



STRUCTURE
RESEARCH

Princeton Digital Group

SAITAMA:

Tokyo's Emerging
Hyperscale & AI Hub

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01 Executive Summary

As the world's third-largest economy, Japan boasts of advanced infrastructure, strong manufacturing capabilities, and a highly innovative IT and technology landscape.

With significant investments in R&D and strong governmental support for initiatives like "Society 5.0," the country is driving digital integration across various sectors, fostering growth in AI, cloud services, and smart solutions. Consequently, the demand for data centers (DC) is surging, with Tokyo and Osaka emerging as key markets for expansion.

The Japanese data center market, the second largest in Asia, is poised for substantial growth. Hyperscalers are dominating the DC leasing landscape to support AI and public cloud adoption. Japan's strategic location, robust infrastructure, and stable governance make it a primary destination for DC investment.

The initial wave of AI is driving significant changes, prompting hyperscalers to develop and lease "AI-ready" data centers with advanced infrastructure designed for high density computing capabilities. As demand continues to rise, there is increasing pressure on power capacity, leading to the development of new regions and hubs beyond the existing ones that provide scalability for power, much like the development patterns seen in Northern Virginia's data center market earlier.

02 Japan Market and Demand Drivers



Japan DC Market

Japan is Asia's second-largest data center market, and it is expected to grow from ~2.0 GW in 2024 to 4.0 GW by 2030 at a CAGR of 12%. It is also a key global AI hub and the surging AI demand has the potential to double this growth.

Within Japan, Tokyo and Osaka data centre markets continue to grow and expand, with hyperscale driving the demand profile and enterprises still being a source of steady demand. According to Structure Research estimates, the Tokyo market is worth USD 3.7B in 2024 and is projected to grow to USD 7.3B by 2030.

Hyperscalers continue to be the primary driver of data center colocation leasing in Tokyo as public cloud and AI adoption accelerates and hyperscalers find it necessary to deploy data center infrastructure in-country to serve local end users effectively. The hyperscale-oriented market, currently accounting for 57% of the total market, is expected to grow to about 75% by 2030, with a projected CAGR of 20.2%.

Key Demand Drivers for Tokyo's market:

Location, Connectivity

Japan's strategic location as the leading financial market in northwestern Asia has made it the first landing point for many submarine cables connecting Asia to the western United States. Tokyo is the primary hub for international internet bandwidth and connectivity, serving as the termination point for over 26 international submarine cable systems.

Infrastructure

Overall Japan has a robust network and reliable power infrastructure. The grids are stable, and power outages are rare, making it an ideal location for setting up data centers. Renewable energy availability is also improving as the green power market develops as per Japan's sixth energy plan.

The stability and reliability of upstream power and the availability of high-speed fiber connections through strong carriers are critical for data centers. It also has a highly developed fiber optic network, some of which is also laid out along the power infrastructure.

Political Climate

Japan has a history of stable governance that is centered around promoting economic development. The data center industry has benefitted from Japan opening its doors for international investments.

The Japanese government is also looking to make further investments into strengthening its digital infrastructure nationwide through its "Vision for a Digital Garden City Nation" initiative where it plans to invest 4.4 trillion yen to resolve the connectivity and compute infrastructure issues in more rural local areas, such as decreasing populations, aging societies, and the hollowing out of industries. The Japanese government plans to complete a "Digital Garden City Superhighway" surrounding Japan using underwater cables together with large-scale data centers established in each local area, optical fiber, and 5G.

Business Climate

The overall business climate is highly conducive to building data centers, thanks to its skilled labor force and relatively welcoming environment for international businesses.

While language and cultural nuances necessitate a local presence to operate effectively, Japan's strong focus on digitization, supported by prominent local systems integrators, is fueling the growth of data centers and cloud services. However, the market's rapid expansion has also led to challenges, such as labor shortages, increased construction costs, and slower time-to-market for new facilities.

