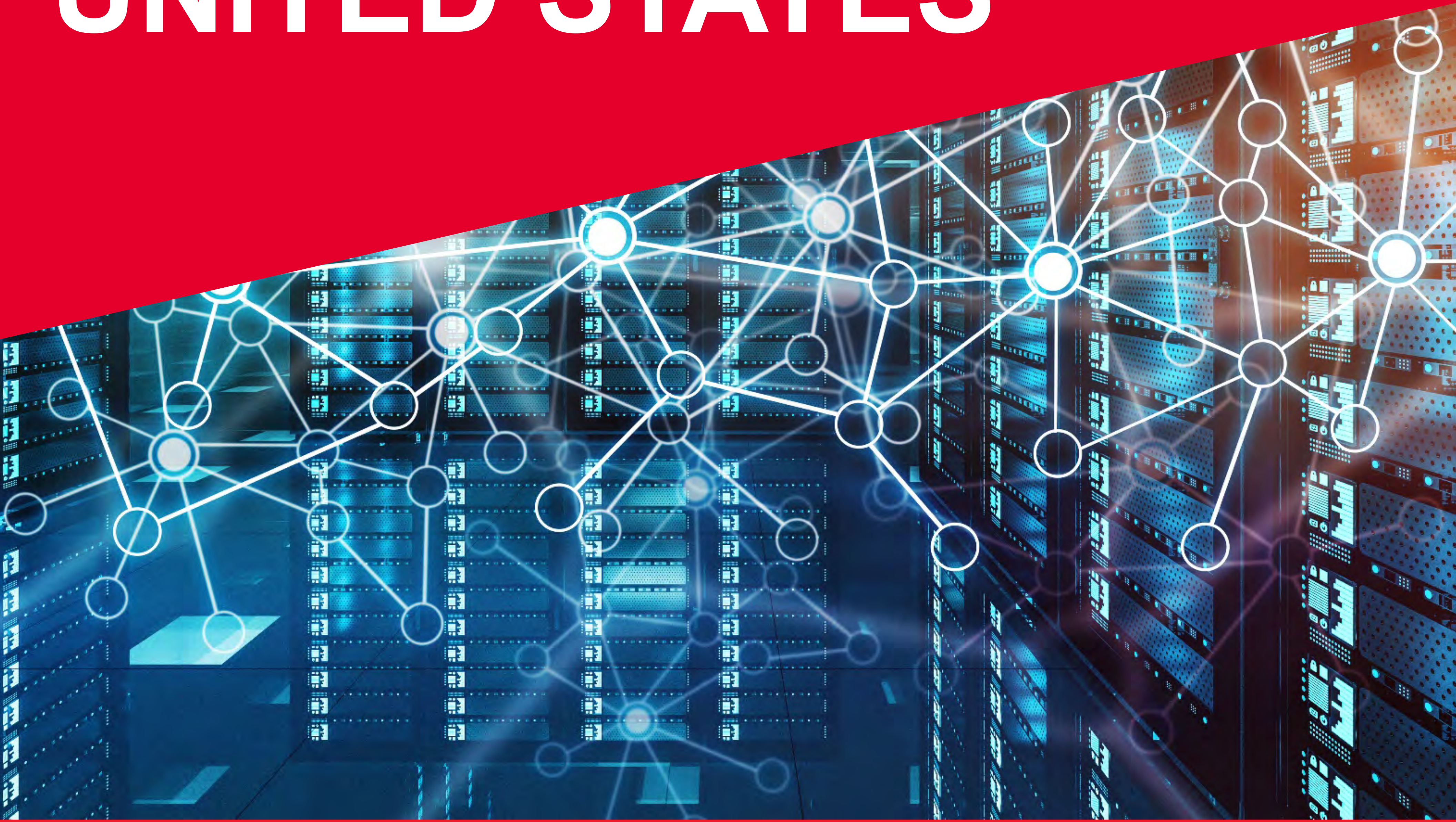
DATA CENTER UPDATE

AMERICAS:

United States, Canada, Mexico

DATA CENTER UPDATE

UNITED STATES



DATA CENTER UPDATE

ATLANTA

WINTER 2021

CUSHMAN & WAKEFIELD

Key Indicators

Under Construction
148 MW

Vacancy
8%

Absorption (2nd Half)
20 MW

Market Overview

Atlanta tightened up throughout the second half of 2020, with vacancy falling to 7% thanks to interest from mid-size cloud services utilizing the city as a regional hub. This interest in turn led to several new development phases launching from the likes of Switch, Flexential, and T5, with several large campuses in serious planning that have the potential to double the local market size at full buildout. Facebook continues to believe in the benefits of Atlanta, recently launching a massive new phase of their campus in the Social Circle area with plans for completion in 2023.

The local outlook remains positive throughout 2021, with the city functioning as the undisputed regional hub for the lower Southeast and home to robust fiber and plenty of locally-based interest. Expect continued take-up in the 500 kW-1MW bracket and occasional larger-scale deals as cloud services pursue further market share.

Ecosystem Developments

- **Colo ATL** announced a new client at mid-year, with Community IX Holdings signing on for their local internet exchange CIX-ATL. The exchange ties in with the dense fiber and robust peering opportunities available at the downtown 55 Marietta Street location.
- **QTS** announced a new partnership in Atlanta with Bandwidth IG, with the dark fiber provider and their 75,000 fiber miles now available. The local Bandwidth IG presence connects 16 data centers across the Atlanta metropolitan area.
- **Digital Realty,** Vapor IO, and Hivelocity launched a new partnership for edge deployments in Atlanta, with other locations across the country to follow. Hivelocity operates out of the Digital Realty location at 250 Williams. Windstream Wholesale completed their own agreement with Digital locally, adding a network hub at 250 Williams and at 2323 Bryan in Dallas for the benefit of an unnamed content provider.
- **EdgeConneX** completed their own agreement with Bandwidth IG late in 2020, adding further dark fiber capacity to their two local buildings. EdgeConneX offers 120,000 square feet of data center space on Donnelly Avenue.
- **Flexential** and American Tower have agreed on a new edge partnership, launching in Atlanta and moving to other cities thereafter. The partnership will develop tiny data centers linked to wireless towers, providing connectivity close to the end user.
- **Southern Telecom** is the newest carrier at the DataBank ATL1 facility, with the locally based company linking the building to their 1,500 regional fiber miles. In other DataBank news, the company closed on their acquisition of Zayo data centers late in 2020, locally taking title to a 72,000-square-foot building on White Street.
- **Amazon** has announced the arrival of AWS Outposts locally, with Atlanta joining 11 other cities nationally throughout 2021. Outposts allows for connectivity to AWS at the local edge.

