The Data Center Trifecta: The Critical Role Power, Fiber, and Climate Play in Choosing a Data Center Location

A Practical Guidance® Article by Michael Pollack, Adler & Stachenfeld LLP

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Demand for data centers has skyrocketed over the past year, fueled by the ever-growing reliance on digital infrastructure across all industries. With the growth of artificial intelligence (AI), cloud computing, and data storage, there has never been more need for data center development. However, selecting the right location depends heavily (and almost entirely) on three important criteria: power, fiber, and climate.

Power

First and foremost, abundant, low-cost, and reliable power is the essential prerequisite for data center operations. With the growth of AI and cloud computing, spending on data center development is estimated to reach $150 billion per year, and it is not unusual to see hyperscale facilities requiring hundreds of megawatts (MW) of electrical capacity. According to KKR, the United States presently consumes 16 to 18 gigawatts (GW) of power to support data center infrastructure, and that figure is projected to double or triple over the next few years. To put that in perspective, 1 GW of electricity is estimated to be able to power 750,000 or more average U.S. homes. This translates to 18 GW powering over 13,000,000 homes, or close to 10% of the estimated 145 million homes currently existing in the U.S. There is no sign of demand slowing down.

With the increasing need for power, it is also important for the power to be low-cost, which means that many data center locations are outside major markets. Cities enjoying access to a diverse fuel mix enjoy competitive advantages in offering lower electricity rates. For example, Phoenix, Arizona, offers power costs well below the national average due, in part, to its access to hydroelectric and solar power.

Fossil fuels and existing traditional power sources are not adequate to meet the current demand. This is creating a bottleneck in the development of new facilities. Large users of computing power are increasingly turning to alternative energy sources (e.g., nuclear, solar, and water), as well as natural gas, to meet demand. For example, Meta owns or contracts for the power generated from more than 10 solar farms in Utah generating over 1.6 GW of power, and Constellation Energy is seeking to recommission the Three Mile Island nuclear power plant, closed since 2019, to generate up to 837 MW of electricity.

Fiber

Similarly, connectivity (i.e., access to fiber) is a critical element in the location of data center facilities. Whether as the chicken or the egg, Northern Virginia has the largest co-location capacity in the country, estimated to be over 8,000 MW. That number far exceeds that of its nearest competitors, Atlanta and Phoenix, each with a capacity estimated at barely 25% of that located in Northern Virginia. The prominence of the Northern Virginia market is attributed primarily to the early adoption of fiber optic networking by the U.S. government in the 1960s, leading to the widespread installation of massive amounts of fiber well ahead of other parts of the country. This head start has placed Northern Virginia at the forefront of the market, with some estimating Northern Virginia handles 70% of all internet traffic in the world. This dominance is not without its disadvantages, as

the thorough saturation of this market has exhausted existing sources of power and made identifying new sources of power a limiting factor in future growth.

While concentration of corporate activity tends to correlate with connectivity, co-location capacity does not necessarily correlate with economic activity. New York City, located in the largest standard metropolitan statistical area (SMSA) in the country, is ranked only 22nd in co-location capacity, with a capacity that is barely 1% of Northern Virginia's capacity. That capacity is supplemented, however, by the approximately 371 MW capacity located in Northern New Jersey (ranked 10th nationwide), driven largely by its proximity to New York City. Still, the capacity of those two markets, combined, is less than 5% of the capacity contained in Northern Virginia (in the 37th largest SMSA) and less than 20% of the co-location capacity in Phoenix (with approx. 2,300 MW in the 10th largest SMSA). See the chart below for an illustration highlighting this trend in select cities.

Co-location Rank	City	SMSA Rank
1	Northern Virginia	37
2	Atlanta	6
3	Phoenix	10
7	Portland	37
10	New York/Northern New Jersey	1
13	Los Angeles	2
16	Houston, TX	5
23	Boston	11

As a fun fact, the transcontinental railroad, which runs from Iowa to California along the 41st parallel, a historical artifact from 1862, has also become a driver of data center location. Rather than having to negotiate with a multitude of private landowners to run their fiber, telecommunication providers are able to negotiate directly with the railroad to run their computing infrastructure along the tracks. As a result, the east-west course of the 41st parallel has become a natural landing spot for hyperscale centers. For example, Council Bluffs, Iowa is home to a $5 billion data center facility owned by Google, and another $500 million center in Cedar Rapids is being planned by the American multinational technology company. Meta has been particularly active in placing its data centers along the 41st parallel, with large facilities in Altoona, Iowa; Sarpy County, Nebraska; Cheyenne, Wyoming; and Eagle Mountain, Utah. By its own account, Meta's reported investments in data center facilities in these states is equal to or exceeds $6 billion.

Climate/Natural Disasters

When deciding where to develop data centers, it is important to keep them safe from natural disasters and drastic climate change. The top co-location destinations (i.e., Northern Virginia, Atlanta, and Phoenix) are all well inland and away from the coasts, where they are less likely to be damaged or have power interrupted by violent storms. And while one cannot entirely avoid large markets that may be subject to risk, such as California for earthquakes or New York City for terror attacks, one just does not want to put a $5 billion facility in harm's way.

Additional Considerations

While power, fiber, and climate play the main role in the location of data centers, a few other factors warrant attention, such as population, government incentives, and workforce. Proximity to the customer base, access to skilled labor, and large concentrations of business activity will always be a factor. Uses and businesses requiring low latency will limit the distance an operator or user will want its data to travel. Access to plentiful amounts of water is a prerequisite to meet the cooling demands of the center's servers. Favorable tax treatment in the form of incentives and sales tax exemptions can provide substantial savings to the company electing to invest in a qualifying project where those benefits are available.

While these additional considerations may motivate an operator to choose between relatively similar locations, the "location" trifecta of "power, fiber, and climate" is still going to largely define the target area for a new facility. With demand for capacity experiencing meteoric growth, new entrants coming into the market, and existing providers implementing their expansion plans, the competition for limited resources and suitable sites is sure to be keen.

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Michael Pollack joined Adler & Stachenfeld in 2022 and is a member of the firm's Corporate Real Estate Practice, Leasing Practice, and co-chairs the Construction Practice.

Mr. Pollack has more than 30 years of experience as a real estate attorney representing some of the most prominent investors in high-profile properties. His practice focuses on complex corporate transactions, including the purchase, sale, and financing of major commercial properties; lease and ground lease transactions, construction contracts, and real estate development; and litigation management. His experience covers a broad range of asset classes, including office buildings, retail properties, multifamily properties, commercial condominiums, development projects, hotels, and industrial projects.

Mr. Pollack, for a number of years, served as Senior Vice President and General Counsel of a substantial private real estate investment, management, and construction company with a geographically diverse real estate portfolio. He was responsible for all transactional, litigation, and corporate matters for business lines ranging from directly owned real estate portfolios, joint ventures, investment funds, and construction and management companies.

Mr. Pollack received his J.D. from Boston University School of Law.

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