ACEC Private Industry Brief

Data Centers & Telecommunications

Special Issue 2020

Introduction & Market Scope

The communications market sector is one of the few expected to grow over the coming years—and may be the most resilient during the current pandemic-caused recession. In this *Private Industry Brief* Special Issue we take a deeper look into two significant parts of the communications sector: data centers, which are largely "vertical" projects; and telecommunications, which includes "horizontal" infrastructure focused on broadband. Once considered niche markets, data centers and telecommunications are increasingly mainstream due to the growth of connected devices and the massive amounts of data moving across the internet. The work-from-home environment of the COVID-19 era has resulted in even more streaming media and meeting applications. Analysis by the Uptime Institute finds that media streaming represents the biggest portion of global internet traffic, and it is in fact the "energy guzzler of the internet".

Many firms count data center developers and owners as well as telecommunications companies as major clients. Typically working under Master Services Agreements or similar type of contracts, a wide range of engineering services are provided to these clients, including: civil, mechanical/electrical, structural, environmental, geotechnical, and water-related design. Telecommunications and other utility clients are also significant buyers of surveying and mapping services, because their projects often span large geographies.

Top Clients

Data center developers and user-owners: Apple, Amazon Web Services (AWS), CyrusOne, Digital Realty, Equinix, Facebook, GDS Holdings, Google, Interxion, Microsoft and NTT Communications.
Source: Data Center Construction Market – Global Outlook and Forecast 2020-2025

Cable companies (ordered by size): Comcast, Charter, Cox, Altice, Mediacom, Cable ONE, WOW (WideOpenWest) and Atlantic Broadband.

Phone companies (ordered by size): AT&T, Verizon, CenturyLink, Frontier, Windstream, Consolidated, TDS and Cincinnati Bell.
Source: Leichtman Research Group, Inc.

See lists of top A/E/C firms in these markets on page 4.

5 Current Market Trends

1. Connectivity Becomes a True Necessity

The need for social distancing during the COVID-19 pandemic has translated into millions of Americans needing to work from home, engage in distance learning, shop via the internet, and even have medical appointments using telemedicine. The result is that communications infrastructure—in the form of data centers and broadband—is not just a market trend, but a life necessity. According to FMI's *Third Quarter 2020 Report*, the communications sector is the only one that will rise each year between 2020 and 2024, from $23 billion to $27 billion in annual design and construction spending. The strength of this sector in 2020 is evident in the performance of data center real estate investment trusts (REITs) which collectively recorded the highest YTD returns ever and outperformed other sectors in the first half (H1) of 2020 *(see chart on page 2)*. Real estate firm JLL credits this growth to immediate demand for e-commerce and

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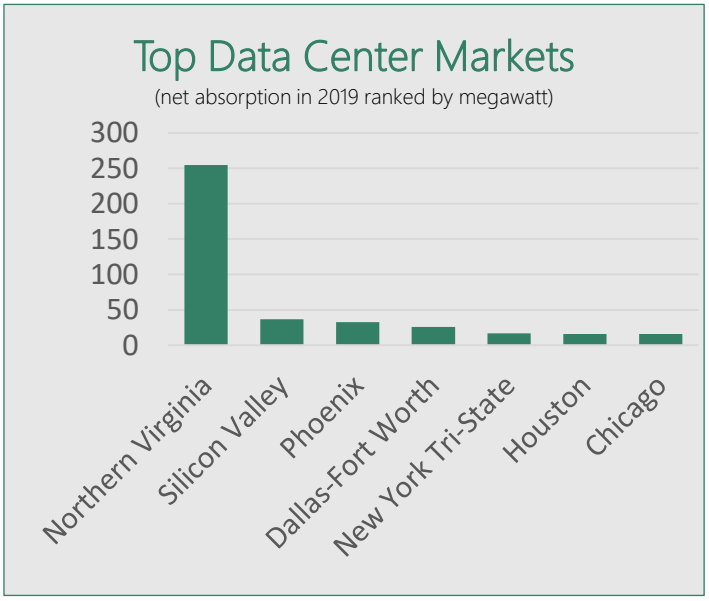

Source: CBRE

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virtual connectivity. In addition, many data center developers continue to have record backlog six months into this pandemic. For broadband there remains a significant challenge in bringing connectivity all the way to residences and small businesses nationwide, particularly in rural areas. According to the Federal Communications Commission (FCC) *2020 Broadband Deployment Report*, 22.3% of Americans in rural areas and 27.3% of those on Tribal lands lack access to high-speed internet. The U.S. Chamber of Commerce's Chamber Technology Engagement Center (C_TEC) reports that if rural small business had broadband access annual GDP and employment would increase by $41.3 billion and 316,605 jobs, respectively. In addition, rural access would likely slow out-migration from rural areas, improving overall economic development. Unlike data centers (which are financed by owner/investors and capital markets), private telecommunications companies have had little incentive to invest in rural connectivity on their own, as the customer base is often not dense enough to support the cost of the infrastructure.