MORE INFORMATION

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GLOBAL DATA CENTER ADVISORY GROUP

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DATA CENTER UPDATE

ATLANTA

WINTER 2021

CUSHMAN & WAKEFIELD

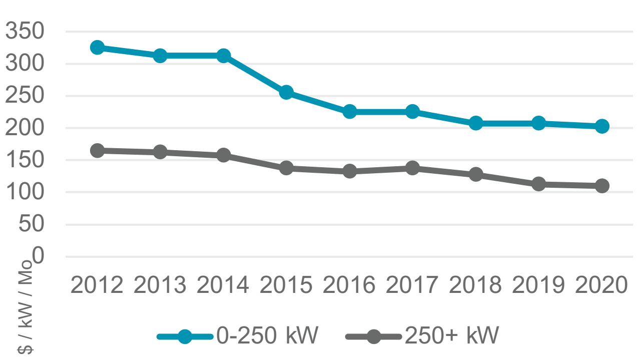
Construction Update

OPERATOR	LOCATION	SIZE (SQ FT)	POWER (MW)	STAGE / EST. DELIVERY
Switch	Atlanta 1 Sector 2 Atlanta 3 Sector 1	100,000 (est) 100,000 (est)	10 15	Under Construction / Q1 2021 Under Construction / Q1 2023
Flexential	Alpharetta	20,000	3	Under Construction / Q1 2021
T5	Lithia Springs	162,500	20	Under Construction / Q4 2021
Facebook	Social Circle	1,500,000	100 (est)	Under Construction / Q4 2023
CyrusOne	Douglasville	440,000	50	In Planning
Stack Infrastructure	Lithia Springs	130,000	12	In Planning
Oceanic Data Centers	Fayetteville	1,500,000	250	In Planning
Microsoft	Palmetto	250,000	25 (est)	In Planning

Recent Property Sales

PROPERTY	SIZE (SQ FT)	SALE DATE	SALE PRICE	BUYER	SELLER
1100 White St SW, Atlanta	72,000	Dec-20	$15,000,000 (est)	DataBank	Zayo
5600 United Dr SE, Smyrna	134,574	Aug-20	$29,771,779	Landmark Infrastructure	Sungard

ATLANTA PRICING



Source: datacenterHawk

Atlanta performed at a strong but uneven pace throughout 2020, with large absorption in certain quarters and slower take-up in others. The market remains key for fiber and peering opportunities with new options announced of late.

DATA CENTER UPDATE

CHICAGO

WINTER 2021

Key Indicators

Under Construction
110 MW

Vacancy
9%

Absorption (2nd Half)
60 MW

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Market Overview

Chicago enjoyed an excellent second half of 2020, with 60 MW absorbed mainly in the fourth quarter leading to a record six months and bringing vacancy to single digits. As with most other markets, hyperscale needs led the way as the biggest services signed on new clients and required further capacity. While the local Facebook project took most recent headlines for local development, initial phases of new projects for colocation are also underway with a surprise new project in Itasca in the planning and approval process pending community concern. As shown below in this report, operators and hyperscale cloud services alike recognize the importance of the Chicago market, with continued rollout of new product for both major and edge deployments.

In an intriguing turn of events that developed through the fall, a proposed tax on financial transactions from the state of New Jersey led organizations such as NASDAQ to relocate certain workloads to Chicago, long home to the disaster recovery locations of these sorts of exchanges. Despite this potential windfall, media reports have indicated interest from local politicians to enact a similar type of tax, thereby leading to the possibility that these clients would continue to search for lower tax areas elsewhere. Positive recent developments and a slightly unclear future then for the local market..

Ecosystem Developments

- **CoreSite** announced enhanced Amazon Web Services (AWS) connectivity late in 2020, with the CoreSite Open Cloud Exchange now provisioned for 10 gigabits per second (Gbps) locally. CoreSite recently completed their CH2 building downtown, the first major build completed under the Illinois state data center incentive package.
- Leading German internet exchange (IX) **DE-CIX** has launched their third North American IX, with DE-CIX Chicago opening at the end of 2020 inside the 365 Data Centers location downtown. The new deployment will provide further peering and connectivity options with access to multiple global networks.
- **Zayo** has completed another new fiber route, connecting Chicago to Nashville via the state of Kentucky. The route is another 100G option linking the local data center market to an up-and-coming new location in the southeast. In other Zayo news, DataBank has closed its acquisition of the Zayo data center platform, with four local locations including two downtown and one each in Mt Prospect and Oak Brook to be operated by the national edge operator.
- **Facebook** has signed a power purchase agreement for 170 MW of wind power, with Apex Clean Energy providing this from their soon to be complete 300 MW Lincoln Wind Project. Facebook remains under construction on their new campus in DeKalb, with start of operations expected in 2022.
- **Oracle** launched new National Security Regions in the fall, with Chicago joining Phoenix and Northern Virginia as hosting options for the Department of Defense and other related organizations. Oracle's Cloud platform has found success with government agencies, particularly at the military and federal levels.
- **CyrusOne** announced Google Cloud onramps in five new markets, with Chicago joining Austin, Houston, San Antonio, and Omaha (Council Bluffs) offering access.
- In other **AWS** news, the company revealed twelve new locations across the US for its Local Zones edge product, with Chicago among those going live in 2021. The availability should assist those with a distributed compute model across urban areas.

DATA CENTER UPDATE

CHICAGO

WINTER 2021

CUSHMAN & WAKEFIELD

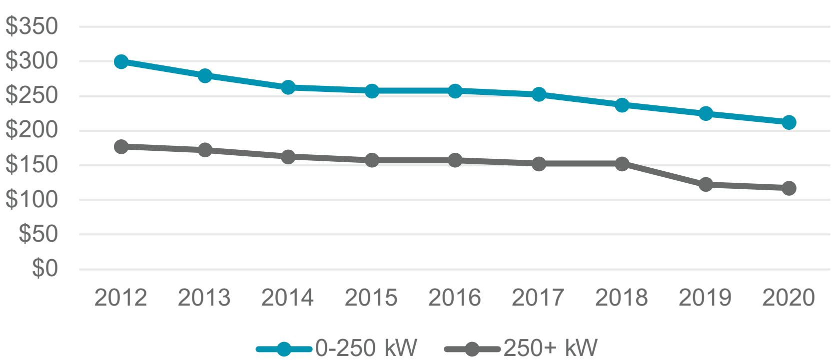
Construction Update

OPERATOR	LOCATION	SIZE (SQ FT)	POWER (MW)	STAGE / EST. DELIVERY
RagingWire	CH1	230,000	6	Under Construction / Q1 2021
Stream Data Centers	Chicago II	208,000	4	Under Construction / Q3 2021
Facebook	DeKalb	907,000	100 (est)	Under Construction / Q4 2022
1547/CIM Group	Chicago	52,000	5	In Planning
Iron Mountain	Des Plaines	330,000	36	In Planning
Bridge Digital Infrastructure	Itasca	300,000	30 (est)	In Planning

Recent Site Sales

PROPERTY	SIZE (Acres)	SALE DATE	SALE PRICE	BUYER	SELLER
1925 Busse Rd, Elk Grove Village	10	Dec-20	$36,600,000	Stream Data Centers	AEW Capital

CHICAGO PRICING



Source: datacenterHawk

The best half of absorption in Chicago history ended 2020 on a high note, and the city remains a key launchpad for connectivity and cloud services.

