

## Industry Overview

The engineering services cluster includes companies that provide a full spectrum of planning, design, development, operations, and maintenance of critical structures, machinery, and equipment. These companies provide engineering services for all types of industries ranging from construction and transportation to manufacturing and energy. More specifically, the cluster includes companies that implement complex projects from initial concept to delivery and operation, provide consultancy services, prepare feasibility studies, prepare preliminary and final plans and designs, provide technical services during the construction or installation phase of a project, inspect and evaluate engineering projects, and other related services. This industry cluster report includes companies involved in all aspects of engineering services, as opposed to engineering occupations since engineers may be employed in a full range of industries.

The Denver South<sup>1</sup> region serves as a major hub for engineering services companies and industry activities and is home to one of the highest concentrations of engineering services employment anywhere in the nation. With 6,820 engineering services workers in nearly 340 companies, the Denver South region had the highest employment concentration out of the 50 largest metropolitan areas in 2016. The Denver South region was followed by the Houston-The Woodlands-Sugar Land, TX metropolitan statistical area (MSA), the Virginia Beach-Norfolk-Newport News Va.-N.C. MSA, the Raleigh, N.C. MSA, and the Sacramento-Roseville-Arden-Arcade, Calif. MSA. Nearly 29 percent of all engineering services employment in the nine-county Metro Denver and Northern Colorado region<sup>2</sup> is located in the Denver South region.

The engineering services cluster has been one of the region's fastest growing clusters over the last five years. Between 2011 and 2016, employment in the engineering services cluster rose 18.6 percent, compared with 6.3 percent nationally. In 2016, the engineering services industry cluster rose 1.1 percent, compared with a 0.1 percent decline nationwide. Engineering services companies employed 2.1 percent of the region's total employment base, compared with a 0.7 percent employment concentration nationwide. Employment in the region's engineering services cluster grew for the sixth-consecutive year in 2016, adding nearly 1,550 workers between 2010 and 2016.

The region's robust educational system prepares the future engineering services workforce with vital skills through leadership, mentorship, and professional experience. Three of Metro Denver's largest K-12 school districts serve the Denver South region including the Cherry Creek School District, Douglas County School District, and Denver Public Schools. The Cherry Creek School District and the Douglas County School District have among the highest high school graduation rates of the 19 school districts in the metro area. Further, the Denver South region is in close proximity to the metro area's nationally ranked universities such as the University of Denver, University of Colorado Denver (CU Denver), and the Colorado School of Mines. The University of Colorado also offers a number of engineering services-related courses at the Liniger Building at CU South Denver. Further, engineering services courses and programs are offered at several community colleges in the region and many of the region's engineering services companies have partnered with area colleges and universities to offer engineering programs such as CH2M and Colorado State University. The region is also in close proximity to a vibrant science, technology, engineering, and mathematics (STEM) ecosystem.

The region's large base of scientific and technical talent, easy global access, and proximity to highly ranked engineering programs at area colleges and universities attract leading national and international engineering firms such as CH2M, Merrick & Company, and AECOM. CH2M was named to the 2016 *Fortune 500* list and to *Forbes'* "America's Largest Private Companies 2016" list with revenue totaling nearly \$5.4 billion. AECOM was named to *Fortune's* list of the World's Most Admired Companies for the third consecutive year, with revenues

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<sup>1</sup> The Denver South region consists of zip codes 80111, 80112, 80124, 80126, 80129, 80130, 80134, and 80237.

<sup>2</sup> The nine-county Metro Denver and Northern Colorado region consists of Adams, Arapahoe, Boulder, Broomfield, Denver, Douglas, Jefferson, Larimer, and Weld Counties.

totaling \$17.4 billion. For the second year in a row, Greenwood Village-based Samuel Engineering, Inc. was selected as the 2016 Rocky Mountain Engineering Company of the Year at the Fourth Annual Oil & Gas Awards. Other notable company announcements in 2016 included:

