.8 percent employed 250 or more.
- Nearly 41 percent of the region’s aviation companies provided airport operations and support services. Another 21 percent provided aircraft repair services and scheduled or nonscheduled air transportation, consisting of both passenger and freight services. The remaining companies were evenly distributed between aircraft and parts manufacturing, maintenance, and flight training.
- About 66 percent of the aviation companies in the region were located in Arapahoe, Jefferson, and Boulder Counties, and in the City and County of Denver.

Major Aviation Companies

- Air Methods Corp. www.airmethods.com
- American Airlines, Inc. www.aa.com
- Air Serv Corp. www.airservcorp.com
- Delta Air Lines, Inc. www.delta.com
- DHL www.dhl.com
- FedEx www.fedex.com
- Frontier Airlines www.flyfrontier.com
- Great Lakes Aviation www.greatlakesav.com
- Integrated Airline Services, Inc. www.iasair.com
- Pilatus Aircraft www.pilatus-aircraft.com
- Jeppesen www.jeppesen.com
- Signature Flight Support www.signatureflight.com
- Southwest Airlines www.southwest.com
- United Airlines www.united.com
- United Parcel Service Inc. www.ups.com
- Worldwide Flight Services www.wfs.aero

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

The region is a top aviation location offering:

1. A prime air transportation location
   - Denver International Airport (DIA) was the fifth-busiest airport in the nation and 11th-busiest worldwide in terms of passenger traffic in 2011. Sixteen commercial carriers—the largest of which are United Airlines, Southwest, and Frontier Airlines—offer scheduled nonstop service to more than 170 domestic and international destinations.
The nine-county region’s central U.S. location allows convenient access as air travelers can easily reach two-thirds of the nation within two hours. Further, the region is within four hours flying time of every North American city with a population of 1 million or more. (Metro Denver Economic Development Corporation)

DIA is, by land size, the largest commercial airport in the nation and the second-largest international airport in the world. Encompassing 34,000 acres, DIA is one of the few major U.S. airports that still has room to expand and accommodate growth. In fact, significant land opportunities exist both inside and outside of the airport. (Denver International Airport, 2012)

Travel + Leisure magazine ranked DIA ninth among “America's Best Airports” in 2012. Contributors classified 22 of the nation’s large airports in groups of the 11 best and worst based on results of a reader survey. DIA earned top-10 grades for cleanliness, security and check-in, baggage handling, and Wi-Fi coverage. (Travel + Leisure, 2012)

About 84 percent of all commercial flights arrived on time at DIA in the first 11 months of 2012, giving it the 11th-best on-time arrival average among the nation's major airports. That arrival record was higher than the national average of 82 percent. (U.S. Bureau of Transportation Statistics, 2012)

Metro Denver ranked 17th among the nation’s 100 largest metro areas for the number of international-through-passengers between 2003 and 2011, according to the Brookings Institution’s Global Gateways: International Aviation in Metropolitan America. The report designated Denver as one of 17 critical global gateway cities with nearly 2 million passengers starting or ending their international flights in Denver in 2011. (The Brookings Institution, 2012)

DIA ranked third among the nation’s 100 largest airports for the greatest decline in average domestic airfares over the past decade. The average domestic fare at DIA fell 29.1 percent between the first quarters of 2001 and 2012, while the average nationwide fare rose 7.2 percent over the 11-year period. DIA’s notable ranking was primarily driven by increasing competition among Denver’s low-cost carriers, particularly with the addition of discount carrier Southwest Airlines in 2006. (U.S. Bureau of Transportation Statistics, 2012)

DIA ranked third among the nation’s 35 largest airports for the percentage increase in the number of scheduled flights between June 2007 and June 2012, according to the U.S. Department of Transportation. DIA added 4.4 percent more flights over the five-year period, while the number of scheduled flights declined an average of 9.4 percent across the nation’s largest airports. (U.S. Department of Transportation, 2012)

Denver is the nation’s seventh-best travel value, according to Hotwire.com’s 2012 “Travel Value Index.” The site evaluated the top 75 U.S. leisure markets based on affordable entertainment, airfare, and accommodations. (Hotwire.com, 2012)

Denver ranked sixth among 15 U.S. cities for the most affordable domestic travel, according to TripAdvisor’s 2012 TripIndex. Contributors evaluated the average four-star hotel price, dinner and drinks, and a round-trip taxi ride for two people. (TripAdvisor, 2012)

Denver ranked fifth among the “Top 10 Most Affordable Places to Fly this Summer,” according to Cheapflights.com. The ranking was based on airfare deals that the company's website users found during a 90-day period. (Cheapflights.com, 2012)

DIA was the first airport in the nation awarded membership in the U.S. Environmental Protection Agency’s Performance Track program, which recognizes facilities that exceeded regulatory requirements and strived to protect public health and the environment. The airport’s Environmental Management System is used to manage environmental issues and increase the airport’s operating efficiency, which has led to many environmental accomplishments over the last decade. (Denver International Airport; U.S. Environmental Protection Agency)

Three general purpose Foreign Trade Zones in Metro Denver and Northern Colorado allow manufacturers to expedite customers and reduce or eliminate fees and tariffs on
imported materials. Aspen Distribution, Inc. operates the original site located near the former Stapleton Airport, and the second zone, WorldPort at DIA, is just minutes from the airport. 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. An overall better quality of life
   - The Denver-Aurora-Broomfield MSA ranked among the top 10 fittest metro areas in the American College of Sports Medicine’s 2012 American Fitness Index. The ranking evaluated the nation’s 50 largest metro areas on criteria ranging from preventive health measures and chronic disease levels to community resources and physical activity policies. Denver received accolades for its low obesity rate, high percentage of residents participating in physical activity, and low diabetes and cardiovascular disease rates. (American College of Sports Medicine, 2012)
   - Business news website Businessweek.com ranked Denver sixth among “America’s 50 Best Cities” in 2012. The ranking is based on metrics including education, income, unemployment, leisure activities, and air quality. (Businessweek.com)
   - Colorado has the third-highest percentage of state land area devoted to the National Forest System, according to the U.S. Forest Service. With more than 40 state parks, 56 national parks and wilderness areas, and the greatest number of 14,000-foot peaks in the nation, Colorado’s access to public lands and outdoor opportunities serves as a cornerstone of the state’s economy. (U.S. Forest Service, 2012; Colorado State Parks, 2012; Wilderness.net, 2012)
   - Castle Rock is among the nation’s top 20 communities in which to live, according to MONEY Magazine’s 2012 “Best Places to Live.” The list identifies 100 small cities and towns with a reputation for safety, education, housing and healthcare affordability, diversity, and other advantages. Highlands Ranch (21st), Centennial (49th), Boulder (60th), and Fort Collins (70th) were also named to the list. (MONEY Magazine, 2012)
   - Denver ranked 14th on Travel + Leisure magazine’s 2012 list of “America’s Best Cities for Singles.” Criteria included a variety of factors ranging from the cost of living to culture and nightlife. Denver received accolades for access to fitness facilities and wide-open spaces. (Travel + Leisure, 2012)
   - Metro Denver voters approved the funding of FasTracks in November 2004. FasTracks is a $7.4 billion comprehensive plan for the design and construction of high-quality transit service and facilities. FasTracks will vastly improve mobility for current residents and future populations throughout the region.
   - Colorado captured a record 2.7 percent of the nation’s travel market with 57.9 million visitors in 2011, including 29 million overnight visitors. Total tourism spending in the state reached a record $10.8 billion in 2011, representing a 6 percent increase over 2010. (Longwoods International, “Colorado Travel Year 2011,” 2012)
   - The cost of living in Metro Denver is only 5 percent above the national average and is well below that of many other major cities. (The Council for Community and Economic Research, Cost of Living Index, Q3 2012)
   - Metro Denver’s third quarter 2012 median home price of $260,300 was significantly less than comparable communities on the east and west coasts, but is higher than the national median price of $186,100. Metro Denver ranked 18th among 154 metro areas for median single-family home price in the third quarter of 2012. (National Association of Realtors, Q3 2012)
   - Metro Denver ranked third-sunniest among 20 major U.S. cities with an average 69 percent of days with sunshine. (U. S. National Oceanic and Atmospheric Administration, National Climatic Data Center, 2012)

3. 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)
• To promote aviation growth in the state, aircraft manufacturers 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 2017. (Colorado Department of Revenue)

• Legislation passed in 2008 abolished Colorado’s fly-away sales tax on planes manufactured in Colorado. The exemption, a valuable incentive for aircraft manufacturers, applies to aircraft built in Colorado but housed in another state. (State of Colorado, Office of the Governor)

• Colorado ranked fifth overall on Forbes’ 2012 “Best States for Business and Careers” list. Rankings were based on six categories for businesses: costs, labor supply, regulatory environment, economic climate, growth prospects, and quality of life. Colorado received its highest rankings for labor supply (first overall), growth prospects (fourth overall), and quality of life (ninth overall). (Forbes, 2012)

• Colorado ranked as the eighth-best state for business, according to CNBC’s annual study. The ranking reflected states’ composite scores on 43 metrics in 10 broad categories ranging from quality of life and business friendliness to the cost of doing business and transportation and infrastructure. Colorado earned top-10 rankings in the categories that measure access to capital (fourth), workforce (fifth), quality of life (eighth), technology and innovation (eighth), and business friendliness (eighth). (CNBC, 2012)

• Colorado has the nation’s 10th-best tax climate for small businesses and entrepreneurs, according to the Small Business & Entrepreneurship Council’s “Business Tax Index 2012.” The index evaluates state taxes on property, sales, income, capital gains, and other factors to determine each tax system’s overall cost to small business. (Small Business & Entrepreneurship Council, 2012)

• Legislation adopted in 2012 provides for economic growth and new job creation. House Bill 12-1029—the Save Colorado Jobs Act—allows Colorado cities, counties, and special districts to negotiate an incentive payment or credit up to 100 percent of locally assessed business personal property tax for qualifying companies looking to relocate or expand.

• Metro Denver office rental rates averaged $25.68 per square foot in the fourth quarter of 2012, making the region’s office market highly competitive with other major markets in the U.S. (CoStar Realty Information, The CoStar Office Report, Q4 2012)

4. Access to aviation-related training programs

• The Aviation and Aerospace Science Department at Metropolitan State University of Denver (MSUD) is the fifth-largest collegiate aviation program in the nation offering majors in aviation management and aviation technology, in addition to certificate programs in airport management and space commercialization. MSUD is the only public institution in Colorado that offers these degrees and certificate programs. (Metropolitan State University of Denver, 2012)

• MSUD and Aims Community College in Greeley are among 36 schools approved under the Federal Aviation Administration’s (FAA) Air Traffic Collegiate Training Initiative. Schools approved under this program teach subjects that encompass FAA’s Air Traffic Basics Courses and provide a qualified pool of applicants for hiring into the FAA air traffic controller workforce. Students at approved schools are eligible to bypass a portion of their required training at the FAA Academy. (Federal Aviation Administration, 2012)

• The Emily Griffith Technical College offers an FAA-certified aircraft maintenance program in airframe and powerplant mechanics at its Aircraft Training Center located at Front Range Airport. For over 50 years, the program has provided more than 1,500 highly qualified technicians to the aviation industry. (Emily Griffith Technical College)

• Denver’s Take Flight Leadership Aviation program provides aviation education and scholarship resources for minority students interested in aviation careers. The legacy of Bessie Coleman and Tuskegee Airman developed the program to provide underprivileged adolescents the opportunity to achieve their future aviation careers through workshops, exposure to aviation occupations, and professional responsibilities. (Take Flight Leadership Aviation)

• Colorado Heli-Ops is one of the fastest growing and most innovative helicopter training centers in the nation. Awarded the Rotor & Wing magazine’s Editor’s Choice Award for flight training, Heli-Ops in Broomfield is the first helicopter flight school in the nation to
adopt a curriculum-wide Scenario Based Training program and offers private pilot and commercial pilot certificates, instrument and flight instructor rating, and career pilot programs. (Colorado Heli-Ops, 2012)

- Redstone College, near Rocky Mountain Metropolitan Airport, offers programs in airframe and power plants and electronics technology and graduates are recruited by some of the nation’s top aviation employers. (Redstone College)

### Aviation 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>238320 (P)</td>
<td>Paint &amp; wall covering contractors</td>
<td>1721-0301</td>
<td>Aircraft painting</td>
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<tr>
<td>314110 (P)</td>
<td>Carpet &amp; rug mills</td>
<td>2273-0100</td>
<td>Aircraft &amp; automobile floor coverings</td>
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<tr>
<td>314110 (P)</td>
<td>Carpet &amp; rug mills</td>
<td>2273-0101</td>
<td>Aircraft floor coverings, except rubber or plastic</td>
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<td>Tire mfg. (except retreading)</td>
<td>3011-0102</td>
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<td>3011-0202</td>
<td>Airplane tires, pneumatic</td>
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<td>331491 (P)</td>
<td>Nonferrous metal (except copper &amp; aluminum) rolling, drawing, &amp; extruding</td>
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<tr>
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<td>3463-9901</td>
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<tr>
<td>333318 (P)</td>
<td>Other comm'tl &amp; service industry machinery mfg.</td>
<td>3699-0302</td>
<td>Flight simulators (training aids), electronic</td>
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<td>333924 (P)</td>
<td>Industrial truck, tractor, trailer, &amp; stacker machinery mfg.</td>
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<td>336310 (P)</td>
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<td>336320 (P)</td>
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<td>336360 (P)</td>
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<td>3721</td>
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<tr>
<td>423860 (P)</td>
<td>Transportation equip. &amp; supplies (except motor vehicle) merchant wholesalers</td>
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<td>Aircraft engines &amp; engine parts</td>
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<td>424720 (P)</td>
<td>Petroleum &amp; petroleum products merchant wholesalers (except bulk stations &amp; terminals)</td>
<td>5172-0201</td>
<td>Aircraft fueling services</td>
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<td>441228 (P)</td>
<td>Motorcycle, ATV, &amp; all other motor vehicle dealers</td>
<td>5599-01</td>
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<td>481111</td>
<td>Scheduled passenger air transportation</td>
<td>4512</td>
<td>Scheduled air transport</td>
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<td>481112</td>
<td>Scheduled freight air transportation</td>
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<td>Scheduled air transport</td>
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<td>481211</td>
<td>Nonscheduled charter passenger</td>
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<td>Nonscheduled air transport</td>
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### Aviation Industry Cluster Definition (Cont’d)

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<th>NAICS Description</th>
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<td>Nonscheduled charter freight</td>
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<td>481219</td>
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<td>7997-9901</td>
<td>Aviation club, membership</td>
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<td>488111</td>
<td>Air traffic control</td>
<td>9621-01</td>
<td>Aircraft regulating agencies</td>
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<td>488119</td>
<td>Other airport operations</td>
<td>4581</td>
<td>Airports, flying fields, &amp; airport terminal services</td>
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<td>488190</td>
<td>Other support activities for air transportation</td>
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<td>Aircraft &amp; heavy equip. repair services</td>
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<td>Other support activities for air transportation</td>
<td>7699-2201</td>
<td>Aircraft flight instrument repair</td>
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<td>488190</td>
<td>Other support activities for air transportation</td>
<td>7699-2202</td>
<td>Aviation propeller &amp; blade repair</td>
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<td>488190</td>
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<td>7699-2206</td>
<td>Hydraulic equip. repair</td>
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<td>532411</td>
<td>Commercial air, rail, &amp; water transportation equip. rental &amp; leasing</td>
<td>7359-0401</td>
<td>Air flight instrument repair</td>
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<td>541330</td>
<td>Engineering services</td>
<td>8711-9902</td>
<td>Aviation and/or aeronautical engineering</td>
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<td>Professional employer organizations</td>
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<td>561599</td>
<td>All other travel arrangement &amp; reservation services</td>
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<td>561720</td>
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<td>611512</td>
<td>Flight training</td>
<td>8249-9901</td>
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<td>Flying instruction</td>
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<td>Ambulance services</td>
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<td>Nonscheduled air transport</td>
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<td>713990</td>
<td>All other amusement &amp; recreation industries</td>
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<td>Air shows</td>
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<td>811213</td>
<td>Communication equip. repair &amp; maintenance</td>
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<td>Aircraft radio equip. repair</td>
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<td>811219</td>
<td>Other electronic &amp; precision equip. repair &amp; maintenance</td>
<td>7629-9901</td>
<td>Aircraft electrical equip. repair</td>
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<tr>
<td>926120</td>
<td>Regulation &amp; admin of transportation programs</td>
<td>9621-01</td>
<td>Aircraft regulating agencies</td>
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</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.”
Aviation Industry Cluster Relationships

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

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

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

Infrastructure
- Ascent to Asia Initiative
- 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

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

For more information on the region’s aviation cluster:
1445 Market Street
Denver, CO 80202-1790
303.620.8083
email: info@metrodenver.org
www.metrodenver.org/MDAC
BIOSCIENCE

Metro Denver and Northern Colorado Industry Cluster Profile

The bioscience cluster is diverse in both size and scope, including companies that research, develop, and distribute products and services ranging from veterinary supplies and chemical testing kits to cutting-edge pharmaceuticals and medical devices and diagnostics. The cluster contributes to the growth and innovative capacity of other industries that transcend the bioscience cluster including healthcare and wellness, energy, information technology, and agriculture in the nine-county Metro Denver and Northern Colorado region. Advances in biology and breakthroughs in human and animal health will continue to foster innovation and provide the nine-county region a leading role in forming collaborative bioscience partnerships and supporting bioscience infrastructure.

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 about 14,980 bioscience workers in nearly 600 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 the 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 over 1,000 workers in approximately 120 companies in the region and grew 4.5 percent between 2007 and 2012, compared with a 1.5 percent decline nationwide.

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

- The Anschutz Medical Campus of the University of Colorado 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 Linda Cmnic Institute for Down Syndrome
- The Marion Downs Hearing Center
- The Eleanor Roosevelt Institute
- The Webb-Waring Institute for Cancer, Aging, and Antioxidant Research
- 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 University of Colorado and CSU also 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 (formerly the Colorado Initiative in Molecular Biotechnology, or CIMB), the Center for Computational Biology, the Center for Translational Pharmacokinetics and Pharmacogenomics, and the Center for Pharmaceutical Biotechnology.

The bioscience cluster is further enhanced by the intersection of academic, research, and corporate biotechnology institutions at the 578-acre, $5 billion Fitzsimons Life Sciences District.

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1 The nine-county Metro Denver and Northern Colorado region consists of Adams, Arapahoe, Boulder, Broomfield, Denver, Douglas, Jefferson, Larimer, and Weld Counties.
and the adjacent Anschutz Medical Campus in Aurora. The site is one of the largest bioscience redevelopment projects in the nation and includes the 184-acre Colorado Science + Technology Park at Fitzsimons, which offers 15 pre-built laboratories and access to more than 80 core laboratories, 21 executive office suites, and many shared services and amenities. Upon completion, the entire district and medical campus will include more than 18.5 million square feet of space dedicated to excellence in bioscience, healthcare, education, and research. In 2012, the Fitzsimons Redevelopment Authority opened its new 37,000-square-foot accelerator facility. The $8 million facility is part of the Bioscience Park Center building expansion and is 80 percent leased to existing tenants graduating from the adjacent Incubator Building and other companies in the modest growth stage.

Another key partner at Fitzsimons is the $1.5 billion Anschutz Medical Campus of the University of Colorado Denver, which includes the University of Colorado Hospital, facilities for University Physicians, Inc, and houses 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. The 180-bed full-service hospital that is under construction is scheduled to open in 2015 and will replace the existing VA hospital in Denver. The award-winning Children’s Hospital Colorado is also adjacent to the campus and undergoing expansion.

In addition to the Bioscience Park Center Incubator, Northern Colorado also supports a network of incubators and accelerators to provide high-potential, innovation-based startups with critical business expertise and assistance. CSU’s Research Innovation Center (RIC) is a hybrid academic research facility and bioscience incubator and includes a state-of-the-art, wet research laboratory capable of manufacturing clinical-grade vaccines or biologics. The RIC works closely with the area’s other primary startup incubator, the Rocky Mountain Innosphere (RMI). The RMI is the only innovation-based startup accelerator in Northern Colorado and provides assistance with raising capital and networking opportunities. The RMI supports bioscience, technology, and cleantech ventures through its FasTrac TechVenture entrepreneurial program developed by the Ewing Marion Kauffman Foundation.

Northern Colorado is a growing center for bioscience activity. Opportunities for research and development already exist through synergies with the cities of Fort Collins and Loveland, as well as CSU and University of Colorado Health (UC Health), formerly Poudre Valley Health System (PVHS). UC Health has dramatically 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 Animal Cancer Center (ACC) is an internationally recognized leader in clinical veterinary oncology and cancer research. In 2012, the American College of Veterinary Surgeons awarded Dr. Steve Withrow, the Center’s founder, the Founders’ Award for Career Achievement for his significant contributions.

The consortium of research universities and supportive bioscience programs and organizations provide a synergistic climate for the region’s thriving bioscience cluster.

- The CBSA launched the Colorado BioScience Institute—the only state institution dedicated solely to all areas of the bioscience industry—in early 2013 to provide educational and workforce programs for teachers, students, bioscience professionals, and the broader community. The Institute will create a framework to train young scientists and business entrepreneurs, as well as assist companies with the recruitment, retention, and attraction of these future bioscience employees and leaders. Further, The Institute will launch its flagship program, the BioGENEius Challenge, which will provide high school students the opportunity to compete and be recognized for outstanding research in biotechnology.

- The University of Colorado Boulder’s (CU-Boulder) Jennie Smoly Caruthers Biotechnology Building opened in spring 2012. The 336,800-square-foot research and teaching facility will house more than 60 faculty members and accommodate more than 1,000 students and research and support staff. The facility was designed to promote increased collaboration amongst students, researchers, and faculty of the Department of Chemical and Biological Engineering, the Division of Biochemistry, and the Biofrontiers Institute. The facility has helped attract new research funding and has been a hub connecting researchers and students to private companies, public entities, and venture capital firms interested in biotechnology opportunities.
• Nobel Laureate Tom Cech returned to CU-Boulder after 10 years as president of the Howard Hughes Medical Institute. Cech, who shared the 1989 Nobel Prize for Chemistry with the discovery that RNA in living cells can function as a catalyst, is the director of the BioFrontiers Institute.

• C2D2—a venture of CSU Ventures, Inc.—awarded more than $216,000 to seven Colorado researchers to support drug discovery research. Funding for C2D2 was provided in part by Colorado’s Bioscience Discovery Evaluation Grant Program (BDEGP) that has awarded C2D2 nearly $498,000.

• More than 3,000 pharmaceutical clinical trials have been completed or are active in Colorado since 1999, according to Pharmaceutical Research and Manufacturers of America’s 2012 study Research in Your Backyard. Additionally, more than 1,400 of the trials have targeted six major chronic disease groups including asthma, cancer, diabetes, heart disease, mental illness, and stroke. Colorado’s biotechnology companies received particular accolades for their close collaboration with the state’s clinicians and research institutions.

• The Innovation Center of the Rockies (ICR) collaborates with tech transfer offices including the University of Colorado, University of Denver, and the Colorado School of Mines to create one of the largest entrepreneurial networks in the nation. ICR also partnered with CSU Ventures to accelerate the creation of new businesses and continue building the state’s entrepreneurial ecosystem of university research, venture capital, and industry leadership.

• The Fitzsimons Redevelopment Authority partnered with the University of Colorado Tech Transfer Office (CU TTO) and ICR to help commercialize Colorado biotech research and present the best technologies to investment professionals across the globe. ICR will develop a pilot program with CU TTO to identify research and faculty teams with near-term commercial potential and will match the best commercial opportunities with venture capital firms and potential strategic partners.

• Startup Colorado is a regional initiative to increase the breadth and depth of the entrepreneurial ecosystem across Colorado’s Front Range. Launched in 2011, the initiative focuses on improving access to entrepreneurial education, encouraging new company creation, increasing connections among entrepreneurs and mentors, and building a more vibrant entrepreneurial community.

• The Colorado Innovation Network (COIN) is a private, public, and academic collaboration designed to foster new technology development across the state’s existing and emerging industries. COIN aims to connect innovation leaders and inventors to solutions and ideas through which they can foster innovation and is part of Gov. John Hickenlooper’s economic development plan, Blueprint Colorado.

The nine-county region’s entrepreneurial talent, thriving research and development assets, and bioscience-focused professional services create an ideal location for private bioscience companies to grow and expand. Notable company announcements in 2012 included:

• AlloSource, one of the nation’s largest providers of skin, bone, and soft tissue allografts, opened its new headquarter campus in Centennial and renovated more than half of its existing facilities. The new campus included laboratory space, testing and research facilities, clean rooms, freezer storage and supply chain support, and equipment rooms. The renovation work included freezer storage, receiving, material management, and cleaning and sterilization space.

• Four biotechnology companies moved into the Bioscience Park Center at the Fitzsimons Life Science District. The startup companies—Mitomics USA, Touch of Life Technologies, Greffex Inc., and Light Labs—are among nearly 40 firms that have opened in the Park. The companies provide products ranging from antiviral vaccines and prostate cancer diagnostics to software dissection tools and laboratory supplies.

• Lakewood-based medical device manufacturer CaridianBCT is now Terumo BCT. The Japanese medical device manufacturing company Terumo Corp. bought CaridianBCT in 2011 and will combine its transfusion products business with CaridianBCT’s blood collection and processing equipment operations. Terumo BCT is the only Terumo Corporation subsidiary with its global headquarters located outside of Japan.

• Fort Collins-based Tolmar Inc. announced plans to expand in Windsor with the purchase of the 146,000-square-foot former Packaging Corp. of America building. Tolmar—a
A number of the region’s bioscience companies received significant awards to advance new technologies and support further research and product development.

- **Boulder-based Biodesix**, a molecular diagnostic company developing personalized medicines, plans to hire up to 40 more employees by the end of 2013. The expansion will add to the company’s current headquarters base of about 33 employees.

- **Global medical device manufacturer Covidien** dedicated a new 63,000-square-foot research and development center in Boulder, one of 24 operated by the company worldwide. The facility expands Covidien’s operations in the state and is expected to house 160 employees in its 18 laboratories.

- **Fort Collins-based Chata Biosystems** will relocate to a larger space in Loveland to accommodate its current and future growth. The chemical solutions company’s new facility will be located near the Fort Collins–Loveland Municipal Airport and will be operational in early 2013.

- **Lawrence, KS-based SurePoint Medical** opened a regional office in unincorporated Douglas County. The durable medical equipment company is planning to expand and will create a number of new positions.

- Two **Boulder-based biopharmaceutical companies**, Array BioPharma and Clovis Oncology, collaborated to develop a compound to inhibit mutations that form gastrointestinal stromal tumors. The companies will conduct clinical trials, including a companion diagnostic, to identify patients with specific cell mutations.

- **Lone-Treer based electrotherapy device manufacturer Zynex, Inc.** was ranked as the seventh fastest growing medical device company in the United States and Canada and the fastest in Colorado in terms of revenue growth according to the 2012 Deloitte Technology Fast 500. The company was ranked 250th across all companies in North America in the technology, media, telecommunications, life sciences, and cleantech industries.

- **Denver-based dialysis provider DaVita Inc.** opened its second U.S. research center at the St. Anthony Central Hospital campus in Lakewood. The new 80-bed, 35,000-square-foot facility supports high-risk studies and can support both patient and healthy volunteer Phase I clinical studies, employing 58 executive and medical professionals.
Aurora-based Sharklet Technologies Inc. received a $2 million investment from Altria Ventures to accelerate the development of the company’s microscopically textured material—modeled after shark skin—that naturally inhibits bacteria growth. The material decreases the colonization and survival of bacteria development on medical devices such as medical catheters.

Fort Collins-based Ventria Bioscience announced its non-therapeutic products division InVitria was awarded a $1.5 million Small Business Innovation Research program (SBIR) grant to develop new technologies to reduce the use of animal-derived products in vaccines. The company will collaborate with a Fort Collins-based division of the U.S. Centers for Disease Control and Prevention, among others.

Boulder-based SomaLogic, Inc. received a grant from the Bill & Melinda Gates Foundation’s Grand Challenges in Global Health program for biomarker research used in the development of tuberculosis diagnostic technologies.

Swedish Medical Center is the first advanced care center in Colorado to use an innovative medical device to treat ischemic stroke patients faster and more efficiently. The Penumbra MAX System of Reperfusion Catheters—used in conjunction with intravenous clot-dissolving drug, t-PA—provides an improved alternative to the standard guidewire used by physicians to navigate the arteries to the brain and can treat patients within eight hours of symptom onset.

State and federal government support continuously drive new product development and innovation in the region’s bioscience cluster.

In fiscal year 2012, Colorado’s Bioscience Discovery Evaluation Grant Program (BDEGP) awarded more than $5.2 million in grants to 33 projects. Notable awards included $250,000 to Sophono, Inc. for the development of hearing technology for children under age five, $250,000 to Crestone, Inc. for infectious disease treatments, $250,000 to Mosaic Bioscience, LLC. to commercialize tissue regeneration technology, and $150,000 to 2C Tech Corporation to create intraocular implants used to treat vision loss. Since the program’s inception in 2006, 130 grants totaling about $22.1 million were distributed to research institutions and early-stage bioscience companies.

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 2012, CID4 had five companies in its Project Portfolio who have raised an additional $21 million in operating funds leading to 195 direct and indirect jobs.

President Obama signed the U.S. Food and Drug Administration (FDA) Safety and Innovation Act (FDASIA) of 2012—a package of reforms designed to improve efficiency, modernize regulations surrounding product development, and improve investor confidence. FDASIA will reauthorize user fees from drug and medical device industries for another five years beginning in 2013 which is expected to generate $6.4 billion. This revenue will fund the hiring of 200 FDA reviewers, improve deadlines for reviewing new medical devices and drugs, expand clinical trials for life-threatening diseases, decrease the amount of time to approve new bioscience products, and improve overall patient safety. The bill is expected to positively impact Colorado’s bioscience industry and could significantly improve business planning efforts across the state.

