

Industry Overview

The broadband and digital communications (BDC) cluster includes companies that deliver voice, data, and video to end users. It includes landline and wireless telephone communications companies, radio and television communications services, and cable and Internet service providers.

The Denver South region¹ is a global hub for BDC activities, with support from strong innovative capacity and core science and technology competencies. Major companies in the region include Charter Communications, Comcast, DISH Network, and others. Three of *Forbes*' 2019 Global BDC companies and two *Fortune* 500 BDC companies have headquarters in the Denver South region. Douglas County-based Liberty Media was also named to *Fortune*'s most recent "World's Most Admired Companies" list. The Denver South region is home to nearly 550 BDC companies, with about 150 companies added to the area over the past five years. Nearly 14 percent of the companies in the nine-county Metro Denver and Northern Colorado region² are located in Denver South.

The Denver South region offers BDC companies a central location with easy global access. The Denver South region'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 provides real-time connections to six of the seven largest continents in a single business day. Denver South is supported by access to national and global business hubs through a strong transportation infrastructure, including close proximity to Denver International Airport (DEN) and Centennial Airport. DEN boasts some of the best connectivity of any airport in the nation with three-hour flights reaching anywhere in the Continental U.S.

The BDC cluster reached its highest employment base in 2019, employing 5.9 percent of the region's total employment base. Employment in the BDC cluster rose for the fourth-consecutive year in 2019, totaling nearly 20,310 workers. Between 2018 and 2019, employment in the BDC cluster rose 7.8 percent, compared with a 3.6 decline nationwide, primarily driven by major employment additions at Charter Communications and others. Between 2014 and 2019, employment in the BDC cluster increased 13.9 percent, outpacing nationwide growth by about 26 percentage points. Over 46 percent of the region's BDC employment is concentrated in the Denver South region. While the region has a significant number of large employers in the BDC cluster, more than 78 percent of the companies employed fewer than 10 people.

Merger and acquisitions continue to change the landscape of the BDC cluster. In 2019, Douglas County-based DISH Network Corp. reached an agreement with EchoStar Corp. to acquire EchoStar's Broadcast Satellite Service business, including nine direct broadcast satellites in a deal valued at \$800 million. Additionally, the



Broadband & Digital Communications Facts - 2019	
5.9%	Employment concentration
20,310	Employees
7.8%	Employment growth between 2018-2019
78.4%	Companies with <10 employees

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

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

Federal Communications Commission approved the T-Mobile and Sprint merger. As part of the merger, DISH Network will locate its new wireless headquarters with at least 2,000 full-time employees in Colorado. T-Mobile, in turn, will significantly build out a statewide 5G (fifth-generation) network, particularly in rural areas.

Service carriers across the Denver South region announced plans to expand network access and increase speed. In fact, Denver is one of the first U.S. cities in the nation where Verizon and other telecommunications companies will deploy 5G service. 5G networks have the promise to be 100 times faster than the current 4G networks and about 10 times faster than 4G LTE networks. Verizon will upgrade 20 cities, including Denver and will be especially concentrated in the Denver Tech Center area, with 5G Ultra-Wideband service. Verizon had installed or had under construction 78 small cells, more than any other provide. CenturyLink will extend its fiber gigabit Internet service to 46,000 additional homes and 1,300 businesses across the region.

BDC technologies have become increasingly accessible business modes for companies in the Denver South region. The advancement of connectivity has helped to increase the number of employees in the Denver South region that telework or work at home while connected by information technology. The Denver South region is one of the nation's top areas for teleworking due to its expansive telecommunications infrastructure, the percentage of high-tech companies, innovative ecosystem, and vibrant workforce. Several companies and organizations in the region employ telework and work at home strategies including AECOM, with 800 employees that allow this business model. Additionally, the Denver South Transportation Management Association (DSTMA) is a partnership of public and private entities in the region that support transportation solutions to enhance mobility, drive economic development, and further position Denver South in the I-25 Corridor, while promoting alternate and environmentally-sound transit choices, such as telecommuting.