DATA CENTER UPDATE
DALLAS
WINTER 2021

Key Indicators

Under Construction
24 MW

Vacancy
14%

Absorption (2nd Half)
18 MW

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Market Overview

Dallas had a strong second half of 2020, with solid absorption and a slight tightening in overall market vacancy, with further phases launched by both Digital Realty and Flexential. Facebook continues to find value locally, adding another phase to their large campus in Fort Worth, with plans for completion late in 2022. Further hyperscale projects remain in planning, including the prospective AllianceTexas campus or the Digital Realty site in Garland, though vacancy may need to tighten further before launch, and Dallas is rapidly becoming a greener market, with Digital Realty and CyrusOne both confirming new renewable energy agreements to power their local campuses. Steady progression in market then, with the possibility for future growth in 2021.

Ecosystem Developments

- Leading internet exchange **DE-CIX** added a point-of-presence (PoP) in the Carrier-1 data center on Round Table Drive, adding further connectivity options locally. This is the third DE-CIX enabled building in Dallas, after the Infomart and 400 S Akard St.
- **Digital Realty** announced another solar power purchase agreement late in the summer, agreeing to source from the Pattern Energy Phoenix Solar Project for Dallas-area data centers. This is the third such agreement signed for Texas facilities for the REIT, who later announced a move of their headquarters to Austin from San Francisco.
- Hosting provider **Xfernet** announced a new PoP at Equinix DA3, adding the dense connectivity of the Infomart to the global Xfernet portfolio. This is the first Xfernet location in the southeast United States.
- **Stack Infrastructure** launched a new local partnership with InnerCity FiberNet, adding new dark fiber options to both local Stack data centers. InnerCity boasts a Metroplex-wide network with dozens of on-net buildings.
- **Amazon** announced that Dallas would be among a dozen markets nationwide to add an AWS Local Zone in 2021, allowing for high-performance AWS applications at the edge. Local Zones initially launched in Los Angeles and added three further markets late in 2020.
- **CyrusOne** signed their own renewable energy agreement, securing 67 MW from the Enel Green Power Azure Sky solar farm. The power will provide the majority of the energy needs for local data centers in Allen and Carrollton.
- **Stream Data Centers** added connectivity to Unite Private Networks at their Garland facility, including ethernet, dark fiber, and data transport services. Unite operates networks in 21 states with a variety of dark and lit fiber options.

DATA CENTER UPDATE
DALLAS
WINTER 2021

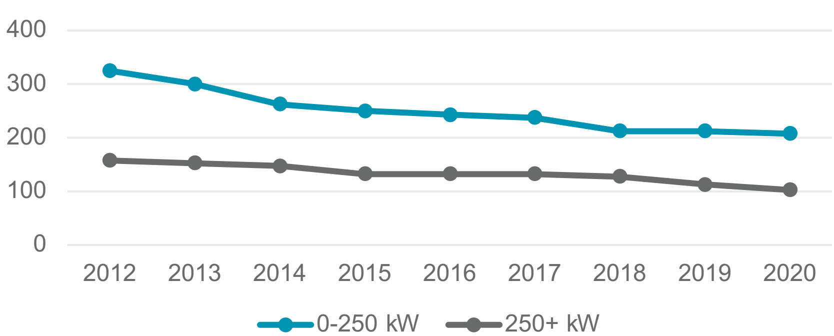
Construction Update

OPERATOR	LOCATION	SIZE (SQ FT)	POWER (MW)	STAGE / EST. DELIVERY
Digital Realty	Dallas Garland	27,991 800,000	1.5 160	Under Construction / Q2 2021 In Planning
Facebook	Fort Worth	277,513	20 (est)	Under Construction / Q3 2022
Flexential	Plano	146,000	2.25	Under Construction
Skybox	Plano	150,000	30	In Planning
Stack Infrastructure **Hillwood** **IPI**	AllianceTexas	1,300,000	70	In Planning

Recent Property Sales

PROPERTY	SIZE (SQ FT)	SALE DATE	SALE PRICE	BUYER	SELLER
1100 Empire Central Pl, Dallas	60,727	Dec-20	$15,000,000 (est)	DataBank	Zayo
1460 Round Table Dr, Dallas	104,427	Dec-20	$7,000,000	Pritchard Associates	BT Foods TX Holdings LLC (Brian Fettner)

DALLAS PRICING



Source: datacenterHawk

Dallas quietly had its best half of absorption in three years, with greener initiatives and more connectivity coming to the market.

DATA CENTER UPDATE

LOS ANGELES

WINTER 2021

Key Indicators

Under Construction
11 MW

Vacancy
7%

Absorption (2nd half)
2 MW

MORE INFORMATION

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Market Overview

The size of Los Angeles makes the city an odd location to be termed an "edge" market, yet the major cloud services have successfully launched a variety of edge applications aimed at local content providers. As building hyperscale remains out of the question in-market, these solutions have proven useful for clients to access major platforms as needed. Space remains limited per usual throughout Los Angeles, though a handful of new phases are underway to add capacity to submarkets both downtown and near LAX. One national merger had recent local connections, with DataBank taking over management of two Zayo facilities locally (including the title to a building in Irvine).

