

## NORTH AMERICAN DATA CENTRE MARKET OVERVIEW

S&P GLOBAL MARKET INTELLIGENCE LLC  
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### GLOBAL DATA CENTRE MARKET

The global data centre industry continued to see strong demand. Public cloud providers and large information technology (“IT”) firms such as AWS, Microsoft, Google, Baidu, Alibaba, Tencent, ByteDance and Oracle were already leasing and developing large quantities of wholesale data centre space before the COVID-19 pandemic. The pandemic has accelerated demand, with some firms reportedly filling data centre space within a year that initially expected to be filled over several years.

The pandemic affected the way in which technology purchasers allocate resources as they require additional resources outside of their headquarters and other central locations. This led to firms increasing their use of shared compute infrastructure, which demonstrated the benefits of flexibility and adaptability. The increased utilisation of cloud infrastructure has benefitted leased data centre providers, as only a few of the largest cloud providers have built their own data centres. Cloud providers continued to lease data centre capacity where it makes economic sense and where they need to access connectivity ecosystems.

The industry is increasingly challenged by governments, local citizens and environmental groups who believe data centres use too much energy and are not sustainable. Some data centre locations such as Dublin, Amsterdam, central Beijing and central Shanghai have restricted new builds and/or encouraged older data centres to become more efficient. The industry has responded by improving power conversion and cooling efficiency, expanding the use of renewable energy and reducing the carbon footprint of new data centre

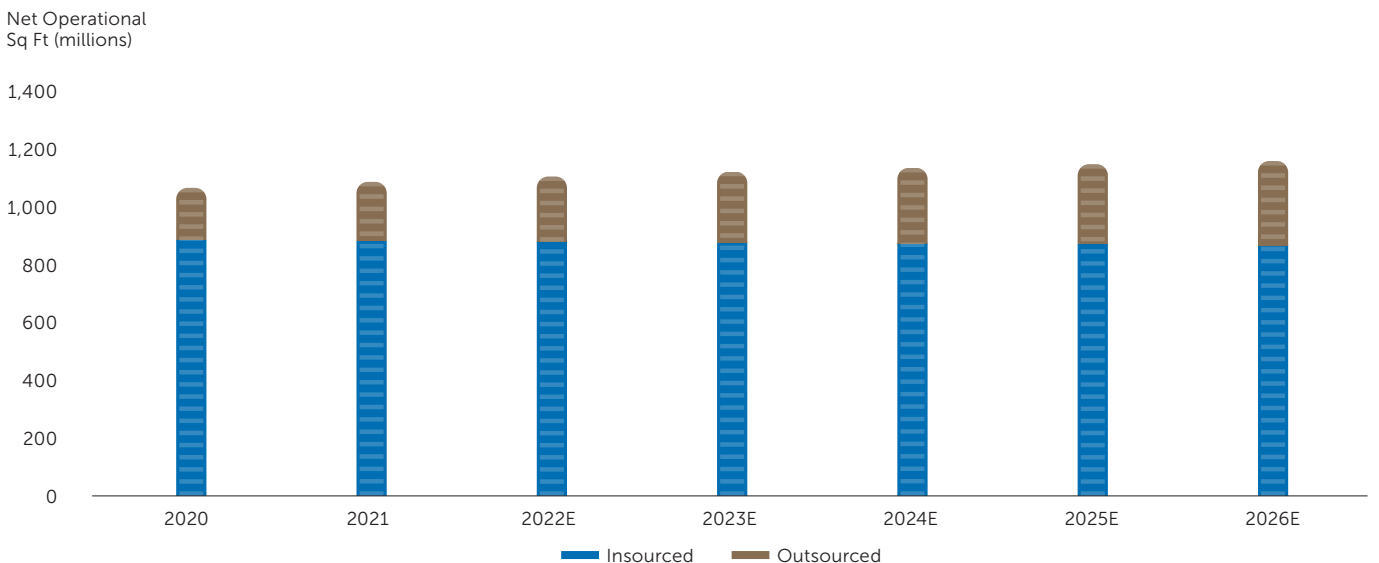
builds. Hyperscale cloud and IT providers are leading the way, as a result of their scale, funding and innovation. This has helped to overcome the restrictions on new data centre builds in some locations while adding to demand, as large-scale data centre users seek to secure data centre facilities in case government restrictions are imposed.