2. Federal Government Ramps Up Broadband Plans:

Recognizing the need for federal action in connecting rural America to broadband, the FCC in 2010 established the National Broadband Plan, which initiated a decade-long push for connectivity, with considerable activity in the last couple of years. Besides the FCC, the U.S. Department of Agriculture (USDA) is the main federal agency with rural broadband initiatives. In addition, the U.S. Department of the Interior and U.S. General Services Administration are advancing rural connectivity through use of federal properties. Key actions and programs of these government agencies include:

- In 2018 the USDA created **ReConnect**, a rural broadband program which is part of the Rural Utilities Service. Congress allocated ReConnect $1.15 billion for grants, grant-loan awards, and low-interest loans for infrastructure including the cost of construction, improvement, and/or acquisition of facilities and equipment. The second round of funding closed on April 15, 2020 with applications currently under review.
- In January 2020 the FCC established the new **Rural Digital Opportunity Fund**, to fund the deployment of high-speed broadband networks in rural America. Through a two-phase reverse auction mechanism, the FCC will direct up to $20.4 billion over 10 years to finance networks.
- In March 2020 President Trump signed into law the bipartisan-supported **Broadband Deployment Accuracy and Technological Availability Act ("DATA")** which requires the FCC to collect granular service data and develop maps detailing rural broadband availability.

3. States Step Up to Coordinate Broadband Initiatives:

As of this year all 50 states have either a task force, commission, or authority to coordinate broadband expansion; and in 2020 alone 43 states legislatures have addressed broadband issues in areas connected to educational institutions, funding, governance authorities and commissions, infrastructure, municipal-run broadband networks, rural and underserved communities, smart communities, and taxes, according to the National Conference of State Legislatures (NCSL). State broadband programs generally have four major activities: stakeholder engagement; data management; planning; and administering a grant program, according to The Pew Charitable Trusts' Broadband Research Initiative. Some state broadband departments engage with clients very familiar to engineering firms, such as in Nevada where the office that coordinates broadband policy is working with the state's Department of Transportation to see that conduit is installed during upgrades to transportation infrastructure.

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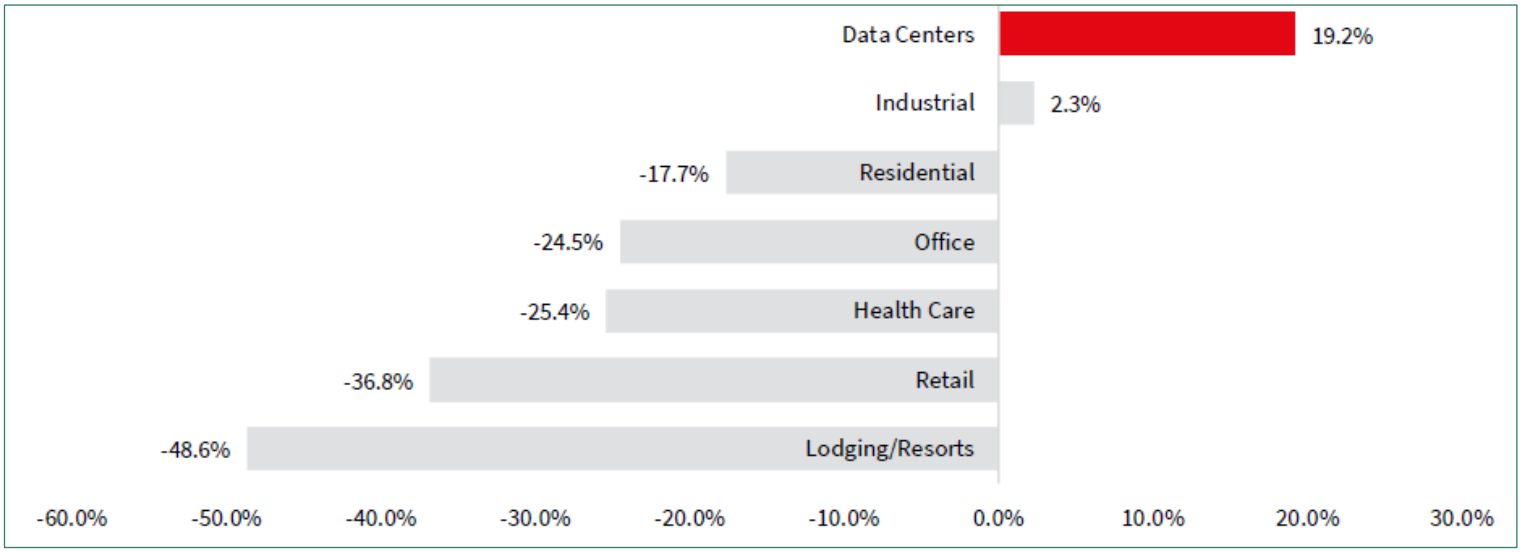
Real Estate Investment Trust (REIT) H1 2020 Performance by Sector