The U.S. Department of Commerce’s United States Patent and Trademark Office will locate one of four new satellite offices in Denver due to the state’s expansive culture of innovation and entrepreneurship, ability to attract high-quality professionals and technical talent, high quality of life and low cost of living, and its vast transportation infrastructure.
**Bioscience Economic Profile**

**Medical Devices and Diagnostics**

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

The nine-county region ranked ninth out of the 50 largest metro areas for medical devices and diagnostics employment concentration in 2012. With direct employment in the medical devices and diagnostics subcluster of about 10,280 employees, the region ranked eighth in absolute employment. About 86 percent of Colorado’s medical devices and diagnostics employees worked in the nine-county region.

<table>
<thead>
<tr>
<th>Direct Employment, 2012</th>
<th>10,280</th>
<th>450,510</th>
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<tbody>
<tr>
<td>Number of Direct Companies, 2012</td>
<td>330</td>
<td>18,330</td>
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<tr>
<td>One-Year Direct Employment Growth, 2011-2012</td>
<td>3.3%</td>
<td>1.6%</td>
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<td>Five-Year Direct Employment Growth, 2007-2012</td>
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<td>4.8%</td>
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<td>Avg. Annual Direct Employment Growth, 2007-2012</td>
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<td>0.9%</td>
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<tr>
<td>Direct Employment Concentration</td>
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<td>0.3%</td>
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</table>


**Medical Devices and Diagnostics Employment**

- The medical devices and diagnostics subcluster directly employed about 10,280 workers in the nine-county region in 2012.
- Medical devices and diagnostics companies accounted for 0.5 percent of the region’s total employment base, compared with a 0.3 percent employment concentration nationally.
- Employment growth in the region’s medical devices and diagnostics subcluster averaged 2.8 percent per year over the past five years. Total medical devices and diagnostics employment increased 15 percent between 2007 and 2012.
- More than 70 percent of the region’s medical devices and diagnostics employees manufactured surgical instruments and appliances, orthopedics, and prosthetics. Analytical instrument manufacturers employed another 12 percent.
- Approximately 73 percent of the region’s medical devices and diagnostics employees worked in Boulder (31 percent), Jefferson (30 percent), and Arapahoe (12 percent) Counties.

**Medical Devices and Diagnostics Wages**

The 2011 average annual salary for medical devices and diagnostics subcluster workers in the region was $72,630, compared with $74,640 nationwide. Given this average salary, the region’s medical devices and diagnostics payroll reached nearly $723 million in 2011.
Medical Devices and Diagnostics Companies

- About 330 medical devices and diagnostics companies operated in the nine-county region in 2012.
- Nearly 68 percent of the region’s medical devices and diagnostics companies employed fewer than 10 workers, while 2.4 percent employed 250 or more.
- Approximately 56 percent of the region’s medical devices and diagnostics companies manufactured surgical instruments and appliances, orthopedics, and prosthetics.
- More than 54 percent of the region’s medical devices and diagnostics companies were located in Boulder (21 percent), Jefferson (19 percent), and Arapahoe (15 percent) Counties.

Major Medical Devices and Diagnostics Companies

- Accellent
  [www.accellent.com](http://www.accellent.com)
- AlloSource
  [www.allosource.org](http://www.allosource.org)
- Baxter Corporation
  [www.baxter.com](http://www.baxter.com)
- Biodesix
  [www.biodesix.com](http://www.biodesix.com)
- Cochlear Americas
  [www.cochlearamericas.com](http://www.cochlearamericas.com)
- ConMed Corporation
  [www.conmed.com](http://www.conmed.com)
- Covidien
  [www.covidien.com](http://www.covidien.com)
- GE Healthcare
  [www3.gehealthcare.com](http://www3.gehealthcare.com)
- Hach Company
  [www.hach.com](http://www.hach.com)
- Medtronic Surgical Technologies
  [www.medtronic.com](http://www.medtronic.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)
- Sorin Group USA, Inc.
  [www.sorin.com](http://www.sorin.com)
- Spartin Group USA, Inc.
  [www.sparton.com](http://www.sparton.com)
- Surefire Medical Inc.
  [http://surefiremedical.com](http://surefiremedical.com)
- Terumo BCT, Inc.
  [www.terumobct.com](http://www.terumobct.com)
- Water Pik, Inc.
  [www.waterpik.com](http://www.waterpik.com)
Pharmaceuticals and Biotechnology

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.

The nine-county region ranked 23rd out of the 50 largest metro areas for pharmaceuticals and biotechnology employment concentration in 2012. With direct employment of about 4,710 pharmaceutical and biotechnology workers, the region ranked 16th in absolute employment. About 88 percent of Colorado’s pharmaceuticals and biotechnology employees worked in the nine-county region.

<table>
<thead>
<tr>
<th>Nine-County Region</th>
<th>U.S.</th>
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<tbody>
<tr>
<td>Direct Employment, 2012</td>
<td>4,710</td>
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<tr>
<td>Number of Direct Companies, 2012</td>
<td>270</td>
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<tr>
<td>One-Year Direct Employment Growth, 2011-2012</td>
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<td>Five-Year Direct Employment Growth, 2007-2012</td>
<td>-11.7%</td>
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<tr>
<td>Avg. Annual Direct Employment Growth, 2007-2012</td>
<td>-2.4%</td>
</tr>
<tr>
<td>Direct Employment Concentration</td>
<td>0.2%</td>
</tr>
</tbody>
</table>


Pharmaceuticals and Biotechnology Employment

- In 2012, the pharmaceuticals and biotechnology subcluster directly employed about 4,710 workers in the nine-county region.
- Pharmaceuticals and biotechnology companies employed 0.2 percent of the region’s total employment base, compared with a 0.3 percent national employment concentration.
- As the pharmaceutical and biotechnology subcluster continues to recover, company consolidations and financial restructuring continue to impact the industry. Employment in the region declined 11.7 percent between 2007 and 2012, compared with a 5.8 percent decline nationwide.
- More than 64 percent of the region’s pharmaceuticals and biotechnology employees worked in the pharmaceutical preparations industry.
- Approximately 74 percent of the region’s pharmaceuticals and biotechnology employees worked in Boulder (35 percent) and Larimer (22 percent) Counties, and in the City and County of Broomfield (17 percent).

Pharmaceuticals and Biotechnology Wages

The 2011 average annual salary for pharmaceuticals and biotechnology employees in the nine-county region was $99,010, compared with $107,410 nationwide. Given this average salary, nine-county pharmaceuticals and biotechnology payroll was more than $460 million in 2011. (Please see the “Medical Devices and Diagnostics Wages” section of this report for relevant occupational wage information.)
Pharmaceuticals and Biotechnology Companies

- About 270 pharmaceuticals and biotechnology companies operated in the nine-county region in 2012.
- Nearly 71 percent of the region’s pharmaceuticals and biotechnology companies employed fewer than 10 people, while 1.9 percent employed 250 or more.
- Approximately 78 percent of the region’s pharmaceuticals and biotechnology companies were involved in biological research (45 percent) and pharmaceutical preparations (33 percent).
- More than 54 percent of the region’s pharmaceuticals and biotechnology companies were located in Larimer (20 percent) and Boulder (18 percent) Counties, and in the City and County of Denver (17 percent).

Major Pharmaceuticals and Biotechnology Companies

- Amgen Inc. www.amgen.com
- Array BioPharma Inc. www.arraybiopharma.com
- Colorado Serum Company www.colorado-serum.com
- Corden Pharma Colorado Inc. www.cordenpharmacolorado.com
- Globelimmune, Inc. www.globelimmune.com
- Heska Corporation www.heska.com
- Hospira, Inc. www.hospira.com
- Sandoz, Inc. www.sandoz.com
- Spectrum Pharmaceuticals (formerly Allos) www.sppirx.com
- TOLMAR, Inc. www.tolmar.com

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
   - Of Colorado’s adult population, more than 36 percent has completed a bachelor’s or higher-level degree, making Colorado the third-most highly educated state in the nation behind Massachusetts and Maryland. (U.S. Census Bureau, 2011 American Community Survey)
   - Colorado has 10 higher education institutions with bioscience programs. Biological sciences graduate programs at the University of Colorado Boulder (CU-Boulder), the University of Colorado Denver, and Colorado State University (CSU) ranked within the nation’s top 100 in 2010. The University of Denver also ranked in the nation’s top 250 biological sciences graduate programs in 2010. (U.S. News & World Report, 2012)
   - Colorado ranked 10th in the number of science and engineering graduate students per 1,000 individuals ages 25 to 34 years old in 2009. Universities such as the Colorado School of Mines, CU-Boulder, and CSU all offer competitive science and engineering doctorate programs and research facilities. (National Science Foundation, 2012)
   - Colorado ranked fourth in the number of scientists and engineers as a percent of the workforce in 2010. The state ranked ninth in life and physical scientists as a share of the
workforce. These measures point to a robust cluster of life sciences and a large pool of potential innovators in the state. (National Science Foundation, 2012)

- Battelle Memorial Institute’s *State Bioscience Industry Development 2012* report ranked Colorado in the second tier of bioscience states and the state’s bioscience industry employment has outpaced national employment growth since 2001. Overall, Colorado’s bioscience industry grew 11.1 percent between 2001 and 2010, while the nation’s bioscience industry grew a smaller 6.4 percent over this same time period. Specifically, the study showed Colorado’s agricultural feedstock & chemicals subsector grew nearly 47 percent between 2001 and 2010, while the medical devices and equipment subsector grew more than 16 percent since 2001. (Battelle Memorial Institute, 2012)

- The University of Colorado’s Charles C. Gates Center for Regenerative Medicine and Stem Cell Biology aims to understand stem cell biology to develop new therapies for debilitating diseases such as juvenile diabetes, cancer, liver and vascular diseases, blood disorders, and neuronal diseases. Established in 2006, the Center focuses on four areas of stem cell research including stem cell biology, stem cells and cancer, stem cells and disease, and stem cells and regenerative medicine. (University of Colorado, 2012)

- The University of Colorado Cancer Center (CU Cancer Center) is the only National Cancer Institute-designated comprehensive cancer center in the Rocky Mountain region that partners with nearly all the cancer research scientists in Colorado to provide patients with the latest research and technologies. The CU Cancer Center is one of only 41 cancer centers to receive this most elite recognition, deeming membership as “the best of the best.” (The University of Colorado Cancer Center, 2012)

- CSU’s biomedical engineering graduate program ranked among the top 25 in the nation. The program’s integration between engineering, veterinary and human medicine, and the sciences enhance learning, transcend boundaries, and provide a strong foundation for bioengineering research and education. (*U.S. News & World Report*, 2012)

- Colorado had the fourth-highest rate of entrepreneurial activity in the nation in 2011, according to the *Kauffman Index of Entrepreneurial Activity*. The index measures the percentage of the adult, non-business owner population that starts new businesses. With 420 new business owners per 100,000 adults in the state, the state’s high ranking signals a flourishing entrepreneurial community with the ability to attract potential investors. (Ewing Marion Kauffman Foundation, 2012)

- Denver ranked 11th among the nation’s “Top 15 Best Cities for Recent College Graduates,” according to a 2012 ranking by Apartments.com and CareerRookie.com. Contributors considered each city’s average rent, employment opportunities, and average entry-level salary. (Apartments.com, 2012; CareerRookie.com, 2012)

- *Kiplinger’s Personal Finance* magazine ranked Denver among the top five “Best Cities for Young Adults.” Contributors identified “best” cities as those that have strong employment growth, a highly educated and tech-savvy population, and a reasonable cost of living. Denver received particular accolades for its invigorating outdoor culture, reasonable one-bedroom apartment rents, and a rosy employment outlook. (*Kiplinger’s Personal Finance*, 2012)

- Metro Denver ranked first among the nation’s largest metropolitan areas for total population gain in the 25- to 34-year age group between 2008 and 2010, according to the Brookings Institution. The region’s stable economies, “cool” cities, and high-tech centers are drawing young adults. (The Brookings Institution, 2012)

- Metro Denver is the nation’s fifth-smartest large metro area, according to news website *The Daily Beast*. The ranking reflects each metro’s share of adult population with bachelor’s or master’s degrees, cognitive performance in five areas, nonfiction book sales, and the concentration of libraries and universities. (*The Daily Beast*, 2012)

- Legislation passed in 2012 will help match Colorado’s industry need for skilled workers to the training provided in the state’s education and workforce programs. House Bill 12-1061 established the Skills for Jobs Act that directs the Colorado Department of Higher Education to coordinate with other state agencies to identify workforce needs, education credential production, the gap between the two, and potential actions to help close the gap and ensure the state’s workforce has marketable skills needed to continue growing the state’s economy.
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.

- The nine-county region offers a variety of real estate opportunities for bioscience companies, ranging from fully furnished executive suites to build-to-suit labs and office space.

- The Colorado Science + Technology Park at Fitzsimons is a 184-acre development adjacent to the Anschutz Medical Campus. The business incubator in the Bioscience Park Center is home to about 40 life science companies and offers turnkey facilities for research, business development, and product commercialization. At full buildout, more than 18 million square feet of space will be dedicated to bioscience, healthcare, education, and research. (Fitzsimons Life Sciences District)

- The Judson M. Harper Research Complex is a life science park dedicated to bioscience research, preclinical testing, technology development, and product commercialization on CSU's Foothills Campus. The Complex houses the Infectious Disease Research Center; Rocky Mountain Regional Biocontainment Laboratory; Arthropod-borne and Infectious Diseases Laboratory (AIDL); the Centers for Disease Control and Prevention's National Center for Zoonotic, Vector-borne, and Enteric Diseases; the USDA-APHIS National Wildlife Research Center; and the 72,000-square-foot Research Innovation Center to develop bioscience products. (Colorado State University)

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)

- Denver ranked 14th among the nation’s most tax-friendly large cities for business, according to KPMG International's 2012 Competitive Alternatives: Focus on Tax report. Analysts tallied each city's total taxes paid by large businesses as a percentage of total taxes paid by similar companies in cities with populations greater than 2 million and Denver’s tax costs were nearly 6 percent below the U.S. average. (KPMG International, 2012)

- Manufacturing equipment used in clean room operations is exempt from state sales tax. (Exemption clarified in Colorado House Bill 07-1277)

- Colorado has one of the nation’s most favorable business tax climates. The state ranked 18th on the Tax Foundation’s 2013 State Business Tax Climate Index, which measured the extent to which state tax policies promote corporate growth and investment. (The Tax Foundation, 2012)

- Colorado has the nation’s 10th-best tax climate for small businesses and entrepreneurs, according to the Small Business & Entrepreneurship Council’s “Business Tax Index 2012.” The index evaluates state taxes on property, sales, income, capital gains, and other factors to determine each tax system’s overall cost to small business. (Small Business & Entrepreneurship Council, 2012)

- Colorado ranked as the eighth-best state for business, according to CNBC’s annual study. The ranking reflected states’ composite scores on 43 metrics in 10 broad categories ranging from quality of life and business friendliness to the cost of doing business and transportation and infrastructure. Colorado earned top-10 rankings in the categories that measure access to capital (fourth), workforce (fifth), quality of life (eighth), technology and innovation (eighth), and business friendliness (eighth). (CNBC, 2012)

- Forbes ranked Metro Denver fifth among the 25 “Best Places for Business and Careers” in 2012, which assessed the nation’s largest metropolitan areas on the costs of doing business, projected economic growth, and educational attainment. Four other Colorado metropolitan areas ranked among the top 50. The Fort Collins metro area ranked third overall, Boulder ranked 27th, Colorado Springs ranked 42nd, and Greeley ranked 46th. (Forbes, 2012)
Colorado is a top state for entrepreneurship and innovation, according to the U.S. Chamber of Commerce and the National Chamber Foundation’s *Enterprising States* report. Colorado ranked eighth as the next boom state positioned to grow and prosper, second for its high-tech business concentration, third for its business creation rate, and fifth in science, technology, engineering, and mathematics job concentration. (National Chamber Foundation, 2012)

4. **Access to financial resources to fund research and development**

- Two grant programs were created by the Colorado Legislature to grow and expand the region’s bioscience industry:
  - The Clean Technology Discovery Evaluation Grant Program was established in 2011 and created a pool of funds to support research and development of new products and technologies, early-stage companies, and develop infrastructure. The Program could generate as much as $2 million each year in new seed money for the bioscience industry.
  - The Bioscience Discovery Evaluation Grant Program was established in 2006 and aims to expand bioscience research and accelerate the development of new products and services disbursed through Proof-of-Concept grants, Early-Stage Bioscience Company grants, and research institution grants for infrastructure development. Since the program’s inception, 130 grants totaling $22.1 million were distributed to research institutions and early-stage bioscience companies to advance research and development in a variety of areas ranging from listeria detection and diabetes treatments to the development of compounds used to treat Parkinson’s disease. (Colorado Office of Economic Development and International Trade, 2012)

- Colorado offers several public and private sources of business funding including the Certified Capital Companies Program and the Colorado Venture Capital Authority. (Contact the Colorado Office of Economic Development and International Trade for more information.)

- The nine-county region has three venture firms currently investing in bioscience: Boulder Ventures, Morgenhaler Ventures, and Tango/HCV.

- Colorado ranked fourth among the states behind California, Massachusetts, and New York in the amount of early-stage venture capital invested in the state in 2011. Colorado companies and entrepreneurs received over $310 million in early-stage funding, nearly half of total venture capital invested in the state. (PricewaterhouseCoopers, *MoneyTree Report*, 2012)

- Colorado ranked third in the nation for funds raised per worker from the Small Business Innovation Research (SBIR) grant program and received 149 grants totaling almost $57.2 million in 2011. More SBIR funding indicates a higher degree of innovativeness and scientific excellence. (U.S. Small Business Administration, 2012; U.S. Bureau of Labor Statistics, 2012)

- CSU research expenditures reached $340 million in fiscal year 2012 and was the fifth consecutive year that research dollars exceeded $300 million. The university’s grant awards totaled $268 million, an increase of $14 million from fiscal year 2011. Increased funding indicates a high level of innovation among university scientists and researchers. (Colorado State University, 2012)

- The University of Colorado system posted record research and development expenditures for science and engineering totaling nearly $722 million in fiscal year 2010. The university ranked 12th among the nation’s public universities for research and development awards and ranked fifth for federally funded research expenditures. (National Science Foundation, 2012)

- The University of Colorado ranked among the nation’s top institutions in total National Institutes of Health funding in fiscal year 2011. The University of Colorado School of Pharmacy ranked seventh out of 71 academic pharmacy schools, while the School of Medicine ranked 25th out of 129 academic medical schools. (National Institutes of Health, 2012)
### Bioscience 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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<td>Other industrial machinery mfg.</td>
<td>3559-9922</td>
<td>Pharmaceutical machinery</td>
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<td>Analytical laboratory instrument mfg.</td>
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<td>334517</td>
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<td>339113</td>
<td>Surgical appliance &amp; supplies mfg.</td>
<td>3821</td>
<td>Laboratory apparatus &amp; furniture</td>
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<td>3842</td>
<td>Orthopedics, prosthetics, &amp; surgical appl.</td>
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<td>339114</td>
<td>Dental equip. &amp; supplies mfg.</td>
<td>3843</td>
<td>Dental equipment &amp; supplies</td>
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**Pharmaceuticals & Biotechnology**

<table>
<thead>
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<th>NAICS Code*</th>
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<th>SIC Code</th>
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<tr>
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<td>Medicinal &amp; botanical mfg.</td>
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<td>Medicinals &amp; botanicals</td>
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<td>325412</td>
<td>Pharmaceutical preparation mfg.</td>
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<td>325414</td>
<td>Biological product (except diagnostic) mfg.</td>
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<td>541711</td>
<td>Research &amp; development in biotechnology</td>
<td>8731-01</td>
<td>Biological research</td>
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<td>541711</td>
<td>Research &amp; development in biotechnology</td>
<td>8731-9902</td>
<td>Medical research (commercial)</td>
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<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.

For additional information, contact us:

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

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.

The expansion of broadband infrastructure plays an important role in enabling widespread use of telecommuting options for many employers and businesses. Telecommuting—or working at home while connected by information technology—has grown rapidly and has led to expanded networks and service areas. The nine-county Metro Denver and Northern Colorado region is one of the nation’s top areas for telework due to the region’s focus on transportation alternatives, advanced telecommunications infrastructure, and percentage of high-tech companies. Nearly 78 percent of Coloradans access the Internet in their home, compared with the national average of about 76 percent. The downtown Denver WiFi Zone was among the first in the nation to provide large-scale, public Internet access and several locations throughout Denver offer free WiFi, including Denver International Airport. The Denver Regional Council of Government’s Telework Colorado program offers free telework consulting services for employers in the region including information, materials, expert advice, and customized programs.

Several of the counties and cities located throughout the region strategically use information and communications technology to meet the needs of their respective communities. Douglas County ranked fourth in the 250,000 to 499,999 population category of the “2012 Digital Counties Survey.” The city of Aurora ranked fifth in the more than 250,000 population category, the city of Lakewood ranked ninth in the 125,000 to 249,999 population, and the cities of Arvada, Westminster, and Thornton ranked among the top 10 in the 75,000 to 124,999 population category in the “2012 Digital Cities Survey.” Both surveys—compiled by e.Republic’s Center for Digital Government and Digital Communities—recognized counties and cities that provided exemplary digital service to their residents and highlighted the areas’ best practices.

Companies in the nine-county region continue to be at the forefront of telecommunications development. Many of the region’s carriers rolled out their fourth-generation mobile broadband, long-term evolution network, or 4G LTE, in 2012 including Verizon Wireless and AT&T. AT&T invested $325 million between 2009 and 2011 to upgrade its nine-county region wireless network to offer 4G LTE speeds. The company added specialized antenna systems, cell sites, and fiber-optic connections for improved call quality and Internet connectivity, including 15 new cell towers, 400 cell site upgrades, and equipment upgrades to 140 antenna sites. Sprint Nextel plans to consolidate multiple network technologies into one network by the end of 2013 and T-Mobile plans to deploy 4G LTE in mid-2013 to improve network data speeds and reduce dropped call frequency.

Companies in the nine-county region are harnessing cloud-based infrastructure to improve broadband technology and create sustainable business solutions.

- Denver-based Verio Inc. partnered with California-based Citrix to launch its CloudStack™ platform as part of the company’s new Cloudn™ service. Verio’s Cloudn platform allows cloud integrators, cloud brokers, and other channel partners to create multiple virtual machines that belong to a partner’s own cloud network, utilize a portal to manage all customers’ virtual machines, offer use-based billing to end-customers, and tap into the company’s own global IP network.

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1 The nine-county Metro Denver and Northern Colorado region consists of Adams, Arapahoe, Boulder, Broomfield, Denver, Douglas, Jefferson, Larimer, and Weld Counties.
Denver-based T3Media, formerly Thought Equity Motion, launched Paya, a web-based service to buy and sell digital content. The cloud-based platform offers consumers the ability to buy and sell their work using social community reach and includes small content libraries, media archiving, e-commerce, and asset management.

The nine-county region's broadcasting and telecommunications companies offered expanded bandwidth and increased fiber-optic network infrastructure in 2012.

- Colorado launched a $130 million broadband project to provide high-speed Internet service for schools and libraries, healthcare organizations, and government offices across the state. Led by Longmont-based nonprofit EAGLE-Net (or Educational Access Gateway Learning Environment Network), the project will add 4,600 miles of fiber-optic line or microwave relays to existing telecom lines and is slated for completion in August 2013. EAGLE-Net is awaiting approval from the National Telecommunications and Information Administration to proceed with its final year of development.

- The U.S. Department of Defense (DoD) awarded Broomfield-based Level 3 Communications Inc. a $410.8 million contract to provide fiber-optic network support, IP-based infrastructure, transport services, and maintenance services to connect the nation's various defense locations. The 10-year contract will provide the Defense Information Systems Agency within the DoD with various security improvements and will support its growing bandwidth needs.

- Louisville-based Zayo Group will expand its fiber-optic network across the Front Range, including Fort Collins, Greeley, Loveland, Longmont, Boulder, Colorado Springs, and the greater Metro Denver region. The company's 521-route mile expansion will strengthen its presence in the Central Business District and the Denver Tech Center and will provide support to the region's largest industries including education, energy, technology, and research and development.

- CenturyLink completed upgrades to its national fiber-optic network and began offering speeds of 100 gigabits per second to its larger customers in 50 U.S. metropolitan locations. The company acquired the majority of its network when it completed a merger with Denver-based Qwest Communications International Inc. in 2011. The upgrades will support high bandwidth services including cloud computing, data applications, and video streaming.

- Denver-based Mobile Pulse secured $2.5 million in angel funding to measure and analyze the town of Castle Rock's mobile service and broadband capability. With the company's mobile network monitoring service and speed checks, Castle Rock negotiated a new contract with its wireless carrier, Sprint Nextel. Colorado's Statewide Internet Portal Authority also partnered with Mobile Pulse to examine the availability and performance of mobile broadband networks across the state and will allow local governments to improve access areas and determine the appropriate carrier.

- The Federal Communications Commission (FCC) approved Douglas County-based DISH Network's plan to convert its satellite spectrum into a nationwide wireless network and could be the first company in the nation to offer mobile television, voice, and data connections. The FCC also removed outdated regulations and authorized auctioning a neighboring block of frequencies—known as H Block—that will improve the nation's broadband capacity.

The nine-county region is a key location for broadcasting and telecommunication companies to grow and expand. Notable company announcements in 2012 included:

- Video rental chain Blockbuster—purchased last year by Douglas County-based DISH Network—relocated its headquarters from Texas to the DISH campus in Douglas County during the summer of 2012. The move will create 150 management jobs over the next five years, some of which may be filled by relocating Blockbuster employees, and will allow DISH and Blockbuster to better leverage their resources.

- Comcast Corp. relocated its Denver field operations office from downtown Denver to a new 43,585-square-foot facility near Interstate 70 and Peña Boulevard. The building will offer improved road access for Comcast service vehicles and a more state-of-the-art business environment. About 250 workers will be housed at the new facility that will open in early 2013.
• DISH Network plans to hire 350 service representatives in Thornton and 80 customer resolution specialists in Littleton. The positions will pay above-average wages and bonus potential with full benefits.

• Universal Sports Network will move its production and broadcast operations from California to the Comcast Media Center in Centennial in early 2013 and will create more than 40 new jobs in Metro Denver. The Olympic-related sports network cited the proximity to the various athletic training centers, particularly the U.S. Olympic Training Center, and winter sports venues as primary reasons for the move.

• Comcast Corp. plans to hire 250 call center workers in Denver by the end of 2013 as part of the company’s call center realignment strategy to specialize in Centers of Excellence. The strategy is to provide subscribers with enhanced customer service and faster resolution when interacting with customer service experts.

• Entravision Communications Corp. moved into a new media facility near Sports Authority Field at Mile High. The 16,000-square-foot building includes new equipment, the company’s four television stations, four radio stations, and other interactive digital media facilities.

• inetwork leased additional office space in lower downtown Denver and expanded its workforce by 50 percent in response to growing customer demand. The company provides scalable voice, 911, and short message services.

Companies in the nine-county region announced several mergers and acquisitions in 2012.

• Greenwood Village-based WideOpenWest (WOW) secured $3 billion in financing commitments from Morgan Stanley, Credit Suisse, and other investment companies to purchase Georgia-based Knology. The $1.5 billion deal would expand WOW’s market to 13 states and could reach more than 800,000 customers with its digital video and high-speed Internet services.

• Zayo Group acquired New York-based AboveNet in a $2.2 billion deal. The company has completed more than 20 acquisitions since opening in 2007 and the AboveNet deal marks the company’s largest in its history.

• Wheat Ridge-based ARC Wireless Solutions purchased Longmont-based Advancing Forming Technologies and Florida-based Quadrant Metals Technologies LLC in a $72.6 million deal to broaden the company’s product offerings. The combined wireless technology company was renamed to ARC Group Worldwide and relocated its headquarters to Longmont.

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 2012. With direct employment of about 39,620 broadcasting and telecommunications employees, the region ranked 10th in absolute employment. More than 78 percent of Colorado’s broadcasting and telecommunications cluster employees worked in the region.

<table>
<thead>
<tr>
<th>Nine-County Region</th>
<th>U.S.</th>
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<tr>
<td>Direct Employment, 2012</td>
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<td>Number of Direct Companies, 2012</td>
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<td>Five-Year Direct Employment Growth, 2007-2012</td>
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<td>Avg. Annual Direct Employment Growth, 2007-2012</td>
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<tr>
<td>Direct Employment Concentration</td>
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Broadcasting and Telecommunications Employment

- The broadcasting and telecommunications cluster directly employed about 39,620 people in the nine-county region in 2012.
- Broadcasting and telecommunications companies employed 2.1 percent of the region’s total employment base, compared with a 0.8 percent employment concentration nationwide.
- Employment in the region’s broadcasting and telecommunications cluster declined 3.8 percent from 2007 to 2012, compared with an 18 percent decline at the national level.
- More than 67 percent of the broadcasting and telecommunications employees provided telephone communication and cable and other subscription services.

- Nearly 76 percent of the region’s broadcasting and telecommunications employees worked in Arapahoe (31 percent) and Douglas (15 percent) Counties and the City and County of Denver (30 percent).

Wages

The 2011 average annual salary for broadcasting and telecommunications employees in the nine-county region was $92,360, compared with $76,430 nationwide. Total payroll for the broadcasting and telecommunications cluster in the region exceeded $3.7 billion in 2011.