Revenue for the global leased data centre market<sup>1</sup> is forecast to grow at a compound annual growth rate (“CAGR”) of 11% from 2020 to 2026E. This will be driven by demand from enterprises, public cloud operators and IT firms. Enterprises will likely need to use additional leased data centre space due to data gravity, the ever-larger quantities of data that enterprises seek to analyse and make available to applications. In many cases, enterprises are reluctant to store such data in a public cloud due to cost, security, vendor lock-in, among other concerns. Leased data centres can offer a secure place to store such data at a lower cost, accompanied by software-defined (automated) interconnection that enables data to be used by applications in various clouds.

Asia Pacific is poised to see the strongest growth in the data centre industry globally, as it continues to see robust demand from cloud, payments, social media, and IT services firms. The region’s largest markets are likely to experience a moderate slowdown in growth as they face constraints on data centre development relating to high land prices, restricted access to power and regulations. The slowdown is expected to be offset by faster growth in suburbs outside of top urban markets as well as growth in emerging data centre markets, for example, in Southeast Asia.

In Europe, cross-border regulatory and cultural differences are expected to drive continued expansion into individual countries by cloud providers and data centre operators.

**FIGURE 1: WORLDWIDE INSOURCED (ENTERPRISE-OWNED) AND OUTSOURCED (LEASED & CLOUD PROVIDER-OWNED) DATA CENTRE SPACE**



Source: 451 Research/S&P Global Market Intelligence, 2022

<sup>1</sup> Leased data centres are facilities owned by data centre operators that are leased to one or more tenants. They do not include facilities owned and operated by enterprises or investors leasing the facilities to enterprises as in-house data space.

**NORTH AMERICAN DATA CENTRE GROWTH AND DEMAND DRIVERS**

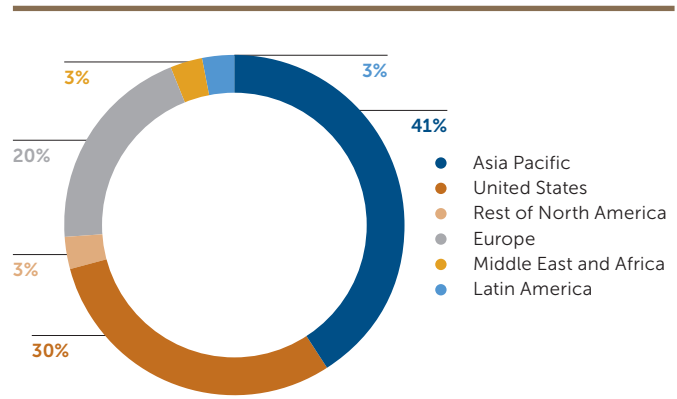
North America remains the second largest region for the data centre industry globally after Asia Pacific, accounting about 33% of the global data centre space (see Figure 2). Within North America, the United States is the top contributor of space, and remains the largest country-level market globally. Its principal metro market – Northern Virginia – is also the world’s biggest.

Continued growth in the North American data centre market is being driven by:

- 1) **Edge computing needs.** There are several factors that have driven the growth of workloads outside of main/core data centres, at the edge. According to the Voice of the Enterprise: Internet of Things, Workloads & Key Projects 2021 survey (see Figure 3), these factors include the cost and availability of supporting infrastructure, data sovereignty considerations, and the ability to provide both physical and digital security. Data centre operators view edge demand as a long-term growth area. In North America, edge requirements have increased demand for capacity in smaller cities, such as Portland and Sacramento.

