

LARGE SUPPLY PIPELINE SETS STAGE FOR MARKET GROWTH IN 2019

North American Data Center Report H1 2019

CBRE

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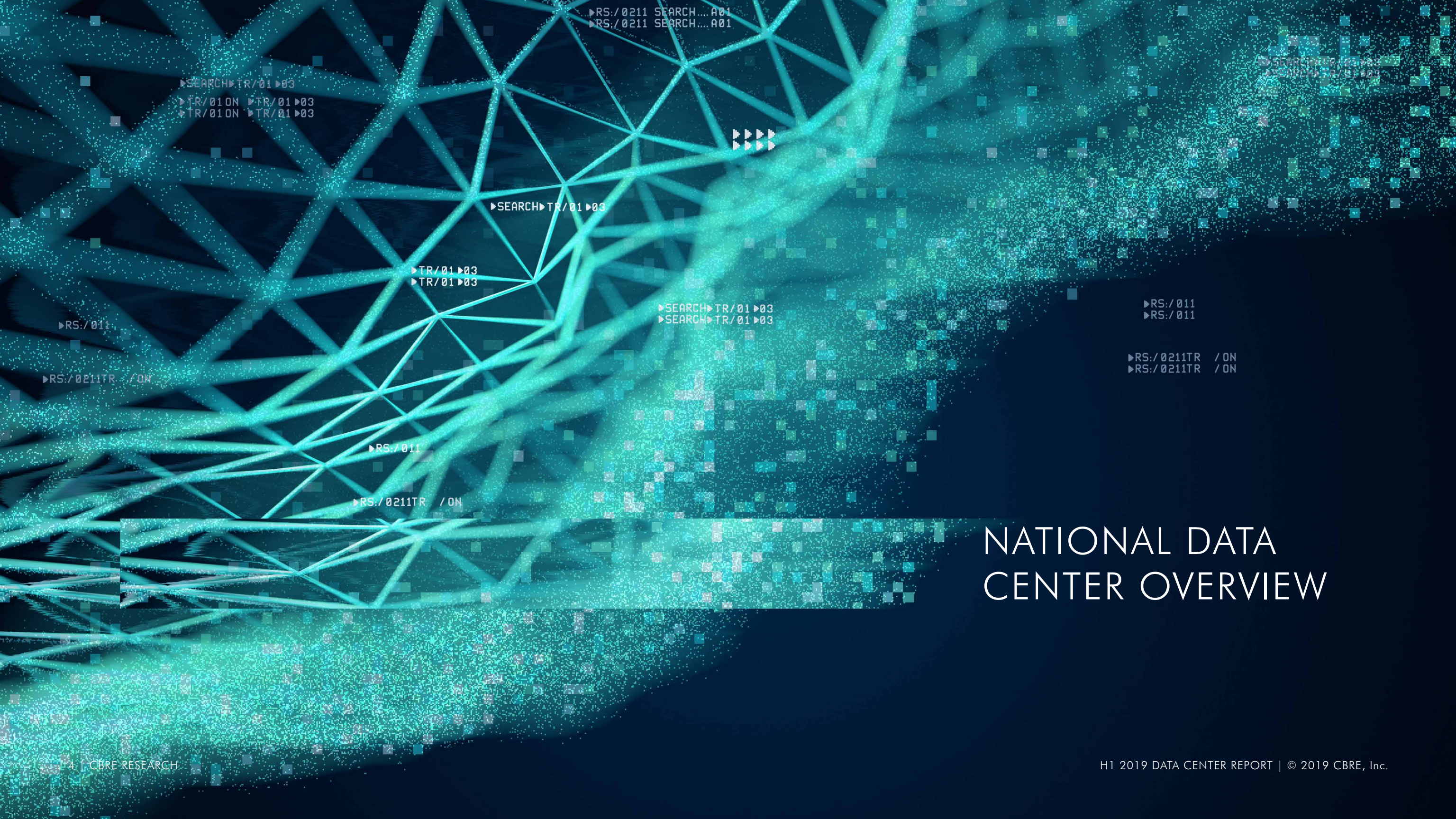
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EXECUTIVE SUMMARY

- Total capacity of U.S. primary data center markets grew by 200 megawatts (MW) or 8% in H1 2019.
- More than 411 MW of additional capacity, 35% of it preleased, is currently under construction and scheduled for delivery in the near term.
- The U.S. primary data center markets recorded 171 MW of wholesale turnkey colocation absorption in H1—57% of the full-year record level in 2018.
- Enterprise users' adoption of hybrid colocation strategies has raised their interest in facilities that offer more than just competitive rental rates, including multi-cloud access and dense connectivity. This is a growing trend across all industries as enterprises seek more agility for their business, real estate and IT needs.
- Competitive pricing lowered average asking rental rates in many markets, as providers sought net-new requirements and companies strived to reduce operational expenses.





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NATIONAL DATA CENTER OVERVIEW

STATE OF THE MARKET

- Wholesale data center supply pipelines continue to grow as demand from enterprise and hyperscale cloud providers increases. The primary U.S. wholesale data center markets (Atlanta, Chicago, Dallas/Ft. Worth, New York Tri-State, Northern Virginia, Phoenix and Silicon Valley) recorded a combined 171 MW of net absorption in H1 2019—more than 56% of 2018’s full-year record. To satisfy this growing demand, under-construction pipelines increased to more than 411 MW of capacity nationwide.
- End user needs continued to evolve as the difference between smaller and larger deal sizes widened. Hyperscale cloud providers (with deployments beginning at 5+ MW) sought immediately available space in addition to strong network and cloud connectivity. Enterprise-based demand (with deployments under 600 kilowatts) continued to diversify with a focus on low-latency and multi-cloud access.
- Secondary markets continue to price at a slight premium over primary markets due to less supply growth and less first-generation available capacity.



The primary U.S. wholesale data center markets recorded a combined 171 MW of net absorption in H1 2019—more than 56% of 2018’s full-year record.



FIGURE 1

H1 2019 Wholesale Primary Market Fundamentals

Market	Inventory	Y-o-Y Change*	Available MW/ Vacancy Rate	Y-o-Y Change*	H1 2019 Net Absorption	Y-o-Y Change*	Rental Rates (kW/mo)**
Northern Virginia	1,027.9 MW	▲ 222.1 MW	73.5 MW / 7.2%	▲ 60 bps	126.4 MW	▲ 26.4 MW	\$100-\$130
Dallas/Ft. Worth	316.0 MW	▲ 48.3 MW	68.8 MW / 21.8%	▲ 340 bps	11.2 MW	▼ -9.9 MW	\$105-\$155
Silicon Valley	269.6 MW	▲ 35.1 MW	18.9 MW / 7.0%	▲ 200 bps	13.7 MW	▲ 3.1 MW	\$135-\$165
Chicago	258.1 MW	▲ 16.1 MW	36.3 MW / 14.1%	▲ 320 bps	4.8 MW	▼ -4.5 MW	\$125-\$140
Phoenix	226.2 MW	▲ 16.0 MW	27.4 MW / 12.1%	▼ 50 bps	6.0 MW	▼ -26.5 MW	\$120-\$135
New York Tri-State	151.2 MW	▲ 2.4 MW	18.2 MW / 12.0%	▼ 310 bps	6.3 MW	▲ 3.8 MW	\$130-\$150
Atlanta	132.5 MW	▲ 6.8 MW	23.1 MW / 17.5%	▲ 420 bps	2.2 MW	▼ -3.3 MW	\$115-\$130

*Y-o-Y changes are calculated by comparing the difference between H1 2019 and H1 2018; **Rental rates are quoted asking rates for 250+ kW at N+/Tier III requirements. Source: CBRE Research, CBRE Data Center Solutions, H1 2019.

FIGURE 2

H1 2019 Wholesale Secondary Market Fundamentals

Market	Inventory	Y-o-Y Change*	Available MW/ Vacancy Rate	Y-o-Y Change*	H1 2019 Net Absorption	Y-o-Y Change*	Rental Rates (kW/mo)**
Austin/San Antonio	132.0 MW	0 MW	6.0 MW / 4.6%	▼ 200 bps	0.7 MW	▼ -1.5 MW	\$130-\$150
Houston	127.9 MW	▲ 15.0 MW	29.7 MW / 23.2%	▼ 270 bps	14.4 MW	▲ 11.2 MW	\$130-\$150
Southern California	111.7 MW	▲ 12.3 MW	22.7 MW / 20.4%	▲ 70 bps	5.8 MW	▲ 1.7 MW	\$100-\$145
Seattle	106.0 MW	▲ 1.5 MW	16.5 MW / 15.6%	▲ 100 bps	1.0 MW	▼ -2.6 MW	\$125-\$145
Denver	82.7 MW	▲ 1.4 MW	18.7 MW / 22.6%	▲ 120 bps	0.5 MW	▼ -1.3 MW	\$125-\$145
Boston	74.5 MW	▲ 6.4 MW	14.4 MW / 19.4%	▼ 240 bps	1.2 MW	▼ -3.1 MW	\$150-\$175
Charlotte/Raleigh	57.3 MW	▲ 6.3 MW	14.8 MW / 25.9%	▼ 150 bps	3.2 MW	▲ 6.2 MW	\$120-\$135
Minneapolis	51.1 MW	▲ 1.5 MW	16.7 MW / 32.7%	▼ 160 bps	2.3 MW	▲ 1.5 MW	\$130-\$145

*Y-o-Y changes are calculated by comparing the difference between H1 2019 and H1 2018; **Rental rates are quoted asking rates for 250+ kW at N+1/Tier III requirements. Source: CBRE Research, CBRE Data Center Solutions, H1 2019.

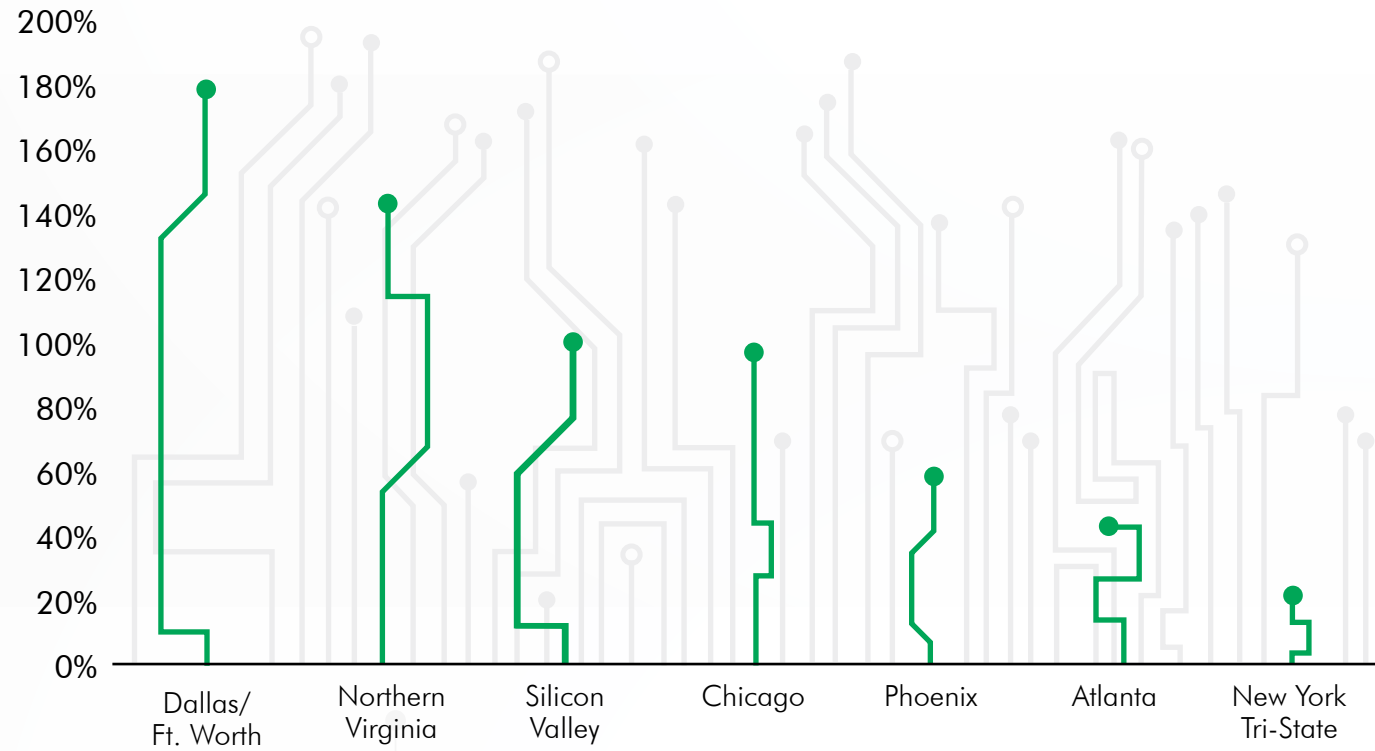
SUPPLY INSIGHTS

- Data center markets across North America posted significant growth in H1 2019 as nearly 200 MW of new capacity was delivered.
- More than 411 MW of capacity are under construction and expected to deliver in the near term. Growing demand for turnkey wholesale colocation space in the immediate term is increasing competition for new customers.
- New deliveries will provide a range of features, including managed-service offerings, connectivity options, variety in deployment sizes and flexible deal structures—all of which will drive market competition. Examples of this include powered shell-based ramp schedules, leasing on a triple-net basis and spend portability offerings. Providers are building facilities and working on deal structures that allow them to keep pace with this shift.