Ecosystem Developments

- **Amazon** has added a second AWS Local Zone in Los Angeles, after finding success with the initial rollout previously. The Local Zone targets clients working on graphics-heavy applications such as game design or animation, drawing interest from local content producers.
- **Google** announced at mid-year that their Cloud Bare Metal service was now available in five new regions, with Los Angeles joining Northern Virginia, London, Frankfurt, and Sydney. Google has plans to roll out further markets in the near future, targeting clients with diverse workloads. The company also added its VMware Engine migration tool locally to assist in moving VMware moves to Google Cloud.
- **Equinix** announced the availability of Alibaba Cloud to their clients mid-year, with Los Angeles and 16 other major markets providing this service at launch. Alibaba Cloud now offers full integration with Platform Equinix and the Equinix Cloud Exchange Fabric.
- Australian telecommunications company **Telstra** announced new points-of-presence (PoP) in both Los Angeles and Portland, explicitly targeting media and content companies. The two locations bring Telstra's total number of US PoPs to 21, with several recent additions to build their US network.
- **Microsoft** has launched their own edge product, with Los Angeles joining New York and Miami as initial regions for Azure Edge Zones. Following the path of similar rollouts, Azure Edge Zones will target low-latency needs and scale to new service offerings over time.
- **CoreSite** announced their expanded Any2Exchange peering service late in 2020, with the Los Angeles and Silicon Valley locations forming the Any2Wast exchange. The enhanced service will provide further regional connectivity options with decreased transit costs.

Recent Property Sales

PROPERTY	SIZE (SQ FT)	SALE DATE	SALE PRICE	BUYER	SELLER
17222 Von Karman Ave, Irvine	50,111	Dec-20	$20,000,000 (est)	DataBank	Zayo

Construction Update

OPERATOR	LOCATION	SIZE (SQ FT)	POWER (MW)	STAGE / EST. DELIVERY
INAP	Redondo Beach	20,000 (est)	1.8	Under Construction / Q1 2021
Equinix	LA7 Phase 2	23,681	3 (est)	Under Construction / Q2 2021
CoreSite	LA3 Phase 2	54,388	6	Under Construction / Q4 2021

DATA CENTER UPDATE

NEW YORK CITY / NEW JERSEY

WINTER 2021

Key Indicators

Under Construction
16 MW

Vacancy
12%

Absorption (2nd Half)
8 MW

MORE INFORMATION

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Market Overview

The greater New York/New Jersey area steadily added greater connectivity and a handful of new projects throughout 2020, with the market an excellent option for peering opportunities. Absorption was somewhat subdued in the second half after a strong first half throughout New Jersey, and it remains unclear if financial tenants will continue to find the market as attractive as the state considers whether to tax financial transactions. Major New York stock exchanges and banks that have deployments in New Jersey are thus reviewing options, with Chicago and Dallas suggested as alternatives. This will be a key discussion point moving forward throughout 2021, as the tax versus connectivity debate will add a new dimension to data center decision making.

Ecosystem Developments

- **NJFX** announced a new point-of-presence (PoP) for PCCW Global in Wall, now offering direct access to the PCCW network and Console Connect platform. Hurricane Electric also signed on for a new PoP at NJFX, their 11th in the greater New York City metropolitan area and the fifth in New Jersey alone. Additionally, NJFX added access to a new fiber route from United Fiber & Data, linking their facility to the largest market in the world in Northern Virginia, and ties in well with the newly launched AEC-2 cable at the building that connects directly to Denmark.
- **DE-CIX** New York completed a new partnership with Aurora, with the payments provider now available for peering. Aurora emphasized the direct connectivity on offer to multiple cloud services as a factor in their decision. DE-CIX later announced their availability at the Iron Mountain Edison site, adding further local peering and cloud options.
- **BCS** has taken over management of 75 Broad Street, with the 650,000-square-foot Manhattan carrier hotel home to an array of office and data center tenants. JEMB Realty has owned the tower for over two decades, upgrading the building throughout.
- The national acquisition of Atlantic Metro had a local component, with **365 Data Centers** assuming operations of several PoPs across New York and New Jersey. 365 now offers colocation in 12 markets across the US and across a growing array of services.
- **Equinix** announced the availability of Alibaba Cloud to their clients mid-year, with the greater New York/New Jersey area and 16 other major markets providing this service at launch. Alibaba Cloud now offers full integration with Platform Equinix and the Equinix Cloud Exchange Fabric. The REIT later announced the availability of Equinix Metal, an interconnected bare metal service launching in Northern New Jersey, Silicon Valley, Amsterdam, and Northern Virginia.
- **Google** launched construction of the Grace Hopper Cable in fall, connecting New York to Bude in the United Kingdom and Bilbao in Spain. The cable is due to complete in 2022, with SubCom as the hands-on builder.
- **Microsoft** has launched a new edge product, with New York joining Los Angeles and Miami as initial regions for Azure Edge Zones. Following the path of similar rollouts, Azure Edge Zones will target low-latency needs and scale to new service offerings over time.
- The national acquisition of Zayo data centers by **DataBank** had a local component, with facilities in New York City, Piscataway, and Newark all under new management. The purchase takes DataBank from an edge player in secondary markets to a fully national colocation operator.

DATA CENTER UPDATE

NEW YORK CITY / NEW JERSEY

WINTER 2021

CUSHMAN & WAKEFIELD

Ecosystem Developments

- **CoreSite** announced their expanded Any2Exchange peering service late in 2020, with the Northern New Jersey locations joining Boston and Washington DC/Northern Virginia in the Any2East exchange. The enhanced service will provide further regional connectivity options with decreased transit costs.
- **Amazon** announced that the New York area would be among a dozen markets nationwide to add an AWS Local Zone in 2021, allowing for high-performance AWS applications at the edge. Local Zones initially launched in Los Angeles and added three further markets late in 2020.

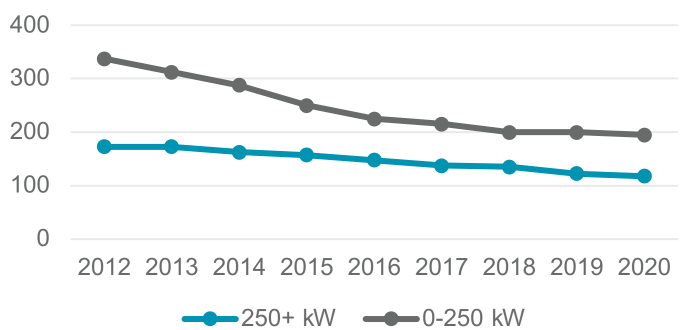
Construction Update

OPERATOR	LOCATION	SIZE (SQ FT)	POWER (MW)	STAGE / EST. DELIVERY
CyrusOne	Somerset I (DH15-16)	63,000	5	Under Construction / Q1 2021
Sabey	Intergate.Manhattan	24,000 (est)	3.6	Under Construction / Q2 2021
Equinix	NY6 Phase 2	17,000	1.7	Under Construction / Q4 2021
Digital Realty	Totowa Piscataway	150,000 10,000	4.8 1.2	Under Construction / Q2 2022 Under Construction / Q2 2022