- Douglas County-based CH2M was awarded a three-year, \$14 million contract to oversee the development of Denver's new 270-acre National Western Center (NWC). CH2M will support the goals of the NWC Master Plan including full rehabilitation of the site and creating a new series of green and healthy spaces. The City and County of Denver, Colorado State University, and other partners are leading an overhaul of the 95-acre stock show site, the 30-acre Coliseum site, and surrounding land to create the new Center.
- CH2M was selected by Denver International Airport (DEN) to provide design and construction administration services for several gate apron rehabilitation and drainage improvements at the airport. The three-year project includes providing pavement evaluations and recommendations, replacing deteriorating apron pavement, mitigating apron drainage issues and ponding, and conducting utility and infrastructure work. Since 1995, CH2M has completed more than 50 projects for DEN.
- Greenwood Village-based Merrick & Company announced several partnerships and awards in 2016:
  - The company expanded its reach with the National Aeronautics and Space Administration (NASA), winning two new five-year contracts at Kennedy Space Center in Florida and Johnson Space Center in Texas. Merrick is currently under contract for engineering and architectural services at NASA's Marshall Space Flight Center in Huntsville, Ala. The three contracts support NASA's current Space Launch System rocket program.
  - Merrick partnered with McCarthy Building Companies, Inc. and UT-Battelle, LLC to deliver ongoing construction projects at the Tennessee-based Oak Ridge National Laboratory. The partnership will include renovation of existing facilities and construction of new office, laboratory, and industrial space. The total value of the program, including option years, is \$49 million.
- Centennial-based Felsburg Holt & Ullevig is designing and permitting E-470's \$80 million, eight-mile widening toll road between Parker Road and Quincy Avenue. The project includes adding an extra lane in each direction, widening 11 bridges, and adding a pedestrian and bike trail beside the highway. The new lanes are expected to be open by early 2018.
- Burns & McDonnell provided planning, design, permitting, and construction observation services for the Biological Nutrient Removal project at the South Adams County Water & Sanitation District's Williams Monaco Wastewater Treatment Plant in Commerce City. The \$20 million retrofit incorporated the latest technologies in treatment, improved process control, energy efficiency, and public safety.
- AECOM and Flatiron Construction Corp. were selected by the Colorado Department of Transportation to design and build the \$215 million, 12-mile long C-470 Tolled Express Lanes Segment 1 project in Douglas County. The project will add two express lanes to westbound C-470 from I-25 to Colorado Boulevard, one express lane between Colorado and Wadsworth Boulevard, and one express lane on eastbound C-470 from Wadsworth to I-25. The project is expected to be completed in early 2019.
- Centennial-based Stanley Consultants received a \$15 million, five-year U.S. Department of Agriculture Architectural/Engineering Services Indefinite Delivery, Indefinite Quantity contract. The company will provide a wide range of services including design plans and specifications, renovations and repairs, value engineering, studies, and master plans for various projects.

### **Engineering Services Economic Profile**

The engineering services cluster includes companies that apply physical laws and principles of engineering in the design, development, and utilization of machines, materials, instruments, structures, processes, and systems. The engineering services cluster consists of one, six-digit North American Industry Classification System (NAICS) code (541330).

**Engineering Services Employment and Company Profile, 2016**

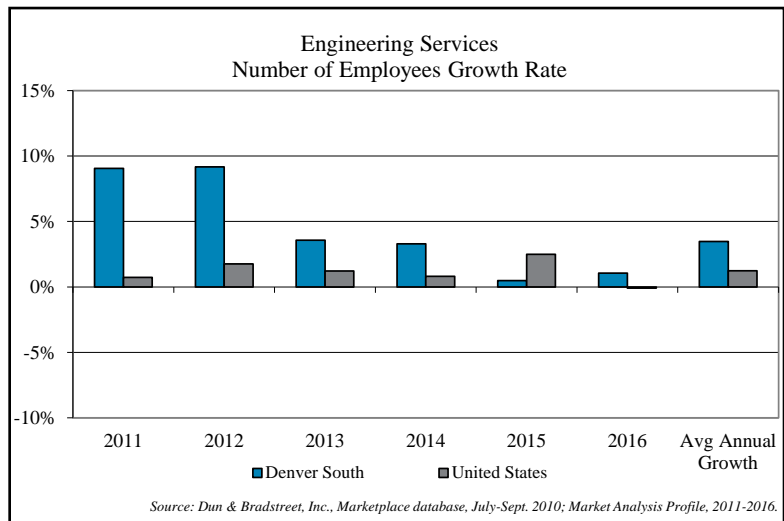
	<b>Denver South</b>	<b>United States</b>
Direct employment, 2016	6,820	1,119,850
Number of direct companies, 2016	340	98,140
One-year direct employment growth, 2015-2016	1.1%	-0.1%
Five-year direct employment growth, 2011-2016	18.6%	6.3%
Avg. annual direct employment growth, 2011-2016	3.5%	1.2%
Direct employment concentration	2.1%	0.7%