Denver-Aurora-Broomfield MSA Occupational Salaries, 2011 Annual Average

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<th>Average Salary</th>
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<td>Telecommunications Equipment Installers &amp; Repairers</td>
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<td>Telecommunications Line Installers &amp; Repairers</td>
<td>$51,610</td>
</tr>
<tr>
<td>Broadcast Technicians</td>
<td>$48,960</td>
</tr>
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</table>


Broadcasting and Telecommunications Companies

- Approximately 2,730 broadcasting and telecommunications companies operated in the nine-county region in 2012.
- About 80 percent of the region’s broadcasting and telecommunications companies employed fewer than 10 people, while 0.9 percent employed 250 or more.
- The majority of broadcasting and telecommunications companies in the region provided either wired or wireless telecommunications or other communications services.
- More than 61 percent of the region’s broadcasting and telecommunications companies were located in the City and County of Denver (24 percent) and in Arapahoe (21 percent) and Jefferson (16 percent) Counties.
Major Broadcasting and Telecommunications Companies

- Alcatel-Lucent
  www.alcatel-lucent.com
- AT&T Inc.
  www.att.com
- Avaya Inc.
  www.avaya.com
- BI Incorporated
  http://bi.com
- BT Conferencing, Inc.
  www.btconferencing.com
- Cbeyond, Inc.
  www.cbeeyond.com
- CenturyLink, Inc.
  www.centurylink.com
- Clear Channel Communications, Inc.
  www.clearchannel.com
- Comcast Corp.
  www.comcast.com
- DISH Network
  www.dishnetwork.com
- DIRECTV, Inc.
  www.directv.com
- EchoStar Corp.
  www.echostar.com
- Integra Telecom, Inc.
  www.integratelecom.com
- Jones International, Ltd.
  www.jones.com
- Level 3 Communications, Inc.
  www.level3.com
- Liberty Media Corp.
  www.libertymedia.com
- Sprint Nextel
  www.sprint.com
- T-Mobile
  www.t-mobile.com
- tw telecom
  www.twtelecom.com
- Verizon Wireless
  www.verizonwireless.com
- WildBlue Communications, Inc.
  www.wildblue.com
- Zayo Group
  www.zayo.com

Key Reasons for Broadcasting and Telecommunications Companies to Locate in the Nine-County Region

The region is a top 10 broadcasting and telecommunications location offering:

1. A central location and easy global access
   - 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. This capability provides companies with real-time connections to six of seven continents in one business day. (Metro Denver Economic Development Corporation)
   - Denver International Airport (DIA) was the fifth-busiest airport in the nation and 11th-busiest worldwide in terms of passenger traffic in 2011. Sixteen commercial carriers—the largest of which are United Airlines, Southwest, and Frontier Airlines—offer scheduled nonstop service to more than 170 domestic and international destinations. (U.S. Bureau of Transportation Statistics, 2012; Airports Council International, 2012; and Denver International Airport, 2012)
   - The nine-county region’s central U.S. location allows convenient access as air travelers can easily reach two-thirds of the nation within two hours. Further, the region is within four hours flying time of every North American city with a population of 1 million or more. (Metro Denver Economic Development Corporation)
   - More than 1,000 miles from the nearest coast and outside of Tornado Alley, Metro Denver’s risk of natural disasters (hurricanes, tornados, and earthquakes) is minimal compared to locations in the east, west, and south. (National Oceanic and Atmospheric Administration, 2012; U.S. Geological Survey, 2012)

2. A large concentration of high-quality technology workers
   - Of Colorado’s adult population, more than 36 percent has completed a bachelor's or higher-level degree, making Colorado the third-most highly educated state in the nation behind Massachusetts and Maryland. (U.S. Census Bureau, 2011 American Community Survey)
• Colorado ranked third in tech-worker concentration for the fifth-consecutive year, with 87 of every 1,000 private-sector workers employed in technology firms. Colorado also had the nation’s 10th-largest employment base in the Internet and telecommunications services industry and ranked 14th for absolute employment in the high-tech industry, seventh for average high-tech wage, and 11th for absolute number of high-tech businesses. Colorado tech workers earn 96 percent more than the average private sector worker. (TechAmerica Foundation, Cyberstates 2011: The Definitive State-by-State Analysis of the U.S. High-Technology Industry, 2011)

• Colorado has the nation’s seventh-most innovative economy, according to the U.S. Department of Commerce, Economic Development Administration’s State Innovation Index. The index incorporates a mix of input measures that characterize the place and its people (accounting for 60 percent of the overall index score) and output measures that characterize its economic success (40 percent of the overall score). (U.S. Department of Commerce, 2012)

• Colorado had the fourth-highest rate of entrepreneurial activity in the nation in 2011, according to the Kauffman Index of Entrepreneurial Activity. The index measures the percentage of the adult, non-business owner population that starts new businesses. With 420 new business owners per 100,000 adults in the state, the state’s high ranking signals a flourishing entrepreneurial community with the ability to attract potential investors. (Ewing Marion Kauffman Foundation, 2012)

• Colorado ranked third in the nation for funds raised per worker from the Small Business Innovation Research (SBIR) grant program and received 149 grants totaling almost $57.2 million in 2011. More SBIR funding indicates a higher degree of innovativeness and scientific excellence. (U.S. Small Business Administration, 2012; U.S. Bureau of Labor Statistics, 2012)

• Metro Denver ranked first among the nation’s largest metropolitan areas for total population gain in the 25- to 34-year age group between 2008 and 2010, according to the Brookings Institution. The region’s stable economies, “cool” cities, and high-tech centers are drawing young adults. (The Brookings Institution, 2012)

• The U.S. Department of Commerce’s United States Patent and Trademark Office will locate one of four new satellite offices in Denver due to the state’s expansive culture of innovation and entrepreneurism, ability to attract high-quality professionals and technical talent, high quality of life and low cost of living, and its vast transportation infrastructure. (U.S. Patent and Trademark Office, 2012)

3. Low to moderate costs of doing business

• Colorado has the eighth-best economic outlook in the nation, according to the 2012 ALEC-Laffer State Economic Competitiveness Index. The index examined each state’s tax structure and spending to demonstrate how public policy shapes economic growth. The state’s sustainable approach to public spending and its low regulatory and tax burdens contributed to its high ranking. (American Legislative Exchange Council, 2012)

• Colorado ranked fifth overall on Forbes’ 2012 “Best States for Business and Careers” list. Rankings were based on six categories for businesses: costs, labor supply, regulatory environment, economic climate, growth prospects, and quality of life. Colorado received its highest rankings for labor supply (first overall), growth prospects (fourth overall), and quality of life (ninth overall). (Forbes, 2012)

• Forbes ranked Metro Denver fifth among the 25 “Best Places for Business and Careers” in 2012, which assessed the nation’s largest metropolitan areas on the costs of doing business, projected economic growth, and educational attainment. Four other Colorado metropolitan areas ranked among the top 50. The Fort Collins metro area ranked third overall, Boulder ranked 27th, Colorado Springs ranked 42nd, and Greeley ranked 46th. (Forbes, 2012)

• Metro Denver office rental rates averaged $25.68 per square foot in the fourth quarter of 2012, making the region’s office market highly competitive with other major markets in the U.S. (CoStar Realty Information, The CoStar Office Report, Q4 2012)
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)

- Denver ranked 14th among the nation’s most tax-friendly large cities for business, according to KPMG International’s 2012 Competitive Alternatives: Focus on Tax report. Analysts tallied each city’s total taxes paid by large businesses as a percentage of total taxes paid by similar companies in cities with populations greater than 2 million and Denver’s tax costs were nearly 6 percent below the U.S. average. (KPMG International, 2012)

- Colorado has the nation’s 10th-best tax climate for small businesses and entrepreneurs, according to the Small Business & Entrepreneurship Council’s “Business Tax Index 2012.” The index evaluates state taxes on property, sales, income, capital gains, and other factors to determine each tax system’s overall cost to small business. (Small Business & Entrepreneurship Council, 2012)

- Colorado ranked as the eighth-best state for business, according to CNBC’s annual study. The ranking reflected states’ composite scores on 43 metrics in 10 broad categories ranging from quality of life and business friendliness to the cost of doing business and transportation and infrastructure. Colorado earned top-10 rankings in the categories that measure access to capital (fourth), workforce (fifth), quality of life (eighth), technology and innovation (eighth), and business friendliness (eighth). (CNBC, 2012)

- Colorado is a top state for entrepreneurship and innovation, according to the U.S. Chamber of Commerce and the National Chamber Foundation’s Enterprising States report. Colorado ranked eighth as the next boom state positioned to grow and prosper, second for its high-tech business concentration, third for its business creation rate, and fifth in science, technology, engineering, and mathematics job concentration. (National Chamber Foundation, 2012)

- Legislation adopted in 2012 provides for economic growth and new job creation. House Bill 12-1029—the Save Colorado Jobs Act—allows Colorado cities, counties, and special districts to negotiate an incentive payment or credit up to 100 percent of locally assessed business personal property tax for qualifying companies looking to relocate or expand.

5. An overall better quality of life

- Colorado ranked among the top 25 states for Internet speeds and had faster download and upload speeds than the U.S. median in 2010. High-speed Internet contributes to economic growth, global competitiveness, and a better quality of life. (Communications Workers of America, Speed Matters, 2011)

- Colorado is the leanest state with the nation’s lowest rate of adult obesity (20.7 percent) and is the only state with an obesity rate below 21 percent. (Trust for America’s Health, 2012; Robert Wood Johnson Foundation, 2012)

- Boulder ranked fifth on the 2011 Gallup-Healthways “Well-Being Index,” which measures the physical and emotional health of residents in 190 metropolitan statistical areas. The survey-based index also ranked the Fort Collins metro area ninth and the indices’ statewide component ranked Colorado sixth for its residents’ overall well-being. (Gallup-Healthways, 2012)

- Colorado has the third-highest percentage of state land area devoted to the National Forest System, according to the U.S. Forest Service. With more than 40 state parks, 56 national parks and wilderness areas, and the greatest number of 14,000-foot peaks in the
nation, Colorado's access to public lands and outdoor opportunities serves as a cornerstone of the state's economy. (U.S. Forest Service, 2012; Colorado State Parks, 2012; Wilderness.net, 2012)

- Business news website Businessweek.com ranked Denver sixth among "America's 50 Best Cities" in 2012. The ranking is based on metrics including education, income, unemployment, leisure activities, and air quality. (Businessweek.com)

- Castle Rock is among the nation's top 20 communities in which to live, according to MONEY Magazine's 2012 "Best Places to Live." The list identifies 100 small cities and towns with a reputation for safety, education, housing and healthcare affordability, diversity, and other advantages. Highlands Ranch (21st), Centennial (49th), Boulder (60th), and Fort Collins (70th) were also named to the list. (MONEY Magazine, 2012)

- Denver ranked 14th on Travel + Leisure magazine's 2012 list of "America's Best Cities for Singles." Criteria included a variety of factors ranging from the cost of living to culture and nightlife. Denver received accolades for access to fitness facilities and wide-open spaces. (Travel + Leisure, 2012)

- The cost of living in Metro Denver is only 5 percent above the national average and is well below that of many other major cities. (The Council for Community and Economic Research, Cost of Living Index, Q3 2012)

- Metro Denver voters approved the funding of FasTracks in November 2004. FasTracks is a $7.4 billion comprehensive plan for the design and construction of high-quality transit service and facilities. FasTracks will vastly improve mobility for current residents and future populations throughout the region.

- Metro Denver ranked third-sunniest among 20 major U.S. cities with an average 69 percent of days with sunshine. (U. S. National Oceanic and Atmospheric Administration, National Climatic Data Center, 2012)

### 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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<td>(P) Other communication &amp; energy wire mfg.</td>
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<td>Cable &amp; other pay television services</td>
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<tr>
<td>519130</td>
<td>(P) Internet publishing &amp; broadcasting &amp; web search portals</td>
<td>8999-0800</td>
<td>Communication services</td>
</tr>
<tr>
<td>561499</td>
<td>(P) 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
- Wi-Fi – Wireless Fidelity
- Fiber Optic Networks
- VoIP – Voice over Internet Protocol
- Nanotechnology
- Internet
- Photonics

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

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

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

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

Metro Denver and Northern Colorado Industry Cluster Profile

Colorado is an energy-rich state with abundant fossil, renewable, and alternative fuel resources. The energy cluster is diverse with both fossil fuel-based energy including oil, coal, and natural gas and renewable energy such as wind, solar, and biomass that contributes to its competitive position in the global marketplace. The state’s fossil fuel and renewable energy technologies, or cleantech, continue to drive job growth, fuel innovation and technology, and create new opportunities for economic prosperity.

This report evaluates the energy industry in the nine-county Metro Denver and Northern Colorado region in two subclusters: (1) fossil fuels and (2) cleantech. With nearly 44,910 energy workers in approximately 2,970 companies in 2012, the nine-county region continues to position itself as a world-class hub of energy activity. 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.

Colorado’s fossil fuel extraction has traditionally taken place in western Colorado, however many companies have Front Range refining and production facilities and Metro Denver corporate offices. Further, advances in horizontal drilling and hydraulic fracturing techniques have contributed to Northern Colorado’s rapidly expanding fossil fuel industry with increasing drilling operations and company expansions in the Denver-Julesburg Basin and Niobrara formations.

The nine-county region serves as the epicenter for uniting cleantech and traditional fossil energy. A key example is the Niobrara Energy Park—a 644-acre microgrid energy and technology park located in Weld County—that will combine a range of traditional and alternative energy-production operations. The Park is prezoned and approved for data centers, power generation, and multiple high technology uses. In addition, the location provides an ideal mix of uses given its proximity to fossil and cleantech resources and offers massive fiber connectivity. The project was awarded the Environmental Business Journal and Climate Change Business Journal Project Merit awards from Environmental Business International which recognizes projects that have achieved exceptional business performance in the environmental industry.

Cleantech

The nine-county region’s flourishing cleantech hub is facilitated by the cooperation between industry, research, and educational partnerships. A key example of this integration is the Colorado Energy Research Collaboratory—a partnership between the University of Colorado Boulder (CU-Boulder), the Colorado School of Mines, Colorado State University (CSU), and the National Renewable Energy Laboratory (NREL)—which brings together vast capabilities in researching, developing, and commercializing energy technologies through its six research centers. The research centers include the Colorado Center for Biorefining and Biofuels (C2B2),

1 The nine-county Metro Denver and Northern Colorado region consists of Adams, Arapahoe, Boulder, Broomfield, Denver, Douglas, Jefferson, Larimer, and Weld Counties.
the Center for Revolutionary Solar Photoconversion (CRSP), the Solar Technology Acceleration Center (SolarTAC), the Center for Research and Education in Wind (CREW), the Carbon Management Center, and the Energy Efficiency and Management Center. Since forming in 2007, the Collaboratory has generated $37 million in federal and private research funds.

Colorado is also one of only five states to have an industry association dedicated entirely to cleantech—the Colorado Cleantech Industry Association (CCIA). Formed in 2008, CCIA provides advocacy, data and research, and education and training to the cleantech sector. CCIA was one of the first regional cleantech organizations to become a chapter of the national Advanced Energy Economy (AEE) system which supports business and policy climates for the advanced energy sector. Further, the Coalition for a Clean Energy Future formed in 2012 to promote energy efficiency and renewable energy efforts in the state. The Coalition is a partnership among business leaders, environmental advocacy groups, civic organizations, industry associations, and students that will focus on efforts related to climate change, reducing air emissions, and supporting electric vehicle development.

The nine-county region is the site of convergence of the world’s renewable energy technology experts and international business leaders. In 2012, Denver hosted the inaugural World Renewable Energy Forum (WREF) which generated an estimated $3.5 million direct economic impact for the local economy and attracted thousands of renewable energy leaders from more than 65 countries. The international showcase helped to raise Denver’s profile as an innovative renewable energy center. Also, the fifth annual International Biomass Conference & Expo in Denver brought together more than 1,500 attendees, 220 exhibitors, and 120 speakers from more than 25 countries that explored topics related to biogas and landfill gas, commercial-scale biomass production, and advanced biofuels. The Conference is the largest gathering of biomass professionals, industry leaders, and academia in the world.

Colorado’s ambitious energy policies and substantial private and government funding continue to expand the state’s energy cluster. Legislation in 2010 created the nation’s second-highest Renewable Energy Standard (RES) that mandated a minimum of 30 percent of the state’s electricity come from renewable sources by 2020. Notable energy policy and funding announcements in 2012 included:

- The U.S. Environmental Protection Agency approved Colorado’s State Implementation Plan to reduce regional haze pollution in the state’s wilderness areas and national parks through 2018. Under the plan, Colorado will meet regional haze requirements outlined in the Clean Air-Clean Jobs Act of 2010 where coal-based power plants at 16 sites across the state will switch to natural gas or renewable energy to reduce emissions.
- The Solar Thermal Alliance of Colorado (STAC) unveiled a roadmap to transform Colorado into a global leader in solar-thermal energy production. Solar thermal systems absorb the sun’s energy to heat water or provide electricity in residential and commercial buildings. STAC hopes to expand Colorado’s solar thermal installed capacity by 2030 to more than 2,400 megawatts (MW) which would generate 15,600 jobs and $677 million in annual revenue. The roadmap outlines four key areas of activity to help Colorado reach these goals including increasing consumer awareness, developing financial mechanisms through collaboration, including solar thermal in the state’s energy standards, and solving local barriers.
- Panel leasing company SolarCity launched the Home Energy Loan program for upgrades in residential communities and small businesses that provides up to $5,000 for qualifying applicants. Elevations Credit Union committed $35 million in financing for renewable energy upgrades for businesses and residents in Boulder County and the City and County of Denver. Boulder’s EnergySmart and Denver’s Energy Challenge programs will provide funds for a wide range of upgrades including lighting and energy management, insulation and heating systems, and solar energy.
- Four Metro Denver projects were chosen to receive grants from the U.S. Department of Energy’s (DOE) Advanced Research Projects Agency-Energy program. NREL will receive two grants totaling nearly $1.7 million to develop a new approach to boost the efficiency of plastic solar cells and develop a solar thermal electric generator to convert heat from concentrated sunlight to electricity. CSU will receive $2 million to introduce genetic traits into crops that cannot currently be engineered and may eventually use them for biofuel. Finally,
CU-Boulder will receive $380,000 to use nanotechnology to improve the structure of gas-to-liquids catalysts, eventually used to convert natural gas to liquid fuels.

Colorado has one of the highest per capita concentrations of federally funded science and research centers in the nation. Among the state’s 24 federally funded research laboratories, Golden-based NREL serves as a cornerstone to the state’s energy cluster. NREL is the DOE’s only laboratory committed to the research, development, commercialization, and deployment of renewable energy and energy efficiency. Since 2009, NREL has spent $450 million on expansion efforts and its campus now totals nearly 2 million square feet. In 2012, NREL opened a $135 million, one-of-a-kind laboratory that will be used to test the impact of new devices on the nation’s electric grid. The Energy Systems Integration Facility will include 200 offices for scientists and administrative staff and a $10 million supercomputer that will expand NREL’s modeling and simulation capabilities and will have the world’s largest computing capability dedicated solely to renewable energy and energy efficient research. NREL is continually recognized for its exceptional discoveries in renewable energy and has received more than 100 awards and honors in recent years.

Other important developments among the region’s energy laboratories included two new advanced laboratory buildings for science and measurements that opened in Boulder in 2012. The $118.6 million Precision Measurement Laboratory on the National Institute of Standards and Technology (NIST) campus and the new $32.7 million X-Wing at JILA—a joint venture of NIST and CU-Boulder—will provide future training of scientists and upgraded facilities to support economic growth and technology innovation. In 2012, JILA celebrated its 50-year anniversary as one of the most prominent and well-respected programs in optical, molecular, and atomic physics and JILA’s discoveries have spun off more than 10 companies operating along the Front Range.

The nine-county region continues to foster the development of a sustainable bioenergy industry. Key company announcements and new project developments in 2012 included:

- Denver-based Enerjetik LLC partnered with North Carolina-based Maverick Biofuels to build a small-scale biofuels plant in Denver. The facility will convert solid waste into biofuels using gasification technology and processes to produce a variety of products including jet fuel, olefins, and other fuel products. The facility is expected to be operational by 2013 and could convert up to five tons of solid waste per day into fuel-based products.

- Littleton-based Community Power Corp. broke ground on a new $4.5 million headquarters facility in the Compark Business Campus in Douglas County and plans to nearly double the size of its current workforce. The facility will house the company’s research and development and manufacturing divisions and could be completed by mid-2013.

- Englewood-based Gevo partnered with Italy-based Beta Renewables to create an integrated process for the production of bio-based isobutanol from cellulosic biomass. The project includes the commercialization of Gevo’s sugar-to-isobutanol Gevo Integrated Fermentation Technology® (GIFT®) and ATJ technologies and Beta’s PROESATM technology that could be used for isobutanol-based chemicals and jet fuel.

- Longmont-based Sundrop Fuels will use the first-of-its-kind biofuels production method that converts almost any type of plant material into fuel. The company partnered with engineering company ThyssenKrupp Uhde to design the biomass gasification process for its first gasoline plant that will be built in Alexandria, Louisiana. The $700 million plant could produce 50 million gallons of gasoline each year.

- DOE awarded CU-Boulder’s Renewable and Sustainable Energy Institute $9.2 million to investigate ways to re-engineer E.coli bacteria to produce biofuels such as ethylene and isobutanol. The five-year grant is the first of its kind from DOE’s Office of Biological and Environmental Research.

The wind energy’s vital federal Production Tax Credit, which was set to expire at the end of 2012, was extended for one year. The credit will apply to projects started in 2013 but not operational until 2014 and saves 2.2 cents per kilowatt-hour of wind energy produced over the first 10 years of service. As doubts about the extension escalated, a number of companies trimmed their workforce in a response to a market slowdown in wind turbine orders. However, agencies such as DOE remain committed to Colorado as witnessed by the recent plan to expand NREL’s 305-acre National Wind Technology Center just south of Boulder. The expansion could include additional wind turbines, meteorological towers, a research and development laboratory, and a conference and learning center.
The nine-county region’s abundant solar resources give companies a competitive edge and hotbeds of solar energy continue to drive demand for solar energy systems across the region. Some key solar energy announcements in 2012 included:

- Berken Energy relocated its headquarters from New Mexico to Fort Collins and plans to hire 50 scientists, engineers, and technicians in 2013. The company produces thermovoltaic technology, which involves generating electricity with semiconductor devices that capture heat.

- The Denver Housing Authority (DHA) signed a $10 million, 20-year solar power purchase agreement with Denver-based Oak Leaf Partners and Atlanta-based Enfinity America Corp. to install 668 solar electric systems on 387 affordable DHA housing buildings. Boulder-based Namasté Solar Electric Inc. will install the solar panels and will hire 40 new employees to aid in the project. The 2.5-MW project—one of the largest in Metro Denver’s history in terms of the number of buildings and MW—is slated for completion in April 2013.

- Boulder-based Concept3D Inc. and Parker-based Simply Civic LLC received more than $1.7 million from the DOE to help fund pilot projects to reduce the cost of rooftop solar installation. Concept3D will receive nearly $1.3 million to limit the time of onsite surveys, system design, financing due diligence, and permitting, while Simply Civic LLC will receive nearly $500,000 to create an online application to automate and manage permits and inspection requests.

- The E-470 Public Highway Authority completed the installation of solar arrays along a 17-mile stretch between 64th Avenue and Gartrell Road. The solar arrays will provide enough power for streetlights, message signs, toll collection plazas and equipment, maintenance facilities, and the E-470 administrative headquarters. The highway’s 20-year solar power purchase agreement with New York-based Adamas will save 24,000 metric tons of carbon dioxide emissions and about $1 million in energy costs.

The nine-county region serves as a green transportation hub, offering innovative solutions that reduce a community’s carbon footprint and increase livability. Legislation passed in 2012 will ensure future development of Colorado’s alternative fuel vehicle market. House Bill 12-1258 enables retail, fleet, and community venues to host locations for compressed natural gas (CNG) and electric vehicles to refuel. The bill also supports the infrastructure needed by removing existing regulation so that natural gas and electricity can be sold to alternative fuel vehicles. Key developments in the region’s green transportation market in 2012 included:

- Longmont-based UQM Technologies Inc. supplied propulsion units for 100 electric trucks to the United Parcel Service that will be used in the Los Angeles area. The all-electric fleet will be one of the largest of its kind in the world.

- The Weld County Natural Gas Coalition opened its first CNG fueling station in Firestone. Three other CNG stations are planned for Kersey, Greeley, and Fort Lupton over the next few years.

- Fort Collins-based VanDyne SuperTurbo Inc. secured $8 million in venture capital funding to perform durability testing of its fuel-efficient engine turbochargers. The company's SuperTurbochargers increase fuel efficiency in trucks up to 6 percent and increase automobile fuel efficiency by up to 30 percent.

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 seventh of the 50 largest metro areas in cleantech employment concentration in 2012. With direct employment of 18,750 workers, the region ranked seventh out of the 50 largest metro areas in absolute employment. About 85 percent of Colorado’s cleantech employment was located in the region.
Cleantech Employment

- The cleantech subcluster directly employed 18,750 people in the nine-county region in 2012.
- The region's unique cleantech assets, innovative technologies, and strong industry partnerships support a growing network of cleantech companies. The region's cleantech employment increased 36.8 percent between 2007 and 2012, compared with a 13.8 percent increase nationwide.
- Cleantech companies employed 1 percent of the region's total employment base, compared with a 0.5 percent employment concentration nationwide.

- More than half of the region's cleantech employees provided energy research, environmental and scientific consulting, and air, water, and solid waste management services.
- Sixty-seven percent of the employment in the cleantech subcluster was located in Jefferson (36 percent) and Boulder (18 percent) Counties, and the City and County of Denver (14 percent).

Cleantech Wages

The 2011 average annual salary for cleantech employees was $78,120 in the nine-county region, compared with the national average of $72,980. Nine-county payroll in the subcluster reached nearly $1.5 billion in 2011.

**Denver-Aurora-Broomfield MSA Occupational Salaries, 2011 Annual Average**

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Nine-County Region</th>
<th>U.S.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geoscientists</td>
<td>$109,480</td>
<td></td>
</tr>
<tr>
<td>Environmental Engineers</td>
<td>$91,820</td>
<td></td>
</tr>
<tr>
<td>Electrical Engineers</td>
<td>$84,900</td>
<td></td>
</tr>
<tr>
<td>Environmental Scientists and Specialists</td>
<td>$81,170</td>
<td></td>
</tr>
<tr>
<td>Environmental Engineering Technicians</td>
<td>$43,630</td>
<td></td>
</tr>
<tr>
<td>Construction and Related Workers, All Other</td>
<td>$33,140</td>
<td></td>
</tr>
</tbody>
</table>

*Mean annual salary data is for the 10-county Denver-Aurora-Broomfield Metropolitan Statistical Area (MSA) consisting of Adams, Arapahoe, Broomfield, Clear Creek, Denver, Douglas, Elbert, Gilpin, Jefferson, and Park Counties.

Cleantech Companies

- About 1,420 cleantech companies operated in the nine-county region in 2012.
- Approximately 80 percent of the region’s companies employed fewer than 10 people, while 0.7 percent employed more than 250 people.
- More than 57 percent of the region’s cleantech companies provided environmental and scientific consulting and earth science services.
- Roughly 63 percent of the cleantech subcluster companies were located in the City and County of Denver and in Jefferson and Boulder Counties.

Major Cleantech Energy Companies

- Abengoa Solar
  www.abengoasolar.com
- Adobe Solar
  www.adobesolar.com
- Aluwind Inc.
  www.aluwind.com
- Ambient Energy Inc.
  www.ambient-e.com
- ARCADIS
  www.arcadis.com
- Ascent Solar Technologies, Inc.
  www.ascentsolar.com
- Bella Energy
  www.bellaenergy.com
- Beyond Aviation
  www.beyond-aviation.com
- Blue Sun Biodiesel
  www.gobluesun.com
- Boulder Wind Power
  www.boulderwindpower.com
- Envirofit International, Ltd.
  www.envirofit.org
- GE Energy
  www.gepower.com
- Gevo Inc.
  www.gevo.com
- juwi Wind/Solar
  www.juwi.com
- Lightning Hybrids, Inc.
  http://lightninghybrids.com
- Namasté Solar
  www.namastesolar.com
- Nokero
  www.nokero.com
- RavenBrick, LLC
  www.ravenbrick.com
- Rentech, Inc.
  www.rentechinc.com
- REpower USA Corp.
  www.repower.de
- RES Americas, Inc.
  www.res-americas.com
- Shaw Environmental
  www.shawgrp.com
- Siemens Energy
  www.siemens.com
- SkyFuel Inc.
  www.skyfuel.com
- SMA America, LLC
  www.sma-america.com
- Sundrop Fuels, Inc.
  www.sundropfuels.com
- Tetra Tech Inc.
  www.tetratech.com
- UQM Technologies, Inc.
  www.uqm.com
- URS Corporation
  www.urscorp.com
- VAIEX air systems
  www.vairex.com
- Versa Power Systems
  www.versa-power.com
- Vestas
  www.vestas.com
- Woodward
  www.woodward.com
Fossil Fuels

Colorado offers a rich complement of natural resources, including fossil fuel-rich basins and substantial quantities of coal, crude oil, and natural gas. 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 more than 49,990 as of December 2012, with 39 percent of total active wells in Weld County. The state is estimated to have produced a record 40 million barrels of oil in 2012, driven by new wells—particularly in Colorado's Niobrara formation—and increased interest in oil and gas development.