Recent Property Sales

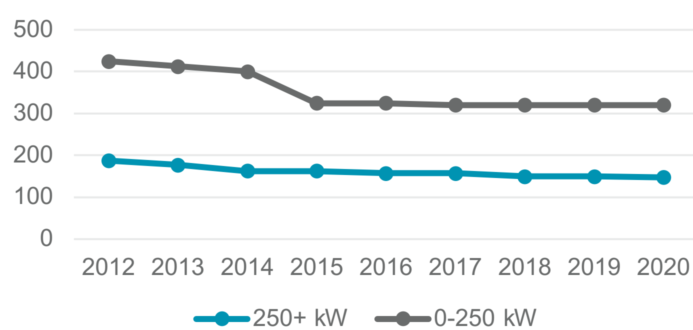
PROPERTY	SIZE (SQ FT)	SALE DATE	SALE PRICE	BUYER	SELLER
300 New Hwy, Hauppauge	111,734	Sep-20	$24,500,000	ViacomCBS	Charter Communications
225 Old New Brunswick Rd, Piscataway	65,253	Aug-20	$3,875,000	Avalair Group	Rafael Holdings

NEW JERSEY PRICING



Source: datacenterHawk

NEW YORK PRICING



Source: datacenterHawk

DATA CENTER UPDATE

NORTHERN VIRGINIA

WINTER 2021

CUSHMAN & WAKEFIELD

Key Indicators

Under Construction
244 MW

Vacancy
3%

Absorption (2nd Half)
153 MW

Market Overview

As if Northern Virginia couldn't get any stronger, an amazing second half of 153 MW absorbed finished the year at just under 390 MW taken up, a record locally and providing most the nearly 700 MW taken across the country. Hyperscale tenants continue to drive this leasing volume, with wholesale deals plentiful throughout the year. Construction continues to just outpace absorption, with several major projects in serious planning, including a large Amazon campus and a Digital Realty development that could total 1 GW of power over multiple phases. Further sites have transacted in-market, including two for Microsoft in Manassas and Aldie, and operators remain on the hunt for further sites with access to power. New development would be much welcomed, as in-market vacancy has dropped to 3%, with few large availabilities remaining.

The increase in the total number of operational data centers has been welcomed locally by Loudoun County, with press reports indicating that data centers contributed $395 million in sales tax revenue to the county coffers, up from $280 million previously. Revenue increases look likely to continue in coming years, suggesting to other markets that local authorities can still find data centers lucrative even with tax incentive packages. As operators and tenants alike continue the necessary path to greener operations, recent news that Dominion Energy is underway on several wind, solar, and biogas projects will allow for scalability in-market for large workloads.

Ecosystem Developments

- **G-Core Labs** opened its third global cloud region in Ashburn, offering a scalable Infrastructure-as-a-Service (IaaS) model for local clients. Following earlier regions in Luxembourg and Moscow, all data will be processed and stored locally at this new location.
- **Whatbox** announced a new agreement with FiberLight, with the fiber provider completing a new dark fiber network between local data center locations for the Software-as-a-Service (SaaS) provider. FiberLight networks are now connected in 430 cities and to over 130 data centers.
- **PathAI** signed on with Digital Realty, with plans to utilize PlatformDIGITAL to deploy their artificial intelligence (AI) workloads for pathology research. The company was attracted to the dense Digital footprint throughout Northern Virginia and the rapid deployment available. Digital Realty remains under construction and in planning on large campuses across the greater market.
- **IonQ** chose to open their Quantum Data Center across the Potomac in the Discovery District in Riverdale, Maryland. The firm is focused on research and development in the quantum compute space with backing from the University of Maryland.
- The **London Internet Exchange (LINX)** is installing a switch at the Iron Mountain VA-1 data center, providing further interconnection and peering options locally in Manassas. This is the third location for LINX locally, after facilities in Ashburn and Reston.

MORE INFORMATION

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DATA CENTER UPDATE

NORTHERN VIRGINIA

WINTER 2021

CUSHMAN & WAKEFIELD

Construction Update

OPERATOR	LOCATION	SIZE (SQ FT)	POWER (MW)	STAGE / EST. DELIVERY
Digital Realty	Ashburn Western Lands	552,033 7,460,000	42 1,000	Under Construction / Q1 2021 Planned
Vantage	VA12	250,000	36	Under Construction / Q1 2021
RagingWire	VA5	250,000	8	Under Construction / Q2 2021
Iron Mountain	VA-2 Phase 2	30,000	6	Under Construction / Q2 2021
Stack Infrastructure	Manassas	700,000	40	Under Construction / Q2 2021
Cologix	Ashburn	350,000	32	Under Construction / Q4 2021
COPT	Parkstone A Parkstone B	227,000 193,000	25 (est) 25 (est)	Under Construction / Q2 2023 Under Construction / Q2 2024
Microsoft	Western Ashburn	250,000	30 (est)	Under Construction
Amazon	South Riding Chantilly	300,000 1,750,000	40 (est) 200 (est)	Planned Planned
EdgeCore	Sterling	180,000	36	Planned
Sentinel Data Centers	Ashburn	238,000	47	Planned
Evoque	Ashburn	100,000 (est)	10	Planned

Recent Site Sales

PROPERTY	SIZE (Acres)	SALE DATE	SALE PRICE	PRICE/ACRE	BUYER	SELLER
11314 Balls Ford Rd, Manassas	46	Oct-20	$29,000,000	$630K	Microsoft	War Horse Cities
24282 Quail Ridge Ln, Aldie	66	Aug-20	$93,700,000	$1.42M	Microsoft	St John Properties, Chuck Kuhn
13700 University Blvd, Gainesville	128	Aug-20	$74,500,000	$582K	The Wolff Co	Buchanan Partners

Recent Property Sales

PROPERTY	SIZE (SQ FT)	SALE DATE	SALE PRICE	BUYER	SELLER
Three assets (Manassas, Gainesville, Ashburn)	978,000	Dec-20	$210,000,000 (total value; 90% interest)	Blackstone	GI Partners, COPT
20935 Loudoun County Pkwy, Ashburn	297,000	Oct-20	$90,000,000 (total value; 90% interest)	Blackstone	COPT
1807 Michael Faraday Ct, Reston	21,100	Aug-20	$8,250,000	Strategic Capital	Lincoln Rackhouse