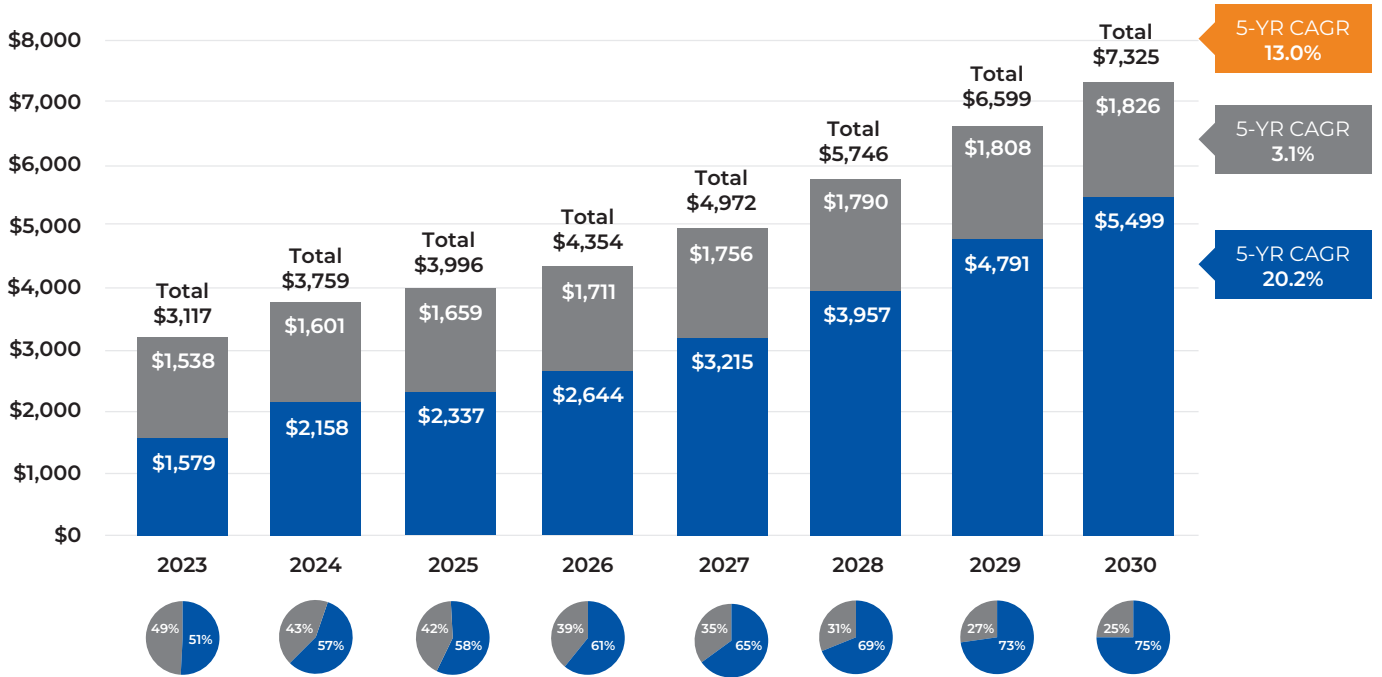
Natural Disaster Risks

Despite being more vulnerable to natural disasters like earthquakes and tsunamis, Japan has implemented strict regulations to support the development of resilient data centers. These regulations require data centers to be built with a unique seismic isolation layer design and long underground columns, ensuring stability and protection in the event of an earthquake.

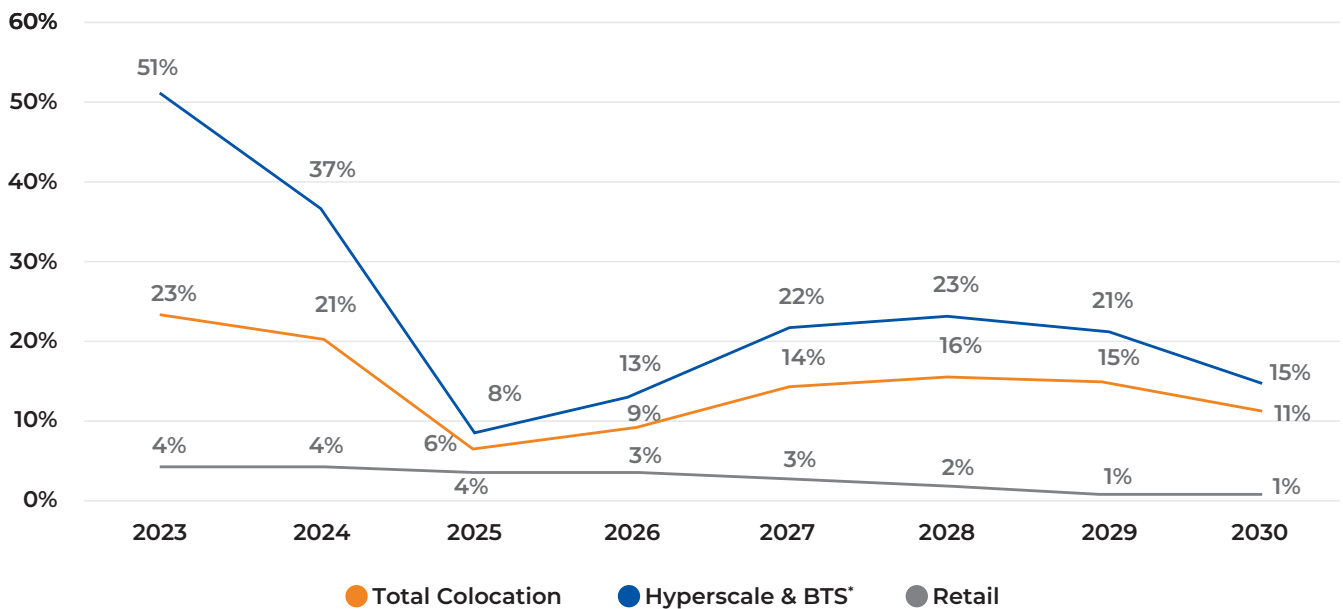
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Tokyo DC Colocation - Market Size (US Millions)