Oil and gas companies continued to expand in 2012 in the Niobrara shale formation located in northeast Colorado's rich Denver-Julesburg Basin. The 7,000-foot-deep geographic layer also includes parts of Wyoming, Nebraska, and Kansas and could hold as much as two billion barrels of recoverable oil reserves in the formation. Further, the discovery of oil in the Niobrara continues to drive merger and acquisition activity. In fact, more than one-third of the deals in the Rocky Mountain region made in the first six months of 2012 were in the Niobrara valued at $2.5 billion and nearly $10 billion in merger and acquisition activity was generated in the region in 2011. Even though Niobrara is in its early stages of development, the formation is producing roughly 10,000 barrels of oil each day. Notable company announcements in 2012 included:

- San Antonio-based NuStar Energy LP plans to build a series of pipelines in the Niobrara formation that would transport crude petroleum from Niobrara to existing refineries in Colorado, Texas, and Oklahoma. The Niobrara Falls Project could transport up to 75,000 barrels a day and could be operational by early 2014.
- DCP Midstream LLC will double its natural gas processing capacity to 800 million cubic feet in the Denver-Julesburg Basin by late 2014. The company broke ground on its new $270 million LaSalle Plant in Weld County which will process up to 160 million cubic feet per day and unveiled plans for a new natural gas plant northeast of Greeley that will have a maximum capacity of 230 million cubic feet per day. Both plants are expected to be operational by late 2014. The upgrades are part of the company's more than $4 billion growth and expansion plan in Weld County by 2015.
- Houston-based Plains All American Pipeline LP will build a crude oil loading facility in Weld County to service the increasing oil production in the Denver-Julesburg basin. The facility will ship up to 68,000 barrels of oil each day to refineries via railway and will be operational by the fall of 2013.
- Oklahoma-based ONEOK Partners LP unveiled plans for a 1,300-mile crude-oil pipeline with the capacity to transport 200,000 barrels a day from the Bakken Shale oil fields of North Dakota to the Cushing oil market. The Bakken Crude Express Pipeline will cross the
northeast corner of Colorado and will be well-positioned to transport crude oil production from
the Niobrara Shale. Construction of the project is expected to begin in 2014 and will be
completed by 2015.
• XTO Energy, a subsidiary of ExxonMobil Corp., moved into a new western region
headquarters in the Meridian Business Park in Douglas County in 2012. XTO Energy
oversees the operations of nearly 700 employees in six states, including Colorado.
• BP awarded CSU a $5 million grant to study oil and gas recovery technology. The five-year
grant will help researchers understand new ways to revitalize oil and gas wells and minimize
their environmental impacts.
• Noble Energy Inc. will invest nearly $10 billion over the next five years to expand horizontal
drilling operations in the Niobrara shale formation. The company plans to double its number
of horizontal wells and opened its new operations center in Greeley to support its increased
activity in the area.
• DCP Midstream will partner with Enterprise Products Partners and Anadarko Petroleum to
build a 435-mile natural gas pipeline between Colorado and refineries on the nation’s Gulf
Coast. The Front Range pipeline could produce up to 150,000 barrels per day and is
expected to be operational by late 2013.
• Halliburton selected Windsor as the site for its new 54-acre sand storage facility in 2012.
Material stored at the facility will be used for hydraulic fracturing, and will support at least 500
new and existing jobs.
• Anadarko Petroleum Corp. invested $1 billion in Weld County in 2012. Since 2007, the
company has invested nearly $2 billion in Weld County and plans to add additional rigs to its
existing nine horizontal rigs in the area.
• Carrizo Oil & Gas added 12 wells to its existing capacity in the Niobrara play and invested
$43 million in the area in 2012. The company’s proven oil reserves are estimated at more
than 730,000 barrels and plans to expand operations over the next few years.

**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 30, 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 2012.* With direct employment in fossil fuels of about 26,160
workers, the region ranked third in absolute employment. As of 2012, about 60 percent of
Colorado’s fossil fuels employees worked in the region.

<table>
<thead>
<tr>
<th>Nine-County Region</th>
<th>U.S.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct Employment, 2012</td>
<td>26,160</td>
</tr>
<tr>
<td>Number of Direct Companies, 2012</td>
<td>1,550</td>
</tr>
<tr>
<td>One-Year Direct Employment Growth, 2011-2012</td>
<td>9.3%</td>
</tr>
<tr>
<td>Five-Year Direct Employment Growth, 2007-2012</td>
<td>29.3%</td>
</tr>
<tr>
<td>Avg. Annual Direct Employment Growth, 2007-2012</td>
<td>5.3%</td>
</tr>
<tr>
<td>Direct Employment Concentration</td>
<td>1.4%</td>
</tr>
</tbody>
</table>

*Sources: Dun & Bradstreet, Inc. Marketplace database, July-Sept. 2007-2010; Market Analysis Profile, 2011-2012;
Development Research Partners.*
The fossil fuels subcluster directly employed about 26,160 workers in the region in 2012. Drilling and mining activity tends to be concentrated in the Rocky Mountains, along the Western Slope, and in Weld County, while fuel refineries and headquarters facilities are located throughout the Front Range.

- Fossil fuels companies accounted for 1.4 percent of the nine-county region’s total employment based, compared with a 1.1 percent concentration nationally.
- The nine-county region’s growing fossil fuel opportunities and the ongoing development of shale oil plays such as the Denver-Julesburg Basin and Niobrara formations contributed to healthy employment gains in 2012.

- Employment in the region’s fossil fuel subcluster increased 29.3 percent between 2007 and 2012, compared with a 14.3 percent increase nationally.
- About 82 percent of the employment in the fossil fuels subcluster was concentrated in the City and County of Denver (54 percent) and in Weld (15 percent) and Adams (13 percent) Counties. More than 56 percent of the region’s fossil fuels employees worked in petroleum and natural gas exploration and extraction support activities for oil and gas operations.

**Fossil Fuels Employment**

<table>
<thead>
<tr>
<th>Year</th>
<th>Nine-County Region</th>
<th>United States</th>
<th>Avg Annual Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2008</td>
<td></td>
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<td>2012</td>
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</tbody>
</table>


**Fossil Fuels Wages**

The 2011 average annual salary for a fossil fuels worker in the nine-county region was $110,280, compared with the national average of $92,170. The nine-county region’s fossil fuels payroll exceeded $2.6 billion in 2011.

**Denver-Aurora-Broomfield MSA Occupational Salaries, 2011 Annual Average**

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Salary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Petroleum Engineers</td>
<td>$128,820</td>
</tr>
<tr>
<td>Mining and Geological Engineers</td>
<td>$100,520</td>
</tr>
<tr>
<td>Petroleum Pump System and Refinery Operators</td>
<td>$69,470</td>
</tr>
<tr>
<td>Geological and Petroleum Technicians</td>
<td>$65,970</td>
</tr>
<tr>
<td>Plant and System Operators</td>
<td>$51,290</td>
</tr>
</tbody>
</table>

*Mean annual salary data is for the 10-county Denver-Aurora-Broomfield Metropolitan Statistical Area (MSA) consisting of Adams, Arapahoe, Broomfield, Clear Creek, Denver, Douglas, Elbert, Gilpin, Jefferson, and Park Counties.

Fossil Fuels Companies

- About 1,550 fossil fuels companies operated in the nine-county region in 2012.
- Approximately 66 percent of the region’s fossil fuels companies employed fewer than 10 people, while 1.1 percent employed 250 or more.
- Fifty-eight percent of the region’s fossil fuels companies provided petroleum and natural gas exploration and extraction services and support activities for oil and gas operations.
- More than 69 percent of the region’s fossil fuel companies were located in the City and County of Denver (38 percent) and in Jefferson (17 percent) and Arapahoe Counties (14 percent).

Major Fossil Fuels Companies

- Anadarko Petroleum Corporation  www.anadarko.com
- BP America  www.bp.com
- Berry Petroleum Company  www.bry.com
- Bill Barrett Corp.  www.billbarretcorp.com
- Cimarex Energy  www.cimarex.com
- Colorado Energy Management LLC  www.coloradoenergy.com
- ConocoPhillips Co.  www.conocophillips.com
- DCP Midstream  www.dcpmidstream.com
- Encana Corporation  www.encana.com
- Endeavour International North America  www.endeavourcorp.com
- Forest Oil  www.forestoil.com
- Halliburton  www.halliburton.com
- InfraSource, Inc.  www.infraresourceus.com
- Intermountain Rural Electric Association  www.intermountain-rea.com
- Kinder Morgan  www.kindermorgan.com
- Magellan Petroleum Corporation  www.magellanpetroleum.com
- MarkWest Energy Partners, L.P.  www.markwest.com
- Noble Energy, Inc.  www.nobleenergyinc.com
- Northern Pipeline Construction  www.gonpl.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
- TransMontaigne Inc.  www.transmontaigne.com
- Tri-State Generation & Transmission Assoc.  www.tristategt.org
- United Power  www.unitedpower.com
- Venoco, Inc.  www.venocoinc.com
- Westmoreland Coal Company  www.westmoreland.com
- Whiting Petroleum Corp.  www.whiting.com
- Williams  www.cowilliams.com/
- Xcel Energy  www.xcelenergy.com

Note: The increase in the number of companies in 2011 is attributed to a break in the data series due to new methodology and enhanced company inclusion. Therefore, historical data is not comparable to 2011. Source: Dun & Bradstreet, Inc., Marketplace database, July–Sept. 2006–2010; Market Analysis Profile, 2011-2012.
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 26 million short tons of coal, or 2.5 percent of the nationwide supply in 2011. 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, 2012)

- **Natural Gas** - Colorado is among the top-five natural gas-producing states and accounts for more than 7 percent of U.S. natural gas production. The state also had the nation's largest reserve of coalbed methane, a fuel source that accounts for more than 40 percent of Colorado's natural gas production and nearly 30 percent of all coalbed methane produced in the nation. (U.S. Department of Energy, Energy Information Administration, 2012)

- **Oil** - Colorado produced 39 million barrels of crude oil in 2011 and ranked as the 10th-largest crude oil producer in the nation. Although Colorado’s 501 million barrels of proved oil reserves accounted for only about 2 percent of the U.S. total in 2010, Colorado has large deposits of oil shale rock which can be converted into crude oil. In fact, Western Colorado’s Piceance Basin is the richest oil shale deposit in the world and holds an estimated 1.5 trillion barrels of recoverable oil reserves. (U.S. Department of Energy, Energy Information Administration, 2012; U.S. Geological Survey, 2012)

- **Colorado transports** roughly 60 percent of its unused natural gas to markets in the Midwest and West via the Rockies Express Pipeline. The 1,679-mile, high-speed pipeline system—the largest interstate gas pipeline project in more than 20 years—extends from the Piceance Basin in Colorado to Clarington, Ohio and became fully operational in 2009 with a capacity of 1.8 billion cubic feet per day of natural gas. (U.S. Department of Energy, Energy Information Administration, 2012; Kinder Morgan, 2012)

- **Colorado is strategically located** along America’s Energy Corridor, which runs from Canada to Mexico.

- **Ten of the nation’s 100 largest natural gas fields and three of the 100 largest oil fields are located in Colorado.** (U.S. Department of Energy, Energy Information Administration, 2012)

Colorado is a top 10 cleantech location with newly enacted requirements for renewable energy generation and access to clean energy resources.

- **Wind** - Colorado’s wind portfolio continues to grow. The state ranked ninth in the nation for total installed wind power capacity in 2012 and has the 12th-highest wind resource potential of the states. In fact, Colorado’s wind resource potential could provide nearly 25 times the state’s current electricity needs. (American Wind Energy Association, 2011; SNL Financial Operating Dataset, 2012)

- **Biomass** - Biomass accounted for 1 percent of the state’s renewable energy generation in 2010. Of Colorado’s 24 million acres of forestland, an estimated 6 million acres have a high or moderate potential for future biomass production. (U.S. Department of Energy, Energy Information Administration, 2012; Colorado State Forest Service, 2012)

- **Solar** - Colorado had the sixth-highest installed solar energy capacity in the nation and more than doubled its solar capacity to 130 megawatts between 2011 and 2012. Three new solar projects in south-central Colorado—a high potential solar resource area—contributed to the capacity additions in 2012. (SNL Financial, 2012)

- **Water** - Major rivers flowing through Colorado offer hydroelectric power resources. Nearly one-third of the renewable energy generated in the state was produced using hydroelectric resources totaling more than 1.7 million megawatt hours (MWh). (U.S. Department of Energy, Energy Information Administration, 2012; National Renewable Energy Laboratory, 2012)

- **Denver was named the first “Solar Friendly Community” under the U.S. Department of Energy’s (DOE) Solar Friendly Communities program.** The designation recognized Denver’s efforts to cut the cost and time necessary to obtain permits for solar power system installations. Denver’s permit fees were reduced to $50 and can be issued in as
little as 15 minutes compared to 20 days in other jurisdictions. (U.S. Department of Energy, 2012)

- Denver ranked 11th among 25 U.S. cities with the greatest number of energy-efficient buildings that earned the 2011 U.S. Environmental Protection Agency’s Energy Star certification. Energy Star enhancements in Denver’s 160 certified buildings will save nearly $33 million annually in energy costs while preventing greenhouse gas emissions equivalent to emissions from the annual energy use of 8,500 homes a year. (U.S. Environmental Protection Agency, 2012)

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 36 percent has completed a bachelor's or higher-level degree, making Colorado the third-most highly educated state in the nation behind Massachusetts and Maryland. (U.S. Census Bureau, 2011 American Community Survey)
   - The American Wind Energy Association ranked Colorado sixth in the nation for total amount of electricity generated from wind in 2011. Colorado’s wind power companies employed between 4,000 and 5,000 workers and are vital to economic development efforts while supporting local manufacturing jobs. (American Wind Energy Association, 2012)
   - Denver ranked as the nation’s sixth-most active cleantech market in Clean Edge Inc.’s inaugural 2012 “U.S. Metro Clean Tech Index.” To compile the ranking, contributors calculated the nation’s 50 largest metropolitan areas index score in four equally-weighted categories including green buildings, advanced transportation, clean electricity and carbon management, and cleantech investment, innovation, and workforce. Denver was recognized for its cutting-edge technology development, high concentration of green buildings, and its proximity to cleantech companies and NREL. (Clean Edge, Inc., 2012)
   - The Colorado Energy Coalition (CEC), a consortium of leaders and stakeholders in Colorado’s diverse energy industry, works to make Colorado an even more competitive place for all energy-related sectors to do business and to market Colorado’s dynamic energy economy nationwide.
   - The Colorado Academy for the Development of STEM-related Careers—a partnership between the Metropolitan State University of Denver, the Colorado School of Mines, the Community College of Denver, and the Cherry Creek School District—is designed to position the state as a leader in scientific and technology education. The overall program ensures Colorado students from kindergarten to graduate level receive specialized training and certifications to connect targeted communities to job readiness and career enhancement, coordinate with state Workforce Centers, and assist in job placement.
   - The Colorado Clean Energy Cluster (CCEC) is an economic development organization that is dedicated to growing clean energy jobs and aims to generate $325 million in economic activity from clean energy by 2015 in Northern Colorado. Launched in 2006, the CCEC and its business partners support more than 30 companies employing 3,000 people and plan to replicate their Northern Colorado success with initiatives statewide including the International Cleantech Network, FortZED, and the Supply Chain Initiative. (The Colorado Clean Energy Cluster, 2012)
   - Legislation passed in 2012 will help match Colorado’s industry need for skilled workers to the training provided in the state’s education and workforce programs. House Bill 12-1061 established the Skills for Jobs Act that directs the Colorado Department of Higher Education to coordinate with other state agencies to identify workforce needs, education credential production, the gap between the two, and potential actions to help close the gap and ensure the state’s workforce has marketable skills needed to continue growing the state’s economy.

2. **Proximity to energy-related higher education programs and research centers**
   - Colorado ranked 10th in the number of science and engineering graduate students per 1,000 individuals ages 25 to 34 years old in 2009. Universities such as the Colorado School of Mines, the University of Colorado Boulder (CU-Boulder), and Colorado State
University (CSU) all offer competitive science and engineering doctorate programs and research facilities. (National Science Foundation, 2012)

- Colorado ranked 12th for research and development expenditures per capita among academic institutions in fiscal year 2010. Research and development spending indicates a strong entrepreneurial economy and substantial federal investments in Colorado universities. (National Science Foundation, 2012)
- Colorado ranked 13th in the nation for the number of science and engineering doctorate holders as a percent of the workforce. (National Science Foundation, 2012)
- The Colorado School of Mines in Golden is one of the few universities in the world to offer programs from baccalaureate through doctorate levels in all key fields related to energy. These fields include geological engineering, geophysical engineering, mining & earth systems engineering, petroleum engineering, chemical engineering, mineral & energy economics, materials science, engineering, physics, and others. (Colorado School of Mines, 2012)

- Education Corporation of America’s Ecotech Institute launched in 2010 and is the first and only college in the U.S. focused on training students for careers in cleantech. The Institute offers two-year associate’s degrees in solar and wind energy technology, renewable energy technology, electrical engineering and energy efficiency, and the newest program in power utility technician, in addition to several other disciplines designed for graduates’ direct entry into the cleantech workforce. In June 2012, numerous companies across Metro Denver and in six different states hired Ecotech’s first group of graduates. (Ecotech Institute, 2012)

- The Colorado Fuel Cell Center, a Colorado School of Mines research center, collaborates with government organizations, academic institutions, and industry stakeholders to develop and commercialize fuel cell technologies. The Center’s Slater Laboratory for Energy Conservation allows researchers to explore precision ink-jet processes for fabrication of solid-oxide fuel cells. (Colorado Fuel Cell Center, 2012)

- The Colorado Energy Research Institute (CERI), located at the Colorado School of Mines, promotes energy-related research and educational programs for government, industry, colleges and universities, and the public. The Colorado School of Mines—in conjunction with CERI’s established Colorado Oil Shale Technology and Research Center—hosts the annual Oil Shale Symposium, which draws worldwide participants. (Colorado School of Mines, 2012)

- The Colorado School of Mines, CU-Boulder, CSU, and NREL formed the Colorado Energy Research Collaboratory in 2007. The Collaboratory combines resources from each of the four institutions and works with public entities and industry partners to research and commercialize renewable energy and energy efficiency technologies. The Collaboratory has successfully launched six research centers and partnerships including the Colorado Center for Biorefining and Biofuels (C2B2), the Center for Revolutionary Solar Photoconversion (CRSP), the Solar Technology Acceleration Center (SolarTAC), the Center for Research and Education in Wind, the Carbon Management Center, and the Energy Efficiency and Management Center. (Colorado Energy Research Collaboratory, 2012)

- The Renewable Energy Materials Research and Engineering Center (REMRSEC)—in partnership with scientists and engineers at the NREL—is a key national and international resource that offers a broad spectrum of renewable energy research ranging from next generation photovoltaic research to advanced membrane and technology transfer. REMRSEC, located at the Colorado School of Mines, works closely with five other centers including the Colorado Fuel Center, the Microintegrated Optics for Advanced Bioimaging and Control (MOABC), the Golden Energy Computing Organization (GECO), the Electron Microscopy Laboratory, and the Nuclear Magnetic Resonance Laboratory (NMR). (Colorado School of Mines, 2012)

- CRSP, launched in 2008 as part of the Colorado Energy Research Collaboratory, researches and pursues advanced approaches to convert solar energy into highly efficient, low-cost fuels and electricity. As part of six research centers formed by the Collaboratory, CRSP focuses on cost-competitive solar energy utilization. (Center for Revolutionary Solar Photoconversion, 2012)
• C2B2 was formed in 2007 as a cooperative research and education center of the Colorado Energy Research Collaboratory devoted to the conversion of biomass to gasoline, diesel fuels, and other products. The center offers researchers, laboratories, students, and educators from CU-Boulder, CSU, Colorado School of Mines, and NREL unique strengths in six research areas ranging from feedstock engineering and biochemical engineering to thermochemical and process engineering and product engineering. C2B2 has nearly 15 industry sponsors, more than any bioenergy research center in the nation. (Colorado Center for Biorefining and Biofuels, 2012)

• CSU's Natural Gas Initiative is an interdisciplinary group of scientists across its eight colleges offering diverse expertise to focus on collaborative solutions for the responsible production of natural gas. The Initiative hosts the annual Natural Gas Symposium, which offers opportunities to promote CSU's strengths in natural gas solutions and highlights potential research collaborations between researchers, industry, and community members to explore the natural gas economy, its impacts in Colorado, and offer solutions to energy development in the state. (Colorado State University, 2012)

• The CSU Engines and Energy Conversion Laboratory (EECL) is one of the largest and most influential engines research programs in the nation and develops market-driven products in partnership with industrial sponsors to reduce pollution in the atmosphere. The EECL is building an $18.5 million expansion—slated for completion by 2013—that will result in the Engines Lab reaching more than 90,000 square feet and will add laboratories, classrooms, offices, and support space. The EECL will also be home to the new Powerhouse Energy Institute, former Colorado Gov. Bill Ritter’s Center for the New Energy Economy, and several other CSU energy programs. (Colorado State University, 2012)

• The Solar Technology Acceleration Center (SolarTAC)—the nation’s largest solar technology testing facility—provides a 74-acre venue in Aurora for researching, demonstrating, and validating a broad range of solar technologies at the early commercial or near-commercial stage of development. SolarTAC offers flat, graded topography and excellent insolation conditions with more than 300 days of sunshine a year in one of the nation’s most progressive renewable energy states. SolarTAC is negotiating with the city of Aurora for an additional 200 acres that would create opportunities for workforce training and microgrid applications. (SolarTAC, 2012)

• Four Metro Denver institutions were recognized in The Princeton Review’s 2012 “Guide to 322 Green Colleges” as environmentally responsibility. Metro Denver honorees included the University of Denver, CU-Boulder, CSU, and Naropa University in Boulder. Institutions named to the list demonstrated notable commitments to sustainability in their academic offerings, campus infrastructure and activities, and career preparation. (The Princeton Review, 2012)

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

• NREL is the only federal laboratory dedicated to the research, development, commercialization, and deployment of renewable energy and energy efficiency research and development. Since 1982, NREL has won more than 50 prestigious “R&D 100 Awards” which are presented to the 100 most important technological innovations each year. The DOE and other government organizations and agencies also recognize NREL as a center for scientific and technical achievements. NREL contributed $831 million to the state's economy in 2011 and accounted for more than 6,200 direct and indirect jobs. (National Renewable Energy Laboratory, 2012)

• 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 DOE; 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.

• Legislation passed in 2012 will ensure future development of Colorado’s alternative fuel vehicle market. House Bill 12-1258 will enable retail, fleet, and community venues to host
locations for compressed natural gas and electric vehicles to refuel. The bill also supports the infrastructure needed by removing existing regulation so that natural gas and electricity can be sold to alternative fuel vehicles.

- The Colorado Office of Economic Development and International Trade's Colorado Export of Innovative & Sustainable Technologies (CO-EXist) fund supports business exchanges between Colorado cleantech companies, industry leaders, and government entities in China, Mexico, Japan, and Canada working on energy efficiency and environmental remediation technology. Launched in 2009, the four-year program has resulted in $33 million in cleantech exports over the past three years.

- The Innovation Center of the Rockies (ICR) and CSU Ventures partnered to accelerate the creation of new businesses and continue building the state’s entrepreneurial ecosystem of university research, venture capital, and industry leadership. The partnership will facilitate and develop the intellectual properties necessary in the energy industry and expand ICR’s network of organizations to commercialize technologies funded by the Small Business Innovation Research grants.

### Energy Industry Cluster Definition

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**Cleantech**

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<td>Steam supply systems, including geothermal</td>
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<tr>
<td>221115**</td>
<td>Wind electric power generation</td>
<td>1781-9901</td>
<td>Geothermal drilling</td>
</tr>
<tr>
<td>221116**</td>
<td>Geothermal electric power generation</td>
<td>1731-0202</td>
<td>Energy management controls</td>
</tr>
<tr>
<td>221117**</td>
<td>Biomass electric power generation</td>
<td>1711-0403</td>
<td>Solar energy contractor</td>
</tr>
<tr>
<td>221118**</td>
<td>Other electric power generation</td>
<td>1742-0204</td>
<td>Solar reflecting insulation film</td>
</tr>
<tr>
<td>237110</td>
<td>Water &amp; sewer line &amp; related structures construction</td>
<td>1729-0403</td>
<td>Cord &amp; fabric for reinforcing fuel cells</td>
</tr>
<tr>
<td>237130</td>
<td>Electrical contractors &amp; other wiring installation</td>
<td>3212-0301</td>
<td>Steam supply systems, including geothermal</td>
</tr>
<tr>
<td>238210</td>
<td>Electrical contractors &amp; other wiring installation</td>
<td>3212-0303</td>
<td>Steam supply systems, including geothermal</td>
</tr>
<tr>
<td>238310</td>
<td>Drywall &amp; insulation contractors</td>
<td>3212-0305</td>
<td>Steam supply systems, including geothermal</td>
</tr>
<tr>
<td>314994</td>
<td>Rope, cordage, twine, tire cord, &amp; tire fabric mills</td>
<td>3212-0307</td>
<td>Steam supply systems, including geothermal</td>
</tr>
<tr>
<td>325180</td>
<td>Ethyl alcohol mfg.</td>
<td>2819-06</td>
<td>Fuels &amp; radioactive compounds</td>
</tr>
<tr>
<td>325193</td>
<td>Ethyl alcohol mfg.</td>
<td>2869-0104</td>
<td>Ethyl alcohol, ethanol</td>
</tr>
<tr>
<td>333414</td>
<td>Heating equipment (except warm air furnaces) mfg.</td>
<td>3433-9904</td>
<td>Solar heaters &amp; collectors</td>
</tr>
<tr>
<td>333611</td>
<td>Turbine &amp; turbine generator set units mfg.</td>
<td>3511</td>
<td>Turbines &amp; turbine generator sets</td>
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<tr>
<td>334413</td>
<td>Semiconductor &amp; related device mfg.</td>
<td>3674-0305</td>
<td>Photovoltaic devices, solid state</td>
</tr>
<tr>
<td>334413</td>
<td>Semiconductor &amp; related device mfg.</td>
<td>3674-0306</td>
<td>Solar cells</td>
</tr>
<tr>
<td>334413</td>
<td>Semiconductor &amp; related device mfg.</td>
<td>3674-9901</td>
<td>Fuel cells, solid state</td>
</tr>
<tr>
<td>334512</td>
<td>Automatic environmental control mfg. for residential,</td>
<td>3822</td>
<td>Environmental controls</td>
</tr>
<tr>
<td>334515</td>
<td>Instrument mfg. for measuring &amp; testing electricity</td>
<td>3825-0305</td>
<td>Electrical power measuring equipment</td>
</tr>
<tr>
<td>334515</td>
<td>Instrument mfg. for measuring &amp; testing electricity</td>
<td>3825-0306</td>
<td>Energy measuring equipment, electrical</td>
</tr>
<tr>
<td>334519</td>
<td>Other measuring &amp; controlling device mfg.</td>
<td>3829-0218</td>
<td>Solarimeters</td>
</tr>
<tr>
<td>335311</td>
<td>Power, distribution, &amp; specialty transformer mfg.</td>
<td>3612</td>
<td>Power, distribution, &amp; specialty transformers</td>
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<tr>
<td>NAICS Code*</td>
<td>NAICS Description</td>
<td>SIC Code</td>
<td>SIC Description</td>
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<tr>
<td>-------------</td>
<td>-------------------------------------------------------</td>
<td>----------</td>
<td>-----------------------------------------------------</td>
</tr>
<tr>
<td>335312</td>
<td>Motor &amp; generator mfg.</td>
<td>3621-03</td>
<td>Control equipment for electric buses &amp; locomotives</td>
</tr>
<tr>
<td>335312</td>
<td>Motor &amp; generator mfg.</td>
<td>3621-9909</td>
<td>Windmills, electric generating</td>
</tr>
<tr>
<td>335911</td>
<td>Storage battery mfg.</td>
<td>3691</td>
<td>Storage batteries</td>
</tr>
<tr>
<td>335999</td>
<td>All other misc. electrical equipment &amp; component mfg.</td>
<td>3629-0102</td>
<td>Electrochemical generators (fuel cells)</td>
</tr>
<tr>
<td>336111</td>
<td>Automobile mfg.</td>
<td>3711-0104</td>
<td>Cars, electric, assembly of</td>
</tr>
<tr>
<td>336390</td>
<td>Other motor vehicle parts mfg.</td>
<td>3799-0302</td>
<td>Cars, off-highway: electric</td>
</tr>
<tr>
<td>423720</td>
<td>Plumbing &amp; heating equipment &amp; supplies (hydronics)</td>
<td>5074-0208</td>
<td>Heating equipment &amp; panels, solar</td>
</tr>
<tr>
<td>482111</td>
<td>Line-haul railroads</td>
<td>4011-9901</td>
<td>Electric railroads</td>
</tr>
<tr>
<td>541380</td>
<td>Testing laboratories</td>
<td>8734-00</td>
<td>Testing laboratories</td>
</tr>
<tr>
<td>541380</td>
<td>Testing laboratories</td>
<td>8734-9902</td>
<td>Calibration &amp; certification</td>
</tr>
<tr>
<td>541620</td>
<td>Environmental consulting services</td>
<td>8748-9905</td>
<td>Environmental consultant</td>
</tr>
<tr>
<td>541620</td>
<td>Environmental consulting services</td>
<td>8999-07</td>
<td>Earth science services</td>
</tr>
<tr>
<td>541620</td>
<td>Environmental consulting services</td>
<td>8999-09</td>
<td>Scientific consulting</td>
</tr>
<tr>
<td>541690</td>
<td>Other scientific &amp; technical consulting services</td>
<td>8748-9904</td>
<td>Energy conservation consultant</td>
</tr>
<tr>
<td>541712</td>
<td>Research &amp; development in the physical, engineering, &amp;</td>
<td>8731-0300</td>
<td>Natural resource research</td>
</tr>
<tr>
<td>541712</td>
<td>Research &amp; development in the physical, engineering, &amp;</td>
<td>8731-0301</td>
<td>Energy research</td>
</tr>
<tr>
<td>541712</td>
<td>Research &amp; development in the physical, engineering, &amp;</td>
<td>8731-0302</td>
<td>Environmental research</td>
</tr>
<tr>
<td>541712</td>
<td>Research &amp; development in the physical, engineering, &amp;</td>
<td>8733-9902</td>
<td>Research institute</td>
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<tr>
<td>924110</td>
<td>Administration of air &amp; water resource &amp; solid waste management programs</td>
<td>9511-00</td>
<td>Air, water, &amp; solid waste management</td>
</tr>
<tr>
<td>924110</td>
<td>Administration of air &amp; water resource &amp; solid waste management programs</td>
<td>9511-01</td>
<td>Environmental agencies</td>
</tr>
<tr>
<td>926110</td>
<td>Administration of general economic programs</td>
<td>9611-9903</td>
<td>Energy development &amp; conservation agency, gov't</td>
</tr>
<tr>
<td>926130</td>
<td>Regulation &amp; admin. of communications, electric, gas, &amp; other utilities</td>
<td>9631</td>
<td>Regulation, administration of utilities</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
- Agriculture
- Beverage Production
- Bioscience
- Geospatial
- Government
- Software
- Transportation

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

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

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
www.metrodenverGIS.org

Colorado Energy Coalition
1445 Market Street
Denver, CO 80202-1790
303.620.8092
e-mail: info@metrodenver.org
FINANCIAL SERVICES
Metro Denver and Northern Colorado Industry Cluster Profile

The nine-county Metro Denver and Northern Colorado region is the major financial center between Los Angeles and Chicago, with downtown Denver’s financial district along 17th Street known as the “Wall Street of the West.” 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 is comprised of insurance carriers and brokerages.