Sources: Dun & Bradstreet, Inc. Marketplace database, July-Sept. 2010; Market Analysis Profile, 2011-2016; Development Research Partners.

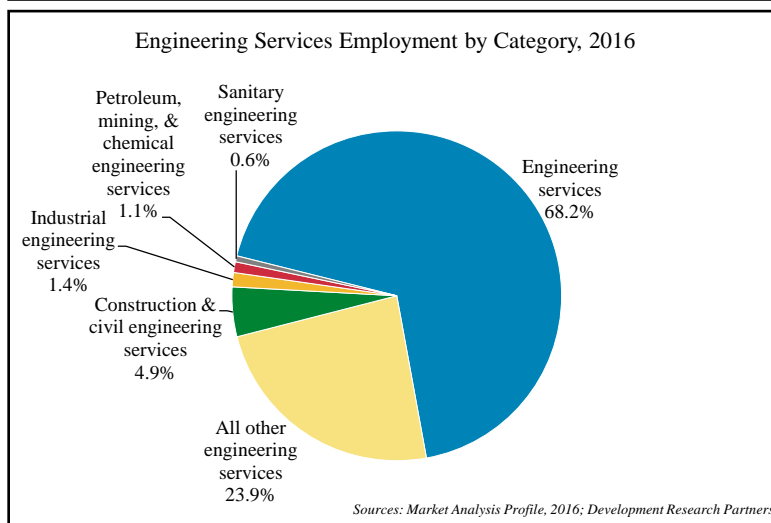
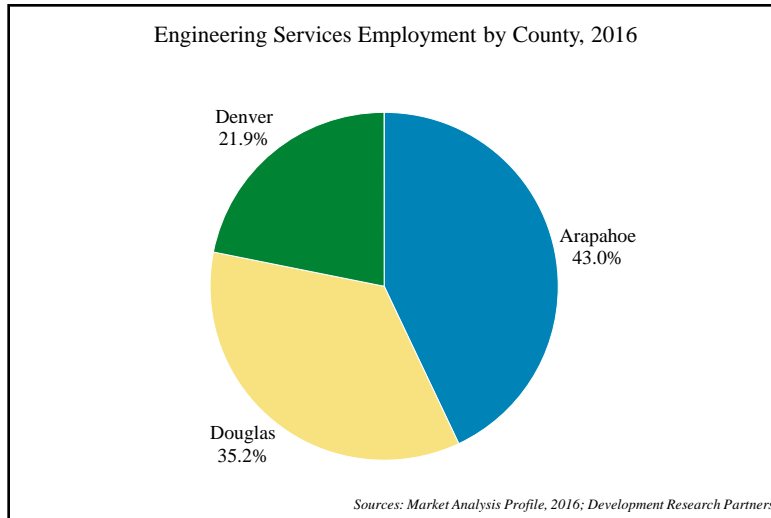
**Engineering Services Employment**

The Denver South region’s engineering services employment (6,820 workers) rose 1.1 percent in 2016, compared with the previous year’s level. National employment levels decreased 0.1 percent over-the-year. The region’s engineering services employment grew an average 3.5 percent per year between 2011 and 2016, compared with a 1.2 percent increase nationwide. Engineering services companies employed 2.1 percent of the region’s total employment base, compared with a 0.7 percent employment concentration nationwide.