FIGURE 3

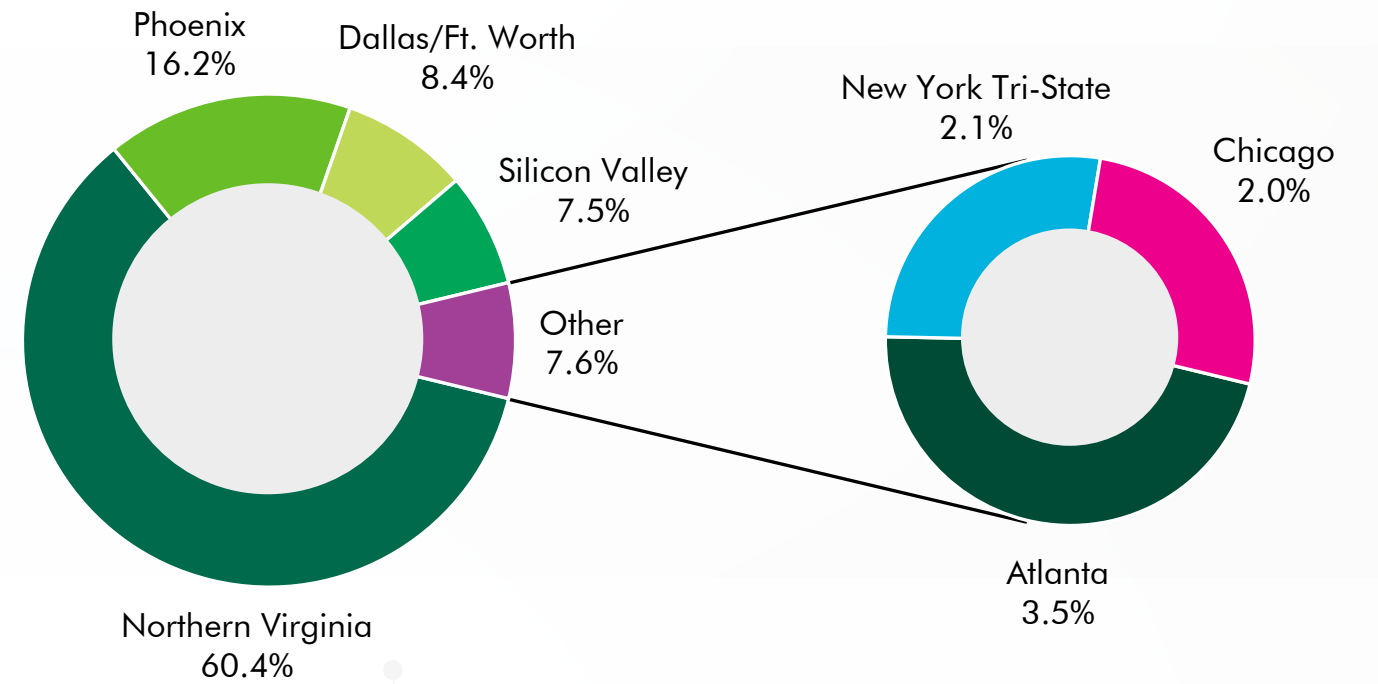
Inventory Growth of Primary Data Center Markets since 2015



Source: CBRE Research, CBRE Data Center Solutions, H1 2019.

FIGURE 4

H1 2019 Primary Market % of Total Under Construction



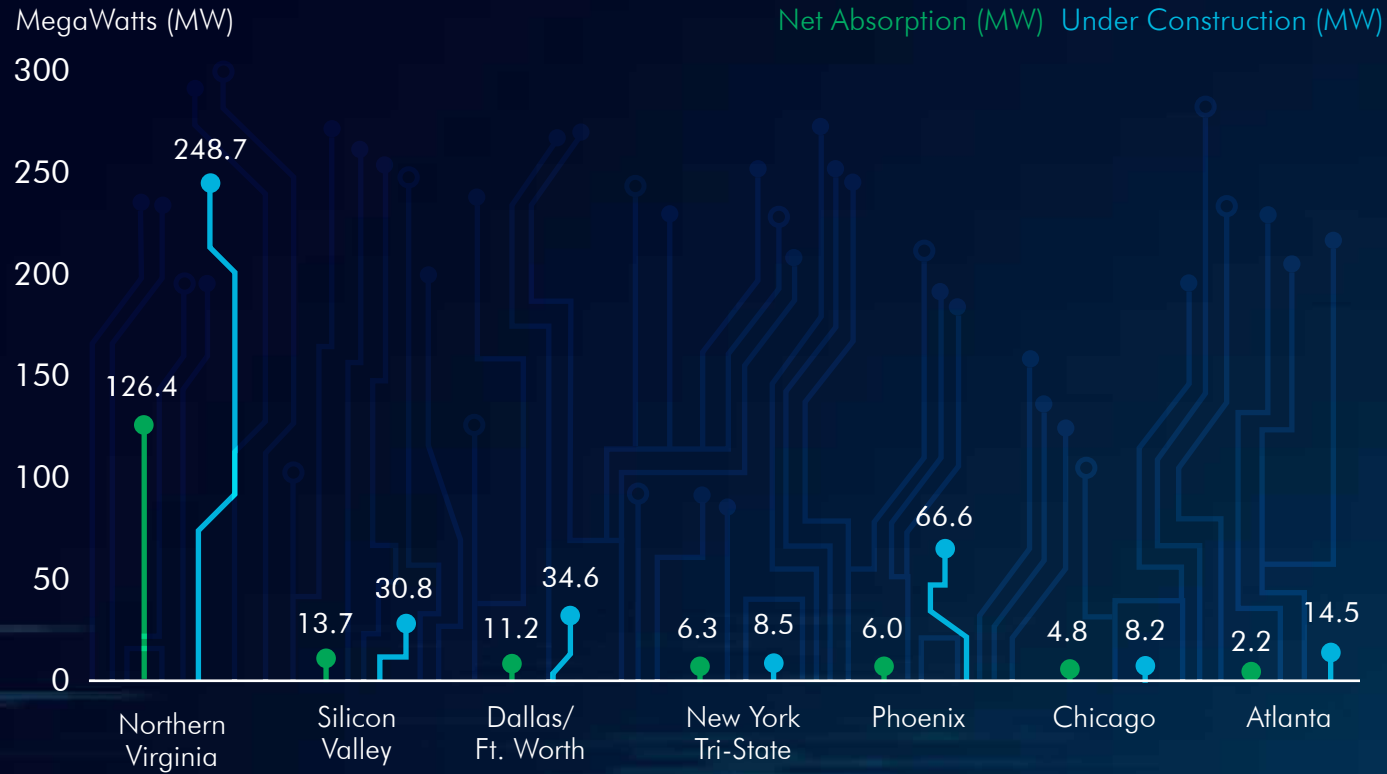
Source: CBRE Research, CBRE Data Center Solutions, H1 2019.

DEMAND INSIGHTS

- More than 170 MW were absorbed in H1 2019, representing nearly 57% of the full-year record in 2018.
- Northern Virginia accounted for most of the absorption, capturing 74% of primary market multi-tenant wholesale demand in H1 2019.
- Industry sentiment suggests that ample demand exists for space in facilities that offer interconnectivity and flexibility.

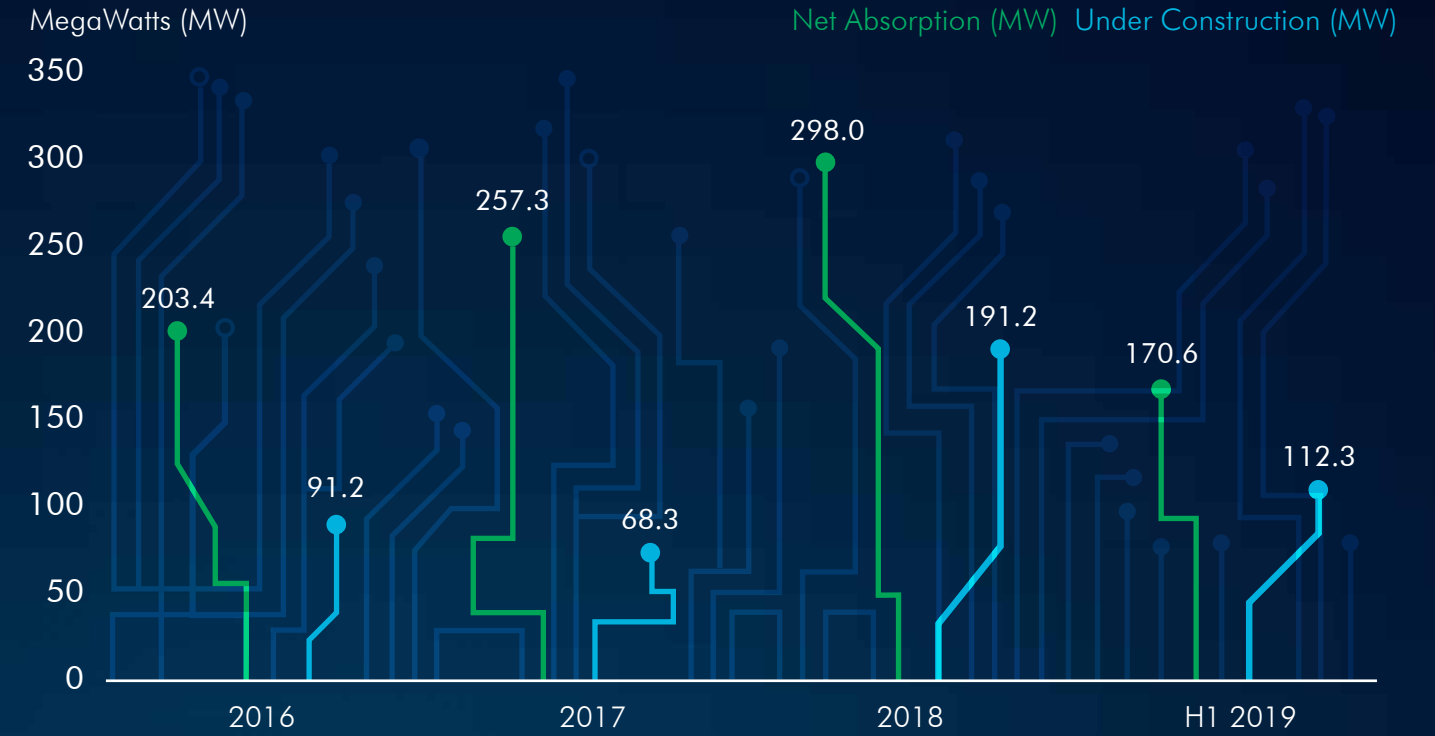


FIGURE 5
H1 2019 Net Absorption vs. Under Construction by Primary Market



Source: CBRE Research, CBRE Data Center Solutions, H1 2019.

FIGURE 6
Primary Markets - Net Absorption & Pre-Leasing



Source: CBRE Research, CBRE Data Center Solutions, H1 2019.