**FIGURE 2: BREAKDOWN OF DATA CENTRE SPACE BY REGION, 2022E**

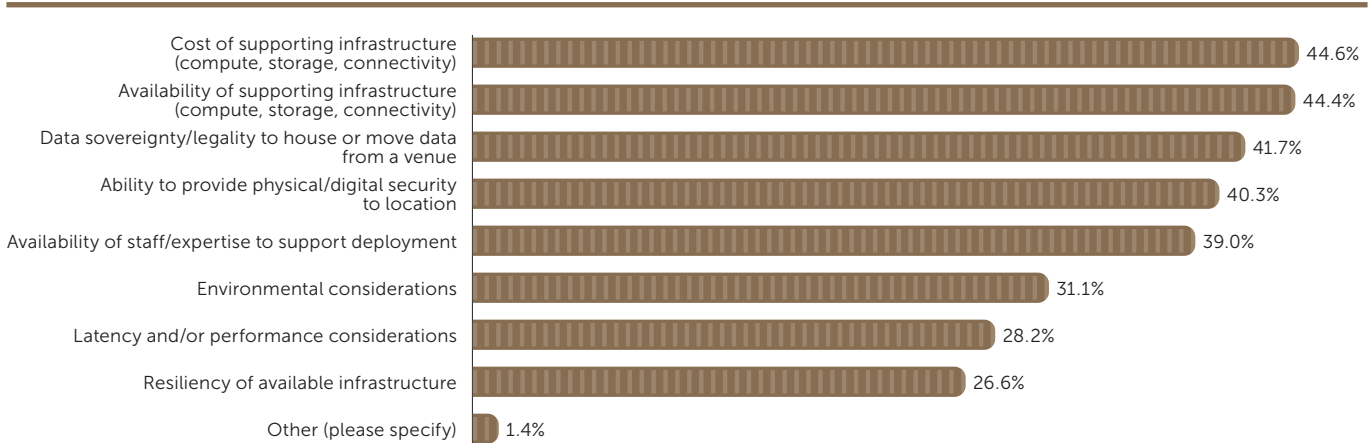
By Net Operational Sq Ft



Source: 451 Research/S&P Global Market Intelligence, 2022

**FIGURE 3: BEST LOCATION FOR IOT WORKLOADS**

In general, which factors are most influential when determining the best execution venue for an IoT workload? Please select all that apply.

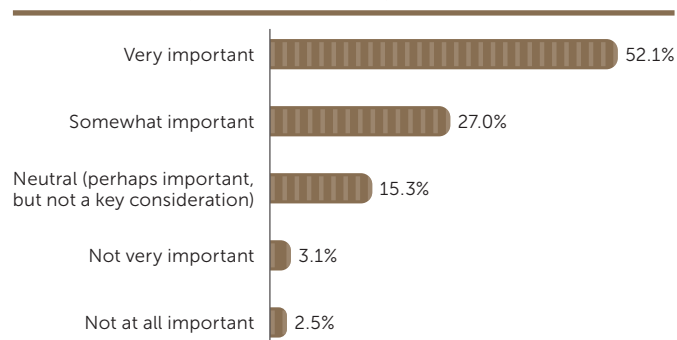


Source: 451 Research’s Voice of the Enterprise: Internet of Things, Workloads & Key Projects 2021

- 2) **The growing importance of sustainability.** Hyperscale operators have been working to improve data centre sustainability for many years. The innovations they have made to the design and operation of facilities – including reduced carbon emissions during construction, improved efficiency, and better use of water – are now spreading across the industry. As sustainability becomes more important to enterprises in many different sectors, leased data centre operators are adopting these new design and operation principles. Many leased data centres are or will be more efficient than enterprise-owned data centres; and this is expected to lead to some enterprises using leased data centres for sustainability reasons. The Voice of the Enterprise: Datacenters 2021 survey results indicated that nearly 80% of respondents consider sustainability/efficiency to be either very important or somewhat important as a selection criteria for colocation vendors (see Figure 4).

**FIGURE 4: SUSTAINABILITY/EFFICIENCY BECOMING MORE IMPORTANT**

When selecting a colocation vendor, how important are overall efficiency and sustainability?