TOTAL COLOCATION MARKET



Y/Y Growth



* Please refer to the definitions on Page 15

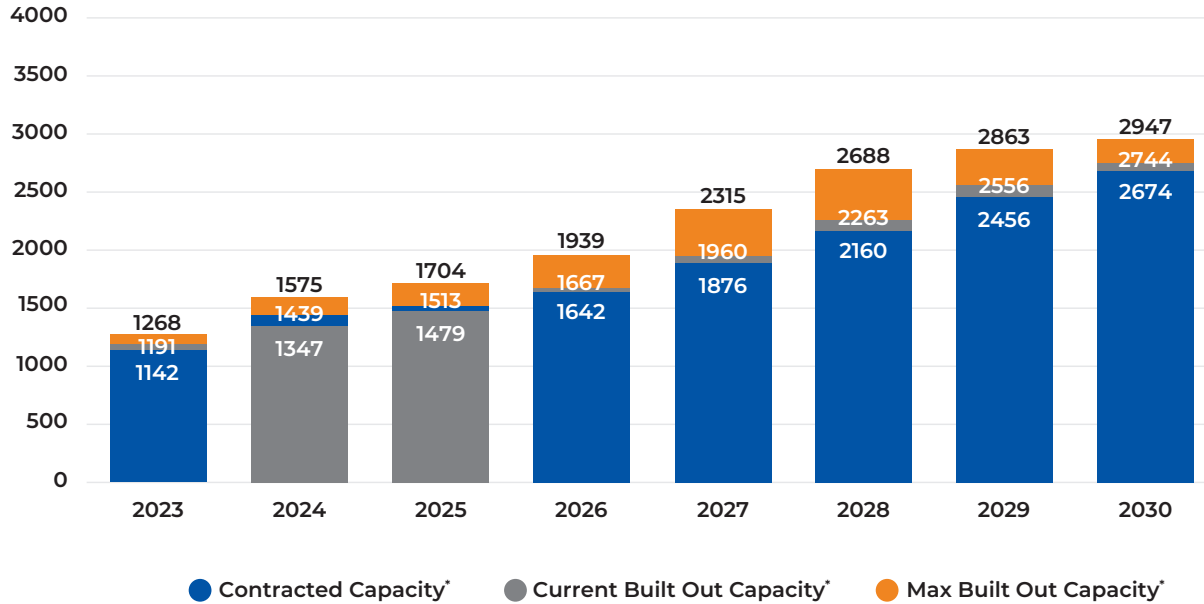
Source: Structure Research 2024 Japan Data Centre, Hyperscale Cloud and Interconnection Report

04

Tokyo DC Colocation - Market Size (Critical MW)