DATA CENTER UPDATE

NORTHERN VIRGINIA

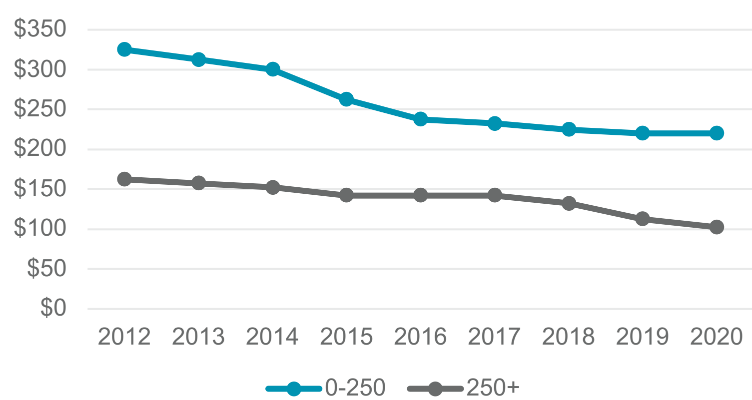
WINTER 2021

CUSHMAN & WAKEFIELD

Ecosystem Developments

- **Cyxtera** has announced a new partnership with Nvidia, providing artificial intelligence and machine learning options for users in Northern Virginia, Dallas, and London. Cyxtera operates several local facilities in Sterling.
- An as-yet unidentified government agency signed on with **Iron Mountain** in Manassas for 4 MW, at the same time relocating their disaster recovery location from the Iron Mountain location in Boyers to their location in Denver. The agency will be moving in at the second quarter of 2021, with Iron Mountain continuing to expand locally to meet client demand.
- The national acquisition of Atlantic Metro had a local component, with **365 Data Centers** assuming operations of the 830 kW data center in Herndon. 365 now offers colocation in 12 markets across the US and across a growing array of services.
- **CoreSite** announced their expanded Any2Exchange peering service late in 2020, with the Northern Virginia and Washington DC locations joining Boston and New York in the Any2East exchange. The enhanced service will provide further regional connectivity options with decreased transit costs.
- **DataBank** has closed on their global acquisition of Zayo data centers, with leased facilities in Ashburn and McLean now coming under DataBank management. Together the two buildings offer utility capacity of nearly 23 MW and are the initial market entry for DataBank.

NORTHERN VIRGINIA PRICING



Source: datacenterHawk

Northern Virginia had the best year on record in 2020, closing the year at nearly 390 MW of absorption, or over half the also record US total. With vacancy down to 3%, the world's largest data center market is now also its tightest.

DATA CENTER UPDATE

PHOENIX

WINTER 2021

CUSHMAN & WAKEFIELD

Key Indicators

Under Construction
6 MW

Vacancy
11%

Absorption (2nd Half)
16 MW

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Market Overview

Phoenix had a relatively quiet second half of 2020, with absorption slightly lower than the first half yet still outpacing current construction. As with several growing areas, connectivity and cloud service development remain important to local development, and platforms such as Microsoft Azure, Amazon Web Services, and Oracle Cloud have all announced local expansion. Overall market vacancy has hovered in the 10-11 percent bracket over the past year and a half, with further large sites in planning as the need arises. The national acquisition of Zayo data center sites by DataBank had a local component, with three leased facilities in Phoenix and Chandler moving under different management late in the year. Further local investment was subdued in the second half, following on the headline Paypal deal early in 2020 and considerable transaction activity over the last few years.

Ecosystem Developments

- **EdgeConneX** added Microsoft Azure ExpressRoute access locally, with all Azure cloud services now available locally. More recently, the global edge company also announced access to a new local internet exchange known as 48 IX, along with Telia Carrier connectivity in Phoenix and three other markets across the country. EdgeConneX received major new funding from EQT in 2020, with expansion likely in several markets.
- **Iron Mountain** announced a 6 MW lease at their upcoming AZP-2 data center, with plans for the as-yet unnamed Fortune 100 tenant to take occupancy in the third quarter this year. The multifaceted storage company will be added a further phase to AZP-2 to accommodate.
- **Hurricane Electric** added a point-of-presence (PoP) at the H5 facility in Chandler, with the connectivity provider offering local clients access to over 8,000 networks and 250 exchange points. This is the fifth in-market location for Hurricane, following placements at Digital Realty, PhoenixNAP, EdgeConneX, and Iron Mountain buildings.
- **Oracle** launched new National Security Regions in the fall, with Phoenix joining Chicago and Northern Virginia as hosting options for the Department of Defense and other related organizations. Oracle's Cloud platform has found success with government agencies, particularly at the military and federal levels.
- **Amazon** announced that Phoenix would be among a dozen markets nationwide to add an AWS Local Zone in 2021, allowing for high-performance AWS applications at the edge. Local Zones initially launched in Los Angeles and added three further markets late in 2020.

Construction Update

OPERATOR	LOCATION	SIZE (SQ FT)	POWER (MW)	STAGE / EST. DELIVERY
Iron Mountain	AZP Phase 2	21,000	6	Under Construction / Q3 2021
Stack Infrastructure	Avondale	1,000,000	150	In Planning
Vantage	Goodyear	250,000 (est)	32	In Planning

DATA CENTER UPDATE
PORTLAND
WINTER 2021

CUSHMAN & WAKEFIELD

Key Indicators

Under Construction
73 MW

Vacancy
13%

Absorption (2nd Half)
8 MW

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Market Overview

Construction continues aplenty in Portland, with the growing market in the suburb of Hillsboro soon gaining new buildings from T5, Flexential, Stack Infrastructure, and EdgeConneX by the end of the year. Flexential in particular has chosen to be bullish locally, with their third Hillsboro facility to be the largest across their portfolio at full buildout. The swathe of recent completions have ticked vacancy back up to 13%, as absorption in the second half of 2020 was a tepid 8 MW. Several new requirements are rumored to be shopping in Hillsboro, as workloads from other higher-cost markets aim for a new home with robust connectivity. Cloud services continue to view the market growth positively, as new deployments for OVH, Google, and Amazon show.

Longtime downtown Portland carrier hotel Pittock Block found new owners as the year turned, with partners 1547 and Harrison Street closing on the tower for an impressive $326 million. The acquisition is a major vote of confidence in Portland growth, and follows the recent national trend of carrier hotel sales.

Ecosystem Developments

- **OVH** added their Public Cloud services locally in Hillsboro, the exclusive location on the west coast to offer this platform. OVHcloud offers a variety of services including private networking, archiving, and other Infrastructure-as-a-Service (IaaS) options.
- **EdgeConneX** now offers Google Cloud Interconnect at their campus in Hillsboro, with two buildings operational and a third coming soon. This is the first Portland data center to offer direct access, and Google has long operated their US-WEST 1 data center in The Dalles.
- **Digital Fortress** announced the acquisition of Atmosera data center operations, with three leased facilities in Beaverton and Portland moving to Digital Fortress management. Together the three offer 1.5 MW for colocation and 100 total customers, with deep connectivity across the greater area.
- **Amazon** announced that Portland would be among a dozen markets nationwide to add an AWS Local Zone in 2021, allowing for high-performance AWS applications at the edge. Local Zones initially launched in Los Angeles and added three further markets late in 2020.