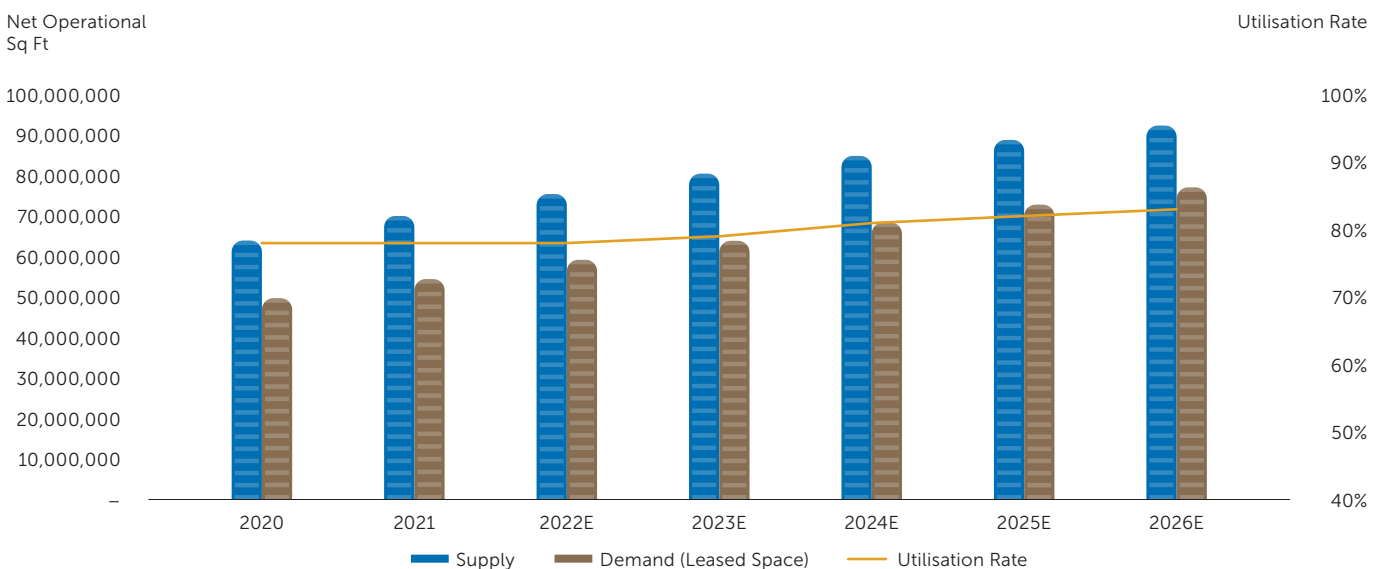
Source: 451 Research LLC., Voice of the Enterprise: Datacenters 2021

## NORTH AMERICAN DATA CENTRE MARKET OVERVIEW

**3) Software-enabled interconnection combined with data storage will create a growth avenue and source of differentiation for leased data centre operators.** The exponential growth of enterprise data is creating large data stores that are more expensive and difficult to transit through network infrastructure. As enterprises still want access to this data for processing by applications, this resulted in leased data centres becoming more integral to enterprise IT infrastructure as they help find a balance between storage and cloud.

Annualised revenue for the North American leased data centre market is forecasted to reach US\$24 billion by the fourth quarter of 2026, with an expected CAGR of 7% from 2020 to 2026E. Leased data centres have experienced strong demand during the COVID-19 pandemic. Such robust demand is expected to persist in the years to come as the process of economy-wide digital transformation continues. Leased data centre supply (by net operational sq ft) and demand (by net utilised sq ft) are expected to grow at a CAGR of 6% and 8% respectively between 2020 and 2026E (see Figure 5).