A variety of trade associations and service firms support the region’s diverse financial services industry base of nearly 13,020 companies and more than 87,740 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 Brokers (www.camb.org) is another 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.

Denver is home to a branch of the Federal Reserve Bank and one of only six U.S. Mints. The Denver Mint 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 more than 4.2 billion coins in 2011.

The region’s central location, unmatched talent pool, and infrastructure contributed to significant growth and expansion activity in 2012. Indeed, Denver was chosen as one of only five U.S. cities to participate in the 2013 Global Cities Initiative. The joint project of the Brookings Institution and JPMorgan Chase is a five-year project to help leaders in U.S. metropolitan areas reorient their economies to compete more effectively in the global economy. Denver was selected because of the region’s emerging profile for global business, growing financial services cluster, and infrastructure to support business activity. Notable company announcements in 2012 included:

- Charles Schwab & Co. plans to build a $230 million corporate campus in Lone Tree for its 2,000 current employees in Metro Denver and plans to add 480 new employees by 2017. The campus is slated to open in 2014.
- California-based Redwood Trust will open its first Colorado office in Douglas County and will create 550 professional jobs in the next five years. The mortgage lending company cited Colorado’s expansive mortgage lending and financial talent pool, and a pro-business environment as key factors in its location decision.
- Fidelity Investments plans to add up to 500 jobs at its new regional U.S. customer service site in Greenwood Village. Fidelity chose a Metro Denver location because the region offers a highly educated workforce, attractive business climate, and high quality of life.
- Visa will expand its existing global technology center in Douglas County. The company will add more than 400 information technology, financial support, and client support positions over the next five years, paying an average of $106,000 a year.

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1 The nine-county Metro Denver and Northern Colorado region consists of Adams, Arapahoe, Boulder, Broomfield, Denver, Douglas, Jefferson, Larimer, and Weld Counties.
Massachusetts-based National Bank Holdings Corp.—which acquired Greeley-based Bank of Choice and Community Banks of Colorado’s 16 branch locations in 2011—expanded its Greenwood Village office and moved its top executives from Boston. The financial services company cited the state’s educated workforce, strong agriculture and energy industries, and diverse economy as reasons for its location decision.

Three Florida-based companies opened locations and expanded in Metro Denver.

- Connextions—a subsidiary of UnitedHealth Group’s Optum—opened a call center in June 2012 in Centennial and plans to hire more than 500 customer-service and insurance agents, management positions, and analysts to staff the facility. The company’s new $4 million, 45,000-square-foot center will provide healthcare providers, health insurers, and accountable care organizations the tools to navigate and to enroll prospective customers in health insurance plans.
- Brightway Insurance plans to expand into Metro Denver with nearly 40 franchise offices and up to 390 insurance agents. The company sells life, home, automobile, and business insurance through multiple carriers.
- FBC Mortgage, LLC opened a national operations center in Centennial and plans to hire up to 50 mortgage professionals. The location will eventually be a full-service retail mortgage division for the company.

Douglas County-based Specialized Loan Servicing plans to add 130 supervisors, customer service specialists, and general mortgage consultants to accommodate company growth.

The Denver division of Northwestern Mutual and Cunningham Financial Group plans to hire a combined total of almost 200 financial representative and interns throughout the state.

IMA Financial Group broke ground on a $32 million headquarters building near Denver Union Station. The 108,000-square-foot building will accommodate company growth from 200 employees to between 300 and 400 employees over the next 15 years and is slated for completion in 2013.

A number of Metro Denver banks established new branches in 2012. Bellco Credit Union constructed two new branches in Denver and Englewood, the Fort Collins-based Bank of Colorado will open a branch in downtown Denver, Fort Morgan-based FMS Bank will open a branch in Greeley, and Loveland-based Home State Bank will open a branch in Lafayette.

Denver-based Citywide Banks acquired a Boulder branch of Loveland-based Advantage Bank, which will enable the company to expand operations. The new branch is Citywide’s first Boulder branch and its 14th in Metro Denver.

Denver-based Lincoln Trust and San Francisco-based PENSICO Trust combined in 2012 to create a new company called PENSICO. The combined company will offer a range of alternative assets including private equity, venture capital, real estate, and precious metals and will expand its advisor network by adding 6,000 advisors that currently work with Lincoln Trust in Denver.

Great-West Financial plans to add 100 new positions over the next year, mainly at its Greenwood Village headquarters. The majority of the new positions will be in the financial services and corporate areas, with some in sales and service departments for its 401(K) sector.

Allstate Insurance Co. added nearly 20 new agents in Colorado in 2012 and plans to hire 50 additional agency owners in 2013 as the company continues to focus on job creation and small business ownership. The company also plans to add 100 new licensed sales professionals across the state.

Denver-based First Western Financial relocated its headquarters from the Tabor Center to lower downtown Denver. The relocation will provide more space for the company to expand operations.

The region’s financial services industry combines with technology expertise to offer more products and services to their customers and power their complex operations with intelligent applications. Key developments in 2012 included:
Atlanta-based iLumen Inc. opened a sales and marketing division in Denver. The company offers customized business intelligence solutions to the banking, accounting, and franchise markets and cited the region’s abundance of franchise companies as a key factor in their location decision.

Financial services company Raymond James Financial Inc. unveiled plans to build a data center in Denver. The 40,000-square-foot facility will house the company’s hardware division, while the operations and support functions will remain at the company’s existing locations in Florida.

The region’s universities and research institutions help prepare students with the vital business and financial skills through innovation, professional experience, and nationally recognized degree programs.

- The University of Colorado Denver and J.P. Morgan Chase opened the J.P. Morgan Center for Commodities at the Business School’s new $45 million building in 2012. The center is a first-of-its-kind academic center that will offer programs in finance, commodities, economics, and policy as well as a state-of-the-art finance and commodities lab, using industry-standard financial software and technology as part of the students’ curriculum. A number of Metro Denver companies including JPMorgan Chase, CoBank, Cordillera Energy Partners, and CQG made significant contributions to the school to support scholarships, learning space, software, and professorships.

- The Anschutz Foundation awarded the University of Colorado Boulder’s Leeds School of Business $2 million to support two new business initiatives. The first will create a business honors program that will provide both professional and academic development experience for high-level students and will heighten the program’s appeal to local, national, and international students. The second, a new business minor, will provide students an overview of the business community. Both programs are intended to bolster the region’s economy and attract new businesses to the state.

- The University of Denver’s Daniels College of Business will receive $5 million from Enterprise Rent-A-Car’s CEO to establish the Taylor Family Undergraduate Career Services Center. The Center will help students explore undergraduate business majors, provide interview and internship assistance, establish professional networks, and assist students in career development. The award will also be used to fund various internships and scholarships with a number of local organizations.

The nine-county region’s population is rapidly expanding, giving rise to increasing demands for financial services, products, and technology. The region’s average annual population growth over the past decade—1.4 percent—was noticeably higher than the national average (0.9 percent). Indeed, the region added more than 58,300 residents between 2010 and 2011 and was the fourth-fastest growing region among the largest metropolitan statistical areas over the same period with more than 2.8 million residents. The region’s locational assets and entrepreneurial spirit continues to attract several Forbes Global 2000, Fortune 500, and Inc. 500 Fastest Growing companies. Fourteen companies headquartered in the region were included on the Forbes’ 2012 “Global 2000” list, nine companies were included on the 2012 Fortune 500 list with revenues totaling more than $94 billion, and 14 were named among Inc. 500’s fastest-growing private companies. These growing companies and the region’s vibrant business environment continue to attract venture capital and investment activity. According to PricewaterhouseCoopers’ MoneyTree Report, Colorado companies in the financial services industry attracted seven deals totaling $85.2 million in venture capital over the past five years. Across all industries, more than 475 Colorado deals valued at a combined $3 billion closed over the past five years.

A number of associations and organizations support entrepreneurship and venture capital financing in Colorado. The Rocky Mountain Venture Capital Association (www.rockymountainvca.com) promotes venture capital funding and venture capital-funded companies in Colorado and holds an annual “Venture Capital in the Rockies” conference to showcase emerging companies and further venture funding in the state (www.vcintherockies.com). The Rockies Venture Club (www.rockiesventureclub.org) is a nonprofit organization that encourages entrepreneurship in the region by connecting entrepreneurs, service professionals, investors, and venture capitalists and offers workshops, training, and capital conferences for its members. The Rocky Mountain MicroFinance Institute (RMMFI) is a nonprofit organization serving the needs of community entrepreneurs to foster growth within Denver communities. RMMFI combines affordable and accessible business
development services and flexible microloans in an effort to support entrepreneurs in creating economic self-sufficiency through business ownership (www.mmmfi.org). The Denver Office of Economic Development released the Denver Capital Matrix, a new resource directory of funding sources for Denver’s small businesses and entrepreneurs. The matrix improves access to capital by identifying more than 250 funding sources including venture capital firms, angel investors, traditional bank lenders, and private equity firms.

Financial Services Economic Profile

Banking and Finance

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 ninth out of the 50 largest metro areas in banking and finance employment concentration in 2012. With direct employment in banking and finance of about 38,520 workers, the region ranked 10th in absolute employment. Three-quarters of Colorado’s banking and finance industry employees worked in the region.

<table>
<thead>
<tr>
<th>Direct Employment, 2012</th>
<th>Nine-County Region</th>
<th>U.S.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct Employment, 2012</td>
<td>38,520</td>
<td>2,127,450</td>
</tr>
<tr>
<td>Number of Direct Companies, 2012</td>
<td>3,860</td>
<td>264,540</td>
</tr>
<tr>
<td>One-Year Direct Employment Growth, 2011-2012</td>
<td>1.1%</td>
<td>0.4%</td>
</tr>
<tr>
<td>Five-Year Direct Employment Growth, 2007-2012</td>
<td>-16.1%</td>
<td>-14.0%</td>
</tr>
<tr>
<td>Avg. Annual Direct Employment Growth, 2007-2012</td>
<td>-3.4%</td>
<td>-3.0%</td>
</tr>
<tr>
<td>Direct Employment Concentration</td>
<td>2.0%</td>
<td>1.4%</td>
</tr>
</tbody>
</table>


Banking and Finance Employment

- The banking and finance subcluster directly employed about 38,520 people in the nine-county region in 2012.
- Banking and finance companies employed 2 percent of the region’s total employment base, compared with a 1.4 percent national employment concentration.
- As the banking and finance subcluster continues to recover, the changing regulatory landscape, volatility and global turmoil, cost reduction, and capital and liquidity management continue to impact the industry. Employment in the region declined 16.1 percent between 2007 and 2012, compared with a 14 percent decline nationwide.

- Nearly 59 percent of the region’s banking and finance subcluster employees worked in commercial banking, mortgage banking and loan correspondence, and loan brokerage companies. About 76 of banking and finance employees worked in Arapahoe (32 percent) and Jefferson (14 percent) Counties and the City and County of Denver (29 percent).
Banking and Finance Wages

The 2011 average annual salary for a banking and finance worker in the nine-county region was $64,570, compared with the national average of $65,090. Total payroll for the banking and finance subcluster in the region reached nearly $2.5 billion in 2011.

Denver-Aurora-Broomfield MSA Occupational Salaries, 2011 Annual Average

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Annual Salary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial Managers</td>
<td>$133,020</td>
</tr>
<tr>
<td>Loan Officers</td>
<td>$77,160</td>
</tr>
<tr>
<td>Tellers</td>
<td>$28,220</td>
</tr>
</tbody>
</table>


Banking and Finance Companies

- About 3,860 banking and finance companies operated in the nine-county region in 2012.
- Approximately 73 percent of the region’s banking and finance companies employed fewer than 10 people, while 0.5 percent employed 250 or more.
- Nearly 72 percent of the region’s banking and finance companies provided commercial banking, mortgage banking, loan correspondence, loan brokerage services, and other business services.
- More than 61 percent of the region’s banking and finance subcluster companies were located in Arapahoe (22 percent) and Jefferson (19 percent) Counties and in the City and County of Denver (21 percent).

Financial Services-Banking and Finance Number of Companies Growth Rate

![Financial Services-Banking and Finance Number of Companies Growth Rate](image)

Note: The increase in the number of companies in 2011 is attributed to a break in the data series due to new methodology and enhanced company inclusion. Therefore, historical data is not comparable to 2011.


Major Banking and Finance Companies

- ADS Alliance Data Systems: [www.alliancedata.com](http://www.alliancedata.com)
- Aurora Bank FSB: [www.aurorabankfsb.com](http://www.aurorabankfsb.com)
- Bank of the West: [www.bankofthewest.com](http://www.bankofthewest.com)
- BBVA Compass Bank: [www.bbvacompass.com](http://www.bbvacompass.com)
- Bellco 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)
- Colorado Business Bank: [www.cobizbank.com](http://www.cobizbank.com)
- Colorado Housing and Finance Authority: [www.chfainfo.com](http://www.chfainfo.com)
- Colorado State Bank and Trust: [www.csbt.com](http://www.csbt.com)
- JPMorgan Chase & Co.: [www.chase.com](http://www.chase.com)
- KeyBank: [www.key.com](http://www.key.com)
- Nelnet: [www.nelnet.com](http://www.nelnet.com)
- Public Service Credit Union: [www.pscu.org](http://www.pscu.org)
- Pulte Mortgage: [www.pultemortgage.com](http://www.pultemortgage.com)
- Specialized Loan Servicing LLC: [www.sls.net](http://www.sls.net)
- U.S. Bank: [www.usbank.com](http://www.usbank.com)
- Vectra Bank Colorado: [www.vectrabank.com](http://www.vectrabank.com)
- VISA Debit Processing Services: [www.visadps.com](http://www.visadps.com)
Major Banking and Finance Companies Cont’d

- Community Banks of Colorado
  www.cobnks.com
- FirstBank Holding Company
  www.efirstbank.com
- First Data Corporation
  www.firstdata.com
- Guaranty Bank and Trust
  www.guarantybankco.com
- Wall Street on Demand
  www.wallst.com
- Wells Fargo Bank Colorado
  www.wellsfargo.com
- Western Union
  www.westernunion.com

Investments

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 ninth out of the 50 largest metro areas in investments employment concentration in 2012. With direct employment of 23,190 investment workers, the region ranked 12th in absolute employment. About 76 percent of Colorado’s investments subcluster employees worked in the region.

<table>
<thead>
<tr>
<th></th>
<th>Nine-County Region</th>
<th>U.S.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct Employment, 2012</td>
<td>23,190</td>
<td>1,315,250</td>
</tr>
<tr>
<td>Number of Direct Companies, 2012</td>
<td>5,750</td>
<td>354,100</td>
</tr>
<tr>
<td>One-Year Direct Employment Growth, 2011-2012</td>
<td>1.6%</td>
<td>0.9%</td>
</tr>
<tr>
<td>Five-Year Direct Employment Growth, 2007-2012</td>
<td>4.4%</td>
<td>-4.7%</td>
</tr>
<tr>
<td>Avg. Annual Direct Employment Growth, 2007-2012</td>
<td>0.9%</td>
<td>-1.0%</td>
</tr>
<tr>
<td>Direct Employment Concentration</td>
<td>1.2%</td>
<td>0.9%</td>
</tr>
</tbody>
</table>


Investments Employment

- The investments subcluster directly employed about 23,190 people in the nine-county region in 2012.
- Investment companies employed 1.2 percent of the region’s total employment base, compared with a 0.9 percent national employment concentration.
- Employment in the region’s investments subcluster increased 4.4 percent between 2007 and 2012, compared with a 4.7 percent decline nationwide.
- More than 67 percent of investments employees worked in the City and County of Denver (32 percent) and in Arapahoe (25 percent) and Douglas (10 percent) Counties. About 55 percent of investments employees worked in security brokering and dealing, and investment advice.

Investments Wages

The 2011 average annual salary for an investments worker in the nine-county region was $172,620, compared with the national average of $199,900. The region’s investment subcluster payroll reached nearly $4 billion in 2011.

Denver-Aurora-Broomfield MSA Occupational Salaries, 2011 Annual Average

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Average Salary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial Analysts</td>
<td>$81,590</td>
</tr>
<tr>
<td>Securities, Commodities, and Financial Services</td>
<td>$73,700</td>
</tr>
<tr>
<td>Financial Specialists</td>
<td>$68,960</td>
</tr>
</tbody>
</table>


Investment Companies

- About 5,750 investment companies operated in the nine-county region in 2012.
- Approximately 93 percent of the region’s investment companies employed fewer than 10 people, while 0.1 percent employed 250 or more.
- More than 63 percent of companies in the investments subcluster provided security brokering and dealing, investment advice, and other investment services.
- Nearly 63 percent of the investment companies in the region were located in Jefferson (18 percent), Douglas (14 percent), and Arapahoe (14 percent) Counties and in the City and County of Denver (17 percent).

Major Investment Companies

- AIMCO
  [www.aimco.com](http://www.aimco.com)
- Atlantic Trust
  [www.atlantictrust.com](http://www.atlantictrust.com)
- Charles Schwab & Co.
  [www.schwab.com](http://www.schwab.com)
- Curian Capital
  [www.curian.com](http://www.curian.com)
- Edward Jones
  [www.edwardjones.com](http://www.edwardjones.com)
- Janus Capital Group
  [www.janus.com](http://www.janus.com)
- Johnson Capital
  [www.johnsoncapital.com](http://www.johnsoncapital.com)
- Lipper Analytical Services
  [www.lipperweb.com](http://www.lipperweb.com)
- Marsico Capital Management LLC
  [www.marsicocapital.com](http://www.marsicocapital.com)
- Merrill Lynch
  [www.ml.com](http://www.ml.com)
- Morgan Stanley
  [www.morganstanley.com](http://www.morganstanley.com)
- Oppenheimer Funds
  [www.oppenheimerfunds.com](http://www.oppenheimerfunds.com)
- RBC Wealth Management
  [www.rbcwealthmanagement.com](http://www.rbcwealthmanagement.com)
- Scottrade
  [www.scottrade.com](http://www.scottrade.com)
- TIAA-CREF
  [www.tiaa-cref.org](http://www.tiaa-cref.org)
- Transamerica Capital
  [www.transamerica.com](http://www.transamerica.com)
Insurance

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 26,040 workers, the nine-county region ranked 17th in absolute employment out of the 50 largest metro areas in 2012. The region ranked 29th for insurance employment concentration. Seventy-five percent of Colorado’s insurance subcluster employment was located in the region.

<table>
<thead>
<tr>
<th>Nine-County Region</th>
<th>U.S.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct Employment, 2012</td>
<td>26,040</td>
</tr>
<tr>
<td>Number of Direct Companies, 2012</td>
<td>3,410</td>
</tr>
<tr>
<td>One-Year Direct Employment Growth, 2011-2012</td>
<td>2.1%</td>
</tr>
<tr>
<td>Five-Year Direct Employment Growth, 2007-2012</td>
<td>-10.8%</td>
</tr>
<tr>
<td>Avg. Annual Direct Employment Growth, 2007-2012</td>
<td>-2.3%</td>
</tr>
<tr>
<td>Direct Employment Concentration</td>
<td>1.4%</td>
</tr>
</tbody>
</table>


Insurance Employment

- The insurance subcluster directly employed about 26,040 people in the nine-county region in 2012.
- Insurance companies employed 1.4 percent of the region's total employment base, compared with a 1.5 percent employment concentration nationwide.
- Insurance employment in the region was primarily concentrated in insurance agents and brokers (57 percent) and health and medical insurance carriers (17 percent).
- About 64 percent of insurance employees worked in Arapahoe County (34 percent) and in the City and County of Denver (30 percent).

Insurance Wages

Total nine-county payroll in the insurance subcluster reached nearly $1.7 billion in 2012. The 2011 average annual salary for insurance employees in the region was $65,900, compared with the national average of $75,330.

Denver-Aurora-Broomfield MSA Occupational Salaries, 2011 Annual Average

<table>
<thead>
<tr>
<th>Occupational Category</th>
<th>Salary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insurance Underwriters</td>
<td>$66,700</td>
</tr>
<tr>
<td>Insurance Sales Agents</td>
<td>$64,600</td>
</tr>
<tr>
<td>Insurance Claims and Policy Processing Clerks</td>
<td>$41,780</td>
</tr>
</tbody>
</table>

Note: Mean annual salary data is for the 10-county Denver-Aurora-Broomfield Metropolitan Statistical Area (MSA) consisting of Adams, Arapahoe, Broomfield, Clear Creek, Denver, Douglas, Elbert, Gilpin, Jefferson, and Park Counties.

Insurance Companies

- Approximately 3,410 insurance companies operated in the nine-county region in 2012.
- About 87 percent of the region's insurance companies employed fewer than 10 people, while 0.4 percent employed 250 or more.
- More than 83 percent of companies in the insurance subcluster were insurance agencies and brokerages.
- About 55 percent of the insurance subcluster companies were located in Jefferson (21 percent) and Arapahoe (20 percent) Counties and in the City and County of Denver (14 percent).

![Financial Services-Insurance Number of Companies Growth Rate](chart)

Note: The increase in the number of companies in 2011 is attributed to a break in the data series due to new methodology and enhanced company inclusion. Therefore, historical data is not comparable to 2011. Source: Dun & Bradstreet, Inc., Marketplace database, July-Sept. 2006-2010; Market Analysis Profile, 2011-2012.

Major Insurance Companies

- 2-10 Home Buyers Warranty Corp. [www.2-10.com](http://www.2-10.com)
- Allied Insurance [www.alliedinsurance.com](http://www.alliedinsurance.com)
- Allstate Insurance [www.allstate.com](http://www.allstate.com)
- American Family Insurance [www.amfam.com](http://www.amfam.com)
- Anthem Blue Cross and Blue Shield [www.anthem.com](http://www.anthem.com)
- CNA Surety Corp. [www.cnasurety.com](http://www.cnasurety.com)
- Connexions [www.connexions.com](http://www.connexions.com)
- Farmers Insurance [www.farmers.com](http://www.farmers.com)
- Great-West Life & Annuity Insurance Co. [www.greatwest.com](http://www.greatwest.com)
- IMA Financial Group [www.imacorp.com](http://www.imacorp.com)
- Jackson National Life Insurance Co. [www.jackson.com](http://www.jackson.com)
- Kaiser Permanente [www.kaiserpermanente.org](http://www.kaiserpermanente.org)
- Land Title Guarantee Company [www.ltgc.com](http://www.ltgc.com)
- Liberty Mutual [www.libertymutual.com](http://www.libertymutual.com)
- Lockton Companies [www.lockton.com](http://www.lockton.com)
- New York Life [www.newyorklife.com](http://www.newyorklife.com)
- Northwestern Mutual [www.northwesternmutual.com](http://www.northwesternmutual.com)
- Pinnacol Assurance [www.pinnacol.com](http://www.pinnacol.com)
- Security Life of Denver Insurance Company [www.ing-usa.com](http://www.ing-usa.com)
- State Farm Insurance [www.statefarm.com](http://www.statefarm.com)
- United Healthcare [www.uhc.com](http://www.uhc.com)
- Van Gilder Insurance Corporation [www.vgic.com](http://www.vgic.com)

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

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

1. **Access to a large, highly qualified workforce**
   - Of Colorado’s adult population, more than 36 percent has completed a bachelor’s or higher-level degree, making Colorado the third-most highly educated state in the nation behind Massachusetts and Maryland. (U.S. Census Bureau, 2011 American Community Survey)
• Metro Denver has a higher-than-average concentration of employment in business and financial operations occupations, which range from financial managers and specialists to financial clerks. About 6.5 percent of Metro Denver’s labor force is employed in business and financial operations occupations, compared with the U.S. average of 4.7 percent. (U.S. Census Bureau, 2009-2011 American Community Survey 3-Year Estimates)

• About 2.6 percent of the 67,240 certified financial planner certificates in the U.S. are held in Colorado even though Colorado’s population represents just 1.6 percent of the national total. (Certified Financial Planner Board of Standards, Inc., 2012; U.S. Census Bureau, 2012)

• Financial Times ranked the Daniels College of Business at University of Denver (DU) among the world’s top 100 executive MBA programs. Criteria for the ranking included graduate salaries, career progression, faculty excellence, and diversity. (Financial Times, 2012)

• Three Metro Denver universities ranked among the nation’s “Best Undergraduate Business Schools,” according to Bloomberg Businessweek. The Daniels College of Business at DU ranked 57th, the Leeds School of Business at the University of Colorado Boulder (CU-Boulder) ranked 92nd, and the College of Business at Colorado State University (CSU) ranked 94th. More than 140 business programs were evaluated on nine criteria designed to address academic quality and the satisfaction and post-graduate experience of business students. (Bloomberg Businessweek, 2012)

• CSU and DU were recognized in The Princeton Review’s 2012 “Best 296 Business Schools.” CSU was also listed as having one of the 10 best-administered business schools (fourth). Institutions named to the list demonstrated notable academic programs, highly regarded professors, campus infrastructure and activities, career preparation, and other factors. (The Princeton Review, 2012)

• Kiplinger’s Personal Finance magazine ranked Denver among the top five “Best Cities for Young Adults.” Contributors identified “best” cities as those that have strong employment growth, a highly educated and tech-savvy population, and a reasonable cost of living. Denver received particular accolades for its invigorating outdoor culture, reasonable one-bedroom apartment rents, and a rosy employment outlook. (Kiplinger’s Personal Finance, 2012)

• The International Graduate Forum named the online MBA program at Colorado Technical University among the top 10 online MBA programs in the world in 2012. The program is also only one of six online MBA programs in the nation to earn this designation, which recognizes schools that have demonstrated a high level of innovation and thought leadership. (The International Graduate Forum, 2012)

• The Business School at the University of Colorado Denver’s (CU-Denver) is the largest accredited graduate school of business in the Rocky Mountain West and has a reputation as an innovator with strong business partnerships. The school’s curriculum includes 10 academic disciplines, more than 80 electives, nine MS programs, and three MBA options. (The University of Colorado Denver, 2012)

• U.S. News & World Report ranked the Leeds School of Business at CU-Boulder among the nation’s top 100 full-time MBA programs. The list recognizes more than 440 MBA programs based on employment rates for graduates, student selectivity, assessments by recruiters and peer deans, and starting salary. The Daniels College of Business at DU ranked among the nation’s top 100 part-time MBA programs. (U.S. News & World Report, 2012)

• Denver ranked 11th among the nation’s “Top 15 Best Cities for Recent College Graduates,” according to a 2012 ranking by Apartments.com and CareerRookie.com. Contributors considered each city’s average rent, employment opportunities, and average entry-level salary. (Apartments.com, 2012; CareerRookie.com, 2012)

• Metro Denver ranked first among the nation’s largest metropolitan areas for total population gain in the 25- to 34-year age group between 2008 and 2010, according to the Brookings Institution. The region’s stable economies, “cool” cities, and high-tech centers are drawing young adults. (The Brookings Institution, 2012)
The U.S. Department of Commerce’s United States Patent and Trademark Office will locate one of four new satellite offices in Denver due to the state’s expansive culture of innovation and entrepreneurship, ability to attract high-quality professionals and technical talent, high quality of life and low cost of living, and its vast transportation infrastructure. (U.S. Patent and Trademark Office, 2012)

2. An overall better quality of life

- Castle Rock is among the nation’s top 20 communities in which to live, according to MONEY Magazine’s 2012 “Best Places to Live.” The list identifies 100 small cities and towns with a reputation for safety, education, housing and healthcare affordability, diversity, and other advantages. Highlands Ranch (21st), Centennial (49th), Boulder (60th), and Fort Collins (70th) were also named to the list. (MONEY Magazine, 2012)

- The Denver-Aurora-Broomfield MSA ranked among the top 10 fittest metro areas in the American College of Sports Medicine’s 2012 American Fitness Index. The ranking evaluated the nation’s 50 largest metro areas on criteria ranging from preventive health measures and chronic disease levels to community resources and physical activity policies. Denver received accolades for its low obesity rate, high percentage of residents participating in physical activity, and low diabetes and cardiovascular disease rates. (American College of Sports Medicine, 2012)

- Business news website Businessweek.com ranked Denver sixth among “America’s 50 Best Cities” in 2012. The ranking is based on metrics including education, income, unemployment, leisure activities, and air quality. (Businessweek.com)

- Colorado has the third-highest percentage of state land area devoted to the National Forest System, according to the U.S. Forest Service. With more than 40 state parks, 56 national parks and wilderness areas, and the greatest number of 14,000-foot peaks in the nation, Colorado’s access to public lands and outdoor opportunities serves as a cornerstone of the state’s economy. (U.S. Forest Service, 2012; Colorado State Parks, 2012; Wilderness.net, 2012)

- Boulder ranked fifth on the 2011 Gallup-Healthways “Well-Being Index,” which measures the physical and emotional health of residents in 190 metropolitan statistical areas. The survey-based index also ranked the Fort Collins metro area ninth and the indices’ statewide component ranked Colorado sixth for its residents’ overall well-being. (Gallup-Healthways, 2012)

- Colorado is the leanest state with the nation’s lowest rate of adult obesity (20.7 percent) and is the only state with an obesity rate below 21 percent. (Trust for America’s Health, 2012; Robert Wood Johnson Foundation, 2012)

- Denver ranked 14th on Travel + Leisure magazine’s 2012 list of “America’s Best Cities for Singles.” Criteria included a variety of factors ranging from the cost of living to culture and nightlife. Denver received accolades for access to fitness facilities and wide-open spaces. (Travel + Leisure, 2012)

- The cost of living in Metro Denver is only 5 percent above the national average and is well below that of many other major cities. (The Council for Community and Economic Research, Cost of Living Index, Q3 2012)

- Metro Denver’s third quarter 2012 median home price of $260,300 was significantly less than comparable communities on the east and west coasts, but is higher than the national median price of $186,100. Metro Denver ranked 18th among 154 metro areas for median single-family home price in the third quarter of 2012. (National Association of Realtors, Q3 2012)

- Metro Denver voters approved the funding of FasTracks in November 2004. FasTracks is a $7.4 billion comprehensive plan for the design and construction of high-quality transit service and facilities. FasTracks will vastly improve mobility for current residents and future populations throughout the region.

