



Data Centers as an asset class

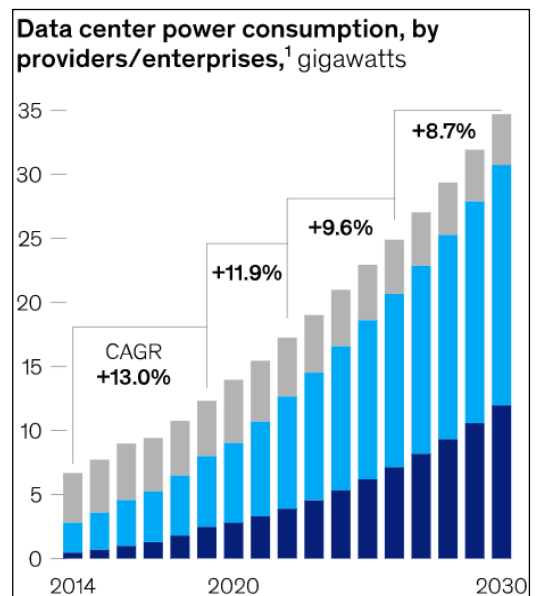
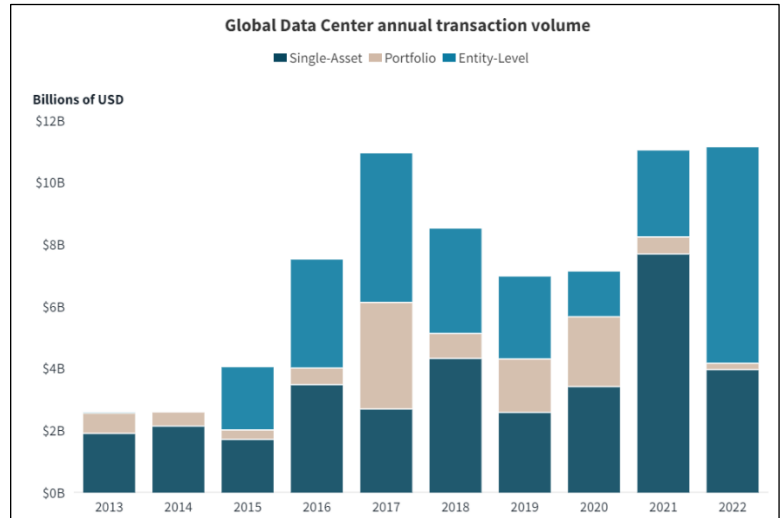
Data centers have become a rapidly growing asset class in the real estate industry. They provide critical infrastructure for businesses of all areas and sizes, including healthcare, finance, e-commerce, and more. Most businesses, require access to large amounts of data but are often unable to maintain the complex infrastructure required to manage this data. As a result, many opt to pay for cloud services provided by other companies, which in turn necessitate the use of large data centers to house their servers. As the volume of data generated and stored continues to increase, there is a rising need for dependable and secure facilities that can effectively manage and store this data. Such facilities are purposefully designed to offer exceptional availability, redundancy, and scalability, all of which are essential for meeting the evolving technology requirements of businesses and organizations.

Data centers come in different types and sizes, from small-edge data centers to much larger hyper-scale data centers that can occupy several football fields. Single-tenant data centers cater to a single large organization that prefers a dedicated and secure infrastructure to manage its data. These facilities provide a safe opportunity for tenants that do not wish to disrupt their services by shifting information centers. They offer long-term leases that ensure a predictable and stable income stream. On the other hand, multi-tenant data centers cater to multiple companies that lease as many racks as they need, and typically have variable lease agreements. These facilities offer greater flexibility to tenants but come at a higher rental cost when compared to enterprise facilities. A single tenant at a multi-tenant facility typically occupies less than 5% of the available space, resulting in minimal economic loss when a tenant vacates. Regardless of their size or ownership, all data centers require reliable power and cooling systems to ensure the uninterrupted operation of critical equipment.