**FIGURE 5: LEASED DATA CENTRE SUPPLY, DEMAND AND UTILISATION IN NORTH AMERICA**



Source: 451 Research Datacenter KnowledgeBase, Q2 2022

There are 16 markets in North America that have over one million square feet of leased data centre space each (see Figure 6). These markets account for an estimated 74% of the total leased data centre space in North America. These key markets are often characterised by dense connectivity infrastructure and ecosystems as well as high population density, making them appealing to public cloud providers, telecommunication firms as well as content and social media companies. There are often large city, state and (in the case of Northern Virginia) federal government deployments in leased data centres as well. Enterprises and cloud providers often seek to place workloads in two or three regions of the United States or Canada; and these top markets are usually one of the main options for a region, adding to their size. Despite challenges in obtaining land and power to construct data centres in some areas, these top markets are expected to continue to see strong demand and growth.

**FIGURE 6: TOP 16 MARKETS IN NORTH AMERICA**  
By Net Operational Sq Ft

Rank	Established Markets
1	Northern Virginia
2	New York
3	Dallas
4	Silicon Valley
5	Chicago
6	Los Angeles
7	Atlanta
8	Phoenix
9	Toronto (Canada)
10	Boston
11	Philadelphia
12	Montreal (Canada)
13	Seattle
14	Denver
15	Portland
16	Houston

While these top markets have seen the most resources allocated to them by the data centre industry, there are over 100 smaller markets around North America (see Figure 7), many of which are also expanding. Most of these markets are expected to grow as data and content increasingly moves closer to end users in the years to come. Low-latency connectivity supporting technologies such as Internet of Things ("IoT") and 5G will require more compute resources close to end users, benefitting secondary markets. In total, this growth should accelerate the growth of the overall growth of the North American leased data centre market.

### FIGURE 7: RANKING OF SECONDARY MARKETS IN NORTH AMERICA

By Net Operational Sq Ft

Rank	Secondary Markets
1	Miami
2	Las Vegas
3	Austin
4	Minneapolis
5	Sacramento
6	San Antonio
7	Kansas City
8	Salt Lake
9	Cincinnati
10	Charlotte
11	Nashville
12	Pittsburgh
13	Cleveland
14	Omaha
15	Indianapolis

### NORTHERN VIRGINIA

#### Leased Data Centre Footprint

Number of Active Data Centres	193	Est. Installed UPS Power (MW)	2,105
Importance of Market	Developed	Average Utilisation Rate*	88%

Source: 451 Research estimates

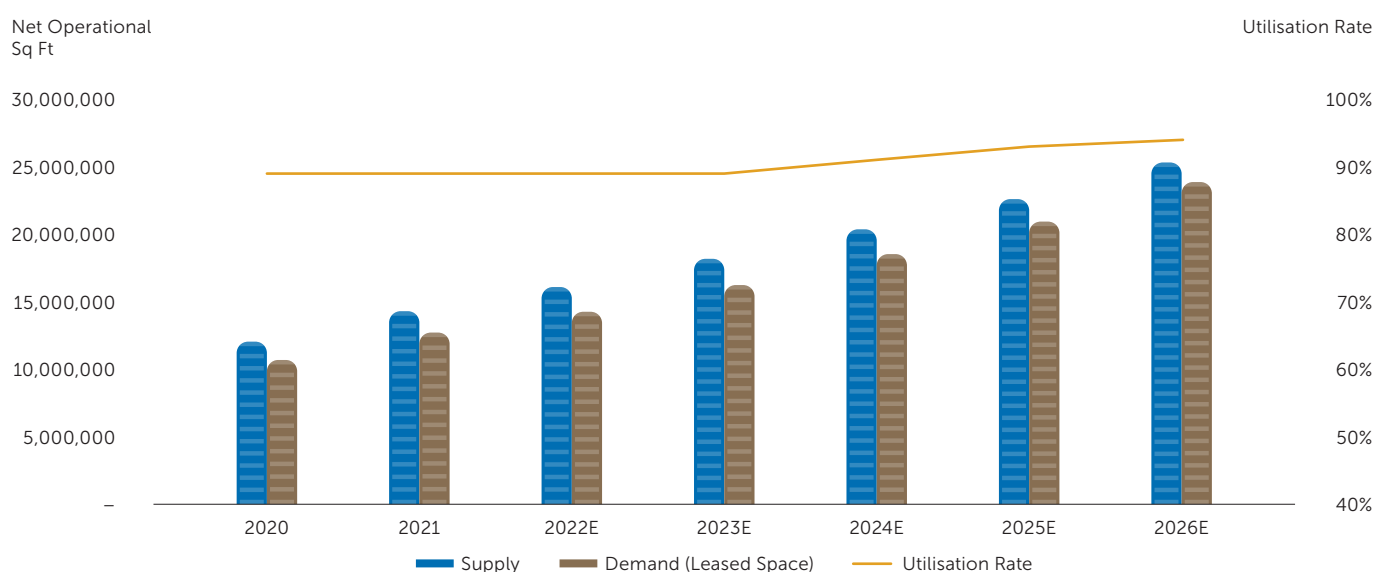
\* Average utilisation rate as of Q2 2022