TOTAL COLOCATION MARKET

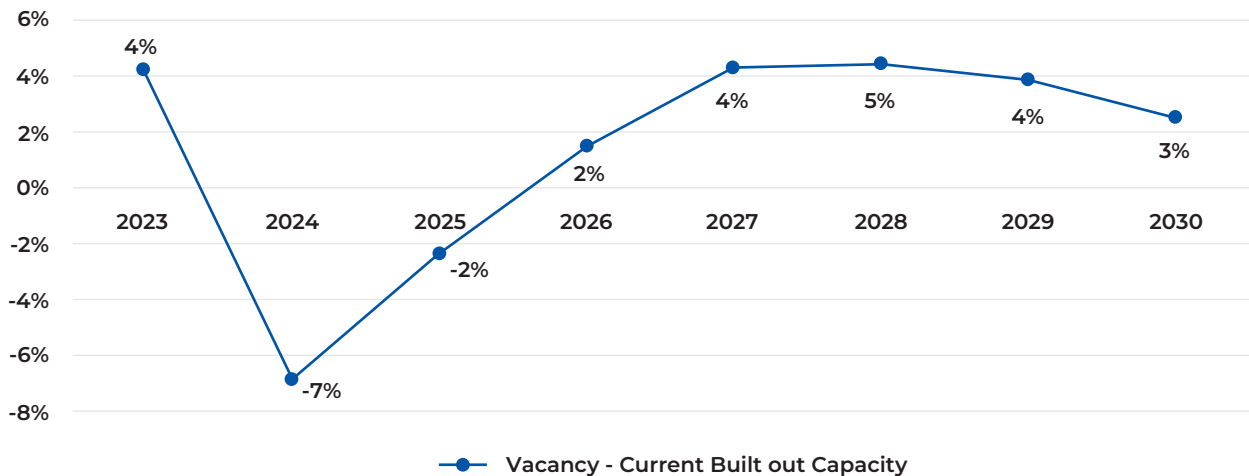
Capacity



Note: For 2024–2025, Contracted Capacity is greater than Current Built Out Capacity

* Please refer to the definitions on Page 15

VACANCY



Source: Structure Research 2024 Japan Data Centre, Hyperscale Cloud and Interconnection Report

05 Tokyo Market Challenges

Power Infrastructure Availability

The Tokyo market is experiencing substantial demand for data center capacity and, by extension, access to substation capacity from the power grid. Like many power utility providers across other major tier 1 markets, these utility providers were not prepared for the surge in power capacity demand coming from the data center sector.

This has constrained their ability to allocate substantial power to large data center campuses for future development. The Japanese government provides resources to encourage data center development in more diverse regions beyond central Tokyo to mitigate disaster risks due to the bottlenecks and centralization of capacity primarily in the Tokyo metro.

Power Constraints in East Tokyo

The Inzai area has been the focal point of several large data center campus developments over the last five years. While TEPCO was initially able to cater to the power capacity demands for these initial campuses, it does not have the ability to continue allocating and servicing hundreds of megawatts of capacity for the third and fourth waves of these data center campuses.

Data center operators and developers have noted that the wait time for getting power capacity allocation from TEPCO in the Inzai area for new data center builds ranges from seven to ten years - which essentially translates into that "Inzai is full" for the near to medium term.

There are alternate hubs like north Tokyo, which alleviate the constraints in east Tokyo and become a routing point between the central and east cloud availability zones.

Land Constraints

Tokyo is a densely populated metropolitan area, and finding large plots of land to construct massive data center campuses is difficult.

The central Tokyo area has very limited available land parcels. Developers have to look at surrounding locations outside of central Tokyo, such as greater Tokyo and Saitama, for alternative sites for data center development.

High Construction Costs

Tokyo ranks as one of the most expensive cities globally for data center construction due to increased demand, limited contractor capacity, skilled labor shortage, and factors like the revised labor standards act limiting overtime for construction workers.

Due to the land constraints in many parts of Tokyo, data centers are often built with multiple floors which introduces additional costs in construction. Compare this with data centers in other less land constrained markets that are single story facilities spread across large land parcels.

06

Initial AI Wave's Impact on the APAC and Japan Markets

The initial wave of AI growth has substantially impacted the APAC (Asia-Pacific) and Japan data center (DC) markets, with AI adoption driving significant shifts in demand, infrastructure, and market dynamics.

Due to AI's early-stage nature, both governments and hyperscale cloud providers are in the discovery and early adoption phases. Hyperscalers have



begun deploying most of their AI capabilities within their domestic markets, with some expansion into international regions. They are accelerating the leasing and construction of data centers worldwide.

Japan has emerged as one of APAC's leading AI and cloud markets, driven by a mature technology landscape, strong enterprise demand, and government-led digital transformation initiatives. Key Japanese markets like Tokyo and Osaka are seeing significant data center investments to meet AI-related demands.

The initial AI wave has driven a need for more GPU-intensive infrastructure in data centers to facilitate AI training and inference. Hyperscalers are building and leasing "AI-ready" data centers catering to these specialized hardware requirements.

The push for edge computing is also accelerating, especially for AI applications requiring low-latency processing leading to establishing smaller, more distributed data centers closer to end-users, particularly in high-demand locations like Japan.

The term "AI factories" has gained prominence as the prospective homes of GPU hubs—dedicated data center buildings and campuses explicitly designed for AI training and inference.