- The Brookings Institution ranked Metro Denver 12th for public transit coverage and ninth for its labor access rate in 2012. For each of the nation’s 100 largest metros, researchers examined the share of the number of jobs located in neighborhoods with public transit
and the share of jobs accessible within a 90-minute commute on public transit. Nationally, 76 percent of jobs are accessible by public transit, but only 27 percent of workers can reach those jobs in 90 minutes or less compared with 87 percent of jobs in Metro Denver are accessible by public transit and 46 percent can reach those jobs. (The Brookings Institution, 2012)

- Metro Denver ranked third-sunniest among 20 major U.S. cities with an average 69 percent of days with sunshine. (U. S. National Oceanic and Atmospheric Administration, National Climatic Data Center, 2012)

3. Low to moderate costs of doing business

- Colorado has one of the most entrepreneur friendly environments. The state ranked among the top 10 in the Small Business & Entrepreneurship Council’s 2012 “U.S. Business Policy Index 2012,” which considers government policy, tax burden, regulatory expenses, healthcare costs, and education standards. The state’s low unemployment, corporate, and capital gains taxes contributed to its high ranking. (Small Business & Entrepreneurship Council, 2012)

- Forbes ranked Metro Denver fifth among the 25 “Best Places for Business and Careers” in 2012, which assessed the nation’s largest metropolitan areas on the costs of doing business, projected economic growth, and educational attainment. Four other Colorado metropolitan areas ranked among the top 50. The Fort Collins metro area ranked third overall, Boulder ranked 27th, Colorado Springs ranked 42nd, and Greeley ranked 46th. (Forbes, 2012)

- Metro Denver office rental rates averaged $25.68 per square foot in the fourth quarter of 2012, making the region’s office market highly competitive with other major markets in the U.S. (CoStar Realty Information, The CoStar Office Report, Q4 2012)

- Colorado’s $13 registration fee for brokers and dealer representatives is one of the lowest in the nation. (State of Colorado, Division of Securities)

- Commercial natural gas prices in Colorado were the 10th-lowest of all 50 states in 2011. (U.S. Department of Energy, Energy Information Administration, 2012)

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)

- Denver ranked 14th among the nation’s most tax-friendly large cities for business, according to KPMG International’s 2012 Competitive Alternatives: Focus on Tax report. Analysts tallied each city’s total taxes paid by large businesses as a percentage of total taxes paid by similar companies in cities with populations greater than 2 million and Denver’s tax costs were nearly 6 percent below the U.S. average. (KPMG International, 2012)

- 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)

- Colorado has the eighth-best economic outlook in the nation, according to the 2012 ALEC-Laffer State Economic Competitiveness Index. The index examined each state’s tax structure and spending to demonstrate how public policy shapes economic growth. The state’s sustainable approach to public spending and its low regulatory and tax burdens contributed to its high ranking. (American Legislative Exchange Council, 2012)

- Colorado ranked fifth overall on Forbes’ 2012 “Best States for Business and Careers” list. Rankings were based on six categories for businesses: costs, labor supply, regulatory environment, economic climate, growth prospects, and quality of life. Colorado received its highest rankings for labor supply (first overall), growth prospects (fourth overall), and quality of life (ninth overall). (Forbes, 2012)
• Forbes ranked Metro Denver fifth among the 25 “Best Places for Business and Careers” in 2012, which assessed the nation’s largest metropolitan areas on the costs of doing business, projected economic growth, and educational attainment. Four other Colorado metropolitan areas ranked among the top 50. The Fort Collins metro area ranked third overall, Boulder ranked 27th, Colorado Springs ranked 42nd, and Greeley ranked 46th. (Forbes, 2012)

• Colorado companies received more than $7 million of venture capital funding in 2012 for the financial services industry. (PricewaterhouseCoopers, MoneyTree Report, 2012)

• Colorado is a top state for entrepreneurship and innovation, according to the U.S. Chamber of Commerce and the National Chamber Foundation’s Enterprising States report. Colorado ranked eighth as the next boom state positioned to grow and prosper, second for its high-tech business concentration, third for its business creation rate, and fifth in science, technology, engineering, and mathematics job concentration. (National Chamber Foundation, 2012)

• Launched in 2011, the Colorado Innovation Network (COIN) is a private, public, and academic collaboration designed to foster new technology development across the state’s existing and emerging industries. COIN aims to connect innovation leaders and inventors to solutions and ideas through which they can foster innovation and is part of Gov. John Hickenlooper’s economic development plan, Blueprint Colorado.

• Legislation adopted in 2012 provides for economic growth and new job creation. House Bill 12-1029—the Save Colorado Jobs Act—allows Colorado cities, counties, and special districts to negotiate an incentive payment or credit up to 100 percent of locally assessed business personal property tax for qualifying companies looking to relocate or expand.

5. A central location and easy global access

• Denver International Airport was the fifth-busiest airport in the nation and 11th-busiest worldwide in terms of passenger traffic in 2011. Sixteen commercial carriers—the largest of which are United Airlines, Southwest, and Frontier Airlines—offer scheduled nonstop service to nearly 170 domestic and international destinations. (U.S. Bureau of Transportation Statistics, 2012; Airports Council International, 2012; and Denver International Airport, 2012)

• 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. This capability provides companies with real-time connections to six of seven continents in one business day. (Metro Denver Economic Development Corporation)

• The nine-county region’s central U.S. location allows convenient access as air travelers can easily reach two-thirds of the nation within two hours. Further, the region is within four hours flying time of every North American city with a population of 1 million or more. (Metro Denver Economic Development Corporation)

• About 84 percent of all commercial flights arrived on time at DIA in the first 11 months of 2012, giving it the 11th-best on-time arrival average among the nation’s major airports. That arrival record was higher than the national average of 82 percent. (U.S. Bureau of Transportation Statistics, 2012)

• More than 1,000 miles from the nearest coast and outside of Tornado Alley, Metro Denver’s risk of natural disasters (hurricanes, tornados, and earthquakes) is minimal compared to locations in the east, west, and south. (National Oceanic and Atmospheric Administration, 2012; U.S. Geological Survey, 2012)
### Financial Services 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>
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<td>52110</td>
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<td>6011</td>
<td>Federal reserve banks</td>
</tr>
<tr>
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<td>Commercial banking</td>
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<td>Commercial banks, NEC</td>
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<td>Commercial banking</td>
<td>6081</td>
<td>Foreign bank &amp; branches &amp; agencies</td>
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<tr>
<td>52120</td>
<td>Savings institutions</td>
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<td>Other depository credit intermediation</td>
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<td>6111</td>
<td>Federal &amp; federally sponsored credit agencies</td>
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<tr>
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<td>Misc. business credit institutions</td>
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<tr>
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<td>International trade financing</td>
<td>6159</td>
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<td>Secondary market financing</td>
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<td>All other nondepository credit intermediation</td>
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<td>Personal credit institutions</td>
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### Insurance

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

Financial Services

Banking and Finance
Insurance
Investments

Technologies

Internet
High-Speed
Infrastructure

Support Industries

Software
Telecommunications
Healthcare
Call Centers
Professional Services

Infrastructure

Angel Networks
CO Assoc. of Mortgage Brokers
CO Bankers Assoc.
CO Venture Capital Assoc.
Rocky Mtn. Venture Capital Assoc.
RMMI
Rockies Venture Club

Client Industries

Consumers
Businesses
Government

For additional information, contact us:

1445 Market Street
Denver, CO 80202-1790
303.620.8092
e-mail: info@metrodenver.org
www.metrodenver.org
www.metrodenverGIS.org
HEALTHCARE AND WELLNESS
Metro Denver and Northern Colorado Industry Cluster Profile

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, mental and social well-being, and disease prevention.

The nine-county Metro Denver and Northern Colorado\(^1\) region offers a unique hub for healthcare and wellness companies to locate. The region’s health services industries are truly regional, serving not only surrounding areas of Colorado but several western states ranging from Montana to New Mexico. With about 176,460 healthcare and wellness workers in nearly 18,260 companies across the region, the healthcare and wellness cluster contributes to the region’s overall economic productivity and is one of the fastest growing industry clusters in the region.

The healthcare and wellness cluster has been relatively immune to economic cycles and continues to expand its employment base in the region as a result of several factors. The aging population is one of the most distinctive demographic events of the 21st century. This demographic shift toward an older population with the aging of the baby boomer generation will generate economic activity based on increased demand for medical services, hospital and nursing care, and long-term and at-home services. Another contributing factor is the influx of people into the healthcare market driven by recent state and national healthcare reforms. Additionally, federal healthcare reform could insure 500,000 more Coloradans beginning in 2014, further boosting demand for hospital procedures. This will also drive further collaboration and cooperation among various healthcare and wellness facilities across the region for specialized services, research, workforce, and facilities. Further, there is a growing interest in changing the way individuals prevent illness and treat diseases. Improved medical practices, holistic approaches, and new intellectual and spiritual philosophies have contributed to the movement toward an integrated approach to healthcare.

The nine-county region is a regional healthcare center for the Rocky Mountain West and is home to internationally renowned clinical systems, institutions, and organizations at the 578-acre, $5 billion Fitzsimons Life Sciences District and the adjacent Anschutz Medical Campus in Aurora. The site is the largest medical-related redevelopment in the nation and the world’s only completely new research, education, and patient complex. This cutting-edge healthcare campus and state-of-the-art technology bridge research and education with two world-class hospitals: the University of Colorado Hospital (UCH) and Children’s Hospital Colorado. The campus serves more than 500,000 patients annually and is home to the schools and colleges of Medicine, Nursing, Dental Medicine, Pharmacy, and Public Health. Upon completion, the entire district and medical campus will include more than 18.5 million square feet of space dedicated to excellence in healthcare, education, and research. After less than five years of operations at Fitzsimons, a number of facilities expanded in Aurora in 2012 as a result of increased patient demand:

- Children’s Hospital Colorado opened its 10-story East Tower at the Anschutz Medical Campus. The $230 million expansion houses a branch of the Colorado Institute for Maternal and Fetal Health, 12 labor and recovery rooms, operating rooms, and infant stabilization rooms. The facility also includes the Center for Cancer and Blood Disorders, Neurosciences Institute, Heart Institute, and a variety of other specialty care clinics.

\(^1\) The nine-county Metro Denver and Northern Colorado region consists of Adams, Arapahoe, Boulder, Broomfield, Denver, Douglas, Jefferson, Larimer, and Weld Counties.
• UCH opened a five-story addition to the Anschutz Cancer Pavilion. With the $20 million expansion, 60 percent more cancer patients can be treated each year. The addition included an updated waiting and reception area, and more space for urologic, oncology, transplant, and radiation therapy treatments.

• The Rocky Mountain Gamma Knife Center opened in the Anschutz Outpatient Pavilion in 2012. The specialized Gamma radiation technology allows neurosurgeons and oncologists to treat small- to moderate-sized brain tumors more effectively.

• Construction is underway on the second UCH patient tower at the Anschutz Medical Campus. The 12-story tower is part of a $400 million project that will add a new emergency department and critical care wing, additional beds and operating rooms, diagnostic treatment centers, additional parking facilities, and expand the hospital’s Cancer Pavilion. The tower is slated for completion in early 2013.

• Another key partner at Fitzsimons is the $1.5 billion Anschutz Medical Campus of the University of Colorado Denver, which includes UCH and facilities for University Physicians, Inc. The University of Colorado Denver hosts the University of Colorado Cancer Center, the Barbara Davis Center for Childhood Diabetes, the Eleanor Roosevelt Institute, and the Webb-Waring Institute for Cancer, Aging, and Antioxidant Research.

• 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—the Mental Illness Research, Education, and Clinical Centers, and conduct research on best practices and care coordination for veterans. Construction began in 2011 on the $800 million VA Hospital that will replace the existing VA hospital in Denver and will be completed in 2015. At buildout, the VA Hospital is expected to employ about 2,000 people and serve nearly 83,000 veterans annually.

• The Buckley Clinic, a collaboration between Buckley Air Force Base and the VA, opened in May 2012 in the Fitzsimons Life Science District. Although construction is still underway, the 543,000-square-foot project will include family practice, optometry, immunizations, mental healthcare, and other services when completed in 2015.

Northern Colorado continues to be a regional leader in healthcare and wellness and supports the region’s medical hub. University of Colorado Health (UC Health), formerly Poudre Valley Health System (PVHS), provides evidence-based healthcare and wellness services in Colorado, Nebraska, and Wyoming and includes UCH in Aurora, Poudre Valley Hospital in Fort Collins, Medical Center of the Rockies in Loveland, Mountain Crest Behavioral Healthcare Center, Colorado Health Medical Group, 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 5 percent of hospitals for clinical quality and NCMC’s specialties in cardiology, pulmonary, 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 and its CardioVascular Institute houses Northern Colorado’s first 64-slice CT scan.

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. The Center also offers an intelligent OB program, a computerized system designed to reduce the chances of complications during labor and delivery.

Notable developments in Northern Colorado in 2012 included:

• UCH and PVHS finalized a partnership agreement that created the UC Health system to widen healthcare services and provide expanded patient care in the Rocky Mountain region. Each of the hospitals now included in the new system will keep their names, and the new system will use Poudre Valley Health’s logo.

• NCMC and Banner Health announced a $60 million renovation and expansion of their current hospital and campus in Greeley. The improvements will help NCMC remain competitive and have a positive impact on its future hospital operations.
The Medical Center of the Rockies launched a new air ambulance program that could transport at least 300 patients annually. The program—Air Link—will serve residents within a 200-mile radius from Loveland.

Kaiser Permanente Colorado opened two medical offices in Loveland and Fort Collins and extended Medicare coverage to its Northern Colorado patients. The offices offer primary care services in internal medicine, family medicine, and pediatrics, in addition to X-ray services, laboratories, and pharmacies. Kaiser hired about 20 healthcare professionals at each office and plans to open a third Northern Colorado clinic in Greeley in 2014.

UC Health opened the Greeley Emergency and Surgery Center in Greeley’s North Gate Village. The $14.5 million, 22,000-square-foot facility employs about 96 full- and part-time doctors, nurses, and other employees and includes 10 examination rooms, two pediatric exam rooms, a diagnostic imaging area, and laboratory.

The nine-county region continues to offer expanded healthcare services to keep pace with the growing healthcare and wellness demands of the population. The U.S. Department of Health and Human Services awarded community health centers in Metro Denver $15.7 million in 2012 for capital improvements to expand health services and create healthcare jobs. In 2012, Gov. John Hickenlooper unveiled plans to expand the state’s mental health services. If approved by state lawmakers, the $18.5 million plan—Strengthening Colorado’s Mental Health System: A Plan to Safeguard All Coloradans—includes the establishment of a mental health crisis hotline, five new 24-hour urgent mental healthcare centers and substance abuse centers, additional hospital beds and housing vouchers for those with serious mental illness, and a consolidated mental health and substance abuse data system.

The nine-county region is a growing medical tourism hub, offering high-quality healthcare, a wide variety of medical services, and outstanding healthcare facilities. A number of the region’s assets include:

- The Colorado Center for Reproductive Medicine (CCRM) is one of the nation’s leading fertility clinics, providing a wide variety of treatments ranging from basic infertility care to the most advanced technology available. Two-thirds of CCRM’s patients travel to Colorado from other states and countries for treatment and it is internationally recognized for success rates and scientific achievements in the field of reproductive endocrinology.
- Two Denver-area medical tourism companies—Greenwood Village-based BridgeHealth and Denver-based MedVoy—expanded in Colorado. The two companies have contracted with several companies including Anova Cancer Center, Loveland Surgery Center, CereScan, and Denver Cosmetic Surgery in an effort to attract patients from around the world.
- Anova Cancer Center, formerly Denver CyberKnife, assisted in the effort to approve Medicare coverage for CyberKnife treatments in 2012. The Center provides non-surgical cancer treatment for several types of cancer including prostate, lung, brain, and spine cancers.
- The Medical Center of Aurora is a leader in cardiovascular care and hosts the largest atrial fibrillation (AFib) center in the Rocky Mountain region. In addition, the Center’s main campus and Centennial Medical Plaza are accredited chest pain centers by the Society of Chest Pain Centers and operate a state-of-the-art heart care tower on its main campus.

2012 was notable for several acquisitions and mergers in the healthcare and wellness cluster. The year was also marked with increased partnerships and collaborations among the region’s healthcare businesses and institutions.

- The Sisters of Charity Leavenworth Health System (SCL Health System) purchased Community First Foundation’s share of Exempla health systems. The $275 million deal will give SCL Health System control of Exempla’s Lutheran Medical Center in Wheat Ridge, Exempla Saint Joseph Hospital in Denver, Exempla Good Samaritan Medical Center in Lafayette, and the Exempla Physician Network of more than 100 physician clinics.
- Englewood-based Centura Health signed a collaboration agreement with Rocky Mountain Hospital for Children in Denver to explore opportunities to integrate pediatric services and improve access to care in the region. Centura Health is the largest healthcare system in the state and Rocky Mountain Hospital for Children is part of HCA-HealthONE LLC, the largest health system in Metro Denver.
• Denver-based DaVita Inc. acquired HealthCare Partners, which operates 152 clinics in Florida, Nevada, and California, including 700 staff physicians and 8,300 independent doctors. The $4.4 billion deal makes DaVita the largest managed healthcare company in the nation.

• Denver-based DaVita subsidiary Paladina Health acquired primary care company ModernMed of Waukesha, Wis. ModernMed operates clinics and physician practices in 12 states. Paladina Health opened a primary care clinic in lower downtown Denver, which is part of a larger network of clinics planned for Denver.

• Colorado Pediatric Collaborative, a group of physicians and specialists working with Children’s Hospital Colorado, received a $1.5 million grant from the Colorado Health Foundation to expand services for Colorado children through partnerships, practices, and infrastructure development. The overarching goal of the grant is to test innovative ways to deliver quality care at lower costs.

• A $1 million grant from the Colorado Health Foundation launched the Culture of Wellness in Preschools program, a partnership between the Colorado School of Public Health and the City and County of Denver. The new program will help schools provide nutrition education and physical activity opportunities through improved school policies and environments. The program will also include health promotion and training opportunities for parents and school staff.

A number of major nine-county region hospital projects moved forward in 2012:

• Children’s Hospital Colorado broke ground on a new $100 million South Campus in Highlands Ranch. The South Campus is slated for completion in late 2013 and will include an emergency room, diagnostic equipment, various clinics, and inpatient and outpatient facilities. The hospital will consolidate its existing south Metro Denver facilities to the South Campus including its Outpatient Specialty Care and Orthopedic Care clinics in Centennial and the Center for Cancer and Blood Disorders and the Outpatient Specialty and Therapy Care centers in Littleton.

• Boulder Community Hospital’s Rocky Mountain Cardiology and Colorado Cardiovascular Center will join forces and move to the new state-of-the-art Anderson Medical Center on the Boulder Community Foothills Hospital campus in early 2013. Anderson Medical Center will house the Hospital’s premier cardiology services, an outpatient surgery center, and several physician offices. Its opening marks the completion of the first phase of Boulder Community Hospital’s extensive 10-year development plan.

• Centura Health expanded many of its healthcare facilities across the region:
  o The St. Anthony Breast Center and the St. Anthony Cancer Center opened on the St. Anthony Medical Campus in Lakewood. Each Center brings together expert staff and advanced technologies to meet the needs of patients.
  o Plans are underway for a $177 million comprehensive care facility in Westminster. The 350,000-square-foot addition to its existing St. Anthony North Pavilion includes a Level III trauma center and emergency department, an ambulatory surgery center with inpatient surgery capabilities, a women’s health center, outpatient diagnostics and treatment center, and inpatient beds. The facility will incorporate the company’s health neighborhood approach and is slated for completion in early 2015.
  o A 40,000-square-foot medical office building on the new Castle Rock Adventist Health Campus opened in 2012 and development continued on Centura’s new $128 million hospital that will include 50 licensed beds and provide intensive care, medical and surgical facilities, obstetrics, orthopedics, and cardiology services. The hospital is slated to open in the summer of 2013.

• Centura Health and the Rocky Mountain Hospital for Children opened a pediatric emergency care center at Littleton Adventist Hospital in 2012. The center is the first step toward an integrated system of pediatric care planned by the new collaboration formed by the two healthcare organizations in 2012.

• Craig Hospital unveiled plans to expand and renovate its Englewood campus. The $90 million project would add 88,000 square feet to the hospital, renovate and modernize an existing 110,000 square feet, and include a new therapy area with adaptive technology and additional private patient rooms. The hospital will begin construction in the spring of 2013.
Construction continued on Exempla St. Joseph Hospital’s redevelopment project in Denver. The $623 million state-of-the-art hospital will have 348 beds and is scheduled to open in late 2014.

Exempla Healthcare purchased 48.9 acres of land at the northwest corner of Interstate 25 and Highway 52 in Frederick with plans to build a new medical campus over the next 30 years.

UC Health plans to develop a 66-acre medical campus in the North Park mixed-use development project in Broomfield. The medical campus will be located across from Children’s Hospital Colorado’s North Campus. UC Health will study the current and future healthcare needs of the residents before deciding what services will be offered.

HCA-HealthONE’s hospitals improved access to healthcare for the region’s growing population:

- Plans are underway for Sky Ridge Medical Center’s 90-bed, $107 million expansion of its Lone Tree hospital. The project will also include a new parking structure, operating rooms, and a women’s health center and is slated for completion by the summer of 2014.
- The North Suburban Medical Center opened a 24-hour emergency room in Thornton. The 10,000-square-foot Northeast ER includes state-of-the-art emergency and diagnostic equipment, an onsite full-service laboratory, a specialized trauma department, and will offer pediatric emergency care in partnership with the Rocky Mountain Hospital for Children. The Northeast ER is the first phase of the planned 9-acre Northeast ER campus that will eventually include an ambulatory surgical center and medical office buildings.

The nine-county region is a key location for healthcare and wellness companies to grow and thrive. Notable company announcements in 2012 included:

- SCL Health System will move its headquarters from Kansas to Metro Denver and could generate 750 local jobs over the next four years. About 200 of those jobs will be located in downtown Denver, and the remaining 550 workers will operate from the Oracle campus in Broomfield. The SCL system oversees Exempla hospitals in Metro Denver as well as facilities in Kansas, California, and Montana.
- Denver-based dialysis provider DaVita Inc. opened its second U.S. research center at the St. Anthony Central Hospital campus in Lakewood. The new 80-bed, 35,000-square-foot facility supports high-risk studies and can support both patient and healthy volunteer Phase I clinical studies, employing 58 executive and medical professionals. In addition, DaVita opened a 100-worker call center in Centennial that will help patients, families, and providers locate dialysis clinics nationwide.
- Health provider Kaiser Permanente broke ground on an $86.9 million, 258,000-square-foot medical campus at Interstate 25 and Lincoln Avenue in Douglas County. The campus—scheduled to open in late 2013—will give patients access to orthopedic care, gastroenterology, outpatient surgery, and other services.
- Kaiser Permanente plans to hire 500 workers in the next three years at a new IT campus in Greenwood Village. The campus opened in early 2013.
- Exempla Lutheran Medical Center unveiled a number of senior-focused facilities. The hospital opened the Senior Surgery Center which includes a separate pre-surgery preparation area and offers a seamless transition to post-surgical home care. The hospital also plans to open a $1.7 million senior behavioral health center in early 2013 that can treat patients with dementia. The new facilities are in addition to the newly opened Lutheran Senior Emergency Room that provides senior citizens with a relaxed hospital atmosphere and staff trained to handle senior-specific conditions.
- Silverado Senior Living opened an $18 million, 86,000-square-foot facility in Arvada in early 2013. The Gardens on Quail Street is a specialized memory-care and rehabilitation services center that can accommodate nearly 140 memory impairment and Alzheimer’s patients.
- The winter division of HEAD USA will relocate from Connecticut to Boulder and will employ about a dozen people locally. The winter division—which manufactures skis—has been expanding partly because of high-profile endorsements.
- The Center for Medicare and Medicaid Innovation awarded Denver Health $19.8 million to transform its primary care delivery system into an integrated healthcare and a team-based approach to manage high-risk cases. The new model—21st Century Care—will
create three new high-risk centers at Denver Health and the Mental Health Center of Denver, while serving an additional 15,000 patients and could result in more than $40 million in savings. Denver Health will hire 20 new health information specialists and 25 patient navigators over a three-year period to improve access and quality of care.

- Children’s Hospital Colorado opened a $4.2 million therapy center in Broomfield. The 20,000-square-foot Broomfield Therapy Center replaces a smaller Westminster facility and offers services ranging from physical and occupational therapy to speech, audiology, and learning therapies. More than 22,000 patient visits are expected at the Center during the first year of operation.

- Centura Health launched the Colorado Health Neighborhoods that will pioneer a new approach to healthcare delivery across the state. The 13 health neighborhoods in Aurora, Parker, Littleton, Thornton, Denver, Erie, Golden Westminster, Pueblo, Cañon City, Grand County, and the San Luis Valley will move beyond the traditional healthcare delivery model into a patient-centered model that combines all facets of medical care into one location.

- The Arapahoe/Douglas Mental Health Network opened a new location in Parker in response to a growing need for its child and family services, adult outpatient support, and private network services. The Parker location will also include additional therapists, larger offices, and community education classes.

- Plans are underway for a 25,000-square-foot sporting complex in Boulder. The Boulder Sporting Club will house indoor fields for lacrosse and soccer, an outdoor 8-versus-8 field, and a smaller indoor field for futsal—a Portuguese variation on soccer.

- Boulder-based online natural grocer Mile High Organics closed an undisclosed, seven-figure seed round to expand its grocery delivery distribution networks that will include new services and products. The company was the first U.S. Department of Agriculture certified organic online retailer and expects to hire additional positions in 2013.

- Boulder-based GoLite opened a flagship retail store in downtown Boulder, a few miles from its headquarters operations. Founded in 1998, GoLite manufactures lightweight outdoor gear products.

- Lafayette-based Door to Door Organics Inc. secured $2 million in venture capital financing to expand its online grocery delivery network. Door to Door Organics provides delivery services for meat, bread, and dairy products.

- MapMyFitness secured $9 million in venture capital funding to expand its product line of health and fitness technologies. With offices in Denver, MapMyFitness helps users map, record, and share their workout routes, access online training tools, nutrition tracking, fitness calculators, and event listings.

The nine-county region is the source of several healthcare technology and wellness innovations, and numerous organizations that promote wellness.

- The Anschutz Health and Wellness Center at the University of Colorado health sciences campus in Aurora opened in 2012 as an innovative, state-of-the-art education, research, and patient care facility for health promotion and disease prevention. The $30 million, 95,000-square-foot facility includes top scientists, researchers, and a multidisciplinary team focused on innovative programs including weight management and nutrition services, wellness at work, and connective wellness. The University of Colorado is the first academic medical center to include prevention and wellness as a key part of its mission.

- Kaiser Permanente Colorado received the 2012 Million Hearts™ Hypertension Control Champion award. Companies receiving an award have achieved blood pressure control rates greater than 80 percent among their patients with high blood pressure. Since 2008, Kaiser’s focus on managing hypertension has resulted in an improvement from an initial blood pressure control rate of 61 percent to 82.6 percent.

- Centennial-based SlimGenics launched a new interactive kiosk, the WeighTM™, which can be located onsite at companies nationwide and act as a virtual coach to employees trying to lose weight. SlimGenics will use the kiosk in combination with the SlimGenics@Work corporate program to help companies reduce insurance premiums, increase employee productivity, and decrease absenteeism.

- HealthONE’s Swedish Medical Center is the only healthcare center in the Rocky Mountain region to offer a new procedure for patients suffering from acid reflux disease. The LINX® Reflux Management procedure is a minimally invasive laparoscopic
procedure that implants a series of interlinked titanium beads with magnetic cores into the esophagus just above the stomach. The magnetic attraction between the beads augments the existing esophageal sphincter's barrier function to prevent reflux.

- The Colorado Health Foundation awarded the Trust for Public Land $2.8 million to create new parks and playgrounds in Metro Denver. The award will support new park development and improve existing parks with playgrounds, designated fitness zones, and community gardens.

- LiveWell Colorado, a nonprofit organization dedicated to reducing obesity in Colorado, awarded $3 million to 22 communities across the state that are working toward healthy eating and active living at the local level. Established in 2009 through a collaborative funding effort between the Colorado Health Foundation, Kaiser Permanente, and the Kresge Foundation, LiveWell Colorado focuses on policy, environmental, and lifestyle changes that remove barriers and increase access to healthy behaviors.