Northern Virginia is the world's largest internet hub in terms of capacity. It remains a critically important hub for connectivity, both for traditional network infrastructure and cloud infrastructure.

The market is unusual in that the main urban centre, Washington D.C., only has a small portion of the market's capacity. Instead Ashburn, in Loudon county, is the focal point of the market. There are also growing deployments nearby in Chantilly, Culpeper, Fairfax, Manassas, McLean, Reston, Sterling and Vienna, among others.

The market's closeness to large population centres in the United States, dense fibre routes, relatively low costs as well as availability of land and power have contributed to its importance. Over time, a large ecosystem of carriers along with content and cloud services providers has continued to drive exceptional growth in the market. Content and cloud services providers are expected to continue fuelling this growth, even as land availability as well as access to fibre conduits and utility power become more challenging.

### FIGURE 8: LEASED DATA CENTRE SUPPLY, DEMAND AND UTILISATION IN NORTHERN VIRGINIA



Source: 451 Research Datacenter KnowledgeBase, Q2 2022

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The Northern Virginia leased data centre market offers several advantages to operators through sales tax incentives, which have encouraged the development of large-scale campuses. Dating back to 2012 but extended to 2035 in 2016, HB 216/SB 112 gave both owners of enterprise and leased data centres the ability to avoid sales tax if they invest more than US\$75 million in computer equipment and create a minimum of 100 jobs that pay twice the local average wage. (Leased facilities may combine investments made by both operator and tenant.) Additionally, when accounting for supporting infrastructure equipment such as generators and chillers, the minimum investment rises to US\$150 million, with the requirement that 50 jobs be created (25 in areas where the local unemployment rate is 150% higher than the Virginia average) at a wage level of 1.5 times the local average figure. Some counties also offer additional localised incentives through a reduction in the property tax rate for data centres.

### ATLANTA

Leased Data Centre Footprint			
Number of Active Data Centres	65	Est. Installed UPS Power (MW)	314
Importance of Market	Developed	Average Utilisation Rate*	88%