MARKET PRICING TRENDS

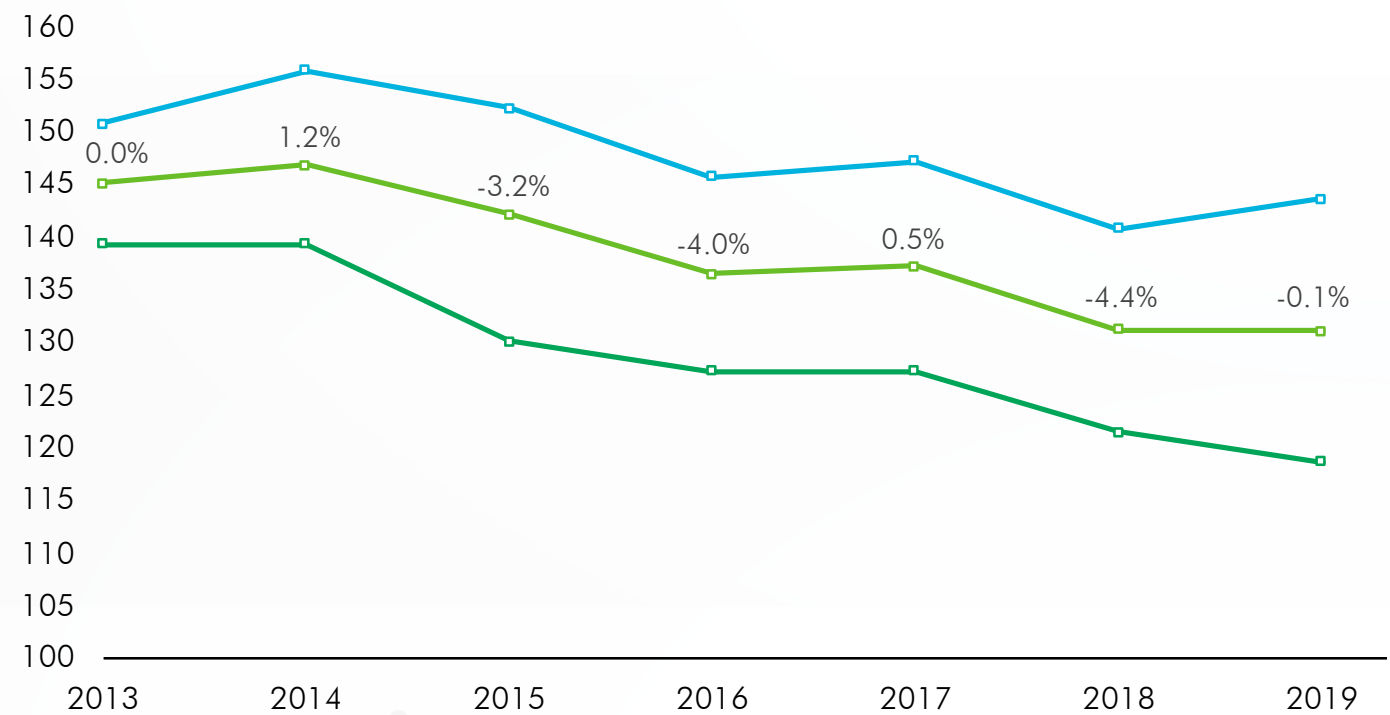
Significant new supply is under construction or planned in the following primary markets: Dallas/Ft. Worth, Northern Virginia, Phoenix and Silicon Valley. This additional supply will continue to lower pricing and keep these markets competitive as providers compete for new tenants or marquee clients that drive other users to their facilities.



FIGURE 7

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

250-500 KW Pricing (\$)

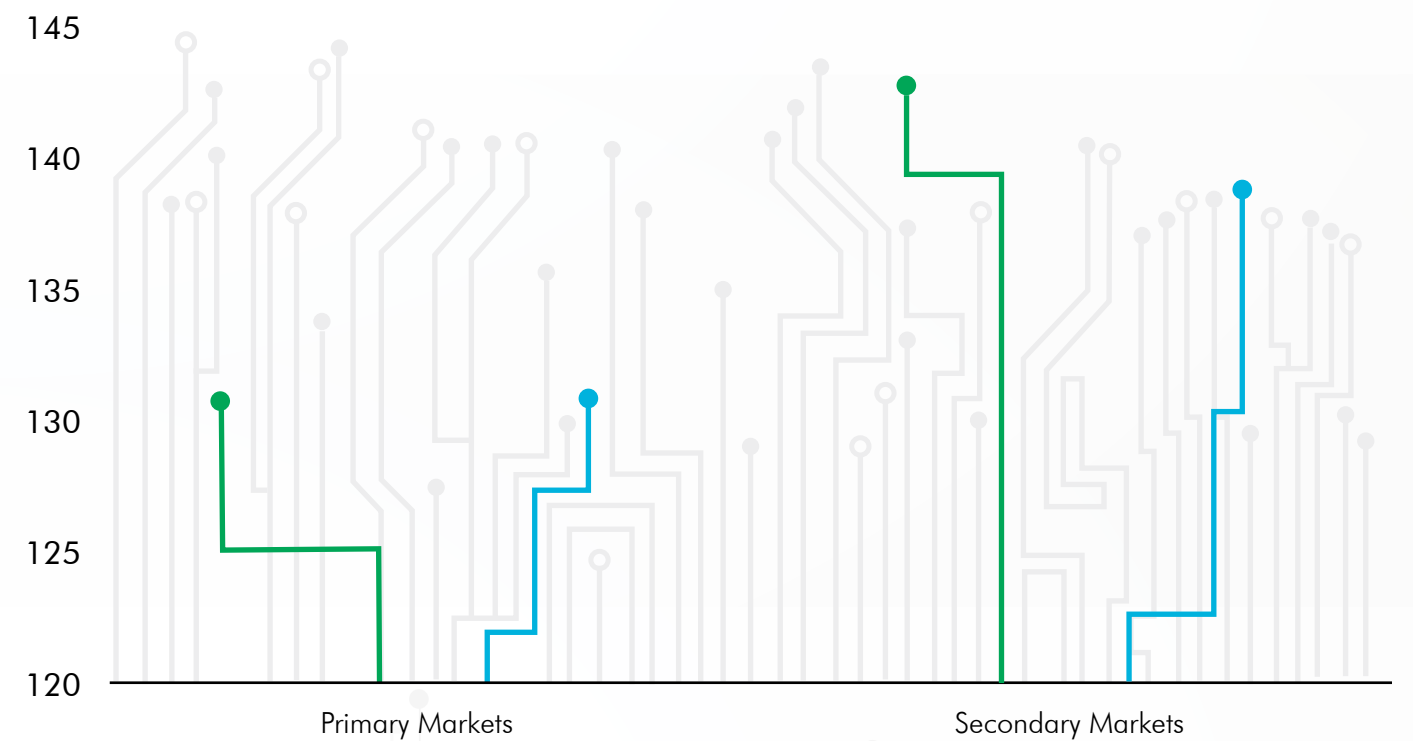


Source: CBRE Research, CBRE Data Center Solutions, H1 2019.

FIGURE 8

Average Asking Rental Rates Primary vs. Secondary Markets

250-500 KW Pricing (\$)



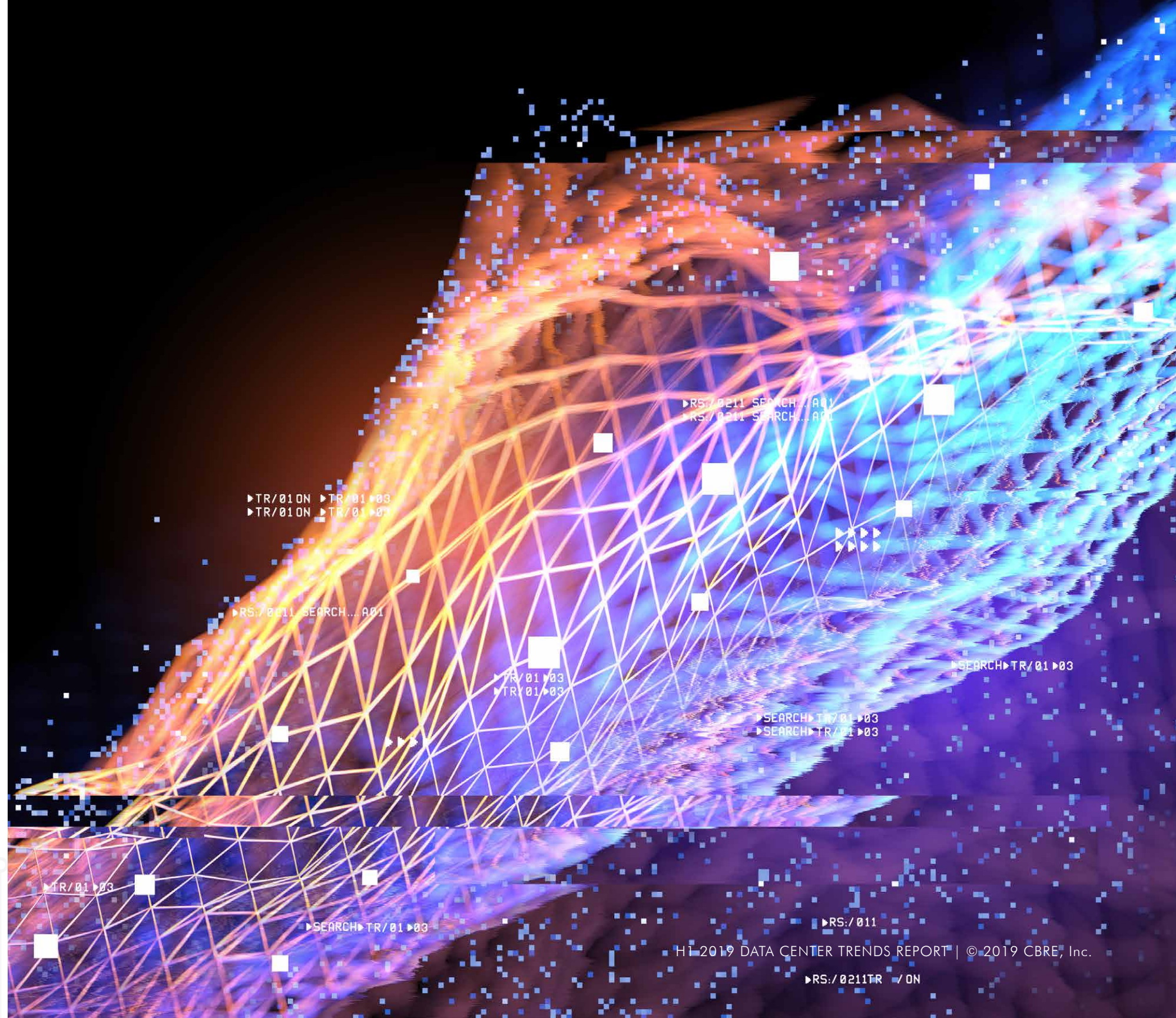
Source: CBRE Research, CBRE Data Center Solutions, H1 2019.

CAPITAL MARKETS TRENDS

North American data center investment volume totaled more than \$1.3 billion in H1 2019. Activity was driven by a few large partial interest trades and select operator portfolio transactions.

Major transactions in H1 included:

- Blackstone's acquisition of seven COPT data centers, with COPT retaining a 10% equity share in the joint venture.
- Alinda Capital Partners' acquisition of a QTS hyperscale data center, with QTS as a 50% joint venture partner.
- GI Partners acquisition of two NTT data centers, which NTT will lease back on a long-term basis.
- Lincoln Rackhouse's acquisition of Bytegrid's three-market data center portfolio, with the real estate assets bifurcated from the operating business as part of the deal.





OUTLOOK FOR H2 2019

An uptick in enterprise sale-leaseback transaction volume is expected as more enterprises try to monetize existing assets while moving to hybrid outsourced models. With allocations continuing to rise, partial-interest trades will remain a large portion of the market activity. Hyperscale cloud providers will continue to seek new aggressive capital sources for powered-shell developments.