Approximately 340 engineering services companies operated in the Denver South region in 2016. Nearly 74 percent of the region’s engineering services companies employed fewer than 10 people, while 0.9 percent employed 250 or more.



Source: Dun & Bradstreet, Inc., Marketplace database, July-Sept. 2010; Market Analysis Profile, 2011-2016.



**Major Engineering Services Companies**

- AECOM  
[www.aecom.com](http://www.aecom.com)
- ARCADIS  
[www.arcadis.com](http://www.arcadis.com)
- Atkins  
[www.atkinsglobal.com](http://www.atkinsglobal.com)
- Black & Veatch  
[www.bv.com](http://www.bv.com)
- Burns & McDonnell Engineering  
[www.burnsmcd.com](http://www.burnsmcd.com)
- CH2M  
[www.ch2m.com](http://www.ch2m.com)
- Farnsworth Group  
[www.f-w.com](http://www.f-w.com)
- Felsburg Holt & Ullevig  
[www.fhueng.com](http://www.fhueng.com)
- Merrick & Company  
[www.merrick.com](http://www.merrick.com)
- Samuel Engineering  
[www.samuelengineering.com](http://www.samuelengineering.com)
- Stanley Consultants  
[www.stanleyconsultants.com](http://www.stanleyconsultants.com)
- Tetra Tech Rooney  
[www.rooney-eng.com](http://www.rooney-eng.com)
- Thyssenkrupp Industrial Solutions  
[www.thyssenkrupp.com](http://www.thyssenkrupp.com)

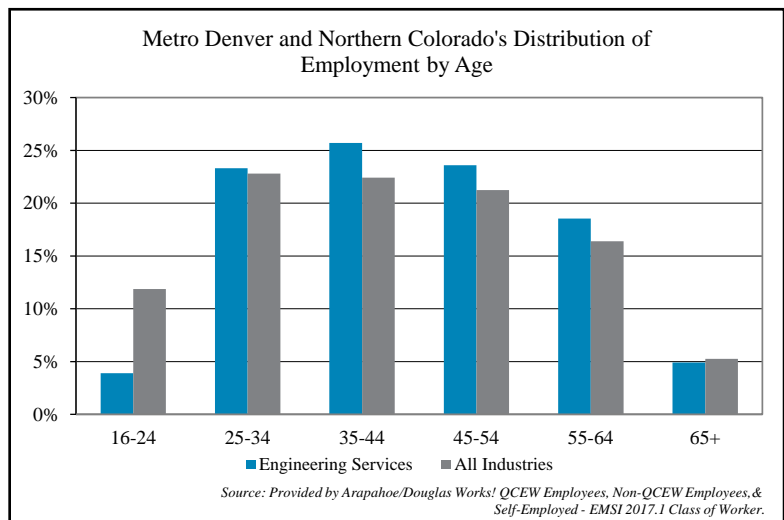
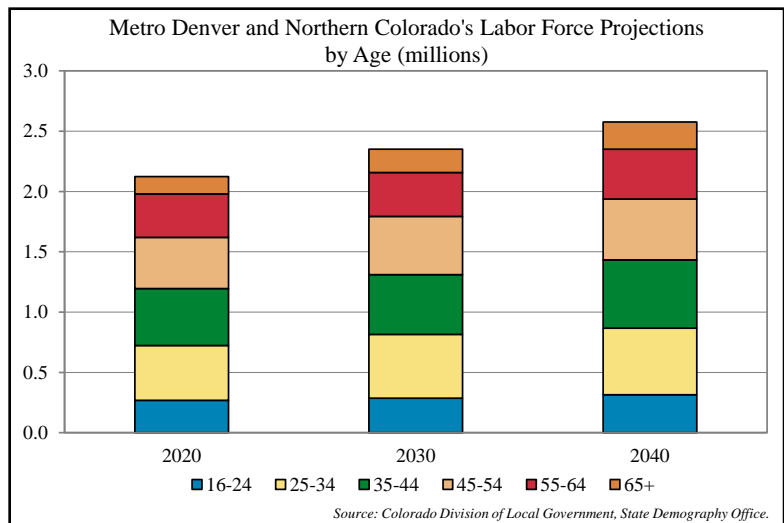
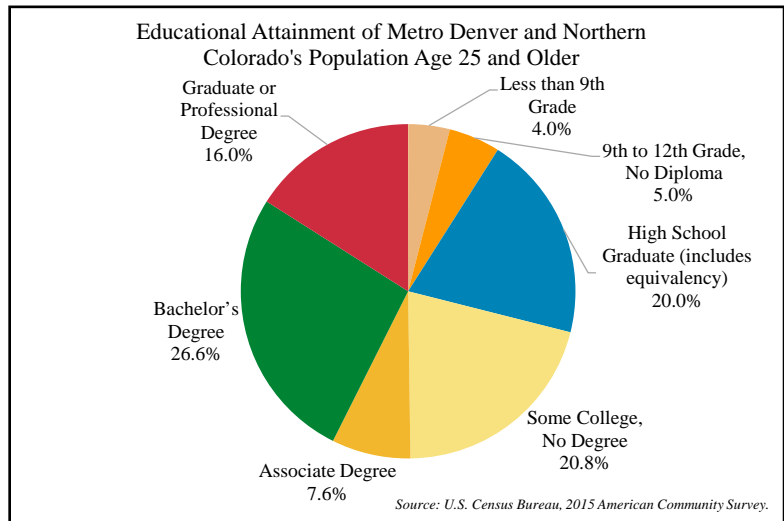
**Engineering Services Workforce Profile**