- Colorado hosted the second annual USA Pro Cycling Challenge in summer 2012. The 683-mile route crossed 12 Colorado cities and towns (Durango, Telluride, Montrose, Crested Butte, Gunnison, Aspen, Avon, Breckenridge, Colorado Springs, Golden, Boulder, and Denver) and drew about 1 million spectators. The race brought an estimated $99.6 million economic impact to Colorado and was broadcasted in 175 countries with 31 hours of coverage.

- Colorado’s northeastern plains communities hosted the inaugural Pedal The Plains bicycle tour in 2012. Nearly 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 between 30 to 100 miles each day and showcased the host communities of Yuma, Wray, and Burlington. Pedal The Plains provided numerous economic benefits and opportunities for host communities including lodging stays, restaurant visits, transportation, and community entertainment.

- Launched in 2012, the Broomfield-based Kitchen Coop is a co-working business incubator for natural food startups looking to grow and expand into large-scale businesses. The 22,000-square-foot incubator space offers up to 50 early-stage companies 18 commissary kitchens, cold production rooms and packaging space, a gluten-free bakery, a fully operational warehouse, and legal and financial services to its incubator clients and industry professionals.

- The Center for Improving Value in Health Care (CIVHC), a nonprofit organization dedicated to helping consumers, businesses, policy-makers, and providers find information for high-quality, affordable health care, launched the All Payers Claims Database, a website that will allow users a way to compare costs of medical procedures at hospitals and outpatient centers across the state. The information will help consumers choose facilities with the most affordable care and encourage high-priced facilities to lower their costs. The system is expected to be operational by the end of 2013.

- 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.

- 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 which is one of the leading national health policy conferences in the nation.

- 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 health for all Coloradans by 2018.
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, and 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.

With direct employment of 176,460 healthcare and wellness workers, the nine-county region ranked 13th in absolute employment out of the 50 largest metro areas in 2012. The region ranked 31st for healthcare and wellness employment concentration. About 69 percent of Colorado’s healthcare and wellness cluster employees worked in the region.

<table>
<thead>
<tr>
<th>Nine-County Region</th>
<th>U.S.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct Employment, 2012</td>
<td>176,460</td>
</tr>
<tr>
<td>Number of Direct Companies, 2012</td>
<td>18,260</td>
</tr>
<tr>
<td>One-Year Direct Employment Growth, 2011-2012</td>
<td>3.1%</td>
</tr>
<tr>
<td>Five-Year Direct Employment Growth, 2007-2012</td>
<td>22.1%</td>
</tr>
<tr>
<td>Avg. Annual Direct Employment Growth, 2007-2012</td>
<td>4.1%</td>
</tr>
<tr>
<td>Direct Employment Concentration</td>
<td>9.2%</td>
</tr>
</tbody>
</table>


Healthcare and Wellness Employment

- The healthcare and wellness cluster directly employed about 176,460 people in the nine-county region in 2012.
- Healthcare and wellness companies employed 9.2 percent of the region’s total employment base, compared with a 10.6 percent employment concentration nationwide.
- Employment in the region’s healthcare and wellness cluster increased 22.1 percent between 2007 and 2012, compared with a 9.5 percent increase nationwide.
- Approximately 64 percent of the region’s healthcare and wellness cluster employees worked in general and medical, surgical, and psychiatric hospitals and offices of physicians, dentists, osteopaths, chiropractors, optometrists, podiatrists, and other health practitioners.
- About 68 percent of the region’s healthcare and wellness employees worked in the City and County of Denver (26 percent), and in Arapahoe (16 percent), Adams (13 percent), and Jefferson (13 percent) Counties.
Healthcare and Wellness Wages

The 2011 average annual salary for a healthcare and wellness worker in the nine-county region was $51,140, compared with the national average of $51,000. Total payroll for the healthcare and wellness cluster in the region reached nearly $8.8 billion in 2011.

Denver-Aurora-Broomfield MSA Occupational Salaries, 2011 Annual Average

<table>
<thead>
<tr>
<th>Occupational Category</th>
<th>Average Salary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Family and General Practitioners</td>
<td>$210,080</td>
</tr>
<tr>
<td>Internists, General</td>
<td>$139,400</td>
</tr>
<tr>
<td>Registered Nurses</td>
<td>$71,680</td>
</tr>
<tr>
<td>Dietitians and Nutritionists</td>
<td>$58,610</td>
</tr>
<tr>
<td>Athletic Trainers</td>
<td>$54,580</td>
</tr>
<tr>
<td>Massage Therapists</td>
<td>$43,050</td>
</tr>
<tr>
<td>Substance Abuse and Behavioral Disorder Counselors</td>
<td>$34,580</td>
</tr>
</tbody>
</table>


Healthcare and Wellness Companies

- About 18,260 healthcare and wellness companies operated in the nine-county region in 2012.
- Nearly 84 percent of the region’s healthcare and wellness companies employed fewer than 10 people, while 0.4 percent employed 250 or more.
- Sixty-three percent of the region’s healthcare and wellness companies were offices of physicians, dentists, osteopaths, chiropractors, optometrists, podiatrists, and other health practitioners, and provided other health and allied services.
- Nearly 69 percent of the healthcare and wellness companies in the region were located in the City and County of Denver (21 percent), and in Jefferson (17 percent), Arapahoe (17 percent), and Boulder (14 percent) Counties.

Major Healthcare and Wellness Companies

- 24 Hour Fitness  
  [www.24hourfitness.com](http://www.24hourfitness.com)
- American Medical Response  
  [www.amr.net](http://www.amr.net)
- Banner Health  
  [www.bannerhealth.com](http://www.bannerhealth.com)
- Better Bodies Fitness Centers  
  [www.betterbodiescolorado.com](http://www.betterbodiescolorado.com)
- Boulder Community Hospital  
  [www.bch.org](http://www.bch.org)
- Boulder Center for Sports Medicine  
  [www.bouldersportsmedicine.org](http://www.bouldersportsmedicine.org)
- Centura Health  
  [www.centura.org](http://www.centura.org)
- HCA-HealthONE LLC  
  [www.healthoneres.com](http://www.healthoneres.com)
- HealthGrades, Inc.  
  [www.healthgrades.com](http://www.healthgrades.com)
- 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)
- Longmont United Hospital  
  [www.luhcares.org](http://www.luhcares.org)
- Massage Envy  
  [www.massageenvy.com](http://www.massageenvy.com)
Major Healthcare and Wellness Companies Cont’d

- Children’s Hospital Colorado  
  www.childrenscolorado.org
- Comfort Dental  
  www.comfortdental.com
- CorePower Yoga  
  www.corepoweryoga.com
- Craig Hospital  
  www.craighospital.org
- DaVita Inc.  
  www.davita.com
- Denver Health and Hospital Authority  
  http://denverhealth.org
- Exempla Healthcare  
  www.exempla.org
- Gaiam, Inc.  
  www.gaiam.com
- National Jewish Health  
  www.nationaljewish.org
- Natural Grocers by Vitamin Cottage  
  www.naturalgrocers.com
- Platte Valley Medical Center  
  www.pvmc.org
- Rocky Mountain Poison & Drug Center  
  www.rmpdc.org
- SlimGenics, LLC  
  www.slimgenics.com
- The University of Colorado Hospital  
  www.uch.edu
- University of Colorado Health  
  http://universityofcoloradohealth.org

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 Health Council  
  www.cbhc.org
- Colorado Community Health Network  
  www.cchn.org
- The Colorado Health Foundation  
  www.coloradohealth.org
- The Colorado Trust  
  www.coloradotrust.org
- Community First Foundation  
  www.communityfirstfoundation.org
- Community Reach Center  
  www.communityreachcenter.org
- The Denver Health Foundation  
  www.denverhealthfoundation.org
- The Denver Hospice  
  www.thedenverhospice.org
- El Pomar Foundation  
  www.elpomar.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://movement.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
- Sisters of Charity of Leavenworth Health System  
  www.sclhealthsystem.org
- Visiting Nurse Association of Colorado  
  www.vnacolorado.org
- Western Dairy Association  
  www.westerndairyassociation.org

Page 10
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 (20.7 percent) and is the only state with an obesity rate below 21 percent. (Trust for America’s Health, 2012; Robert Wood Johnson Foundation, 2012)
   - Metro Denver ranked ninth on the American College of Sports Medicine’s 2012 American Fitness Index, which evaluated the nation’s 50 largest metro areas on criteria ranging from preventive health measures and chronic disease levels to community resources and physical activity policies. Denver received accolades for its low obesity rate, high percentage of residents participating in physical activity, and low diabetes and cardiovascular disease rates. (American College of Sports Medicine, 2012)
   - Pedestrian advocacy organization Walk Friendly Communities designated Fort Collins a bronze-level walk friendly community. Fort Collins received particular accolades for its outstanding Safe Routes to School program (SRTS) and excellent pedestrian planning practices. Half of the city’s elementary and middle schools have SRTS programs that include walkability audits and safe route maps. (Walk Friendly Communities, 2012)
   - Colorado has the third-highest percentage of state land area devoted to the National Forest System, according to the U.S. Forest Service. With more than 40 state parks, 56 national parks and wilderness areas, and the greatest number of 14,000-foot peaks in the nation, Colorado’s access to public lands and outdoor opportunities serves as a cornerstone of the state’s economy. (U.S. Forest Service, 2012; Colorado State Parks, 2012; Wilderness.net, 2012)
   - The City and County of Denver has the nation’s largest city park system with more than 200 parks and more than 34,000 acres of parks are located in the nearby mountains. Also, counties throughout Metro Denver have preserved more than 143,300 acres as open space. (Metro Denver Economic Development Corporation)
   - Denver ranked 13th among the nation’s 40 largest cities for best park facilities on the 2012 Trust for Public Land’s ParkScore, which scored cities by parks acreage, park accessibility, and investment and services. Denver’s 240 parks account for roughly six percent of the city’s area and 79 percent of the city’s residents live within a half-mile walk of a neighborhood park. (The Trust for Public Land, 2012)
   - More than 100 public and private golf courses are located throughout Metro Denver. In addition, 11 world-class ski resorts are within 100 miles. (Metro Denver Economic Development Corporation)
   - Boulder ranked fifth on the 2011 Gallup-Healthways “Well-Being Index,” which measures the physical and emotional health of residents in 190 metropolitan statistical areas. The survey-based index also ranked the Fort Collins metro area ninth and the indices’ statewide component ranked Colorado sixth for its residents’ overall well-being. (Gallup-Healthways, 2012)
Douglas County is Colorado’s second-healthiest county, according to the 2012 County Health Rankings released by the University of Wisconsin Population Health Institute and the Robert Wood Johnson Foundation. Researchers ranked all U.S. counties within their respective states based on a combination of health outcomes and health factors, which ranged from smoking and obesity rates to air pollution, unemployment, and availability of clinical care. (University of Wisconsin Population Health Institute, 2012)

The Colorado Health Foundation’s 2011 Colorado Health Report Card ranked Colorado first in the nation on several health indicators including lowest adult obesity and highest teen consumption of fruits and vegetables. The state also ranked second-lowest for the prevalence of hypertension among working-age adults and has the third-lowest prevalence of diabetes. The report examined 38 health indicators in five life stages and assigned a grade to each to show how Coloradans fare at every age. (The Colorado Health Foundation, 2012)

Colorado scored among the top 15 in the nation on four of the six healthy aging indicators in the Colorado Health Foundation’s 2011 Colorado Health Report Card. Colorado’s older adults are living longer and healthier lives, and had the highest rate of immunization of any state and ranked fourth for rates of physical activity. This is important since the fastest-growing age group in Colorado over the next 20 years will be ages 65 and older. (Colorado Health Foundation, 2012; Colorado State Demography Office, 2012)

Denver ranked fifth among 10 U.S. cities for eye health, according to VSP Vision Care’s “2012 Eye Health City Index.” To compile the index, contributors evaluated how frequently each city's residents had their eyes examined in 2011 and who have VSP Vision Care benefits. (VSP Vision Care, 2012)

Denver ranked ninth on GrubHub’s 2012 list of the 10 most vegetarian-friendly cities. To compile the rankings, analysts reviewed 15,000 restaurants with online ordering that identify vegetarian cuisine on their menus. Seattle, San Jose, and San Diego ranked as the most vegetarian-friendly. (GrubHub.com, 2012)

Boulder’s natural and organic industry directly employs nearly 7,000 people, resulting in $234.1 million in salaries and $303.1 million in economic output, according to the 2011 Natural and Organic Industry Study by the Leeds School of Business at the University of Colorado and Naturally Boulder. The industry’s total impact is nearly 8,300 jobs, $297 million in salaries, and $492 million in economic output. (University of Colorado, 2012; Naturally Boulder, 2012)

Colorado ranked second-highest in health club participation, according to the International Health, Racquet & Sportsclub Association. Signaling the state’s overall interest in fitness, one out of five Colorado residents belonged to a health club in 2010. Gym membership nationwide reached an all-time high of 50.2 million members in 2010. (International Health, Racquet & Sportsclub Association, 2012)

Colorado is an emerging powerhouse in the organic products market. The state’s farmers, ranchers, and food processors account for an estimated $2.5 billion in organic sales, or about 10 percent of total U.S. sales of organic products. (Colorado Department of Agriculture, 2012)

Colorado ranked eighth-highest in the nation for organic vegetable and fruit acreage, totaling 3,850 certified organic acres in 2008. In total, Colorado’s organic industry includes nearly 170 certified organic farms and ranches with more than 106,700 certified organic acres. (United States Department of Agriculture, 2012)

Colorado ranked 11th among the 50 states in the 2012 edition of America’s Health Rankings, which are produced by the United Health Foundation, the American Public Health Association, and the Partnership for Prevention. Criteria for the ranking included 24 measures of health determinants and outcomes ranging from the prevalence of smoking and obesity to air pollution and the prevalence of prenatal care. Colorado had the lowest obesity and diabetes rates of any state, the most active residents, and low rates of cancer deaths. (United Health Foundation, 2012)

Metro Denver ranked among the nation’s top 20 “Best Cities for Successful Aging” in 2012 for seniors ages 65 to 75 years old, according to Milken Institute. The study ranked
the nation’s 100 largest metro areas in eight categories ranging from wellness, general healthcare, and transportation to employment and community engagement. Metro Denver’s highest scores were in the wellness and financial categories. (Milken Institute, 2012)

- Healthy lifestyles website RealAge.com ranked Denver fifth among the “25 Best Cities for Staying Young” in 2012. Contributors based the ranking on 12 factors—including rates of smoking and exercise habits—that support a healthy, low-stress lifestyle. (RealAge.com, 2012)

- Denver ranked high among Travel + Leisure magazine’s 2012 “America’s Favorite Cities.” The rankings are based on surveys of travelers and residents and show Denver ranked highest in quality of microbrews (second), most active and athletic residents (third), having the nicest summer (eighth), and environmental friendliness (10th). (Travel + Leisure, 2012)

2. The ability to recruit and retain a healthy, skilled, and productive workforce

- Healthy employees are more productive, have less absenteeism, and cost an average of $4,000 less each year in healthcare costs than unhealthy employees. (University of Michigan Health Management Research Center, 2012)

- Of Colorado’s adult population, more than 36 percent has completed a bachelor’s or higher-level degree, making Colorado the third-most highly educated state in the nation behind Massachusetts and Maryland. (U.S. Census Bureau, 2011 American Community Survey)

- Colorado ranked 10th in the number of science and engineering graduate students per 1,000 individuals ages 25 to 34 years old in 2009. Universities such as the Colorado School of Mines, the University of Colorado Boulder (CU-Boulder), and Colorado State University (CSU) all offer competitive science and engineering doctorate programs and research facilities. (National Science Foundation, 2012)

- Metro Denver ranked first among the nation’s largest metropolitan areas for total population gain in the 25- to 34-year age group between 2008 and 2010, according to the Brookings Institution. The region’s stable economies, “cool” cities, and high-tech centers are drawing young adults. (The Brookings Institution, 2012)

- Denver ranked 11th among the nation’s “Top 15 Best Cities for Recent College Graduates,” according to a 2012 ranking by Apartments.com and CareerRookie.com. Contributors considered each city’s average rent, employment opportunities, and average entry-level salary. (Apartments.com, 2012; CareerRookie.com, 2012)

- Healthcare business news website HealthExecNews.com named Rose Medical Center of Denver and the University of Colorado Hospital (UCH) among the “25 Best Hospitals to Work for in the U.S.” Contributors highlighted Rose Medical Center’s unique approach to development strategies and employee engagement, its strong leadership team that spends 4,500 annual hours collaborating ideas, and the “Rose Code” of values that makes it a positive place to work. UCH received particular accolades for its advancements in medicine, exceptional educational opportunities, and tuition reimbursement program. (HealthExecNews.com, 2012)

- The Colorado Health Foundation awarded $1.75 million in 2012 to the Central Colorado Area Health Education Center to support scholarships for health professionals, particularly in rural and underserved urban areas of the state. The four-year program will designate 48 scholarships to nurse practitioners, physician assistants, and behavioral health, pharmacy, and dental students to help meet the shortage of health professionals in the state. (The Colorado Health Foundation, 2012)

3. The convergence of health-related education, research, and application

- The University of Colorado’s School of Medicine ranked fifth nationally for primary care and 35th among research-oriented programs, according to U.S. News & World Report’s 2013 “America’s Best Graduate Schools” report. The School of Medicine also ranked among the top 35 for health programs ranging from nursing and pharmacology to physical therapy. (U.S. News & World Report, 2012)
• The University of Colorado College of Nursing’s online graduate program is one of the nation’s top online graduate nursing programs, according to the first-ever edition of “Top Online Education Programs” rankings by *U.S. News & World Report*. The program was among an elite group of five that received top ranks in four indicators of student services and technology (third), student engagement and accreditation (10th), faculty credentials and training (13th), and admissions selectivity (24th). The program’s graduate specialties include informatics, health systems, and mental health. (*U.S. News & World Report, 2012*)

• The University of Colorado’s School of Medicine graduates about 140 medical students per year and offers programs in dental medicine, medicine, nursing, pharmacy, and public health. Other professionals, including dieticians, dental hygienists, physician assistants, and physical therapists also train at the Fitzsimons campus. (University of Colorado, 2012)

• Metro Denver has two higher education institutions with accredited entry-level physician assistant (PA) programs. The University of Colorado Denver’s PA program ranked 11th among the nation’s top PA programs and the Red Rocks Community College PA program ranked within the nation’s top 120 in 2011. Red Rock’s program is also affiliated with Regis University, which awards a master’s degree in clinical leadership. (*U.S. News & World Report, 2012; Colorado Health Institute, 2012*)

• The College of Nursing at the University of Colorado was the birthplace of the first nurse practitioner program in the world and is nationally recognized for its programs dedicated to preparing quality nurses. In 2011, *U.S. News & World Report* ranked the College of Nursing master’s degree program among the top 15 in the nation and the College’s Pediatric Nurse Practitioner specialty program ranked among the top five in the nation. (*U.S. News & World Report, 2012*)

• The Colorado School of Public Health (CSPH) is the first and only school of public health in the Rocky Mountain region. The CSPH is home to the collaborative faculty, students, and accredited public health programs of the University of Colorado, CSU, and the University of Northern Colorado. Further, the CSPH strengths include cancer research and obesity prevention, biostatistics and informatics, and community health. (The Colorado School of Public Health, 2012)

• In 2012, the CSPH—in partnership with the Colorado Department of Public Health and Environment and CSU—was designated by the Centers for Disease Control and Prevention to create a regional Center for Food Safety Excellence in the United States. Colorado was selected among five national centers in response to the Food Safety Modernization Act of 2011 and will create partnerships between state health departments, schools of public health, and agriculture schools to improve foodborne illness outbreak surveillance and investigations. (Centers for Disease Control and Prevention, 2012)

• The University of Colorado ranked among the nation’s top institutions in total National Institutes of Health funding in fiscal year 2011. The University of Colorado School of Pharmacy ranked seventh out of 71 academic pharmacy schools, while the School of Medicine ranked 25th out of 129 academic medical schools. (National Institutes of Health, 2012)

• The University of Colorado Cancer Center (CU Cancer Center) is the only National Cancer Institute-designated comprehensive cancer center in the Rocky Mountain region that partners with nearly all the cancer research scientists in Colorado to provide patients with the latest research and technologies. The CU Cancer Center is one of only 41 cancer centers to receive this most elite recognition, deeming membership as “the best of the best.” (The University of Colorado Cancer Center, 2012)

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

• HealthGrades awarded several honors to hospitals in the nine-county region in 2012 and early 2013. Exempla Lutheran Medical Center (Wheat Ridge), Exempla Saint Joseph Hospital (Denver), Exempla Good Samaritan Medical Center (Lafayette), Centura Health-Littleton Adventist Hospital (Littleton), Medical Center of the Rockies (Loveland), McKee Medical Center (Loveland), and North Colorado Medical Center (Greeley) earned
HealthGrades’ 2013 Distinguished Hospital Award for Clinical Excellence. North Colorado Medical Center also ranked among “America's 100 Best Hospitals” in 2012, four of the region’s hospitals received awards for Emergency Medicine Excellence, and six hospitals won awards for Outstanding Patient Experience. (HealthGrades, Inc., 2012-2013)

- Metro Denver’s hospitals are among the safest in the nation, according to The Leapfrog Group’s 2012 Hospital Safety Score. More than 2,600 hospitals were assigned a letter grade based on 26 hospital safety measures ranging from the institution’s standards for recommended patient care and treatment to the systems in place for providing care and surgical safety measures. Denver Health, Centura-St. Anthony, Centura-Porter Adventist Hospital, Centura-Littleton Adventist Hospital, UCH, McKee Medical Center, Exempla St. Joseph Hospital, Exempla Good Samaritan Medical Center, Medical Center of Aurora, and hospitals within the HealthONE Network, including Rose Medical Center and Sky Ridge Medical Center, received an “A” safety grade. Eight Metro Denver hospitals received a “B” grade and five received a “C” grade. (The Leapfrog Group, 2012)

- Thomson Reuters named Poudre Valley Hospital one of the “100 Top Hospitals” nationwide, the only Colorado hospital to achieve a top-100 ranking. The list is based on an analysis of patient care, operational efficiency, financial stability, and other criteria. (Thomson Reuters, 2012)

- WomenCertified® recognized Sky Ridge Medical Center as Metro Denver’s “Best Hospital for Patient Experience” in 2012. The prestigious annual list is based on female patient satisfaction and considers in-depth research on customer satisfaction among women. WomenCertified® also honored Sky Ridge with the Women’s Choice Award in 2012, which represents the collective opinion of women who highly recommend the hospital and its services. (WomenCertified®, 2012)

- The American Association of Critical Care Nurses awarded UCH’s Neurosurgical Intensive Care Unit the gold-level Beacon Award for Excellence in 2012. The prestigious award is given to programs that achieve excellent and sustained unit performance and patient outcomes. (University of Colorado Hospital, 2012)

- The Colorado Center for Reproductive Medicine (CCRM) is one of the nation’s leading fertility clinics providing a wide variety of treatments ranging from basic infertility care to the most advanced technology available. Two-thirds of the Center’s patients travel to Colorado from other states and countries for treatment and it is internationally recognized for success rates and scientific achievements in the field of reproductive endocrinology. (The Colorado Center for Reproductive Medicine, 2012)

- The Colorado Center for Robotic Surgery at the Sky Ridge Medical Center added a second robotic surgery system in 2012, allowing more surgeons to offer robotic surgery as an option for patients. Sky Ridge Medical Center performs more da Vinci robotic prostatectomies than any other hospital in Metro Denver. (Sky Ridge Medical Center, 2012)

- Craig Hospital in Denver is a world-renowned center for specialty rehabilitation and research for people with spinal cord and traumatic brain injuries. Half of Craig’s patients come from outside of Colorado and Craig has treated patients from all 50 states and several foreign countries in the past five years. Craig provides housing for out-of-state families and outpatients, including the first 30 days free for families of new inpatients. (Craig Hospital, 2012)

- The Barbara Davis Center for Childhood Diabetes is one of the largest diabetes programs specializing in Type 1 diabetes research and care in the world. The Center provides state-of-the-art clinical diabetes care to 3,600 children and 2,400 adults with diabetes within the Rocky Mountain region, as well as receiving national and international referrals. (The Barbara Davis Center for Childhood Diabetes, 2012)

- Children’s Hospital Colorado ranked among the nation’s top-10 pediatric hospitals in the 2012-2013 edition of U.S. News & World Report’s “Best Children’s Hospitals.” Children’s Colorado was the only one of 80 facilities ranked in all 10 specialty categories, and the hospital received its highest rankings for diabetes and endocrinology (fourth), pulmonology (sixth), and cancer (eighth). Children’s Hospital Colorado ranked among the nation’s eight-best pediatric hospitals overall. (U.S. News and World Report, 2012)
U.S. News & World Report’s 2012-2013 “Best Hospitals” named 11 Metro Denver hospitals to its top-ranked healthcare facilities list. UCH ranked as the top facility in Metro Denver and ranked nationally in pulmonology (first), rheumatology (17th), cancer care (33rd), nephrology (42nd), and diabetes and endocrinology (48th). For the second year in a row, National Jewish Health and Craig Hospital tied as the second-best facilities in Metro Denver. Craig ranked seventh nationally for rehabilitation, and National Jewish Health also shared the first-place national ranking for pulmonology with UCH. The Medical Center of Aurora ranked fourth and Exempla St. Joseph hospital and Porter Adventist tied as the fifth-best hospitals in Metro Denver. (U.S. News & World Report, 2012)

UCH and Denver Health were among 10 academic medical centers in the nation to receive the University HealthSystem Consortium (UHC) Quality Leadership Award in 2012. The UHC Quality Leadership Award is given to academic medical centers that demonstrated overall quality of care, efficiency, and patient safety. (University HealthSystem Consortium, 2012)

HCA-HealthONE’s Rocky Mountain Hospital for Children, Youth Sports Medicine Institute’s team of nationally recognized orthopedic surgeons, sports medicine pediatricians, athletic trainers, and clinic psychologists focuses on adolescent athletic care and concussions. Established in 2010, the Institute offers special radiology equipment, and sports injury and performance research to young athletes. (Youth Sports Medicine Institute, 2012)

HCA-HealthONE’s Rocky Mountain Hospital for Children has the largest Neonatal Intensive Care Unit (NICU) in the Rocky Mountain region and treats twice as many NICU patients annually than other Metro Denver hospitals. In 2012, the hospital launched a study to obtain critical data for the early detection of congenital heart disease in newborns. (Rocky Mountain Hospital for Children, 2012)

Three Metro Denver hotel spas—the Oxford Hotel, the Brown Palace Hotel & Spa, and the St. Julien Hotel & Spa in Boulder—were named to Condé Nast Traveler magazine’s 2012 “Top 75 U.S. Hotel Spas” and the Omni Interlocken Resort in Broomfield was named to the magazine’s 2012 “Top 100 Resort Spas” on the U.S. mainland. Contributors determine the awards based on an annual Readers’ Choice Awards survey. Eight other resorts throughout Colorado also received top Condé Nast honors. (Condé Nast Traveler, 2012)

5. An overall better quality of life

Business news website Businessweek.com ranked Denver sixth among “America’s 50 Best Cities” in 2012. The ranking is based on metrics including education, income, unemployment, leisure activities, and air quality. (Businessweek.com)

Castle Rock is among the nation’s top 20 communities in which to live, according to MONEY Magazine’s 2012 “Best Places to Live.” The list identifies 100 small cities and towns with a reputation for safety, education, housing and healthcare affordability, diversity, and other advantages. Highlands Ranch (21st), Centennial (49th), Boulder (60th), and Fort Collins (70th) were also named to the list. (MONEY Magazine, 2012)

Denver ranked 14th on Travel + Leisure magazine’s 2012 list of “America’s Best Cities for Singles.” Criteria included a variety of factors ranging from the cost of living to culture and nightlife. Denver received accolades for access to fitness facilities and wide-open spaces. (Travel + Leisure, 2012)

The cost of living in Metro Denver is only 5 percent above the national average and is well below that of many other major cities. (The Council for Community and Economic Research, Cost of Living Index, Q3 2012)

Metro Denver voters approved the funding of FasTracks in November 2004. FasTracks is a $7.4 billion comprehensive plan for the design and construction of high-quality transit service and facilities. FasTracks will vastly improve mobility for current residents and future populations throughout the region.

The Brookings Institution ranked Metro Denver 12th for public transit coverage and ninth for its labor access rate in 2012. For each of the nation’s 100 largest metros, researchers
examined the share of the number of jobs located in neighborhoods with public transit and the share of jobs accessible within a 90-minute commute on public transit. Nationally, 76 percent of jobs are accessible by public transit, but only 27 percent of workers can reach those jobs in 90 minutes or less compared with 87 percent of jobs in Metro Denver are accessible by public transit and 46 percent can reach those jobs. (The Brookings Institution, 2012)

- Metro Denver ranked third-sunniest among 20 major U.S. cities with an average 69 percent of days with sunshine. (U. S. National Oceanic and Atmospheric Administration, National Climatic Data Center, 2012)

### Healthcare and Wellness 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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<td>2329-01</td>
<td>Men's &amp; boys' sportswear &amp; athletic clothing</td>
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<tr>
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<td>Health &amp; dietetic food stores</td>
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<td>Offices &amp; clinics of health practitioners, NEC</td>
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<td>Outpatient mental health &amp; substance abuse centers</td>
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<td>HMO medical centers</td>
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<td>Medical laboratories</td>
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## Healthcare & Wellness Industry Cluster Definition Cont'd

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<td>Blood &amp; organ banks</td>
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<td>Voluntary health organizations</td>
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<td>Health &amp; welfare council</td>
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<td>Administration of public health programs</td>
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<td>Administration of public health programs</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."
Healthcare and Wellness Industry Cluster Relationships

Technologies
- Bioinformatics
- Biotechnology
- Chronic Disease Management Devices
- Electronic Health Records
- Genomics
- Interactive Gaming
- Nuclear Medicine
- Physiological and 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

Healthcare and Wellness

Infrastructure
- Fitzsimons Life Science District
- 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 Management Centers
- Poison and Drug Centers
- Specialty Outpatient Clinics
- Health Information Organizations
- Medical Specialty Schools
- Mental Health and Substance Abuse Clinics
- Counseling and Rehabilitation Centers

For additional information, contact us:

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

INFORMATION TECHNOLOGY-SOFTWARE
Metro Denver and Northern Colorado Industry Cluster Profile

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 industries are high-knowledge, human capital-based industries that are expanding globally and are expected to continue growing. A broad 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 more than 175,000 information technology workers in the state representing more than 5,000 software companies and nearly 1,000 hardware and related technology companies.