Impact of AI Growth – Tokyo Data Center Market

The growth of AI is reshaping Tokyo's data center market, driving significant demand for high-performance computing, specialized infrastructure, and new hyperscale facilities. New hyperscale facilities aiming to deploy AI infrastructure need to deploy high-density racks and advanced cooling technologies, support high-performance networking, and ensure security and compliance—all while maintaining scalability, energy efficiency, and adaptability to meet the evolving demands of AI workloads.

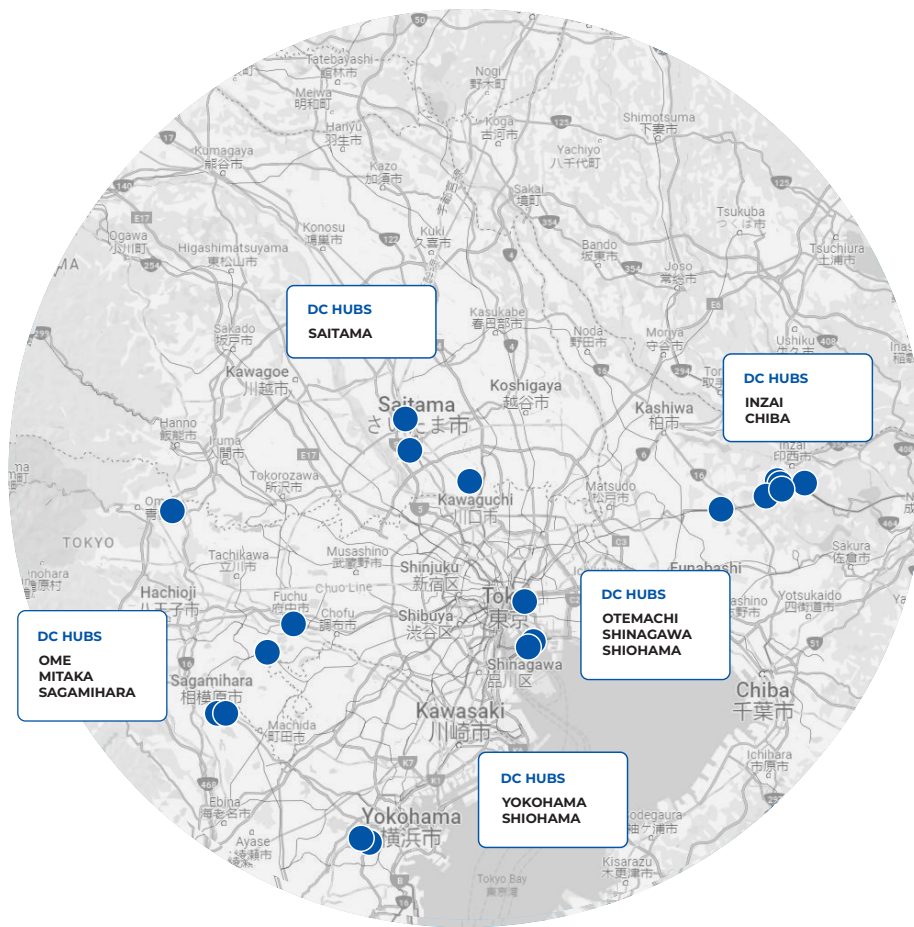
There are currently well-established data center hubs in the Tokyo market. However, due to the recent surge in data center development and demand within these hubs, Structure Research believes that this trend will eventually lead to supply constraints, particularly regarding power availability. The existing utility grid and infrastructure may not be able to support additional hyperscale data centers.

07 Tokyo New Data Center Build Pipeline

Development activity is increasing across several hubs outside central Tokyo. The upcoming pipeline is distributed across east, west, and north Tokyo, with capacity expected to come online in each area over the next few years. While these capacity figures appear substantial, they are being leased rapidly, leaving limited room to support growth beyond the next five years in most hubs, except for north Tokyo, due to power constraints.

North Tokyo stands out for its land availability for data center development and significantly better power accessibility and availability compared to other hubs in the Greater Tokyo area. Additionally, it boasts excellent network connectivity to central Tokyo, providing customers with access to all critical networks and submarine cable landing points.