Many companies choose locations because of the available workforce. With nearly half of the nine-county region’s 3.8 million residents under the age of 35, employers can draw from a large, young, highly educated, and productive workforce. Of the region’s adult population, 42.6 percent are college graduates and 91 percent have graduated from high school. The state has the nation’s second-most highly educated workforce as measured by the percentage of residents with a bachelor’s degree or higher.

The attractiveness of the region draws new residents through in-migration. The region’s population is expected to grow 31 percent from 2020 to 2040, driving a 21.2 percent increase in the region’s labor force over the same period. It is important to note the changing composition of the workforce supply as the baby boomers begin to retire, which will pose implications for businesses whose employee pool includes significant numbers of these workers.

The Denver South region’s engineering services industry employs nearly 6,820 people and includes a large pool of talented, well-educated, and highly skilled workers. In the nine-county region, the engineering services cluster has a larger share of employees (72.6 percent) that are between the ages of 25 and 54 years old, compared with the age distribution of all industries (66.5 percent).

The engineering services workforce supply consists of four main components: those currently working in the industry; those doing a similar type of job in some other industry; the unemployed; and those currently in the education pipeline. The Metro Denver and Northern Colorado Occupation & Salary Profile below includes the 10 largest engineering services occupations in the region. For these 10 largest occupations, the chart details the total number of workers employed in that occupation across all industries, the number of available applicants



that would like to be working in that occupation, the number of recent graduates that are qualified for that occupation, and the median and sample percentile annual salaries.

### Wages

The 2015 average annual salary for an engineering services worker in the nine-county region was \$99,190, compared with the national average of \$92,530. Total payroll for the engineering services cluster in the nine-county region reached over \$2.3 billion in 2015.