THINGS TO WATCH



MARKET EQUILIBRIUM

- Will hyperscale cloud demand absorb the significant supply pipeline?
- How will providers differentiate themselves from their competitors?
- Will some municipalities implement new incentive packages to compete for demand?



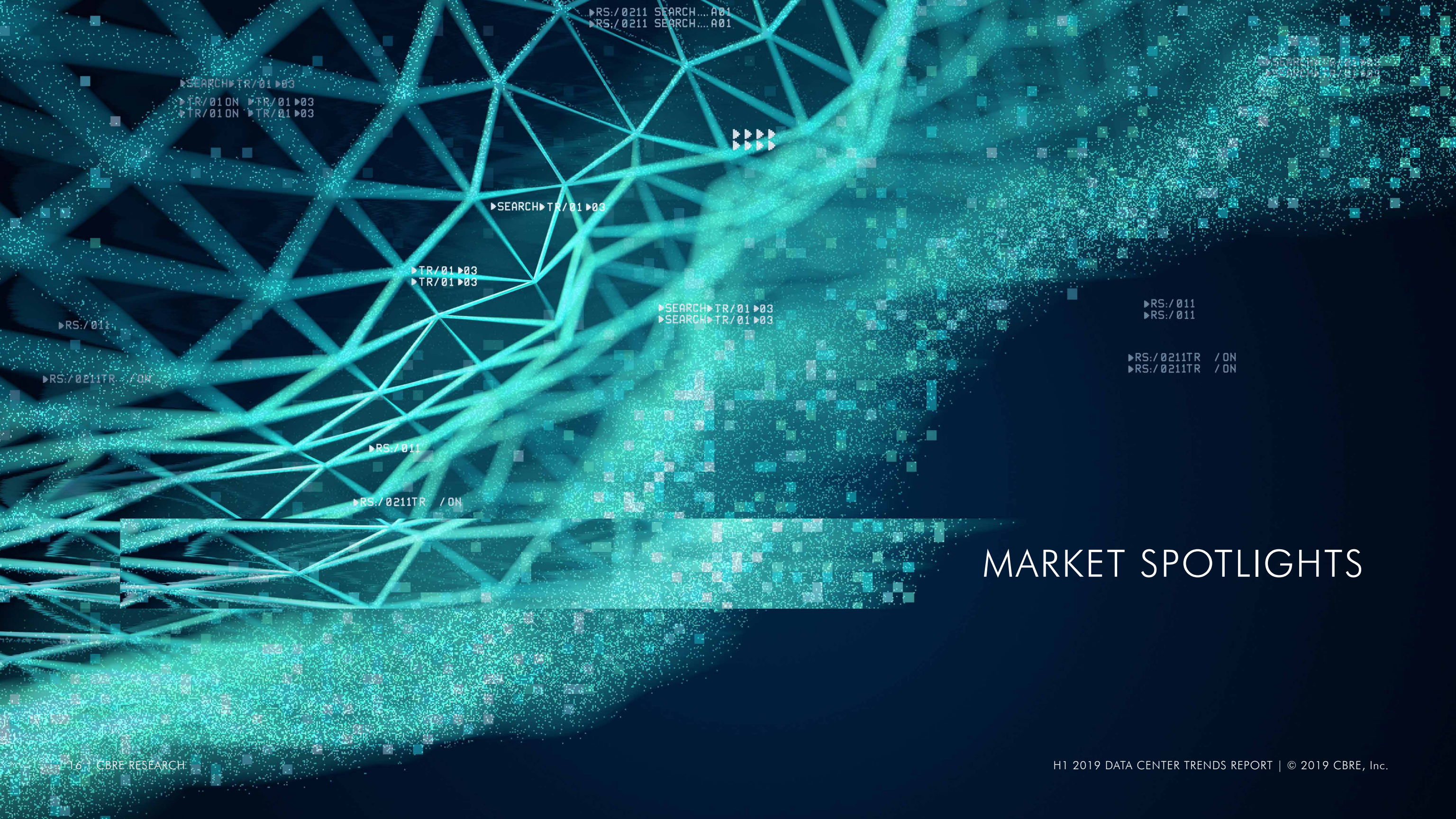
PRICING TRENDS

- For enterprises, what impacts will the need for available and commissioned turnkey capacity and interconnection have on future pricing levels?
- As providers open new facilities and expand existing ones, how will they implement flexibility into their offerings to attract tenants?
- In an era when relocation costs can be prohibitive, how will enterprises leverage hybrid colocation models to be more strategic and agile?



THE IMPORTANCE OF CONNECTIVITY

- How will the need for low-latency and access to multi-cloud environments impact site selection and future developments?
- What approaches are providers using to attract a diverse tenant mix to their facilities/portfolios?
- How will the growth of 5G and edge computing impact the growth of primary and secondary data center markets?



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MARKET SPOTLIGHTS

ATLANTA



COLOCATION INSIGHTS

- Atlanta remains top of mind for data center users due to the blend of competitive power costs and strong economic benefits.
- Local growth is driven by a large presence of financial, credit card data and processing companies. As connectivity and expansion needs grow, enterprises are seeking creative solutions, including acquisitions of legacy assets that are prime for retrofit/sale-leaseback.

MARKET TRENDS

- Atlanta's data center market continued to grow as multi-tenant data center providers, including Databank and Flexential, delivered speculative capacity in H1 2019. Large blocks of availability remain scarce and indicate a need for new supply from larger in-market providers.
- Capacity build-outs from providers that have previously land banked (including CyrusOne, Cyxtera, Digital Realty, QTS, Switch, Stack Infrastructure and zColo) could provide additional capacity to the market.
- Until new development occurs, other primary markets will continue to outpace Atlanta's growth.

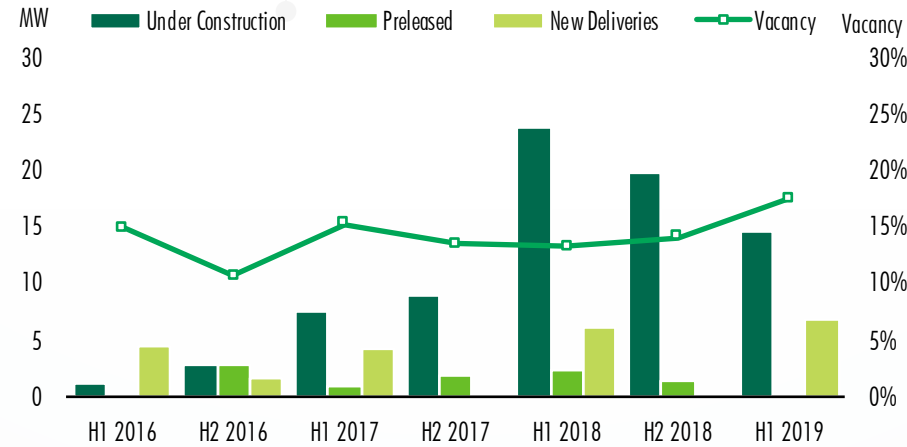
NOTABLE DEALS

- Databank landed a supercomputer center for Georgia Tech.
- A large hyperscale provider deployed a new gaming platform.

DEVELOPMENT ACTIVITY

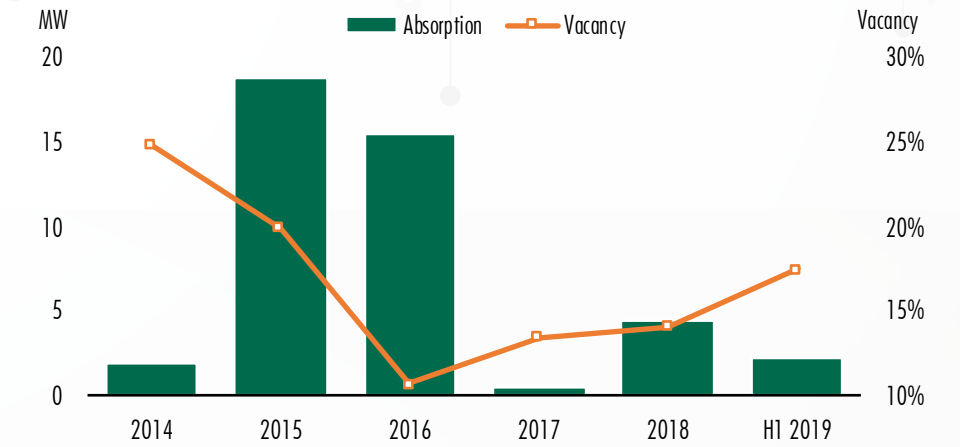
- Flexential delivered first-generation capacity in H1 2019.
- Switch will deploy a new site by year-end 2019.
- QTS will develop a newly acquired site near its current Atlanta metro site.

MARKET INFORMATION



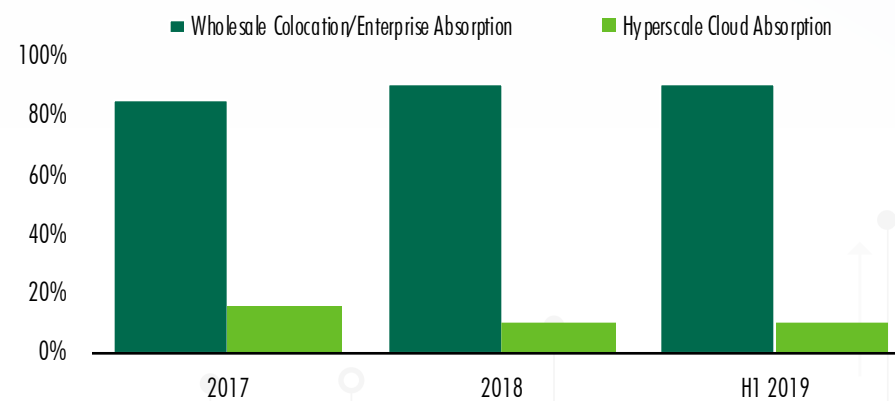
Source: CBRE Research, CBRE Data Center Solutions, H1 2019.

SUPPLY AND DEMAND



Source: CBRE Research, CBRE Data Center Solutions, H1 2019.

COLOCATION VS. CLOUD ABSORPTION



Source: CBRE Research, CBRE Data Center Solutions, H1 2019.

AVERAGE ASKING RATES

	Min	Max
5-10 MW	\$100	\$110
1-4 MW	\$110	\$120
250-500 KW	\$115	\$130

Source: CBRE Research, CBRE Data Center Solutions, H1 2019.

AUSTIN/SAN ANTONIO



COLOCATION INSIGHTS

- Limited available contiguous space led to lower absorption in H1 2019.
- While available colocation spaces remain scarce, pressure from Austin's technology economy may drive demand in the coming quarters as CyrusOne and Data Foundry have developable shell capacity.
- San Antonio is predominately driven by hyperscale cloud activity and largely supplied by CyrusOne.

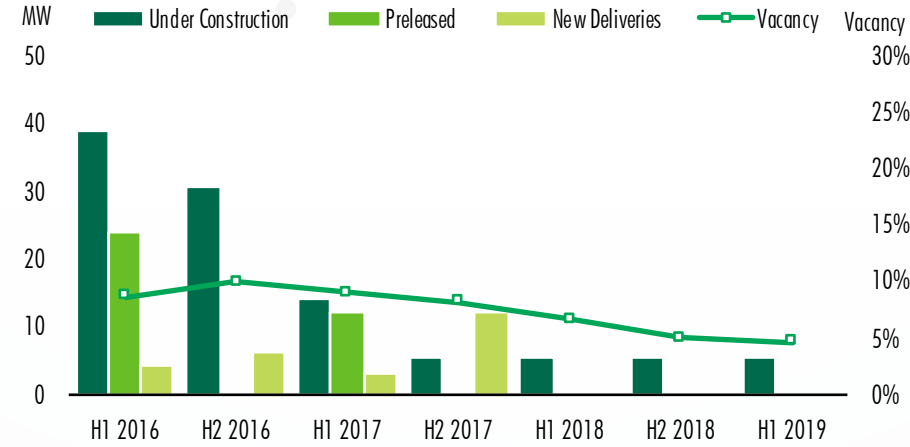
MARKET TRENDS

- Austin remains a robust tech market with the potential of expansion from companies such as CyrusOne, Digital Realty, Data Foundry, OnRamp and Stream.
- Both Austin and San Antonio are options for multi-site strategies within Texas due to business and economic support platforms.