This industry cluster report is based on a narrower 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 business information. Software, which is covered in this report, includes companies involved in activities ranging from the development of 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.

Colorado’s strong entrepreneurial activity and talented IT workforce supports an innovation ecosystem, fueled by investment, modern infrastructure, and high-tech exports. Colorado ranked third in tech-worker concentration for the fifth-consecutive year, with 87 of every 1,000 private-sector workers employed in technology firms, according to the TechAmerica Foundation’s Cyberstates 2011 report. The report also ranked Colorado 14th for absolute employment in the high-tech industry, seventh for average high-tech wage, and 11th for the absolute number of high-tech businesses. Further, the most recent Cybercities report by the TechAmerica Foundation ranked Boulder 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 as Denver tech workers earned 81 percent more than the average private-sector worker.

The nine-county Metro Denver and Northern Colorado region is a major user of technology and is an influential high-tech center. Colorado had the nation’s 17th-highest prevalence of Internet usage in 2010, according to the U.S. Census Bureau. About 69 percent of Colorado residents over age three access the Internet at home, and nearly 78 percent live in a home with Internet access. In addition, Denver ranked fifth on CNBC’s list of “America’s Most Wired Cities” in 2011. Criteria for the ranking included the average download speeds across all U.S. cities. Denver’s download speed averaged 10.2-megabits per second and the city received particular accolades for its large number of state and federal agencies and its key role as a distribution hub, making fast Internet connections a necessity in the region.

From 2002 to 2011, the IT-software industry attracted significant capital and investment firms in deals and funds across the nine-county region. According to Pricewaterhouse Coopers’ MoneyTree Report, Colorado companies in the IT-software industry have attracted $1.98 billion in

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1 The nine-county Metro Denver and Northern Colorado region consists of Adams, Arapahoe, Boulder, Broomfield, Denver, Douglas, Jefferson, Larimer, and Weld Counties.
venture capital in 390 deals, representing nearly 32 percent of the total amount invested across all industries in the state and about 42 percent of all deals over the last 10 years. The IT-software industry continues to be one of the strongest recipients of funding from venture capitalists, private investors, and angel investors as innovation accelerates and more companies integrate technology into their infrastructure.

A number of notable venture capital deals and investment opportunities occurred in 2012:

- Denver-based Wayin secured $14 million to support the company's leading mobile and web engagement platform that enables conversations between businesses, government agencies, and other organizations with their customers, employees, and communities. Since launching in 2011, the company has secured $20 million in funding and its suite of conversation tools can be integrated across a variety of media including Facebook, Twitter, mobile applications, and deployed in real-time during live events.

- Broomfield-based Starboard Storage Systems Inc. raised $13 million in funding to expand its sales, marketing, and local workforce. In 2012, the data storage company launched its AC72 Storage System that utilizes software and applications to manage a variety of different file types and storage protocols.

- Cloud-based software company Trackvia secured $7.1 million in venture capital financing to expand the company’s marketing, sales, and engineering operations. The Denver-based company plans to double its workforce, customer base, and revenue over the next year.

- Boulder-based Knowledge Factor Inc. received a $5 million investment from Leeds Equity to continue developing its e-learning software. The award was based on the company's high-quality work and advanced software for online training and education courses.

- Metro Denver launched its first stock exchanges in Boulder in response to the Jumpstart Our Business Startups (JOBS) Act, allowing individuals to make small investments in new businesses and provide incubation for growing companies. The SSX: The Story Stock Exchange is an angel fund that invests capital and marketing resources in high-growth companies and capitalizes on its technology resources, angel network, and marketing capabilities. The SSX team will provide custom programs, seed funding, business and capital formation, investor relations, and digital marketing in exchange for future equity participation in its portfolio projects and will provide incubation that will lead to the development of an equity pool of story stocks.

- Bullet Time Ventures II launched in 2012 as a new $28 million seed- and early-stage investment fund. The fund will make initial investments over the next five years between $50,000 and $200,000 for startups and emerging TechStars companies.

The nine-county region is the site of a vibrant entrepreneurial network, hosting a high-tech talent pool, a variety of organizations that foster innovation, and an appealing lifestyle for startups.

- Boulder startup incubator TechStars is a three-month program that provides up to $18,000 in seed funding for startups, intensive mentorship and idea development, and the chance to present to angel investors and venture capitalists for those companies selected to participate. The incubator’s new accelerator called TechStars Cloud focuses entirely on backing cloud computing and infrastructure startups.

- The Denver Metro Chamber of Commerce and Colorado Technology Partners (CTP) hosted the inaugural Business Technology Exposition to bring together technology-focused organizations to discuss, engage, and exchange ideas about improving business through technology. The exhibition also provided training and educational opportunities for local technology organizations, fostered entrepreneurial activity, and honored outstanding vendors for multiple technology-focused fields. Further, more than 60 technology providers showcased the latest software, hardware, and cloud solutions technologies.

- The region’s technology base continued to grow with the first-ever Denver Startup Week in October 2012. The event showcased the region’s entrepreneurial community with an emphasis on technology, design, social entrepreneurship, and business. Denver Startup Week featured more than 70 events and 4,000 people in attendance and celebrated the great companies, innovation, and ideas in the region with a specific focus on downtown Denver.
The Colorado Technology Association (CTA) serves as the state’s premier industry association dedicated entirely to advancing the technology industry. The CTA was established in 1994 to represent the state’s software, hardware, IT services, storage, and other technology-related industries. CTA provides advocacy, leverages insights and trends to help businesses optimally perform in the global marketplace, and ensures Colorado’s technology companies are recognized for their leadership and innovation.

Founded in 2008, Colorado Technology Partners (CTP) is a strategic partnership representing technology service providers in the region. CTP brings technology providers together to help clients manage and grow their businesses.

Galvanize, a 30,000-square-foot workspace for digital startups, is helping to attract new businesses. The technology coworking and office space in downtown Denver could accommodate more than 300 individuals and up to 70 startups once fully operational and combines venture capital, flexible workforce, and an experimental engineering and business school called gSchool. The school offers an intensive six-month course to train students to code software and graduate high-caliber programmers. A second Galvanize and gSchool model is already planned in late 2013—the G2 project—for the Riverfront neighborhood and will be a 72,000-square-foot mix of cowork, startup space, gSchool classrooms, and an eatery.

The Innovation Center of the Rockies (ICR) and CSU Ventures partnered to accelerate the creation of new businesses through university research, venture capital, and industry leadership. The partnership will facilitate and develop the intellectual properties necessary in the IT-software cluster and expand ICR’s network of organizations to commercialize technologies funded by the Small Business Innovation Research grants.

Federal legislation passed in 2012 will ensure future growth and success of Colorado’s IT-software industry. President Obama signed the JOBS Act to encourage funding of small businesses by easing various securities regulations. The JOBS Act will also help startups and small businesses use the Internet to raise up to $1 million in small investments, especially through crowdfunding, and will allow larger companies to offer up to $50 million in stock to the public without registering with the Securities and Exchange Commission. Software companies will benefit from the accelerated IPO process and access to a larger pool of potential investors.

Startup Colorado is a regional initiative to increase the breadth and depth of the entrepreneurial ecosystem across Colorado’s Front Range. Launched in 2011, the initiative focuses on improving access to entrepreneurial education, encouraging new company creation, increasing connections among entrepreneurs and mentors, and building a more vibrant entrepreneurial community.

The Colorado Innovation Network (COIN) is a private, public, and academic collaboration designed to foster new technology development across the state’s existing and emerging industries. COIN aims to connect innovation leaders and inventors to solutions and ideas through which they can foster innovation and is part of Gov. John Hickenlooper’s economic development plan, Blueprint Colorado.

The region continues to be a leader in patent and intellectual property initiatives.

The U.S. Patent and Trademark Office launched the first-of-its kind patent initiative called ProBoPat in Denver to connect low-income local inventors and entrepreneurs with patent attorneys at free or reduced rates. The Mi Casa Resource Center will be a partner on the initiative and will support its current programs for entrepreneurs and small business owners.

The U.S. Department of Commerce’s United States Patent and Trademark Office will locate one of four new satellite offices in Denver due to the state’s expansive culture of innovation and entrepreneurism, ability to attract high-quality professionals and technical talent, high quality of life and low cost of living, and its vast transportation infrastructure.

A number of notable mergers and acquisitions in the region’s information technology industry drove company growth, expanded product offerings, and extended customer networks in 2012.

Broomfield-based Datavail acquired Seattle-based Blue Gecko to expand its customer network across the United States. The agreement will increase project opportunities for the database management company and will double the size of its current customer base. The company could have more than 250 database administrators and additional staff by early 2013 as a result of the agreement.
Douglas County-based IHS Inc. acquired a number of software companies in 2012 to expand its product offerings and consumer market, accelerate growth, and increase the value offered to its employees by connecting innovation to knowledge workers. Notably, the company purchased search, product information, and digital media company GlobalSpec for $230 million and semantic search technology company Invention Machine for $40 million. IHS has acquired nearly 30 companies since 2008.

Boulder-based Ajubeo, a cloud infrastructure company, sold to private equity firm Grey Mountain Partners. The transaction will allow the company to grow rapidly and add new cloud hub locations.

The nine-county region’s vibrant information technology hub is an ideal location for companies to establish and expand. Some key company announcements in 2012 included:

- Healthcare technology and services company The TriZetto Group will build a new worldwide headquarters building in Douglas County’s Meridian International Business Center development. The 186,000-square-foot, $40 million project will accommodate the company’s growth and is slated for completion in spring 2013.

- Atlanta-based NeoMedia Technologies Inc. relocated its headquarters to Boulder. The 2D mobile barcode technology and infrastructure solutions company cited Boulder’s strong talent pool and center for high-tech and mobile as key factors in its location decision.

- Colorado Springs-based Intelligent Software Solutions opened an office in the Denver Tech Center to take advantage of Denver’s strong technology workforce and quality talent. The company plans to hire software engineers, project managers, and support staff.

- Boulder-based SendGrid opened an office in downtown Denver and will hire software engineers, support staff, and web developers. The email delivery company’s new location will improve access to its client base and offers a highly skilled talent pool.

- Virginia-headquartered PIXIA Corp., an industry leader in commercial software and solutions for BIG data, opened an office in downtown Denver. The company expanded to Metro Denver to capitalize on the region’s large number of digital data companies and high-tech talent pool, specifically geospatial experienced software engineers.

- Red Door Interactive moved to a new downtown Denver office space along 17th Street to accommodate the company’s expanding team and growing client base. The company’s new workspace will include meeting rooms and gathering space to host informal meetings.

- Boulder-based Confio Software more than doubled the space of its local headquarters and plans to hire additional employees in the next year to accommodate growth. The database performance software company doubled its workforce to 60 employees over the last year.

- Boulder-based Rally Software Corp. plans to more than double the size of its headquarters facility to support the company’s rapid growth and expansion over the last few years.

- Boulder-based Simple Energy Inc. relocated to a larger 4,200-square-foot office space in Boulder to accommodate company growth. The company is a TechStars 2011 graduate that works with utilities to develop user-engagement tools to boost client’s energy conservation and efficiency. The company chose the new Boulder location because of its software startup environment, access to veteran entrepreneurs, and large talent pool.
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 10th out of the 50 largest metro areas in software employment concentration in 2012. With direct employment of about 43,230 software employees, the region ranked 12th in absolute employment. About 77 percent of Colorado’s software cluster employees worked in the region.

<table>
<thead>
<tr>
<th>Nine-County Region</th>
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<tr>
<td>Direct Employment, 2012</td>
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<td>Number of Direct Companies, 2012</td>
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<td>One-Year Direct Employment Growth, 2011-2012</td>
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<td>Five-Year Direct Employment Growth, 2007-2012</td>
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<td>Avg. Annual Direct Employment Growth, 2007-2012</td>
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<tr>
<td>Direct Employment Concentration</td>
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Software Employment

- The software cluster directly employed about 43,230 people in the nine-county region in 2012.
- Software companies employed 2.3 percent of the region’s total employment base, compared with a 1.3 percent employment concentration nationwide.
- Employment in the region’s software cluster increased 1.6 percent from 2007 to 2012, compared with a 13.2 percent increase at the national level.
- Nearly 74 percent of the region’s software cluster employees provided custom computer programming, computer integrated design services, and other computer-related services.

- Software cluster employment was widely dispersed throughout the region with the heaviest concentrations in the City and County of Denver (23 percent) and in Boulder (20 percent), Arapahoe (19 percent), and Jefferson (13 percent) Counties.

Wages

Total payroll for the software industry cluster in the region exceeded $4 billion in 2011. The 2011 average annual salary for software cluster employees in the nine-county region was $95,830, compared with $96,450 nationwide.

Denver-Aurora-Broomfield MSA Occupational Salaries, 2011 Annual Average

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Salary</th>
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</thead>
<tbody>
<tr>
<td>Computer and Information Research Scientists</td>
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<tr>
<td>Software Developers, Applications</td>
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<tr>
<td>Computer Programmers</td>
<td>$79,840</td>
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<tr>
<td>Database Administrators</td>
<td>$77,500</td>
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</tbody>
</table>

Software Companies

- About 4,170 software companies operated in the nine-county region in 2012.
- Nearly 83 percent of the region’s software companies employed fewer than 10 people, while 0.4 percent employed 250 or more.
- Approximately 60 percent of software companies in the region provided custom computer programming or other computer-related services.
- About 71 percent of the region’s software companies were located in Jefferson (20 percent), Arapahoe (18 percent), and Boulder (16 percent) Counties, and in the City and County of Denver (17 percent).

Major Software Companies

- Center Partners, Inc. www.centerpartners.com
- CGI Group Inc. www.cgi.com
- CIBER, Inc. www.ciber.com
- Cisco Systems, Inc. www.cisco.com
- Constant Contact, Inc. www.constantcontact.com
- Digital Folio Inc. www.digitalfolio.com
- Dot Hill Systems Corp. www.dothill.com
- EMC Corporation www.emc.com
- Fast Enterprises, LLC www.fastenterprises.com
- Hosting.com www.hosting.com
- IBM Corp. www.ibm.com
- IHS Inc. www.ihs.com
- Intermap Technologies, Inc. www.intermap.com
- Intrado Inc. www.intrado.com
- Latisys www.latisys.com
- LogRhythm Inc. www.logrhythm.com
- MapQuest, Inc. www.mapquest.com
- McKesson Technology Solutions www.mckesson.com
- Oracle Corporation www.oracle.com
- Pearson eCollege www.ecollege.com
- Ping Identity www.pingidentity.com
- Quark Software Inc. www.quark.com
- Rally Software Development Corp. www.rallydev.com
- Rivet Software www.rivetsoftware.com
- SendGrid www.sendgrid.com
- SolidFire Inc. www.solidfire.com
- Statera, Inc. www.statera.com
- Sybase, Inc. www.sybase.com
- Tendril www.tendrilinc.com
- The TriZetto Group, Inc. www.trizetto.com
- Trulia Inc. www.trulia.com
- VMware, Inc. www.vmware.com
- Webroot Software www.webroot.com

Note: The increase in the number of companies in 2011 is attributed to a break in the data series due to new methodology and enhanced company inclusion. Therefore, historical data is not comparable to 2011.
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 36 percent has completed a bachelor’s or higher-level degree, making Colorado the third-most highly educated state in the nation behind Massachusetts and Maryland. (U.S. Census Bureau, 2011 American Community Survey)
   - Colorado had the nation’s sixth-largest employment base in the software publishing industry in 2010. Further, Colorado tech workers earn 96 percent more than the average private-sector worker. (TechAmerica Foundation, Cyberstates 2011: The Definitive State-by-State Analysis of the U.S. High-Tech Industry, 2011)
   - Colorado ranked fourth in the number of scientists and engineers as a percent of the workforce in 2010. The state ranked third in computer specialists as a share of the workforce. These measures point to a large pool of potential innovators in the state. (National Science Foundation, 2012)
   - Colorado has the nation’s seventh-most innovative economy, according to the U.S. Department of Commerce, Economic Development Administration’s State Innovation Index. The index incorporates a mix of input measures that characterize the place and its people (accounting for 60 percent of the overall index score) and output measures that characterize its economic success (40 percent of the overall score). (U.S. Department of Commerce, 2012)
   - TechAmerica Foundation’s Cybercities 2010 report ranked Boulder third in tech-worker concentration, while Denver ranked 17th with nearly 9 percent of private sector workers employed in technology firms. The report examined 16 sectors of the high-tech industry ranging from employment to businesses and wage differentials across the nation’s 60 largest metro areas. Denver also ranked 13th for average high-tech wage and 10th for absolute number of high-tech businesses. Denver tech workers earned 81 percent more than the average private-sector worker. (TechAmerica Foundation, Cybercities 2010: The Definitive Analysis of the High Technology Industry in the Nation’s Top 60 Cities, 2010)
   - Compensation data provider PayScale Inc. ranked Metro Denver fifth among the nation’s top 10 “Hotspots for Startup IT Jobs.” Researchers rated the nation’s 50 largest metro areas on prevalence of tech startup workers and their annual pay and job experience. (PayScale Inc., 2012)
   - Denver ranked 11th on Modis Inc.’s “Top 12 Cities to Find an IT Job in 2012.” Contributors used internal data to count each city in North America’s number of IT job openings over a six month period and generated a “general economic assessment.” (Modis Inc., 2012)
   - Denver and nearby Boulder ranked ninth in USA Today’s 2012 “Top 10 Cities for Technology Start-Ups.” The rankings highlighted the region as a magnet for creative talent and funding, in addition to assets such as TechStars. (USA Today, 2012)
   - Colorado ranked 10th in the nation for the proportion of application developers to its total workforce, according to CTIA-The Wireless Association and the Application Developers Alliance. Colorado’s mobile software applications sector supports 8,000 jobs and has a $429 million annual economic impact. Application developers represent 0.9 percent of Colorado’s workforce compared with 1 percent of the national workforce. (CTIA-The Wireless Association, 2012)
   - Metro Denver ranked first among the nation’s largest metropolitan areas for total population gain in the 25- to 34-year age group between 2008 and 2010, according to the Brookings Institution. The region’s stable economies, “cool” cities, and high-tech centers are drawing young adults. (The Brookings Institution, 2012)
• Boulder is the nation’s most creative city, according to a recent ranking by news website *The Daily Beast*. Contributors ranked 20 cities based on the talent pool, technology, and the physical environment that attracts open-minded individuals using data from *The Rise of the Creative Class, Revisited*. Boulder received accolades for its innovative green companies and high-tech startup firms. (*The Daily Beast*, 2012)

• Denver ranked 11th among the nation’s “Top 15 Best Cities for Recent College Graduates,” according to a 2012 ranking by Apartments.com and CareerRookie.com. Contributors considered each city’s average rent, employment opportunities, and average entry-level salary. (Apartments.com, 2012; CareerRookie.com, 2012)

• *Kiplinger’s Personal Finance* magazine ranked Denver among the top five “Best Cities for Young Adults.” Contributors identified “best” cities as those that have strong employment growth, a highly educated and tech-savvy population, and a reasonable cost of living. Denver received particular accolades for its invigorating outdoor culture, reasonable one-bedroom apartment rents, and a rosy employment outlook. (*Kiplinger’s Personal Finance*, 2012)

• The University of Northern Colorado’s College of Business and the College of Natural Health Sciences/Computer Science partnered to offer students a Bachelor of Science, Software Engineering degree beginning in the fall of 2013. The interdisciplinary program will offer students computer information systems training to be market-ready for computer software development. (The University of Northern Colorado, 2012)

• The Colorado Academy for the Development of STEM-related Careers—a partnership between the Metropolitan State University of Denver, the Colorado School of Mines, the Community College of Denver, and the Cherry Creek School District—is designed to position the state as a leader in scientific and technology education. The overall program ensures Colorado students from kindergarten to graduate level receive specialized training and certifications to connect targeted communities to job readiness and career enhancement, coordinate with state Workforce Centers, and assist in job placement.

• Legislation passed in 2012 will help match Colorado’s industry need for skilled workers to the training provided in the state’s education and workforce programs. House Bill 12-1061 established the Skills for Jobs Act that directs the Colorado Department of Higher Education to coordinate with other state agencies to identify workforce needs, education credential production, the gap between the two, and potential actions to help close the gap and ensure the state’s workforce has marketable skills needed to continue growing the state’s economy.

2. Direct access to a large and growing customer base

• Colorado ranked third in the nation for funds raised per worker from the Small Business Innovation Research (SBIR) grant program and received 149 grants totaling almost $57.2 million in 2011. More SBIR funding indicates a higher degree of innovativeness and scientific excellence. (U.S. Small Business Administration, 2012; U.S. Bureau of Labor Statistics, 2012)

• Colorado had the fourth-highest rate of entrepreneurial activity in the nation in 2011, according to the *Kauffman Index of Entrepreneurial Activity*. The index measures the percentage of the adult, non-business owner population that starts new businesses. With 420 new business owners per 100,000 adults in the state, the state’s high ranking signals a flourishing entrepreneurial community with the ability to attract potential investors. (Ewing Marion Kauffman Foundation, 2012)

• Colorado ranked third for 2011 venture capital investments per $1,000 of gross domestic product. This high level of investment drives economic growth, job creation, and opportunities for innovation. (PricewaterhouseCoopers, *MoneyTree Report*, 2012; Bureau of Economic Analysis, 2012)

• Denver ranked fifth on *CNBC’s* list of “America’s Most Wired Cities” in 2011. Criteria for the ranking included the average download speeds across all U.S. cities. Denver’s download speed averaged 10.2-megabytes per second and received particular accolades for its large number of state and federal agencies and its key role as a distribution hub, making fast Internet connections a necessity in the region. (*CNBC*, 2011)
• Colorado ranked among the top 25 states for Internet speeds and had faster download and upload speeds than the U.S. median in 2010. High-speed Internet contributes to economic growth, global competitiveness, and a better quality of life. (Communications Workers of America, Speed Matters, 2011)

• Colorado ranked 17th among the 50 states for Internet usage at home by residents age three and older, according to the U.S. Census Bureau. About 69 percent of Colorado residents over age three access the Internet at home, and nearly 78 percent live in a home with Internet access. (U.S. Census Bureau, 2012)

• Colorado is home to 17 Fortune 1,000 companies, and the state has more than 770 companies that employ 250 or more workers. (Fortune, 2011; U.S. Census Bureau, County Business Patterns, 2010)

• Colorado’s leading export is computers and electronic products, which accounted for 28 percent of all of the state’s exports in 2011. Computers and electronics represented nearly 14 percent of U.S. exports in the same year. (U.S. Department of Commerce, International Trade Administration, 2012)

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)

• Denver ranked 14th among the nation’s most tax-friendly large cities for business, according to KPMG International’s 2012 Competitive Alternatives: Focus on Tax report. Analysts tallied each city’s total taxes paid by large businesses as a percentage of total taxes paid by similar companies in cities with populations greater than 2 million and Denver’s tax costs were nearly 6 percent below the U.S. average. (KPMG International, 2012)

• Installed or downloaded standardized software products are exempted from sales and use tax, which could save consumers and businesses more than $21 million per year. (Colorado Department of Revenue)

• Colorado has the nation’s 10th-best tax climate for small businesses and entrepreneurs, according to the Small Business & Entrepreneurship Council’s “Business Tax Index 2012.” The index evaluates state taxes on property, sales, income, capital gains, and other factors to determine each tax system’s overall cost to small business. (Small Business & Entrepreneurship Council, 2012)

• Colorado has the eighth-best economic outlook in the nation, according to the 2012 ALEC-Laffer State Economic Competitiveness Index. The index examined each state’s tax structure and spending to demonstrate how public policy shapes economic growth. The state’s sustainable approach to public spending and its low regulatory and tax burdens contributed to its high ranking. (American Legislative Exchange Council, 2012)

• Colorado ranked fifth overall on Forbes’ 2012 “Best States for Business and Careers” list. Rankings were based on six categories for businesses: costs, labor supply, regulatory environment, economic climate, growth prospects, and quality of life. Colorado received its highest rankings for labor supply (first overall), growth prospects (fourth overall), and quality of life (ninth overall). (Forbes, 2012)

• Forbes ranked Metro Denver fifth among the 25 “Best Places for Business and Careers” in 2012, which assessed the nation’s largest metropolitan areas on the costs of doing business, projected economic growth, and educational attainment. Four other Colorado metropolitan areas ranked among the top 50. The Fort Collins metro area ranked third overall, Boulder ranked 27th, Colorado Springs ranked 42nd, and Greeley ranked 46th. (Forbes, 2012)

• Colorado has one of the nation’s most favorable business tax climates. The state ranked 18th on the Tax Foundation’s 2013 State Business Tax Climate Index, which measured
the extent to which state tax policies promote corporate growth and investment. (The Tax Foundation, 2012)

- Colorado has one of the most entrepreneur friendly environments. The state ranked among the top 10 in the Small Business & Entrepreneurship Council’s 2012 “U.S. Business Policy Index 2012,” which considers government policy, tax burden, regulatory expenses, healthcare costs, and education standards. The state’s low unemployment, corporate, and capital gains taxes contributed to its high ranking. (Small Business & Entrepreneurship Council, 2012)

- Legislation adopted in 2012 provides for economic growth and new job creation. House Bill 12-1029—the Save Colorado Jobs Act—allows Colorado cities, counties, and special districts to negotiate an incentive payment or credit up to 100 percent of locally assessed business personal property tax for qualifying companies looking to relocate or expand.

- Commercial natural gas prices in Colorado were the 10th-lowest of all 50 states in 2011. (U.S. Department of Energy, Energy Information Administration, 2012)

4. An overall better quality of life

- Castle Rock is among the nation’s top 20 communities in which to live, according to MONEY Magazine’s 2012 “Best Places to Live.” The list identifies 100 small cities and towns with a reputation for safety, education, housing and healthcare affordability, diversity, and other advantages. Highlands Ranch (21st), Centennial (49th), Boulder (60th), and Fort Collins (70th) were also named to the list. (MONEY Magazine, 2012)

- The Denver-Aurora-Broomfield MSA ranked among the top 10 fittest metro areas in the American College of Sports Medicine’s 2012 American Fitness Index. The ranking evaluated the nation’s 50 largest metro areas on criteria ranging from preventive health measures and chronic disease levels to community resources and physical activity policies. Denver received accolades for its low obesity rate, high percentage of residents participating in physical activity, and low diabetes and cardiovascular disease rates. (American College of Sports Medicine, 2012)

- Colorado is the leanest state with the nation’s lowest rate of adult obesity (20.7 percent) and is the only state with an obesity rate below 21 percent. (Trust for America’s Health, 2012; Robert Wood Johnson Foundation, 2012)

- Boulder ranked fifth on the 2011 Gallup-Healthways “Well-Being Index,” which measures the physical and emotional health of residents in 190 metropolitan statistical areas. The survey-based index also ranked the Fort Collins metro area ninth and the indices’ statewide component ranked Colorado sixth for its residents’ overall well-being. (Gallup-Healthways, 2012)

- Colorado has the third-highest percentage of state land area devoted to the National Forest System, according to the U.S. Forest Service. With more than 40 state parks, 56 national parks and wilderness areas, and the greatest number of 14,000-foot peaks in the nation, Colorado’s access to public lands and outdoor opportunities serves as a cornerstone of the state’s economy. (U.S. Forest Service, 2012; Colorado State Parks, 2012; Wilderness.net, 2012)

- Denver ranked high among Travel + Leisure magazine’s 2012 “America’s Favorite Cities.” The rankings are based on surveys of travelers and residents and show Denver ranked highest in quality of microbrews (second), most active and athletic residents (third), having the nicest summer (eighth), and environmental friendliness (10th). (Travel + Leisure, 2012)

- MoneyRates.com ranked Colorado fifth among the “10 Best States to Make a Living 2012,” which considers each state’s average income, cost of living, tax burden, and job availability. Colorado’s increasing average income and decreasing unemployment rate were cited as major contributing factors to its top five ranking. (MoneyRates.com, 2012)

- The cost of living in Metro Denver is only 5 percent above the national average and is well below that of many other major cities. (The Council for Community and Economic Research, Cost of Living Index, Q3 2012)
Metro Denver voters approved the funding of FasTracks in November 2004. FasTracks is a $7.4 billion comprehensive plan for the design and construction of high-quality transit service and facilities. FasTracks will vastly improve mobility for current residents and future populations throughout the region.

The Brookings Institution ranked Metro Denver 12th for public transit coverage and ninth for its labor access rate in 2012. For each of the nation's 100 largest metros, researchers examined the share of the number of jobs located in neighborhoods with public transit and the share of jobs accessible within a 90-minute commute on public transit. Nationally, 76 percent of jobs are accessible by public transit, but only 27 percent of workers can reach those jobs in 90 minutes or less compared with 87 percent of jobs in Metro Denver are accessible by public transit and 46 percent can reach those jobs. (The Brookings Institution, 2012)

Metro Denver ranked third-sunniest among 20 major U.S. cities with an average 69 percent of days with sunshine. (U. S. National Oceanic and Atmospheric Administration, National Climatic Data Center, 2012)
Information Technology-Software Industry Cluster Definition

<table>
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<tr>
<th>NAICS Code</th>
<th>NAICS Description</th>
<th>SIC Code</th>
<th>SIC Description</th>
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Note: NEC indicates “not elsewhere classified.”

Information Technology-Software Industry Cluster Relationships

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