Construction Update

OPERATOR	LOCATION	SIZE (SQ FT)	POWER (MW)	STAGE / EST. DELIVERY
T5	Hillsboro	124,000	13.2	Under Construction / Q2 2021
Flexential	Hillsboro 3	358,000	36	Under Construction / Q3 2021
Stack Infrastructure	Hillsboro	180,000	24	Under Construction / Q3 2021
EdgeConneX	POR 03	40,000 (est)	13	In Planning / Q4 2021

DATA CENTER UPDATE

SILICON VALLEY

WINTER 2021

CUSHMAN & WAKEFIELD

Key Indicators

Under Construction
263 MW

Vacancy
6%

Absorption (2nd Half)
63 MW

Market Overview

Silicon Valley stormed to a record half of absorption at the end of 2020, with hyperscale leases pushing several new builds to begin construction and several large projects in planning. Although certain workloads have found homes in Las Vegas, Portland, or Phoenix, the tight local market and continued hunt for available capacity are overwhelming votes of confidence in Santa Clara and other clusters. Multi-floor buildings are now a must, with four floor construction increasingly de rigueur for maximum efficiency on smaller sites. EdgeConneX and T5 both secured large sites for occupancy and future expansion in recent months, with T5 already launching plans for a 32 MW add-on at their Newark campus. Harvest Properties also elected to pick up another Financial District property, purchasing the mixed-use 360 Spear Street for over $165 million after the building enjoyed recent upgrades. Another intriguing acquisition came from Amazon, who elected to acquire 20 acres in the San Jose exurb of Gilroy, ostensibly for data center usage in the near future. The cloud giant (who already has a large campus under construction in Santa Clara) could push the geographic boundaries of the local data center market to new limits if and when construction went ahead. Data centers will continue to have a bright future locally, as Silicon Valley has reaffirmed its status as a top global market.

Ecosystem Developments

- **Colovore** has announced a new partnership with Bandwidth Infrastructure Group, with the Bandwidth IG dark fiber network now accessible in Santa Clara. The local Bandwidth IG network offers 89,000 fiber miles and helps connect the high performance compute focused tenants at Colovore to the wider ecosystem.
- **Equinix** announced the availability of Alibaba Cloud to their clients mid-year, with Silicon Valley and 16 other major markets providing this service at launch. Alibaba Cloud now offers full integration with Platform Equinix and the Equinix Cloud Exchange Fabric. The REIT later announced the availability of Equinix Metal, an interconnected bare metal service launching in Silicon Valley, Amsterdam, Northern New Jersey, and Northern Virginia, and remains under construction on their new SV11 building.
- **Amazon Web Services (AWS)** and Verizon have agreed to partner on new 5G server sites both locally and in Boston, aiming to provide 5G wireless connectivity at the edge for local clients. Amazon has a new campus under construction in Santa Clara and acquired a further expansion site in Gilroy in the summer.
- **CoreSite** announced their expanded Any2Exchange peering service late in 2020, with the Silicon Valley and Los Angeles locations forming the Any2Wast exchange. The enhanced service will provide further regional connectivity options with decreased transit costs.
- **CloudMosa** has consolidated all operations with vXchnge in Santa Clara, with the Puffin operating system creator expanding on a long-term relationship with the colocation operator. CloudMosa sited cost savings and the high density available as key deciding factors.
- The **PCCW** Console Connect platform now offers direct on-ramps to IBM Cloud, with San Jose an initial market for this connectivity. The partnership enables access to the entire IBM portfolio including compute and storage infrastructure options.
- **DataBank** has closed on their national acquisition of Zayo data centers, with the leased local building on Lafayette Street now moving to DataBank management. This is the initial entry for the colocation operator in Santa Clara.

MORE INFORMATION

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DATA CENTER UPDATE

SILICON VALLEY

WINTER 2021

CUSHMAN & WAKEFIELD

Construction Update

OPERATOR	LOCATION	SIZE (SQ FT)	POWER (MW)	STAGE / EST. DELIVERY
RagingWire	Santa Clara	160,000	5	Under Construction / Q1 2021
Equinix	SV11 Phase 1	193,000	10	Under Construction / Q2 2021
Vantage	CA23	200,000	32	Under Construction / Q4 2021
Digital Realty	Santa Clara	430,000	48	Under Construction
1547, CIM Group	San Francisco	187,000	24	Under Construction
Stack Infrastructure	San Jose	240,000	32	Under Construction
CyrusOne	Santa Clara	144,000	36	Under Construction
China Mobile	San Jose	217,000	26	Under Construction
Amazon	Santa Clara	495,610	50 (est)	Under Construction
EdgeCore	Santa Clara	350,000	36	In Planning
Lightstone	Santa Clara	80,000	13.5	In Planning
Prime Data Centers	Santa Clara	73,500	9	In Planning
T5	Newark	180,000	32.1	In Planning

The Valley had a record half of absorption to end 2020, and several large campuses remain under construction. The local market is among the tightest across the country.

Recent Site Sales

PROPERTY	SIZE (Acres)	SALE DATE	SALE PRICE	BUYER	SELLER
Camino Arroyo, Gilroy	20	Aug-20	$31,300,000	Amazon	Southpoint Business Park Associates (John Filice, Eli Reinhard)

Recent Property Sales

PROPERTY	SIZE (SQ FT)	SALE DATE	SALE PRICE	BUYER	SELLER
360 Spear St, San Francisco	154,950	Dec-20	$165,470,000	Harvest Properties	Madison Capital, PGIM Real Estate
39800 Eureka Dr, Newark	128,566	Oct-20	$60,000,000	T5 Partners	Apple
1600 Memorex Dr, Santa Clara	229,000	Aug-20	$83,250,000	EdgeConneX	DRA Advisors, Westcore Properties

CUSHMAN & WAKEFIELD

DATA CENTER UPDATE

CANADA

DATA CENTER UPDATE
MONTREAL
WINTER 2021

Key Indicators

In Planning
100 MW

Vacancy
19%

Absorption (2nd Half)
3 MW

Market Overview

Montreal had a tepid second half from an absorption standpoint, though this may be a pause before a more impressive 2021. As renewable energy becomes an ever-greater talking point for the industry, the low-cost hydropower discussed in our previous update stands to gain in importance, with those looking to lower their carbon footprint apt to consider Montreal in the future. For the time being, Vantage generated the biggest headlines late in 2020, acquiring the business and operational campus of Hypertec, with expansion plans at current and future sites. Further development will likely take some time, with vacancy needing to drop further before additional capacity makes sense.