### Metro Denver and Northern Colorado Engineering Services Occupation & Salary Profile, 2016

10 Largest Engineering Services Occupations in Metro Denver and Northern Colorado	Total Working Across All Industries (2016)	Number of Available Applicants (2016)	Number of Graduates (2015)	Median Salary	10th Percentile Salary	25th Percentile Salary	75th Percentile Salary	90th Percentile Salary
1. Civil engineers	6,610	102	432	\$79,148	\$51,578	\$63,536	\$102,242	\$132,451
2. Mechanical engineers	5,400	76	721	\$85,077	\$56,048	\$68,618	\$112,171	\$141,490
3. Electrical engineers	3,193	65	375	\$91,139	\$60,383	\$72,408	\$114,033	\$139,732
4. Architectural & engineering managers	2,996	68	3,502	\$149,221	\$107,533	\$126,059	\$182,712	\$305,562
5. Environmental engineers	1,931	66	110	\$90,490	\$58,403	\$71,414	\$113,447	\$136,058
6. Secretaries & administrative assistants, except legal, medical, & executive	44,652	994	45	\$36,706	\$24,096	\$29,696	\$45,346	\$53,935
7. Architectural & civil drafters	1,744	62	190	\$54,003	\$35,947	\$43,119	\$67,901	\$84,737
8. Electronics engineers, except computer	4,792	104	441	\$97,314	\$64,979	\$77,373	\$123,133	\$150,281
9. Business operations specialists, all other	33,213	749	50	\$74,415	\$41,789	\$54,444	\$97,774	\$126,967
10. Software developers, systems software	10,952	291	1,038	\$106,930	\$67,989	\$86,915	\$128,554	\$154,831

Notes: The number of available applicants is a point-in-time measurement of the number of people who have registered in Colorado's workforce development system's statewide database, Connecting Colorado, as being able and available to work in a particular occupation. Results should be interpreted with caution since registration in Connecting Colorado is self-reported. In addition, the skills rubric may assign up to four occupation codes for each registrant. Therefore, the number of available applicants could be inflated. Source: Provided by Arapahoe/Douglas Works!; QCEW Employees, Non-QCEW Employees, Self Employed, & Extended Proprietors - EMSI 2017.1 Class of Worker.

### Education & Training

Colorado's higher education system provides an excellent support system for businesses in the region. There are 28 public higher education institutions in Colorado, of which seven four-year and six two-year public institutions offering comprehensive curricula are located in the nine-county region. In addition, there are more than 100 private and religious accredited institutions and more than 350 private occupational and technical schools offering courses in dozens of program areas throughout the state. Although not exhaustive, a list of the major, accredited educational institutions with the greatest number of graduates for each of the 10 largest engineering services occupations in the nine-county region are included below. A directory of all higher education institutions with corresponding websites may be accessed via <http://higher.ed.colorado.gov>.

- Colorado State University  
[www.colostate.edu](http://www.colostate.edu)
- Colorado State University Global Campus  
[www.colostate.edu](http://www.colostate.edu)
- Colorado School of Mines  
[www.mines.edu](http://www.mines.edu)
- Front Range Community College  
[www.frontrange.edu](http://www.frontrange.edu)
- Metropolitan State University of Denver  
[www.msudenver.edu](http://www.msudenver.edu)
- Red Rocks Community College  
[www.rrcc.edu](http://www.rrcc.edu)
- Regis University  
[www.regis.edu](http://www.regis.edu)
- University of Colorado: Boulder, Denver, South Denver  
[www.cu.edu](http://www.cu.edu)
- University of Denver  
[www.du.edu](http://www.du.edu)



## Key Reasons for Engineering Services Companies to Locate in the Denver South Region and the Surrounding Nine-County Region

### 1. Access to a large, technical and scientific workforce

- Colorado has one of the nation's most educated workforces, ranking second among the 50 states for percentage of residents (39.2 percent) with a bachelor's degree or higher. (U.S. Census Bureau, 2015 American Community Survey)
- Denver South has a higher-than-average concentration of employment in architecture and engineering occupations. Approximately 3.4 percent of Denver South's labor force is employed in architecture and engineering occupations, compared with the U.S. average of 1.8 percent. (U.S. Census Bureau, 2015 American Community Survey, 5-Year Estimates)
- Lone Tree ranked among the best places in Colorado for millennial job seekers. The city's millennial population increased over 50 percent from 2010 to 2013. (NerdWallet, 2015)
- Metro Denver ranked as the fourth-best metro area for science, technology, engineering, and mathematics (STEM) professionals in 2016. Metro Denver ranked seventh for the projected number of STEM jobs needed by 2020. (WalletHub, 2016)
- The Summer Engineering Experience for Kids, SEEK Denver, is a collaborative effort between Denver Mayor Michael B. Hancock and his Office of Children's Affairs, CH2M, Denver Public Schools, the National Society of Black Engineers, and local businesses. During the three-week period, 300 kids in grades 3-5 design, build, test, and troubleshoot various project toys while discovering the underlying math and science principles involved in these processes. (SEEK, 2017)
- CH2M supports a variety of STEM programs in Metro Denver, including the STEM Partnerships Program through the Denver School of Science and Technology and Girls Inc. of Metro Denver. The Denver School of Science and Technology provides internships and career opportunities to help ensure their graduates persist and succeed in higher education STEM majors. Girls Inc. provides funds and volunteers for the five-year Eureka! STEM program for middle and high school girls, including a four-week summer program, a Transportation Engineering Week, an internship, and travel-abroad experience. (CH2M, 2017)