The BDC cluster continues to undergo technology shifts across the Denver South region. Over the last several years, cable companies have transformed into broadband companies, and expanded product offerings. 5G development will change BDC companies' roles from technology distributors to also service providers. The growth of video streaming will continue to explode with the majority of households indicating they have at least one streaming video subscription service. Unique partnerships are also being established that offer streaming services including Comcast and Netflix, and Hulu and Amazon Prime so that services can be integrated into one cable box. Other companies are offering new services and growing their net Pay-TV services such as Charter's \$15-a-month Spectrum TV Essentials and Comcast is investing \$2 billion in a standalone Peacock stream service. Companies also have a renewed focus on customers and will continue to improve customer experience through artificial intelligence, robotic process automation, and the increasing Internet of Things (IoT) market.

2019 Industry Highlights

Notable company announcements and expansions in the Denver South region included:

- Charter Communications plans to build a significant private LTE test network in the Denver South region. The company intends to install approximately 100 fixed transmitters and employ 500 fixed and mobile End User Devices (EUDs) during the testing. The test network could signal the company's interest in the business of private wireless networking.
- Flexential recently added a new tenant to its Compark data center in northern Douglas County, with AsTech selecting the company for data center services in Dallas and Denver. AsTech chose to duplicate their Dallas infrastructure in Flexential's Denver data center to serve as a disaster recovery location.
- Denver-based broadband and communications company WOW! Internet, Cable & Phone will expand the availability of its WOW! Whole-Business WiFi solution across most of the WOW! Business service-ware footprint. Whole Business WiFi is WOW!'s mesh network solution that provides WOW! Business customers low-cost, easy-to-manage, and seamless coverage to keep businesses and their customers securely connected without sacrificing speed or performance.

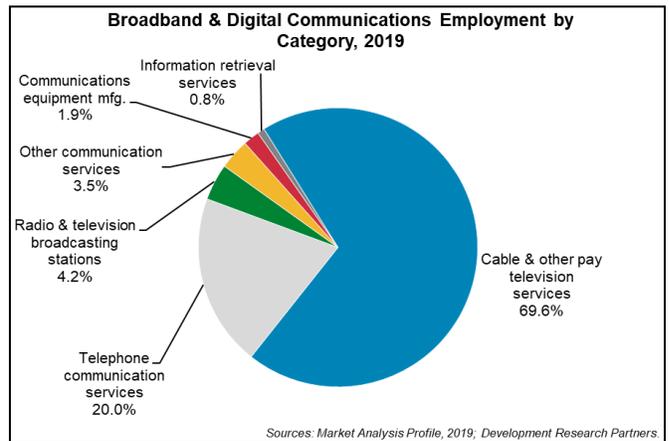
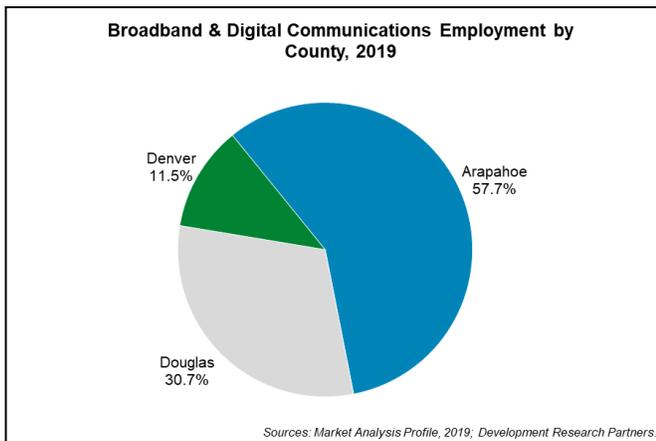
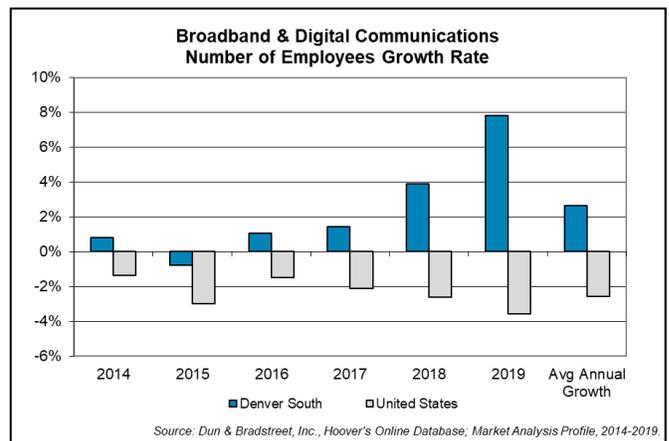
- WOW! Internet, Cable & Phone was honored for the fifth time as the “2018 Best and Brightest Company to Work For in the Nation” by the National Association for Business Resources.
- Englewood-based Lightwave Logic, Inc. was awarded “Best Achievement in Photonic Integrated Circuits (PIC) Platform” for its breakthrough technology. The company’s achievement with its 100 GHz polymer platform targets the demand for fast data communications and data markets supporting media streaming, artificial intelligence, and IoT.