NOTABLE DEALS

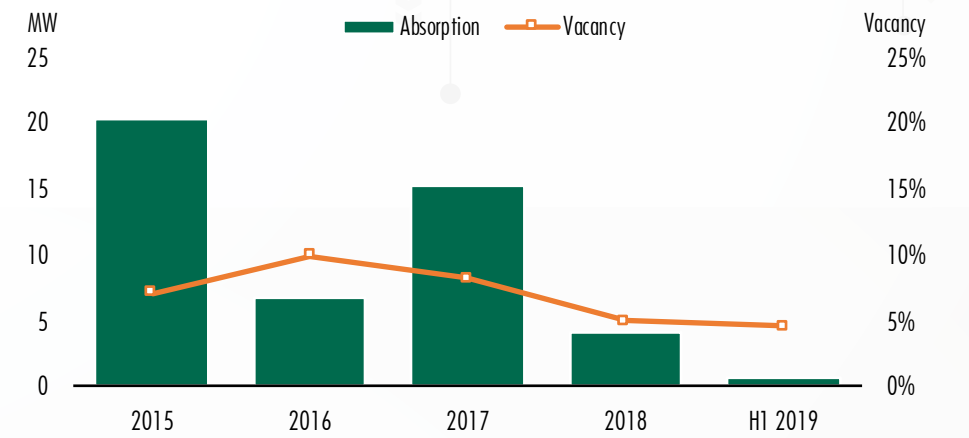
- A hyperscale cloud provider completed a multi-megawatt deal in San Antonio.

MARKET INFORMATION



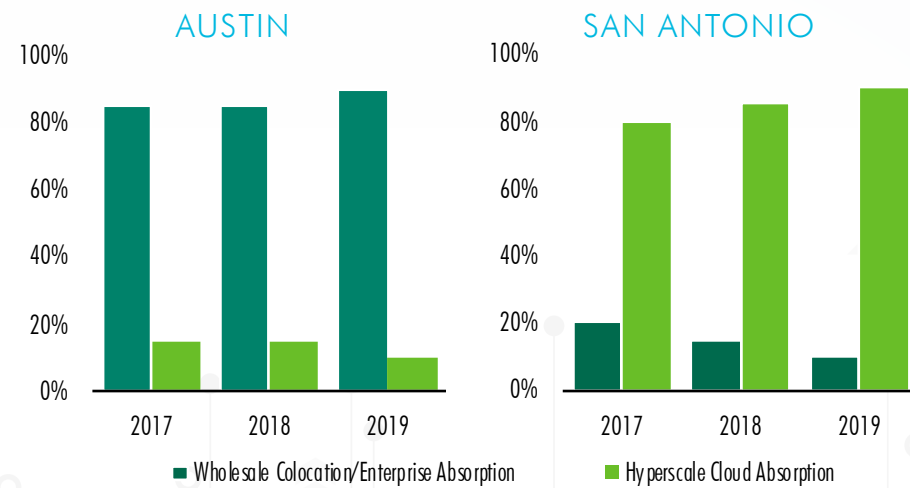
Source: CBRE Research, CBRE Data Center Solutions, H1 2019.

SUPPLY AND DEMAND



Source: CBRE Research, CBRE Data Center Solutions, H1 2019.

COLOCATION VS. CLOUD ABSORPTION



Source: CBRE Research, CBRE Data Center Solutions, H1 2019.

AVERAGE ASKING RATES

	Min	Max
5-10 MW	\$100	\$125
1-4 MW	\$120	\$135
250-500 KW	\$130	\$150

Source: CBRE Research, CBRE Data Center Solutions, H1 2019.

BOSTON



COLOCATION INSIGHTS

- Vacancy remained below 20% in H1 2019. Boston's diverse economy has led to steady incremental absorption from the Life Sciences, Health Care, FinServ and TAMl sectors.
- The higher pricing and costs of the Boston data center market present headwinds for larger deployments to enter, especially as only CoreSite is currently under construction.
- Boston is experiencing a minor market correction as several operators have shut down high-cost, underperforming facilities. Four colocation facilities have been taken off line with a fifth expected by Q2 2020.

MARKET TRENDS

- While a smaller data center market, Boston continues to see growth in edge deployments from the major CDN, OTT and tech companies.
- Boston continued to see sophisticated enterprise users and local cloud companies migrate to lower costs markets, such as Chicago, Dallas/Ft. Worth and Northern Virginia. Over the next few years, potential multi-MW of flight may occur as legacy colocation contracts and leases expire.

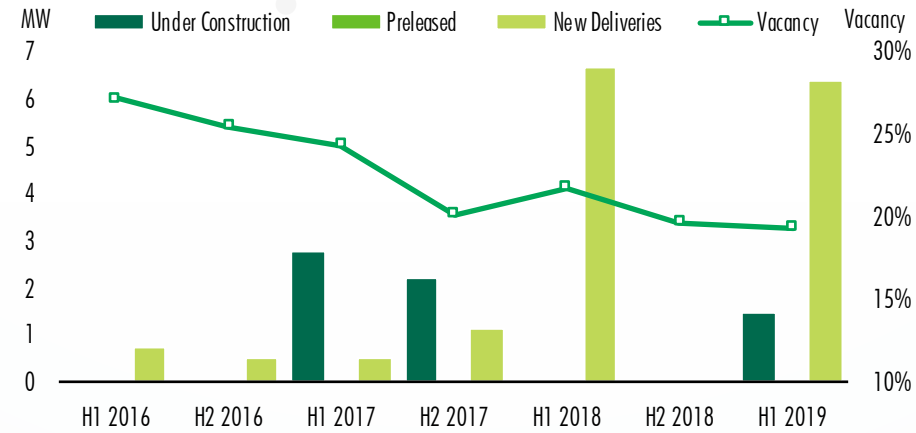
NOTABLE DEALS

- A health-care technology company completed a 200 kW lease.

DEVELOPMENT ACTIVITY

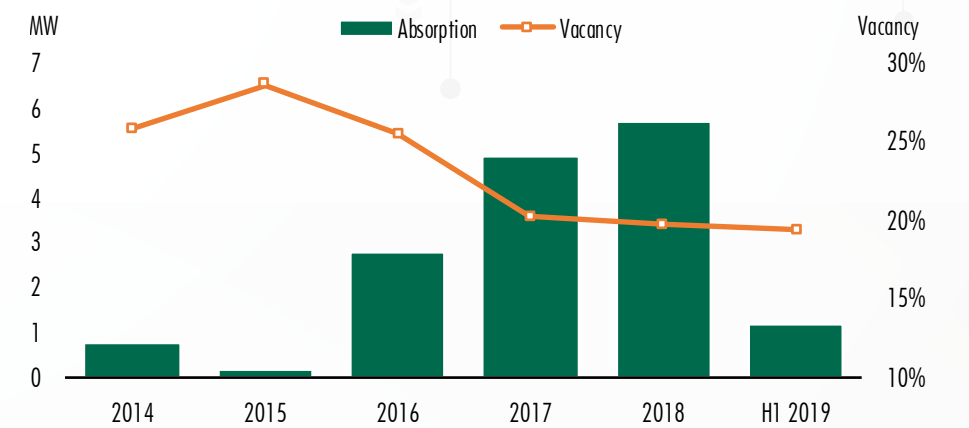
- CoreSite has 19,961 sq. ft. coming online in Q2 2019.

MARKET INFORMATION



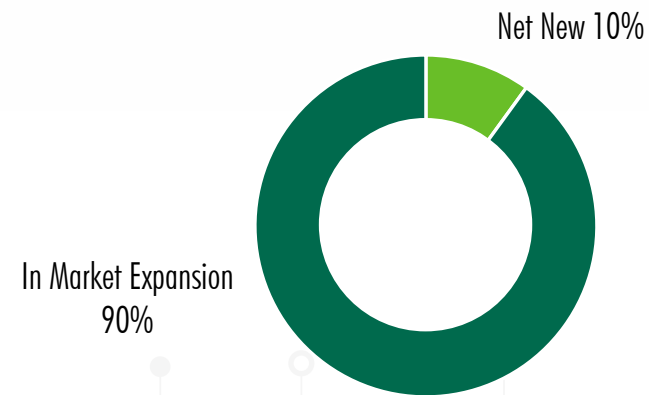
Source: CBRE Research, CBRE Data Center Solutions, H1 2019.

SUPPLY AND DEMAND



Source: CBRE Research, CBRE Data Center Solutions, H1 2019.

HISTORIC DEAL SOURCE



Source: CBRE Research, CBRE Data Center Solutions, H1 2019.

AVERAGE ASKING RATES

	Min	Max
5-10 MW	\$100	\$115
1-4 MW	\$115	\$120
250-500 KW	\$150	\$175

Source: CBRE Research, CBRE Data Center Solutions, H1 2019.

CHARLOTTE/RALEIGH



COLOCATION INSIGHTS

- The first half of 2019 had strong absorption of more than 3 MW.
- Flexential, GIGA Data Centers and Tierpoint have a competitive supply of first-generation capacity as they combine demand from renewal expansions and net-new entrants.

MARKET TRENDS

- Geographic proximity to Northern Virginia poses a headwind to capturing larger regional requirements.
- The Charlotte data center inventory rose in early 2019. Raleigh is expected to grow in the near-term as well.

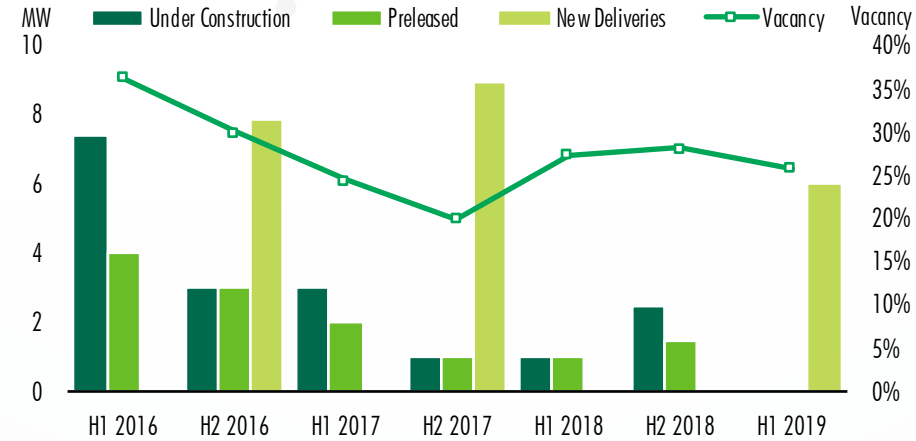
NOTABLE DEALS

- A financial services firm committed to 500 kW in Kings Mountain.
- Flexential added new supply in Charlotte.

DEVELOPMENT ACTIVITY

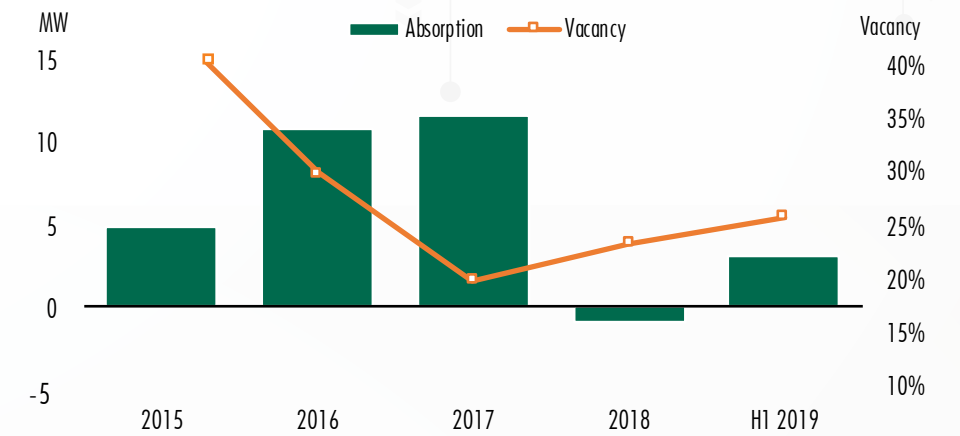
- Flexential delivered new capacity in Charlotte.
- Giga Data Centers delivered 2 MWs north of Charlotte.
- Tierpoint and CyrusOne expansions are expected in H2 2019.