Japan New Hyperscale DC Build Pipeline



LAND BANK	UNDER DEVELOPMENT	TOTAL CAPACITY
1,959 MW	552 MW	2,511 MW

Source: Structure Research 2024 Japan Data Centre, Hyperscale Cloud and Interconnection Report

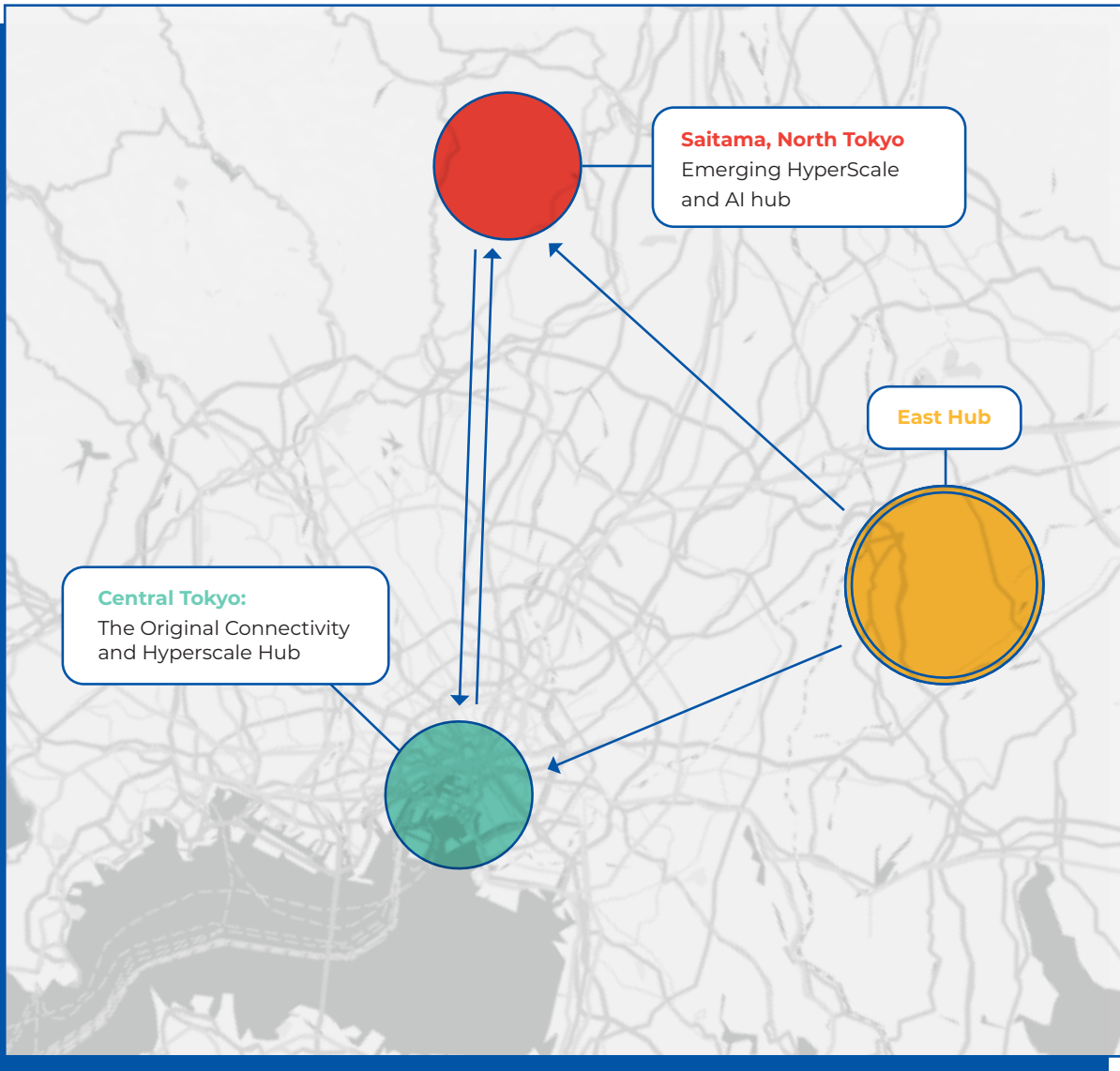
08

Saitama: Emerging Hyperscale & AI Hub for Tokyo

Tokyo's DC market initially clustered around the city centre, driven by proximity to businesses and connectivity infrastructure. As demand is growing, it is moving from concentration in the centre to expansion towards the suburbs.

Central Tokyo: The Original Connectivity and Hyperscale Hub

Central Tokyo emerged as the initial destination for data center deployments in the Tokyo market due to its proximity to end-users and its role as an aggregation point for network connectivity. As demand for data centers in Tokyo increased, central Tokyo quickly reached constraints in terms of the availability of land and power to develop larger-scale data centers to serve the needs of today's cloud infrastructure deployments.



Saitama, North Tokyo: Emerging Hyperscale & AI Hub

Saitama is rapidly emerging as the leading hyperscale & AI hub given abundant land availability for data center development and significantly superior power accessibility and availability.