Broadband and Digital Communications Economic Profile

The broadband and digital communications 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.

Broadband & Digital Communications Employment and Company Profile, 2019		
	Denver South	United States
Direct employment, 2019	20,310	1,045,020
Number of direct companies, 2019	550	160,450
One-year direct employment growth, 2018-2019	7.8%	-3.6%
Five-year direct employment growth, 2014-2019	13.9%	-12.1%
Avg. annual direct employment growth, 2014-2019	2.6%	-2.6%
Direct employment concentration	5.9%	0.6%

Sources: Dun & Bradstreet, Inc., Hoover's Online Database, Market Analysis Profile, 2014-2019; Development Research Partners.



Major Broadband and Digital Communications Companies

- AT&T Inc.
www.att.com
- Avaya Inc.
www.avaya.com
- CenturyLink
www.centurylink.com
- Charter Communications, Inc.
www.spectrum.com
- Colorado Pubic Radio
www.cpr.org
- Comcast Corp.
www.xfinity.com
- DIRECTV, Inc.
www.directv.com
- DISH Network
www.dish.com
- EchoStar Corp.
www.echostar.com
- Entercom Communications
www.entercom.com
- iHeartMedia, Inc.
www.iheartmedia.com
- Liberty Media Corp.
www.libertymedia.com
- Nokia
www.nokia.com
- RingCentral, Inc.
www.ringcentral.com
- Sprint Corp.
www.sprint.com
- Starz
www.starz.com
- Verizon
www.verizon.com
- ViaSat, Inc.
www.viasat.com
- WOW! Internet, Cable & Phone
www.wowway.com
- Zayo Group, LLC
www.zayo.com

Industry Infrastructure



Broadband and Digital Communications Workforce Profile

With 62.5 percent of the adult population having a bachelor’s degree or higher, the Denver South region provides a highly educated labor base with industry specific skills and talent. According to JLL, Denver attracted highly skilled labor at the fastest rate in the country based on growth in the population 25 years and over with a bachelor’s degree or higher. The Denver-Boulder region ranked as the eighth-best market for technology workers and Denver ranked No. 10 for the top cities with tech growth, according to CBRE. Telecommunications and Internet services ranked second among the top 5 leading tech industry sectors by employment in Denver, according to CompTIA’s *Cyberstates 2019* report. Median tech wages in Denver are 87 percent higher than median state wages.

Age Distribution

The BDC cluster has a larger share of employees that are between the ages of 35 and 54 years and older (53.3 percent), compared with the age distribution of all industries across the nine-county region (41.3 percent).