A key difference in evaluating the capacity of a data center is that the facility should be measured in Megawatts and not in square feet like traditional real estate. This is because Megawatts has replaced square feet as the primary benchmark for data centers due to the main value of a data center being access to power.

State of The Market

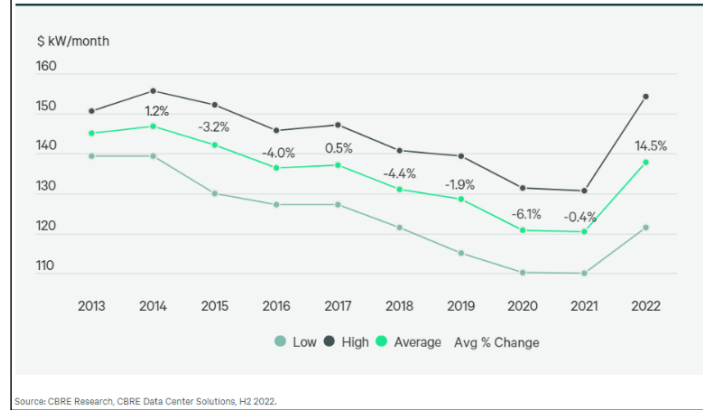
The rise of artificial intelligence and other technological advancements are increasing data usage and the need for computing efficiency, both of which bolster demand for data centers. Cloud computing has also been a major driver of to access computing resources on demand without the need for on-premises infrastructure. According to JLL, the global collocation data center market size is forecast to increase at a CAGR of 11.3% between 2021 and 2026. In terms of geography, the North American market has been the largest data center market in the world for several years with revenues projected to reach \$110.80bn in 2023. CBRE reported that limited supply and strong demand continued to drive up rental rates in the second half of 2022, increasing by 14.5% y/oy. This trend is expected to continue through 2023 as demand outpaces supply and creates a rent premium for available space. Supply and demand imbalance has also worsened due to delayed construction timelines caused by longer lead times for critical infrastructure components, such as substations. Hyperscale and edge data centers are expected to be the fastest-growing segment of the space leading investor demand. Another positive indicator is the overall record low vacancy rate across North American primary markets holding at 3.2% which further fell from a year before. CBRE reports that both debt and equity investors are attracted to the strong industry fundamentals of positive rental growth, historically low vacancy and record demand. The data center market is also relatively stable during times of economic downturn as the Credit-rating firm S&P Global Ratings noted that although they expect data centers to see some growth deceleration in a recessionary environment, they believe it will be mitigated due to their critical nature. At the same time, investors are now looking for leased facilities at lower prices than in the past due to higher interest rates affecting their ability to meet expected returns.