### 2. A central location and easy global access

- Metro Denver is the largest region in the U.S. to offer one-bounce satellite uplinks to six out of seven continents in one business day due to its unique geographic location in the Mountain time zone. (Metro Denver Economic Development Corporation)
- Denver South boasts a close proximity to Denver International Airport (DEN) and Centennial Airport.
  - DEN was the sixth-busiest airport in the nation and 18th-busiest worldwide in terms of passenger traffic in 2016. (U.S. Bureau of Transportation Statistics, 2017; Airports Council International 2017; and Denver International Airport, 2017)
  - Centennial Airport is the premier reliever and business airport in the state to connect people, places and product. Supporting 23 business parks and 6,000-plus businesses in the south metro area, the airport provides all services necessary to compete in the global economy. The airport generates more than \$1.3 billion for the region annually, the highest among the state's general aviation airports. (Centennial Airport, 2016; Colorado Department of Transportation, Division of Aeronautics, 2016)
- Denver South is supported by access to national and global business hubs through a strong transportation infrastructure.
  - The region is served by I-25 and E-470, giving residents and workers easy access to DEN and downtown Denver.

- Businesses and residents also have access to Regional Transportation Districts E and F light rail lines connecting the Denver South region to Metro Denver and DEN with six light rail stations, numerous bus connections, bike storage, and call and ride services.
- The R Line, providing service along I-225, opened in early 2017 and construction of the southeastern light rail along I-25 that will add 2.3 miles of track and three more stations is underway. The completed rail and stations at the Sky Ridge Hospital complex, the Lone Tree City Center, and RidgeGate Parkway will open in 2019. (Denver South Economic Development Partnership, 2017)
- Metro Denver’s central U.S. location on the 105th meridian at the midpoint between Tokyo and Frankfurt makes it a strategic choice for conducting national and international business. (Metro Denver Economic Development Corporation)
- Fast Internet speeds are vital to consumers and businesses in the region. More than 94 percent of residents across the Denver South region have access to broadband speeds of 25 megabits per second (Mbps) or faster and 93 percent of residents have access to broadband speeds of 100 Mbps or faster. (BroadbandNow.com, 2017)

