

Data Center Demand Remains Strong

By Erin McLaughlin



Data center design and construction is expected to be one of the few markets that will experience growth over the next few years—and may be the most resilient during the current pandemic-caused recession. According to Market Data Forecast, the global data construction market was valued at \$20.11 billion in 2019, and is projected to reach \$32.5 billion by 2025, representing an impressive expected annual growth rate of more than 8 percent.

Once considered a niche commercial real estate market, data centers have increasingly become mainstream, fueled by the advancement of connected devices and the massive amounts of data moving across the internet. More specifically, the uptick of this market can largely be attributed to the growth of colocation for data servers, cloud services, the Internet of Things (IoT), as well as the expectation of 5G impacts.

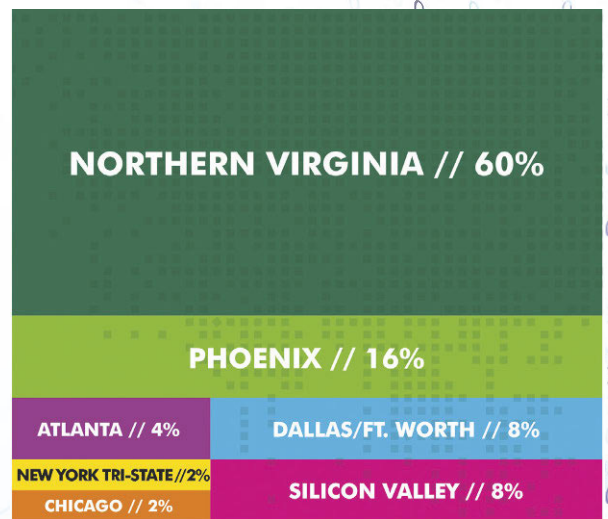
The work-from-home environment of the COVID-19 era and watching television and movies from internet-based applications has only increased internet traffic, with Zoom calls and streaming from home increasing rapidly. Analysis by the Uptime Institute finds that media streaming represents the biggest portion of global traffic and it is in fact the “energy guzzler of the internet” (source: *Facility Executive* magazine). According to their analysis, “streaming a 2.5 hour high-definition (HD) movie consumes 1 kilowatt-hour (kWh) of energy. But for 4K (Ultra HD) streaming—expected to become mainstream in 2020—energy consumption will be closer to 3 kWh. Expected increases in demand will drive greater cloud, colocation and data center development, and energy consumption. The rollout of 5G, with its increased

bandwidth requirements, will substantially accelerate the data use and energy trends.”

This increasing demand resulted in 2019 being a record year for data center leasing and construction completions, according to CBRE. The United States has the largest data center infrastructure globally, with seven primary geographic markets (see chart below), and the Northern Virginia market is the largest in the world. Demand domestically is driven by large enterprises and cloud users who continue to locate near subsea cable landing stations and key internet exchange points (see call-out box of Top Data Center Owners and Top A/E/C Firms for Data Centers).

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

THE 7 KEY DOMESTIC DATA CENTER MARKETS



Source: CBRE

TOP A/E/C FIRMS FOR DATA CENTERS:

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

Source: *Building Design + Construction* magazine, 2019 Giants 300 Report



Consumer Behavior Drives U.S. Economy, Commercial Design

The U.S. economy started becoming consumer focused as early as the 1920s when the middle class began emerging. However, the current level of consumer spending, which accounts for about 70 percent of U.S. economic activity, really began in the 1980s. As a result of this heavily consumer-driven economy, the service and retail sectors grew considerably, greatly impacting urban and building design, and elevating the importance of the “third space” (social spaces outside of homes or workplaces, such as a coffee shop). The importance of commercial spaces and the social experiences we have in them is significant; how the coronavirus pandemic will change consumer attitudes, and therefore design of such spaces, is largely to be determined. Consumer sentiment is an economic indicator to watch closely (see chart below), as it will likely offer clues to changes in our economy, and to the public’s desire to fully interact once again in the “third space.” ■

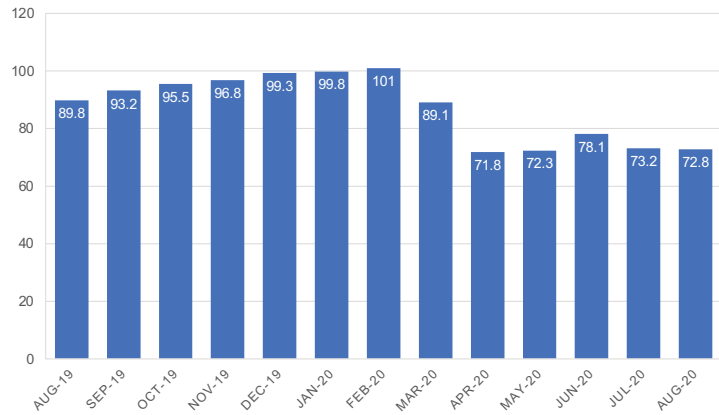
TOP DATA CENTER OWNERS

- Apple
- Amazon Web Services (AWS)
- CyrusOne
- Digital Reality
- Equinix
- Facebook
- GDS Holdings
- Google
- Interxion
- Microsoft
- NTT Communications

Source: Data Center Construction Market - Global Outlook and Forecast 2020-2025

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.

INDEX OF CONSUMER SENTIMENT AUGUST 2019–AUGUST 2020



Source: University of Michigan



Commercial & Residential Real Estate



Intermodal & Logistics



Energy & Utilities



Health Care & Science+Technology



Economic Outlook



Public-Private Partnerships (P3s)

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