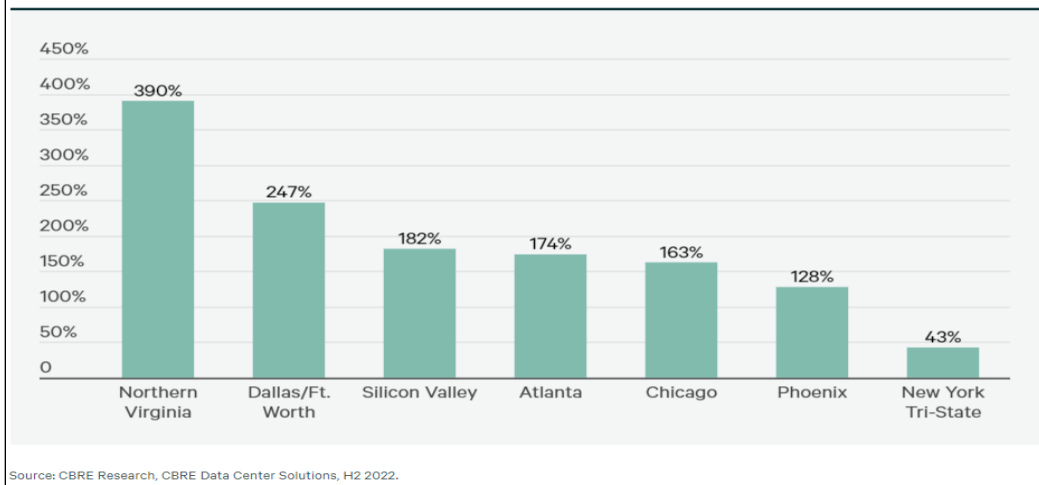
Investment Potential

Data centers can be a valuable and unique asset class that offers a multitude of benefits. They typically have long-term leases with tenants that are willing to pay a premium for their reliability and security. Leases are usually signed for at least ten years, and sometimes purchase agreements can be obtained that allow funding the building while simultaneously securing a pre-committed tenant. This provides a level of financial security and reduces the risks associated with building and operating the data center. Furthermore, the lease rates for data centers are typically higher than other commercial properties and additional revenue can be generated by offering value-added services such as cloud computing, disaster recovery, and managed services. Additionally, data centers often have lower turnover rates than other commercial real estate properties, which can help reduce costs. The maintenance costs are usually on the lower end as most of the value is in the technology infrastructure rather than the physical building itself. With demand for data centers continuing to grow, there is also room for capital appreciation providing investors with a potential capital gain when wanting to sell their investment. Cap rates in the sector are on the rise as well, with MSCI reporting that the trailing 12-month cap rate expanded by 230 basis points over the previous year ending up at 7.1% in the fourth quarter of 2022.

Average Asking Rental Rate with Y-o-Y % Change for Primary Markets



Inventory Growth of Primary Data Center Markets Since 2015



Location Criteria

In order to determine a suitable location for a data center, several crucial factors must be considered. The most important being the availability of power and fiber infrastructure in the region, both of which are essential for data center operations. This makes it necessary to consider proximity to electricity grids, telecommunications infrastructure, and network services. Environmental risks must also be assessed specifically the geological zone of the location in anticipation of seismic events, flood risk and external risk factors. Additionally, complex mechanisms are necessary to maintain optimal temperature and humidity levels within the facility to protect the technology. Thus, it is necessary to take into consideration the average outdoor temperature to ensure optimal performance and cooling ability.

High Weight Criteria

Market size

Large, established markets have many advantages that appeal to both data center operators and clients. These markets offer access to all major cloud services, experienced talent for hire, and knowledgeable sales representatives. Local governments are familiar with the planning approval process, and utilities can handle large power requirements. This momentum allows the largest markets to grow, attracting hyperscale cloud services to create new business and expand thereafter. After an initial anchor tenant, several services will lease or build a major data center, with other enterprises or government organizations expected to follow. This competition for market share leads to further construction and expansion, with mid-scale cloud services moving in afterward.

Top Markets: Northern Virginia, Dallas, Silicon Valley

Fiber Connectivity

Fiber density and quality are crucial for data center location due to their ability to connect the facility to other networks and end-users, with more networks providing better performance.

Top Markets: Atlanta, Austin, Silicon Valley

Cloud Availability

The trend of hyperscale cloud services dominating the market has continued after the pandemic. Markets offering multiple cloud services and peering opportunities are becoming increasingly important, as early adopters diversify their workloads to create hybrid IT environments. Cloud providers' edge locations are also now being considered in market analysis, as they provide direct access to secure backbones and high-performance for more users. As more entities move their workloads to the public cloud, various markets stand to benefit as hyperscalers work to bring clients online.

Top Markets: Toronto, Montreal, Northern Virginia

Primary markets

These markets are experiencing significant growth, with many surpassing the 1,000MW threshold. This trend is expected to continue, as colocation and hyperscalers solidify their presence in secure metropolitan areas which have become regional centers.

Northern Virginia, USA

In Total Inventory (MW): 3442 Under Construction (MW): 651.