Source: JLL

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5 Current Market Trends *continued*

4. Electric Co-Ops Become Key to Broadband:

Electric cooperatives (referred to as "co-ops") were created after President Franklin D. Roosevelt established the Rural Electrification Administration in 1935, bringing electricity to rural parts of the country in the 1930s and 1940s. Today there are still 900 co-ops, which are independent electric utilities owned by the members they serve, and co-ops are getting the opportunity to once again transform rural America through broadband deployment. In 2010 only one co-op was providing broadband connectivity, but as of 2019 more than 140 were offering broadband, according to the Institute for Local Self-Reliance. Besides supporting their rural customers, there is an additional driver for co-ops which need to add fiber to modernize their electrical grids so they are "smarter", more resilient and efficient. According to the National Rural Electric Cooperative Association 200+ co-ops who are not yet deploying broadband are seriously exploring this as an additional offering.

5. Focus on Data Center Innovation, Sustainability:

With their unique requirements for siting, cooling, and energy redundancy, data centers have unique design requirements and engineering innovations are key to data center evolution. These innovations include: developing on-site water treatment plants designed with dual piping; adoption of air- and water-cooled chillers that facilitate partial cooling of the facility using outside air; on-site energy generation from a variety of sources; and deriving energy from renewable and sustainable sources such as solar, wind, waste-to-energy, and natural gas fuel cells. The continual need for data centers to decrease carbon emissions (largely due to increasingly stringent state and local requirements) offers considerable opportunities for the engineering community. Large data center owners—not unlike others in the commercial real estate industry—have set their own targets in response to climate change, such as Microsoft which has announced a goal of being carbon negative by 2030.