MARKET INFORMATION



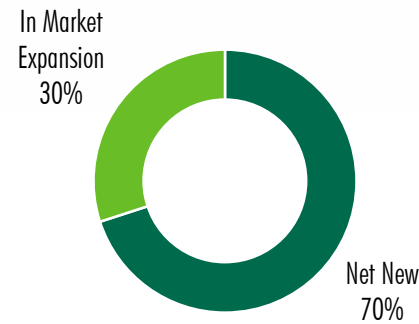
Source: CBRE Research, CBRE Data Center Solutions, H1 2019.

SUPPLY AND DEMAND

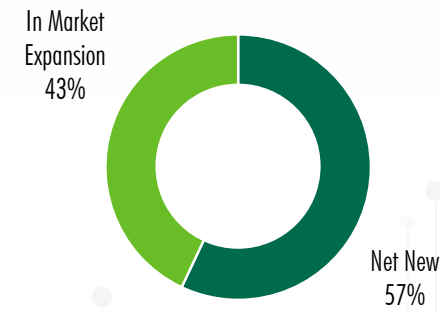


Source: CBRE Research, CBRE Data Center Solutions, H1 2019.

H1 2019 DEAL SOURCE



HISTORIC DEAL SOURCE



Source: CBRE Research, CBRE Data Center Solutions, H1 2019.

AVERAGE ASKING RATES

	Min	Max
5-10 MW	\$100	\$110
1-4 MW	\$110	\$120
250-500 KW	\$120	\$135

Source: CBRE Research, CBRE Data Center Solutions, H1 2019.

CHICAGO



COLOCATION INSIGHTS

- As in previous half years, most demand came from organic growth as availabilities favored smaller deployments in H1 2019.
- Supply increased as Digital Realty, QTS and Server Farm delivered capacity.
- Element Critical purchased two data centers that will be retrofitted, bringing more options to the Wood Dale market.
- Market vacancy exceeded 14% for the first time due to larger requirements going to other markets.

MARKET TRENDS

- The state of Illinois has approved a new tax-incentive plan to drive data center development. The plan is focused on providing tax exemptions on data center equipment for 10 years with a minimum investment of \$250 million in the facility and the creation 20 full-time jobs.
- The combination of the new legislation and current development is creating optimism for larger requirements in Chicago.
- This legislation is a new trend and creates momentum moving forward in Chicago as there has been a lag in past quarters due to higher total occupancy costs and operational expenditure.

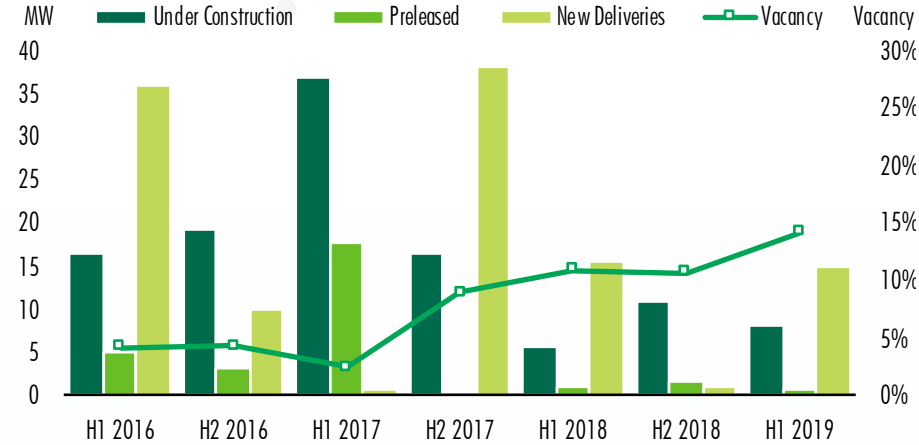
NOTABLE DEALS

- A software company committed to 2 MW.

DEVELOPMENT ACTIVITY

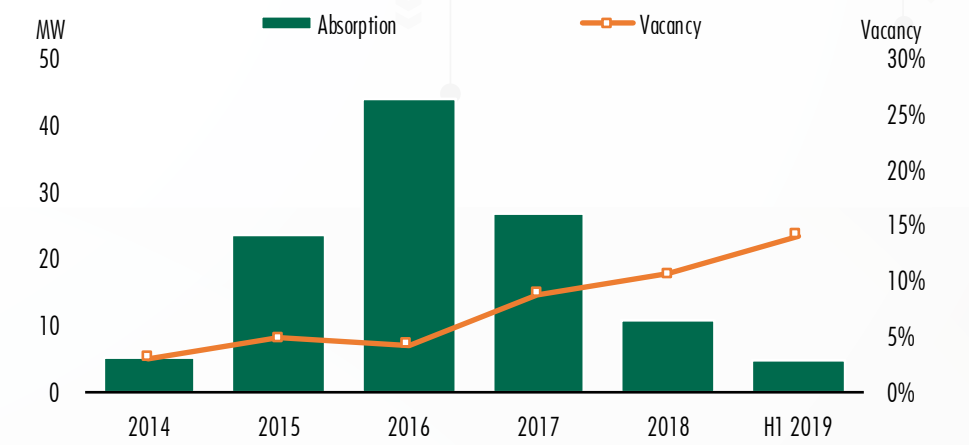
- CoreSite is developing the first phase of CH2, with 2 MW of capacity.
- Digital Realty completed its Franklin Park capacity with a 6.4 MW delivery in the 9377 Grand Ave Building.

MARKET INFORMATION



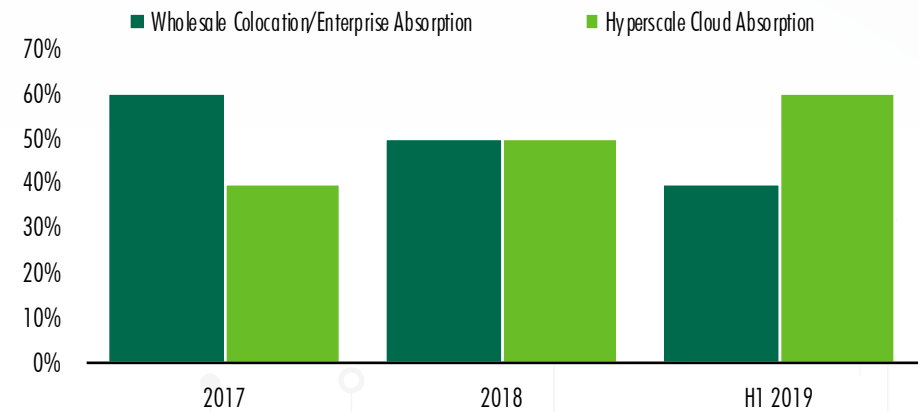
Source: CBRE Research, CBRE Data Center Solutions, H1 2019.

SUPPLY AND DEMAND



Source: CBRE Research, CBRE Data Center Solutions, H1 2019.

HISTORICAL COLOCATION VS. CLOUD ABSORPTION



Source: CBRE Research, CBRE Data Center Solutions, H1 2019.

AVERAGE ASKING RATES

	Min	Max
5-10 MW	\$100	\$110
1-4 MW	\$100	\$120
250-500 KW	\$125	\$140

Source: CBRE Research, CBRE Data Center Solutions, H1 2019.

DALLAS/FT. WORTH



COLOCATION INSIGHTS

- High availability has created low barriers to market entry.
- 34 MW of additional development is underway at CyrusOne, DataBank, Flexential, Equinix, QTS, Stream and Stack Infrastructure. The pipeline includes a planned 16 MW facility by Raging Wire.
- The steady demand is focused on first-generation facilities stemming from further enterprise migration, as well as adaptable connectivity and spend options for occupiers.

MARKET TRENDS

- Pricing, operational expenses, PUE and deal structure are more competitive than they have ever been in the Dallas/Ft. Worth market. The availability of first-generation space and slow 2019 absorption has created a tenant-friendly market in DFW.
- While demand historically has focused more on enterprise requirements, there were numerous hyperscale cloud provider requirements in H1 2019.
- Organic growth of companies in Dallas is expected to create net-new absorption, as a robust fiber and connectivity platform enable corporations to maintain their growth strategies.

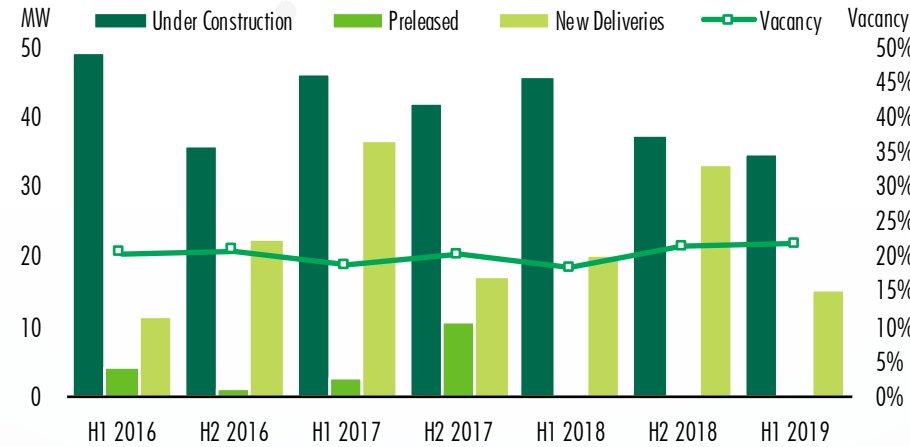
NOTABLE DEALS

- Social media companies completed multiple deals, including a 6 MW and a 4 MW requirement.
- A federal IT services organization committed to 4 MW.
- An automotive technology company inked a deal for 2 MW.

DEVELOPMENT ACTIVITY

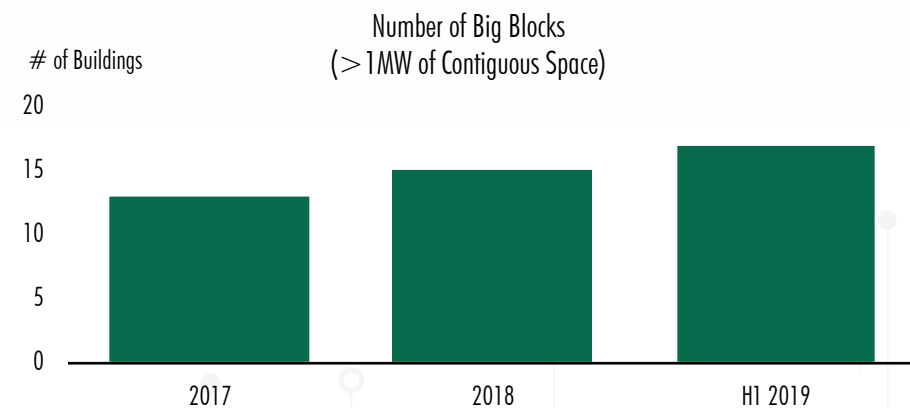
- Stream Data Centers' 3 MW Phase 1 (138,150 sq. ft.) is in development.
- Equinix is developing a 9.2 MW (phase 1) facility totaling approximately 250,000 sq. ft.
- A global technology company is building a \$600 million facility in Ellis County.

MARKET INFORMATION



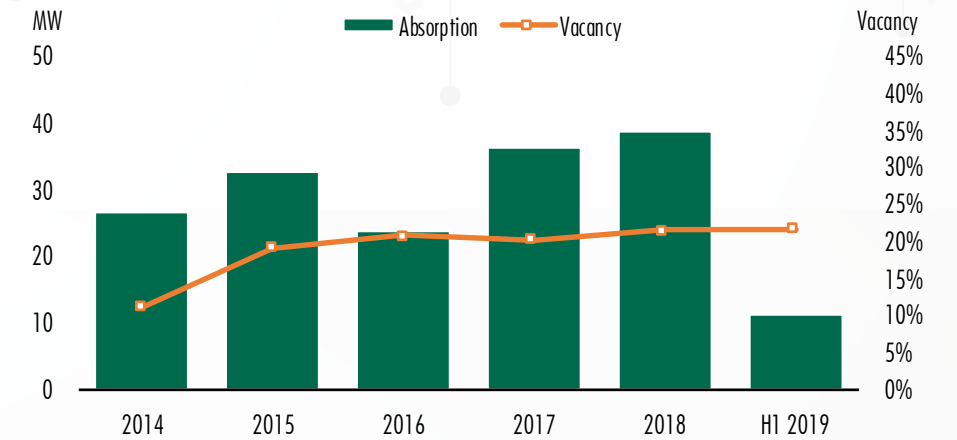
Source: CBRE Research, CBRE Data Center Solutions, H1 2019.