In 2023, Northern Virginia saw the delivery of 163MW of multi-tenant inventory and 203MW of single-tenant inventory. The region experienced a record-breaking absorption of 479MW in 2022.

Although power delivery timelines are a concern, hyperscalers are confident and continue to invest in the region. The surge in demand and decreased vacancy rates have led to increased pricing. Power constraints may also impact supply until 2025, but the market is still expected to remain active.

H2 2022 Wholesale Primary Market Fundamentals

Market	Inventory (MW)	Y-o-Y Change (MW)	Available MW/Vacancy Rate	Y-o-Y Change* (bps)	2022 Net Absorption (MW)	Y-o-Y Change (MW)	Rental Rates (kW/mo)**
Northern Virginia	2,060.1	▲ 371.5	20.1 / 0.98%	▼ -408	436.9	▲ 133.6	\$100-\$140
Dallas/Ft. Worth	392.3	▲ 23.0	23.8 / 6.1%	▼ -613	44.3	▲ 15.7	\$120-\$160
Silicon Valley	379.6	▲ 66.0	8.6 / 2.3%	▲ 71	62.4	▲ 39.1	\$155-\$250
Chicago	342.2	▲ 32.7	21.1 / 6.2%	▼ -553	48.0	▲ 20.6	\$115-\$125
Phoenix	324.5	▲ 37.5	27.5 / 8.5%	▼ -346	44.3	▲ 14.5	\$120-\$140
New York Tri-State	177.5	▲ 16.9	13.9 / 7.8%	▼ -156	18.1	▲ 7.5	\$125-\$135
Atlanta	252.5	▲ 23.0	9.1 / 3.6%	▼ -472	33.0	▼ -37.4	\$115-\$130

Secondary markets

These markets are now in the spotlight as investors, lenders and developers seek new opportunities in less saturated markets.

Toronto, Canada

Total Inventory (MW): 506.0 Under Construction (MW): 54

Toronto's existing immediate capacity is limited due to ongoing absorption of newly constructed space. The demand has been steadily increasing since 2021, mainly driven by the growth of hyperscale tenants in the Greater Toronto Area. With the rise in interest rates, industrial developers have halted speculative development, presenting an opportunity for data center developers to purchase land without significant competition. It is anticipated that additional supply will enter the market in the next 24-36 months.

Emerging markets

Smaller data centers and data sovereignty laws are helping open up emerging markets, which have traditionally faced challenges such as infrastructure, regulation, and political instability. These markets present an opportunity with fewer power and land constraints compared to more established markets.

Vancouver, Canada

Total Inventory (MW): 29.4 Under Construction (MW): 4

In 2022, Vancouver saw a 12% increase in total inventory, with 3.5 MW of positive net absorption, and a low 5.9% vacancy rate. 18.7 MW of future capacity is planned, with demand expected to increase due to content delivery requirements. The completion of the Google subsea cable and green hydroelectric power supply is expected to drive significant growth in the Vancouver market.

Considerations

The data center industry is experiencing several challenges that have impacted its supply and demand dynamics. This includes supply chain disruptions, labor shortages, and power constraints, especially in key markets such as Northern Virginia and Silicon Valley. These factors have caused delays in construction timelines and limited new supply growth, which is driving a trend toward pre-leasing. In addition, high energy and material prices have contributed to rising construction costs, with data center operators raising rates to remain competitive. Furthermore, governments and regulators are imposing sustainability standards on newly built data centers, and the use of renewable energy is a critical component of the hyperscalers' strategies. Carbon neutrality has already been achieved by companies like Apple, Google, and Meta using carbon offsets, and they have committed to using only carbon-free energy by 2030. Co-location companies are also under pressure to meet sustainability goals, as customers are increasingly considering sustainability records when deciding which companies to work with. Environmental considerations are increasingly impacting site selection, with firms seeking to source and generate renewable energy adjacent to data center facilities. As JLL reported "Those who react the fastest and improve efficiency with both energy and water usage stand to benefit as environmental impacts are top-of-mind for most leading companies.