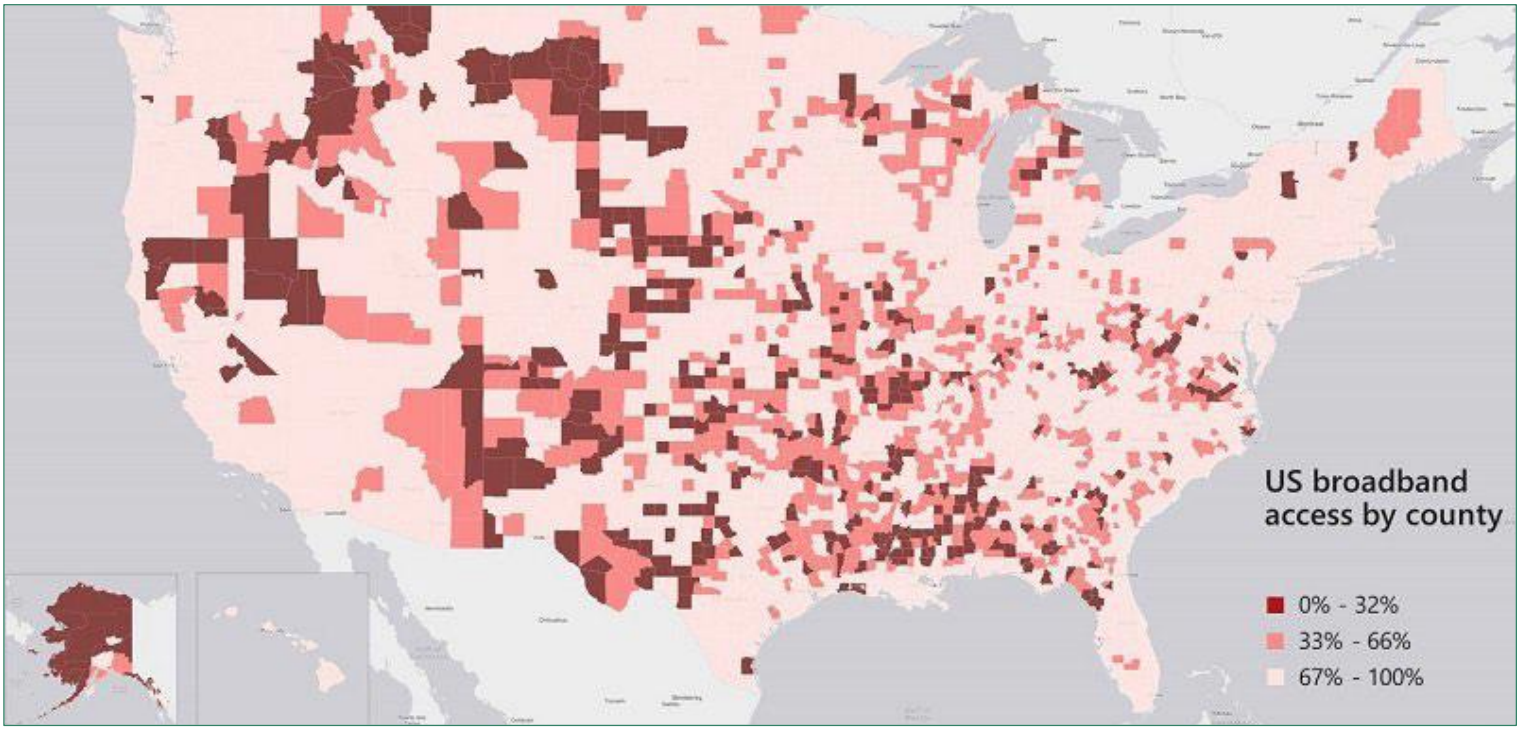
Business Development Insight

Follow the funding from newly initiated programs to electric co-ops, and team strategically.

The activities around funding and financing rural broadband deployment, and the targeting of electric co-ops to play a new and unique role in this deployment, present new business opportunities for engineering firms. Within a larger telecom business development plan, firms may consider the following three tactics to gather information and secure new contracts in this market.

1. Connect with the state agency responsible for broadband deployment to gather information on what is happening at the state and local level.
2. Track federal program grant and loan awardees (*major programs are detailed on page 2 of this brief*) to see what co-ops and other telecom companies are receiving monies for infrastructure development.
3. Consider teaming with larger firms already established in this market area (*see page 4 for list*).

U.S. Broadband Access by County



Source: Benton Institute for Broadband & Society, FCC (2018 data)

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Top A/E/C Firms in the Data Center Market

Source: Building Design + Construction

Rank	Architecture	Engineering	Construction
1.	Corgan	Vanderweil Engineers	Whiting-Turner Contracting Co.
2.	HDR	ESG	Turner Construction
3.	Gensler	kW Mission Critical Engineering	Holder Construction
4.	AECOM	Jacobs	DPR Construction
5.	Page	EXP	Fortis Construction
6.	HED	Morrison Hershfield	HITT Contracting
7.	Highland Associates	WSP USA	STO Building Group
8.	DLR Group	Syska Hennessy Group	JE Dunn Construction
9.	KZF Design	Salas O'Brien	Hensel Phelps
10.	Stantec	Dewberry	AECOM

Top Engineering Firms in Telecommunications Market

Rank	Engineering Firm
1.	Jacobs
2.	KBR Inc.
3.	Black & Veatch
4.	Tower Engineering Professionals
5.	Burns & McDonnell
6.	EXP
7.	Corgan
8.	HDR
9.	Bechtel
10.	ECS

Source: Engineering News-Record

ACEC Focus on Communications

Gauging your interest in participating in an ACEC working group.

ACEC is considering forming a working group focused on the growing communications sector. The activities of such a group may include exchanging information on this market sector, tracking federal policy actions and providing input from the engineering community, hearing from client representatives in group or virtual settings, and networking with prospective team members.

If you would be interested in participating in such a group, please e-mail Erin McLaughlin (*emclaughlin@acec.org*).

Private Industry Briefs

Focusing on the private-sector markets listed below, ACEC's *Private Industry Briefs* are available via subscription; they are free and you can cancel at any time. To sign up or download current issues, visit: https://programs.acec.org/industrybrief/


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ACEC's Private Industry Briefs include annual updates of four key markets, as well as quarterly economic reviews. Further coverage can be found in *Engineering Inc.*'s regular column 'The Private Side.'

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