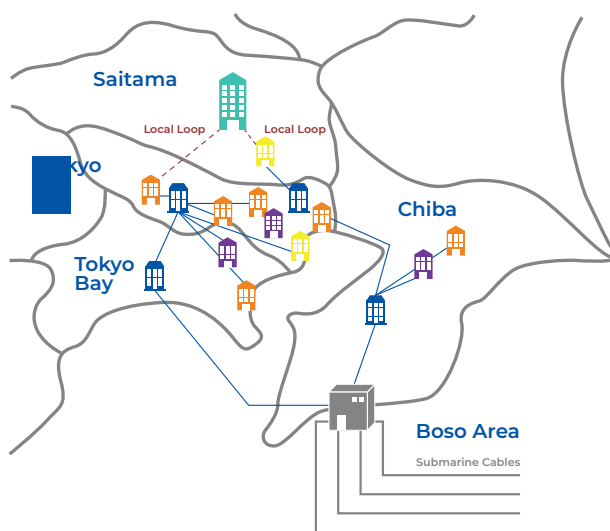
The area also has the right fiber infrastructure to support the growth of data centers that is well distributed via local telcos such as NTT, KDDI, Softbank, and other providers such as Colt. Many other local IT companies/system integrators, such as IJ and Arteria, have also laid their own fibre networks.

Saitama is well connected to both the submarine cable landing points and to central Tokyo's connectivity ecosystem. Additionally, Saitama also is the best positioned for hyperscalers to have redundant and cost effective connectivity to their existing hubs in Inzai and central Tokyo.

It would also enable hyperscalers to more effectively bridge and create redundant connectivity paths between the other hubs.



Fiber Providers available in TY1 vicinity



Submarine Cable Landing and Terrestrial connectivity - East and Central Tokyo



STRUCTURE RESEARCH ANALYST TAKE: Comparable examples of Alternate DC hubs development across markets

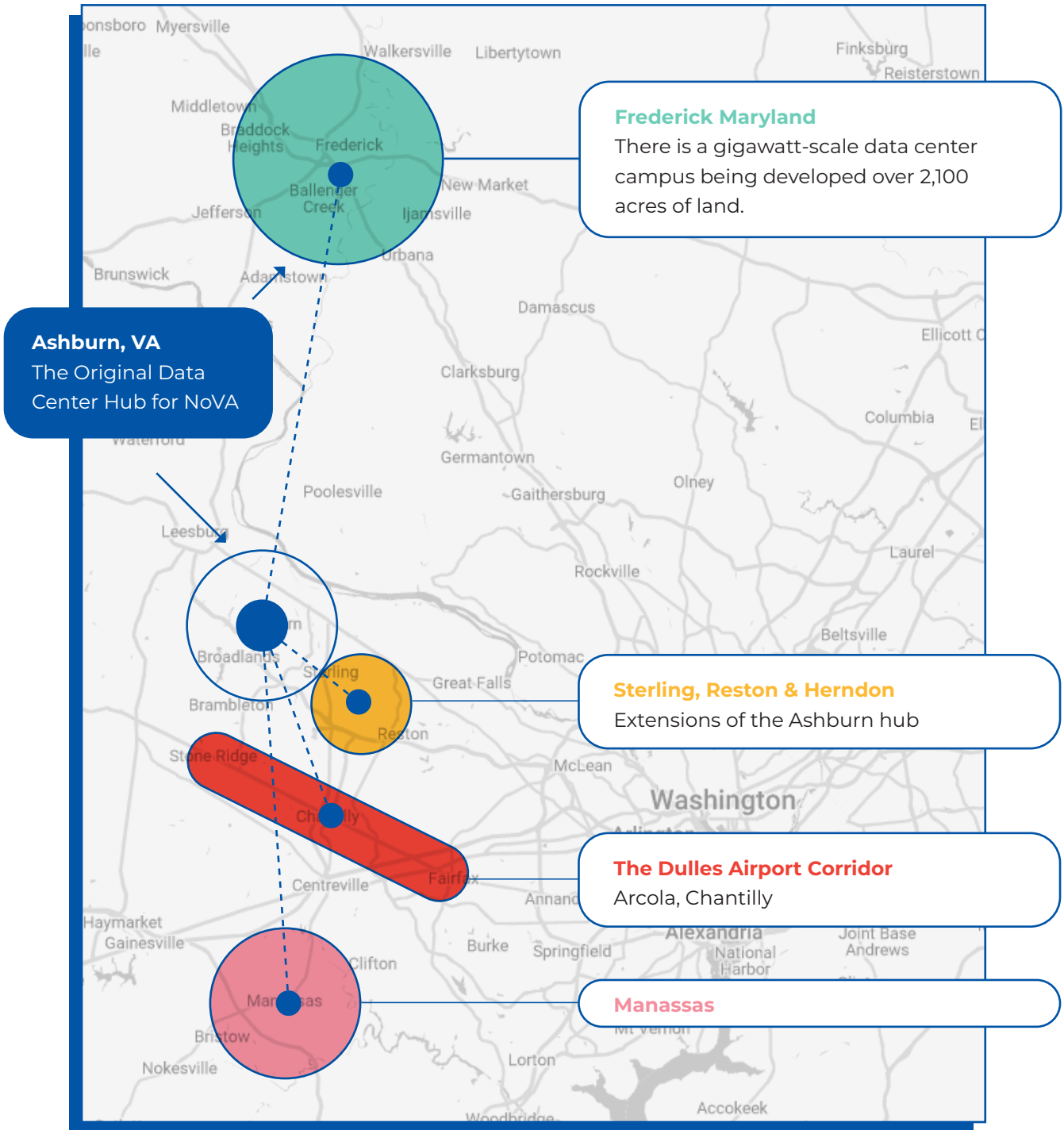
Tokyo market is developing like several other large tier 1 markets have evolved over time with alternate hubs coming up within or the outskirts of the the existing large hubs where infrastructure resources are available relatively in abundance compared to the central regions.