BIG BLOCK AVAILABILITY



Source: CBRE Research, CBRE Data Center Solutions, H1 2019.

SUPPLY AND DEMAND



Source: CBRE Research, CBRE Data Center Solutions, H1 2019.

AVERAGE ASKING RATES

	Min	Max
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250-500 KW	\$105	\$155

Source: CBRE Research, CBRE Data Center Solutions, H1 2019.

DENVER



0.5 MW
Net Absorption



82.7MW
Total Inventory



0.0 MW Under
Construction



\$0.07-\$0.08
Power Rate



22.6%
Vacancy

COLOCATION INSIGHTS

- Demand in H1 2019 mirrored past half years with smaller enterprise requirements averaging 500 kW.
- CoreSite's delivery at its downtown facility added 1.4 MW of supply to the market, which can attract users with low-latency needs.

MARKET TRENDS

- The market has potential to grow an additional 40 MW via planned facilities by EdgeConnex, Flexential, Iron Mountain and H5.
- Denver is a very connected market to the headquarters of multiple fiber and network providers. This offers potential provisioning for future hyperscale deployments.
- The diversity of options for occupiers will continue to keep Denver a tenant-favorable market.
- Denver currently does not have an incentive program for data center development that could help rapidly grow the market.

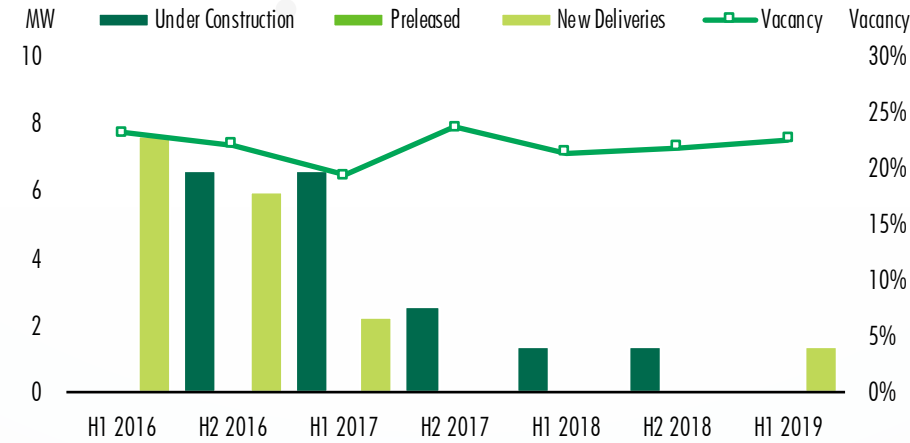
NOTABLE DEALS

- Centura Health completed a colocation deal.
- A Fortune 500 company completed an in-market expansion.

DEVELOPMENT ACTIVITY

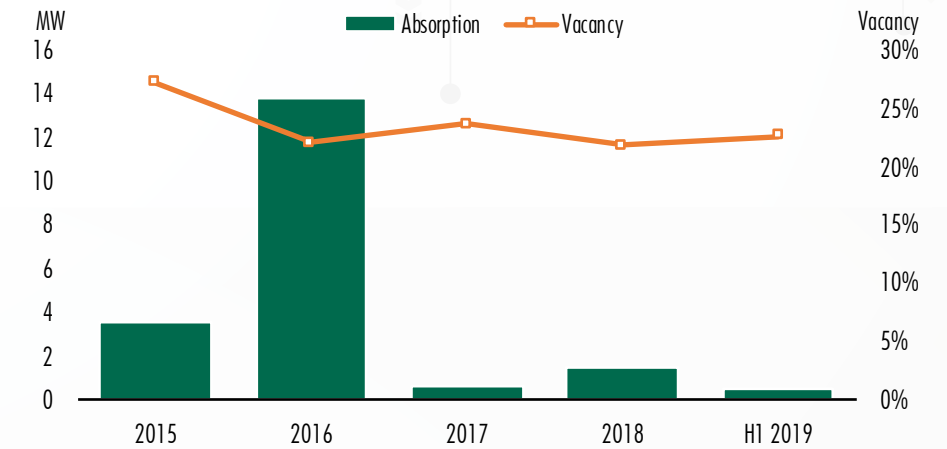
- Chirisa acquired a PayPal data center.

MARKET INFORMATION



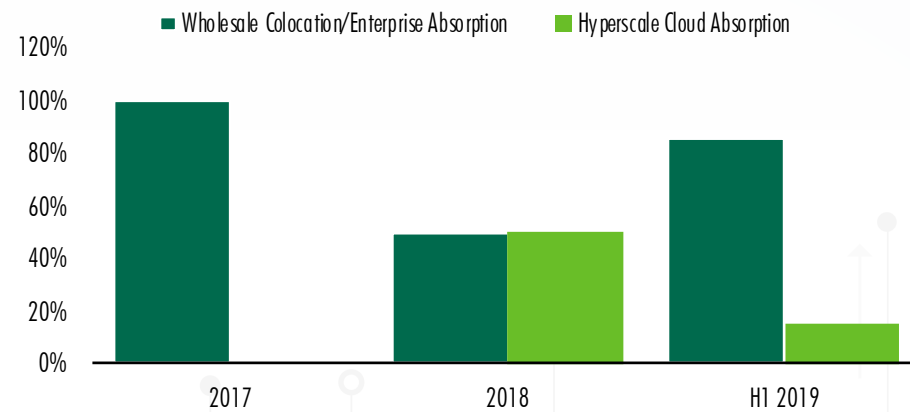
Source: CBRE Research, CBRE Data Center Solutions, H1 2019.

SUPPLY AND DEMAND



Source: CBRE Research, CBRE Data Center Solutions, H1 2019.

COLOCATION VS. CLOUD ABSORPTION



Source: CBRE Research, CBRE Data Center Solutions, H1 2019.

AVERAGE ASKING RATES

	Min	Max
5-10 MW	\$100	\$110
1-4 MW	\$110	\$125
250-500 KW	\$125	\$145

Source: CBRE Research, CBRE Data Center Solutions, H1 2019.

HOUSTON



COLOCATION INSIGHTS

- Record absorption is attributable to the delivery of a 100% immersion-cooled facility for an oil and gas user.
- Availability in Houston is best positioned to absorb hybrid colocation-based strategies with a diversity of providers, including CyrusOne, Data Foundry, Digital Realty, Equinix, EdgeConneX, Netrality and Stream.

MARKET TRENDS

- Historically, market activity has been primarily fueled by oil and gas companies along with health-care suppliers.
- Providers are positioning themselves for demand by implementing additional flexible connectivity options and increasing cloud access as disaster recovery efforts remain top-of-mind in the market.
- In the near-term, enterprise workloads may take advantage of the well-connected Houston commercial real estate market.

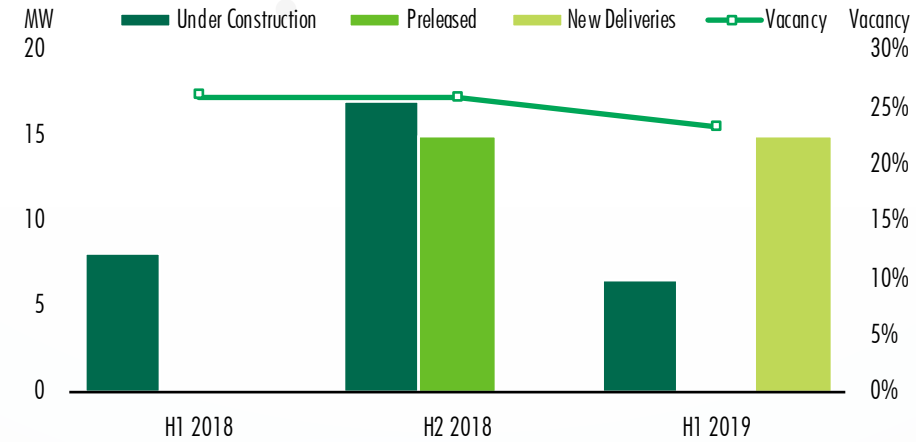
NOTABLE DEALS

- DownUnder GeoSolutions moved into its new 15-MW space at Skybox Datacenters.
- An oil and gas company leased 450 kW of capacity.

DEVELOPMENT ACTIVITY

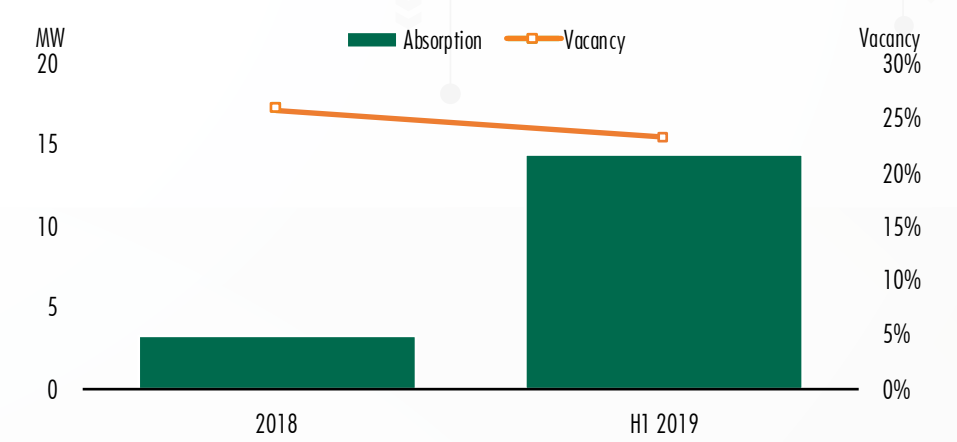
- Data Foundry is under construction on 2 MW for an expansion of existing capacity.

MARKET INFORMATION



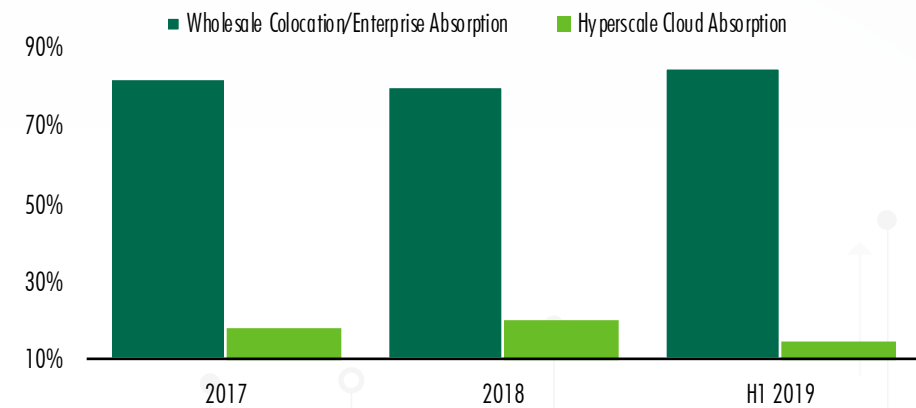
Source: CBRE Research, CBRE Data Center Solutions, H1 2019.

SUPPLY AND DEMAND



Source: CBRE Research, CBRE Data Center Solutions, H1 2019.

COLOCATION VS. CLOUD ABSORPTION



Source: CBRE Research, CBRE Data Center Solutions, H1 2019.

AVERAGE ASKING RATES

	Min	Max
5-10 MW	\$100	\$110
1-4 MW	\$115	\$130
250-500 KW	\$130	\$150

Source: CBRE Research, CBRE Data Center Solutions, H1 2019.

MINNEAPOLIS



COLOCATION INSIGHTS

- Databank delivered over 1 MW in H1 2019, with more than 50% of it preleased.
- More than 250 kW are available at each of the following facilities: Cyxtera, DataBank, DCI Holdings, Flexential, IronGate and Stream.