### 3. Proximity to colleges/universities

- Three Metro Denver universities ranked among the nation’s top 100 graduate engineering programs in 2017. The College of Engineering and Applied Science at the University of Colorado Boulder (CU Boulder) ranked 32nd, Colorado School of Mines (CSM) ranked 56th, and the College of Engineering at Colorado State University (CSU) ranked 67th. (*U.S. News & World Report*, 2017)
- Five Metro Denver universities ranked among the nation’s “Best Undergraduate Engineering Programs” that offer doctoral degrees in 2016. The College of Engineering and Applied Science at CU Boulder ranked 32nd, CSM ranked 44th, the College of Engineering at CSU ranked 75th, the College of Engineering and Applied Science at CU Denver ranked 151st, and the Daniel Felix Ritchie School of Engineering and Computer Science at the University of Denver ranked 183rd. (*U.S. News & World Report*, 2017)
- CSM in Golden ranked among the top-10 schools in the nation for an engineering degree in 2016. (College Factual, 2016)
- CSM ranked among the “Top 21 STEM Colleges of 2016.” CSM’s most popular areas of study included at least 40 percent of students in STEM. (*Forbes*, 2016)
- CU South Denver offers classes and certificates in engineering. The Integrated Construction, Management and Leadership certificate is an interdisciplinary program to train designers, architects, engineers, and business entrepreneurs and update existing skill sets. The Mini Engineering School is an eight week, non-credit training program designed for community members and professionals to learn about the engineering field. (The University of Colorado, 2017)
- CSU offers graduate-level courses that are part of the university’s College of Engineering, Systems Engineering program. Through the CSU Denver South initiative and partnerships with local companies, courses are offered both in-person and online to cover the core curriculum needed for completion of a master’s or Ph.D. in systems engineering from CSU. CSU Denver South provides convenient educational opportunities to students where they live and work, addressing the workforce needs of local industry. (Colorado State University, 2017)
- The University of Denver completed a new \$60 million, 110-square-foot expansion of the Daniel Felix Ritchie School of Engineering and Computer Science in 2016. The addition nearly doubled the existing school’s space and includes new engineering and manufacturing technologies, laboratories, and classrooms. The school partners with companies to deliver comprehensive continuing education and training programs to ensure that employees are equipped with the engineering skills to meet the evolving workplace. (University of Denver, 2017)



- CU Denver is the only institution in the area where working professionals can earn both undergraduate and graduate degrees in engineering entirely through evening studies. The College of Engineering and Applied Science offers undergraduate and graduate programs in bioengineering, civil engineering, computer science and engineering, electrical engineering, and mechanical engineering. The Department of Bioengineering is the first of its kind in Colorado. (University of Colorado Denver, 2017)

#### **4. Low to moderate costs of doing business**

- Colorado has one of the nation’s most favorable corporate income tax structures. The state’s corporate income tax rate of 4.63 percent is one of the lowest in the nation and is based on single-factor apportionment, which allows companies to pay taxes based solely on their sales in the state. (State of Colorado; The Tax Foundation)
- Metro Denver ranked No. 1 among *Forbes'* 2016 “Best Places for Business and Careers” for the second-straight year. Four other Colorado metropolitan areas were included on the list. The Colorado Springs metro area ranked 12th, Fort Collins ranked 18th, Boulder ranked 26th, and Greeley ranked 51st. (*Forbes*, 2016)
- Colorado ranked among the top five “Best States for Small Business Friendliness” in 2016. Denver received an “A-” grade for overall friendliness. (Thumbtack.com, 2016; Ewing Marion Kauffman Foundation, 2016)
- Denver South’s office rental rates averaged \$24.51 per square foot in the first quarter of 2017, making the region’s office market highly competitive with other major markets in the U.S. Denver South has nearly 42.5 million square feet of office space and roughly 5,000 acres of ready-to-be-developed land. (CoStar Realty Information, Q1 2017; Denver South Economic Development Partnership)

#### **5. An overall better quality of life**

- Highlands Ranch (sixth) and Centennial (13th) ranked among *MONEY Magazine’s* 2016 “Best Places to Live” list. (*MONEY Magazine*, 2016)
- Centennial ranked among the “Best Cities for Young Families” in 2017. The city ranked No. 49 out of 510 U.S. communities. (Apartment List, 2017)
- Highlands Ranch ranked as the seventh-happiest community in the nation in 2016. The city had the lowest poverty rate, a low unemployment rate, and high homeownership rates. (Zippia, 2016)
- The Denver South region boasts a variety of quality living options from expansive apartment complexes to single-family homes surrounded by open spaces. One of the largest and most comprehensive master planned communities in the nation—RidgeGate—is located conveniently along I-25 and Lincoln Avenue in Lone Tree and offers over 3,500 acres of mixed-use density. The area is also known for beautiful neighborhoods, award-winning schools, and popular parks and trail systems. (Denver South Economic Development Partnership, 2017)
- Metro Denver ranked as the third-fittest metropolitan area in the U.S. in 2016. Increased physical activity, low obesity and diabetes rates, and access to recreational opportunities contributed to its high rank. (American College of Sports Medicine, 2016)

*For additional information, contact us:*



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