Equinix also closed their national C$1.04 billion portfolio acquisition of Bell Canada data centers, with a leased facility locally in Montreal as their 8.5 MW initial foray into the market. The deal provides Equinix with locations in primary and secondary markets throughout the country, along with an array of new clients.

Ecosystem Developments

- **eStruxture** recently announced a new partnership with La Guilde du jeux video du Quebec, with members of the video game industry nonprofit now able to obtain preferable colocation and cloud pricing. Gaming is a local focus for eStruxture, with high-density deployments available at three local facilities.
- Prior to acquisition by **Vantage**, the Hypertec signed the Montreal Internet Exchange (QIX) to their data center in Pointe-Claire, with the nonprofit offering peering opportunities with dozens of local organizations. Access to QIX will be available across all future phases of the campus.
- **Google** has added their Bare Metal Solution option in Montreal, with the city joining Northern Virginia and Los Angeles as new areas to offer this service.

Construction Update

OPERATOR	LOCATION	SIZE (SQ FT)	POWER (MW)	STAGE / EST. DELIVERY
UnitedCorp	Beauharnois	770,000	49	In Planning
Vantage	YUL-02 Montreal II	300,000 (est) 200,000 (est)	26 25	In Planning In Planning

Recent Property Sales

PROPERTY	SIZE (SQ FT)	SALE DATE	SALE PRICE	BUYER	SELLER
2800 Rte Transcanadienne (Pointe-Claire)	125,000	Nov-20	C$27,600,000	Vantage	Hypertec

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DATA CENTER UPDATE
TORONTO
WINTER 2021

Key Indicators

Under Construction
78 MW

Vacancy
6%

Absorption (2nd Half)
4 MW

MORE INFORMATION

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Market Overview

The record absorption for Toronto in the first half of 2020 was met by a predictable issue for the second; there simply is little large scale capacity left to take up! This is being remedied by several projects underway, including by major operators Digital Realty, Urbacon, and Compass, adding close to 80 MW of capacity to the area in coming months. As some of this is already pre-leased, further phases will likely be required later in the year as corporations and cloud services alike look to cover their local needs. Oracle and Google Cloud both recently received provisional approval to offer their services to the national government, suggesting a continued focus on major national markets if the government moves in either direction. Overall outlook for Toronto thus remains exceptionally positive for the rest of 2021.

Equinix closed on their national C$1.04 billion acquisition of Bell Canada data centers in autumn, obtaining title to two buildings in Brampton as part of the transaction. The deal provides the global REIT with a pan-Canadian portfolio, with facilities in primary and secondary cities and an array of new customers. Landmark Infrastructure recently made their first Canadian acquisition as well, purchasing a Sungard data center in Mississauga via a sale-and-leaseback arrangement for just under C$27 million. Investors remain hungry for acquirable assets in-market, as Toronto serves as the introductory point to Canada for most US-based funds.

Ecosystem Developments

- **Telstra** recently added a new point-of-presence (PoP) at the Cologix TOR1 data center, acting as the first in all of Canada for the Australian telecommunication company. Telstra was particularly interested in the networking opportunities at the site, located in the premier carrier hotel at 151 Front Street.

Construction Update

OPERATOR	LOCATION	SIZE (SQ FT)	POWER (MW)	STAGE / EST. DELIVERY
Digital Realty	TOR1	139,548	14	Under Construction / Q3 2021
Urbacon	DC2 DC7	105,000 180,000	12 22	Under Construction Under Construction
Compass Datacenters	Etobicoke	214,000	30	Under Construction

Recent Property Sales

PROPERTY	SIZE (SQ FT)	SALE DATE	SALE PRICE	BUYER	SELLER
Two assets (Brampton)	639,378	Oct-20	C$120,000,000 (est)	Equinix	Bell Canada
1800 Argentia Rd, Mississauga	85,000	Sep-20	C$26,800,000	Landmark Infrastructure	Sungard

CUSHMAN & WAKEFIELD

DATA CENTER UPDATE

MEXICO

DATA CENTER UPDATE

QUERETARO

WINTER 2021

Key Indicators

Under Construction

48 MW

Queretaro has arrived as the primary data center market in all Mexico, with large development launching over the past year.

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Market Overview

Over the course of the last year Queretaro appeared on the global data center map thanks to massive investments underway from international operators Equinix, Odata, and Ascenty backed by Digital Realty. The area offers available land for lower cost than industrial parks closer to Mexico City, and a thriving and developing ecosystem with access to major cloud services providers. The blossoming of Queretaro reflects a turning point for data centers across Mexico, as the country has been widely underserved for many years, particularly reflecting a top 20 global economy with large corporations and government organizations pursuing their own IT transformations. The growing ecosystem suggests an opportunity for these entities to leap directly to a hybrid IT strategy, with cloud services immediately available for organizational planning. As Queretaro will be the first of what will likely be several markets in-country, the future locally and for potential major secondary markets in Guadalajara, Monterrey, and perhaps even at the undersea cable landing area in Cancun remains extremely bright.

Ecosystem Developments

- **Microsoft** announced the arrival of Azure to Mexico in 2020, with plans to invest MEX$22 billion in-country over the next five years. The plan goes above and beyond a new cloud region, also creating an educational program to build a new generation of technical talent. Microsoft is already working with a variety of organizations locally, including Telmex and government entities.
- Rumors swirled throughout the second half of 2020 that **KIO Networks** was for sale, with the locally-based data center operator and managed services company drawing interest from international investors. KIO has data centers locally in Queretaro and across other locations in Central America and Spain.
- **Amazon** has launched CloudFront locally to provide connectivity at the edge for AWS, with Queretaro joining Auckland in New Zealand as new markets in fall. The new deployment will allow for less latency when accessing AWS.
- **Gold Data** plans on spending MEX$200 million on a new fiber network linking Mexico City to Queretaro and Veracruz among other markets. The network will be part of a larger investment of nearly MEX$2 billion through 2023.
- After their market entry via the Axtel acquisition early in 2020, **Equinix** announced the availability of Equinix Fabric locally alongside six other markets across the globe. Equinix Fabric allows for direct interconnection to other clients and cloud services.

Construction Update

OPERATOR	LOCATION	SIZE (SQM)	POWER (MW)	STAGE / EST. DELIVERY
Ascenty-Digital	Queretaro	10,050	10 (est)	Under Construction / Q4 2021
Equinix	MX2 Phase 2	5,574	6 (est)	Under Construction / Q4 2021
Odata	Queretaro	30,400	32	Under Construction / Q4 2021