Source: 451 Research estimates

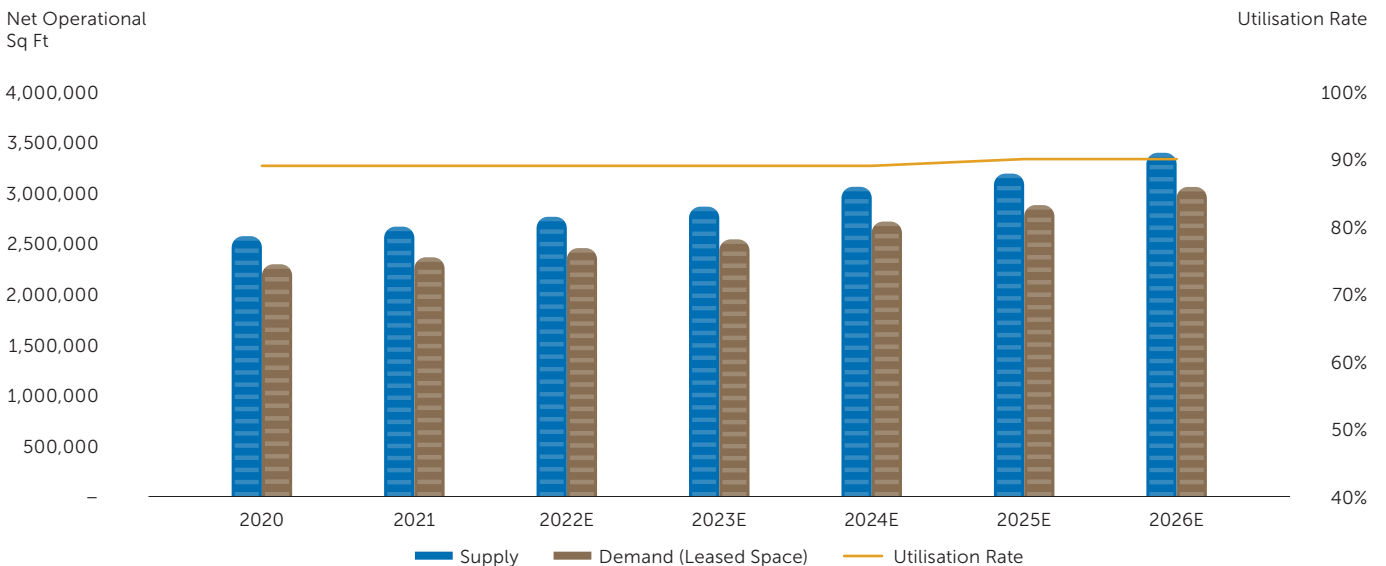
\* Average utilisation rate as of Q2 2022

Atlanta is North America’s seventh largest leased data centre market. The market has developed due to several factors, including plentiful availability of large land plots, low operational costs, stable power prices, dense fibre infrastructure, and government incentives. Atlanta is also a major thoroughfare for fibre infrastructure on the east coast of the United States.

Industrial power rates in Georgia are often below the national average. Those rates, combined with lower development and operational costs, mean that prices for leased data centre customers in the market can be 10 to 15% below that of some other top cities.

Hyperscale activity had remained relatively muted for many years, with only Google operating in the market since 2003, but this changed in 2019 with the arrival of Facebook (in Newton, Georgia). In 2021, Microsoft acquired nearly 100 acres in Douglas County, to the west of the city. In early 2022, AWS announced its intention to launch a local zone in the market. Although providers such as Flexential and STACK Infrastructure have established substantial land banks in anticipation of hyperscale growth in the market, the hyperscale operators have chosen to develop their own facilities. Data centre providers have instead served cloud-adjacent customers such as software-as-a-service and managed service providers.

FIGURE 9: LEASED DATA CENTRE SUPPLY, DEMAND AND UTILISATION IN ATLANTA



Source: 451 Research Datacenter KnowledgeBase, Q2 2022

Adding to the market’s natural competitive advantages are legislated state incentives for data centre operators, offering sales tax rebates for both enterprise-owned and leased facilities starting in mid-2018 through the end of

2028. For operators that meet minimum investment and job creation thresholds, purchases of materials, components, machinery, hardware, software, and equipment are eligible for tax rebates.

**SOUTHERN CALIFORNIA**

Leased Data Centre Footprint			
Number of Active Data Centres	99	Est. Installed UPS Power (MW)	344
Importance of Market	Developed	Average Utilisation Rate*	75%

Source: 451 Research estimates  
 \* Average utilisation rate as of Q2 2022

Southern California can be divided into two main data centre markets: Los Angeles and Los Angeles submarkets such as Orange County (which are often grouped into the larger Los Angeles market).