Eg: the Northern Virginia (NoVA) data center market has over time seen the emergence of several alternative hubs beyond the original “Data center Alley” in Ashburn (Loudoun County) over time, due to the same factors like land constraints, power availability, and efforts to diversify risk as east and central Tokyo are facing now.

09

Development of New Hubs Example - North America

Here's an overview of how these alternative hubs have developed in Northern Virginia market:



Prince William County

As Loudoun County's land and power resources became constrained, data center development spilled over into neighboring Prince William County in the late 2010s. Major developments include: The approval of the "PW Digital Gateway" in 2022, opening up over 2,000 acres for data center campuses.

The Dulles Airport Corridor (Fairfax County)

Fairfax County, particularly the areas around Dulles International Airport, has emerged as another alternative hub. Major cloud providers and other data center colocation providers have built large campuses here.

Frederick, Maryland

A 2,100 acres campus is being positioned as a new "data center market" that can provide virtually unlimited scalability and infrastructure resources to serve the overflow demand from supply constrained markets like Northern Virginia.

While Loudoun County remains the core of the Northern Virginia data center market, the development of these alternative hubs has been driven by the need for additional land, power resources, and risk diversification. However, community opposition and power constraints continue to pose challenges for further expansion in some of these areas.

Manassas/Prince William Electric Cooperative Area

The region served by the Prince William Electric Cooperative (PWEC), including Manassas and parts of Prince William County, has attracted data centers due to PWEC's independent power supply. Major data center operators have developed data centers within this area which offers an alternative to the constrained power grid in Loudoun County.

10 Definitions

Total Capacity:

Total market colocation capacity assuming confirmed secured sites, land banks by colocation providers, data centre sites under development/construction, and operationally live data centre assets are fully built out.

Max Built Out Capacity:

Maximum built out capacity assuming current operationally live data centre assets are fully built out. Does not include capacity from confirmed secured sites, land banks by colocation providers and data centre sites under development/construction.

Current Built Out Capacity:

Live and operational data centre capacity or in some cases referred to as fitted out capacity.

Contracted Capacity:

Represents sold or contracted data centre capacity. This also includes pre-commitments while a given data centre asset is still under development.

Current Vacancy:

Non contracted capacity / Current built out capacity

BTS:

Build to Suit

PDG

Princeton Digital Group (PDG) is the leading developer and operator of internet, cloud and AI infrastructure in Asia-Pacific region.

Headquartered in Singapore with presence and operations in Singapore, Japan, India, Indonesia, China and Malaysia, its portfolio of data centers powers the expansion of hyperscalers and enterprises in the fastest-growing digital economies across the region.



PDG TY1: TY1 is a 96 MW hyperscale campus in Saitama, located less than 35 kms from Tokyo's central business district. TY1 has scalable and resilient power and is designed to support high-density deployments leveraging the latest cooling technology.

The site is carrier neutral and has robust connectivity to hubs in central Tokyo, Inzai and to submarine cable landing stations in Japan. The site represents a \$1B investment for PDG.

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STRUCTURE RESEARCH

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