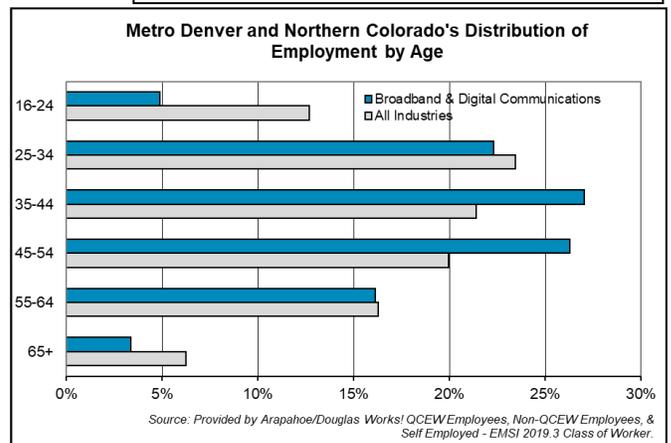
Wages

The 2018 average annual salary for workers in the BDC cluster was \$103,690 in the nine-county region, compared with the national average of \$92,790. Total payroll reached nearly \$4.5 billion in 2018.

Occupation & Salary Profile

The Occupation & Salary Profile below includes the 10 largest BDC 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.

- Metro Denver & Northern Colorado’s Educational Programs with Largest Number of BDC-related Graduates
- Accounting
 - Business Administration & Management, General
 - Business/Commerce, General
 - Computer & Information Sciences, General
 - Computer Science
 - Computer Systems Networking & Telecommunications
 - Electrical & Electronics Engineering
 - Finance, General
 - Information Technology
 - Marketing/Marketing Management, General



Metro Denver and Northern Colorado Broadband & Digital Communications Occupation & Salary Profile, 2019

10 Largest Broadband & Digital Communications Occupations in Metro Denver and Northern Colorado	Total Working Number of			Median Salary	10th Percentile Salary	25th Percentile Salary	75th Percentile Salary	90th Percentile Salary
	Across All Industries (2019)	Available Applicants (2019)	Number of Graduates (2018)					
1. Sales representatives, services, all other	26,169	690	17	\$60,245	\$28,140	\$40,735	\$91,120	\$137,063
2. Telecommunications equipment installers & repairers, except line installers	3,731	98	10	\$66,985	\$42,413	\$53,853	\$76,727	\$84,842
3. Customer service representatives	35,851	946	0	\$35,784	\$23,673	\$28,138	\$46,314	\$59,133
4. Business operations specialists, all other	36,497	963	53	\$75,567	\$43,759	\$56,278	\$100,452	\$129,838
5. Electronics engineers, except computer	4,802	127	547	\$99,503	\$65,134	\$77,372	\$131,761	\$160,007
6. Software developers, applications	27,310	720	1,368	\$104,774	\$62,917	\$81,992	\$130,715	\$157,967
7. Telecommunications line installers & repairers	1,922	51	10	\$48,752	\$30,627	\$37,051	\$63,022	\$76,609
8. Computer network architects	5,283	139	2,419	\$115,434	\$72,132	\$89,874	\$143,423	\$164,664
9. Network & computer systems administrators	9,179	242	662	\$83,602	\$53,380	\$66,941	\$104,466	\$125,602
10. Market research analysts & marketing specialists	17,010	449	401	\$67,436	\$38,421	\$50,210	\$93,221	\$127,203

Notes: The number of available applicants is a point-in-time measurement of the number of people who have registered in Colorado's workforce development system's statewide database, Connecting Colorado, as being able and available to work in a particular occupation. Results should be interpreted with caution since registration in Connecting Colorado is self-reported. In addition, the skills rubric may assign up to four occupation codes for each registrant. Therefore, the number of available applicants could be inflated. *Source: Provided by Arapahoe/Douglas Works!; QCEW Employees, Non-QCEW Employees, & Self Employed - EMSI 2019.3 Class of Worker.*

For additional information, contact us:



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