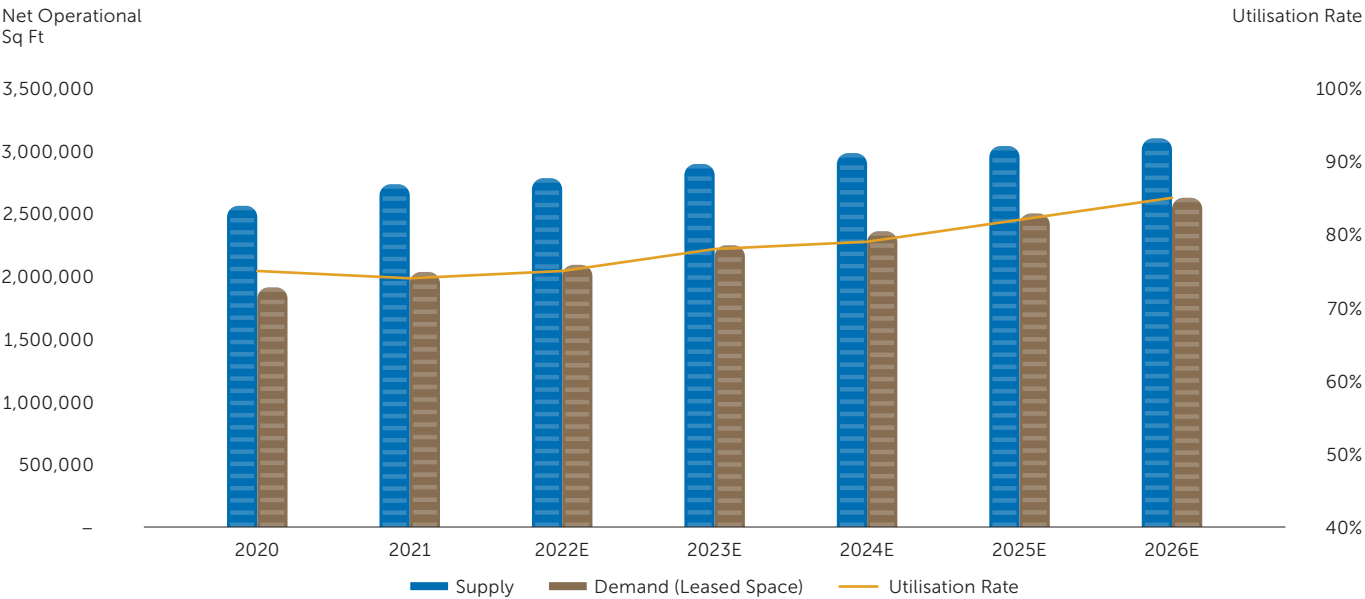
The region boasts a surprisingly diverse industry environment. While downtown typically caters to clients with latency-sensitive workloads, other submarkets such as Orange County, serve a broader range of customers, including entertainment and media, healthcare, e-commerce, finance/banking, technology, real estate and gaming. Irvine, for example, has been known to serve predominantly local

businesses; however, the market has seen a notable amount of activity as of late, including interest from international customers and even hyperscale operators.

The Los Angeles economy ranks second in the United States by gross domestic product, according to the US Bureau of Economic Analysis. While the city is mainly known for its vibrant media and entertainment industry, it experiences high levels of economic activity across several other sectors, including manufacturing, technology, aerospace and defense, bioscience, and hospitality.

As was the case across the globe, Los Angeles saw an uptick in demand for colocation services due to the COVID-19 pandemic, as enterprise clients moved away from on-premises data centres and into third-party ones. The additional demand has not translated into new builds coming online, with many colocation providers instead filling up space previously built out. Currently, colocation providers are seeing rising utilisation rates for their facilities and working to reformat existing space to fit more racks, which could be a positive sign indicating new builds are coming in the near future.

**FIGURE 10: LEASED DATA CENTRE SUPPLY, DEMAND AND UTILISATION IN SOUTHERN CALIFORNIA**



Connectivity is essential for clients looking to be in Los Angeles. Due to the higher pricing for colocation services, many enterprise clients opt to only keep minimal

infrastructure in Los Angeles facilities but are often willing to pay higher prices for connectivity-rich environments.