MARKET TRENDS

- The market regularly competes for regional requirements and usually is shortlisted due to the presence of multiple providers, network connectivity options and strong economic incentives for new capacity.
- The presence of Fortune 1000 companies in the greater Minneapolis metro area drives demand for in-market deployments needing cloud connectivity.

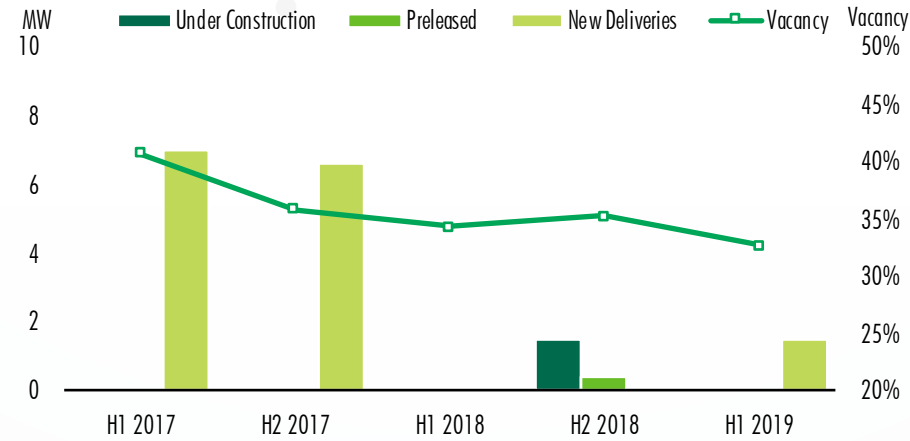
NOTABLE DEALS

- Flexential completed a 300 kW deal with a financial trading company.
- Databank completed 695 kW deals with information management, security and financial service companies.
- Stream landed a 100 kW requirement with a cloud service provider.

DEVELOPMENT ACTIVITY

- Three existing service providers are considering development of additional facilities.
- Mix of higher-density requirements and enterprise is actively searching for colocation capacity.

MARKET INFORMATION



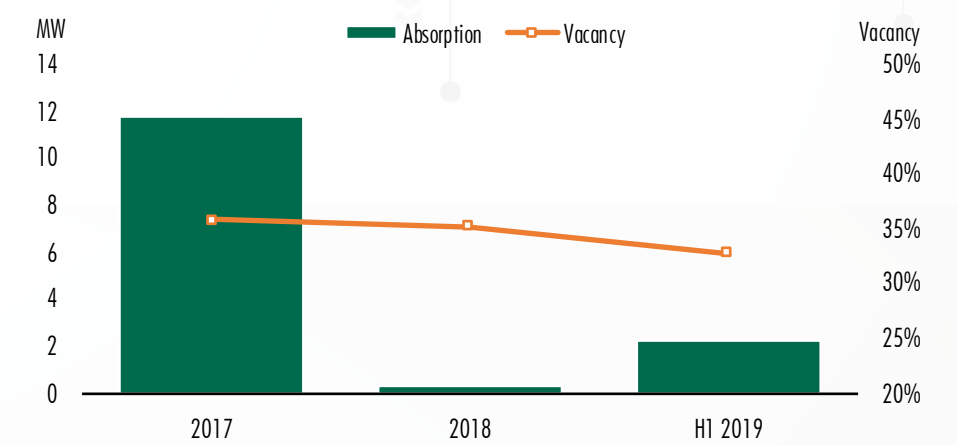
Source: CBRE Research, CBRE Data Center Solutions, H1 2019.

HISTORIC DEAL SOURCE



Source: CBRE Research, CBRE Data Center Solutions, H1 2019.

SUPPLY AND DEMAND



Source: CBRE Research, CBRE Data Center Solutions, H1 2019.

AVERAGE ASKING RATES

	Min	Max
5-10 MW	\$100	\$110
1-4 MW	\$110	\$135
250-500 KW	\$130	\$145

Source: CBRE Research, CBRE Data Center Solutions, H1 2019.

MONTREAL/TORONTO



240.6 MW
Total Inventory



45.0 MW Under
Construction



\$0.03-\$0.13
Power Rate



23.2%
Vacancy

COLOCATION INSIGHTS

- Digital Realty and Urbacon Data Center Solutions remain the largest wholesale providers in Toronto and continue to pursue growing market share.
- Supply in Montreal is growing rapidly as Colo-D/Cologix, Compass/Root, eStructure Data Centers, GI Partners, Hypertec and Vantage have capacity under construction or planned.
- Both markets are openly available to capacity requirements greater than 1 MW due to a diversity of provider solutions.

MARKET TRENDS

- Toronto and Montreal requirements are focused on hyperscale activity with Montreal taking advantage of inexpensive hydroelectric power costs and lower total occupancy costs.
- U.S.-based providers and investors are expanding footprints into Canadian markets as demand pursues advantageous operational expense models.
- In addition to bottom-line numbers, Canadian data center markets allow providers to provide clients with appropriate data sovereignty, which will keep the market at the top of provider and occupier lists.

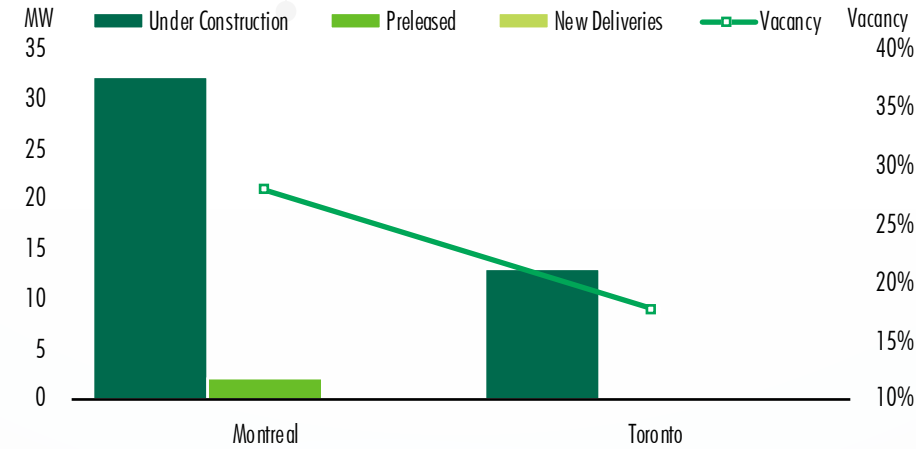
NOTABLE DEALS

- Vantage Data Centers bought 4Degrees.
- Cologix acquired Colo-D in Montreal.
- Cologix bought Metro Optic.
- A global technology company leased 27 MW in Toronto.

DEVELOPMENT ACTIVITY

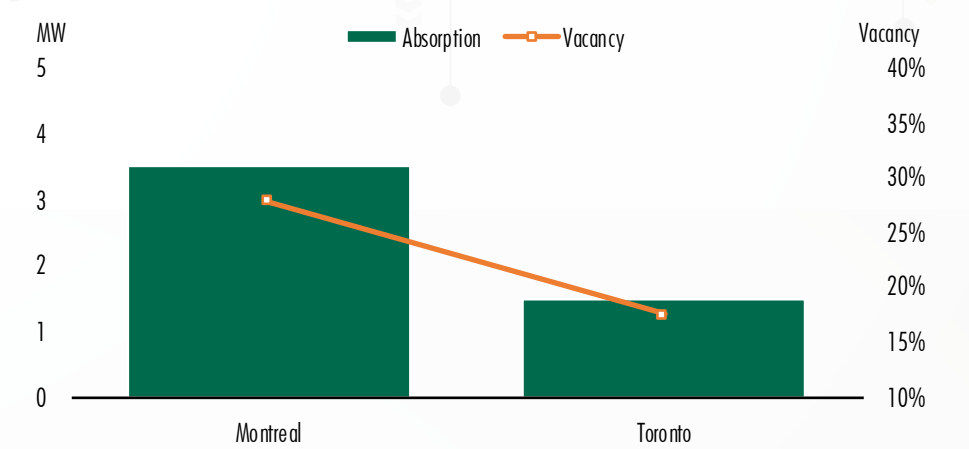
- Digital Realty announced the second phase of 1 Century Place in Toronto totaling 16 MW.
- Server Farm announced a 6 MW revitalization in Toronto.
- Vantage expanded its two Quebec facilities.

MARKET INFORMATION



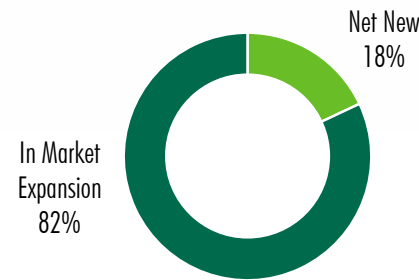
Source: CBRE Research, CBRE Data Center Solutions, H1 2019.

SUPPLY AND DEMAND

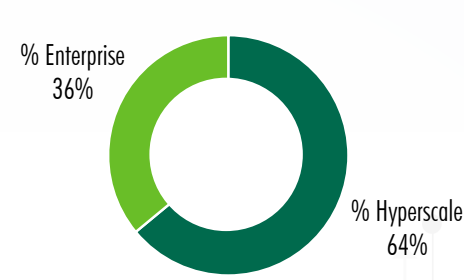


Source: CBRE Research, CBRE Data Center Solutions, H1 2019.

HISTORIC DEAL SOURCE



TENANTS IN THE MARKET



Source: CBRE Research, CBRE Data Center Solutions, H1 2019.

AVERAGE ASKING RATES

	Min	Max
5-10 MW	\$102	\$118
1-4 MW	\$110	\$130
250-500 KW	\$130	\$155

Source: CBRE Research, CBRE Data Center Solutions, H1 2019.

NEW YORK TRI-STATE



COLOCATION INSIGHTS

- Demand reached near record levels with 6 MW of absorption from enterprise users at CoreSite, CyrusOne and Digital Realty.
- Deal sizes increased to more than 1 MW from a range of 150 kW to 250 kW. Most of these transactions were by financial companies focusing on high-performance compute and expansion to meet current business objectives.
- Digital Realty remains the market-share leader of inventory and delivered the first new supply to the market in recent quarters, adding more than 2 MW of preleased capacity.

MARKET TRENDS

- Many providers with powered-shell and planned capacity, including CoreSite, CyrusOne, DataGryd, Digital Realty, QTS and Sabey, remain optimistic that larger requirements will be drawn to the market due to the diversity of connectivity and population densities.
- The market continues to need a blend of retail and wholesale deployments. Providers offer flexibility and agility for customers through unique partnerships with cloud enablement and managed-service companies.
- Lease and contract terms are adapting to allow for both near- and long-term expansion goals as enterprises seek growth into contracted powered shell.

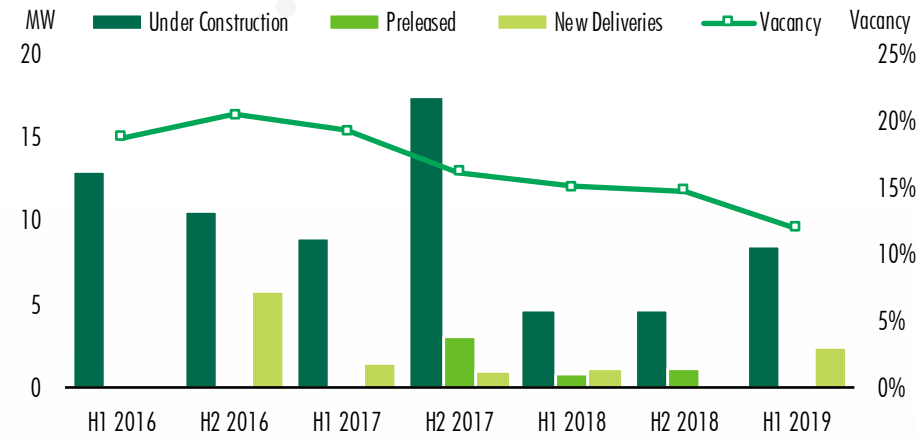
NOTABLE DEALS

- Digital Realty leased space to global financial companies at two sites.
- DXC purchased a Credit Suisse data center in Clifton, NJ.

DEVELOPMENT ACTIVITY

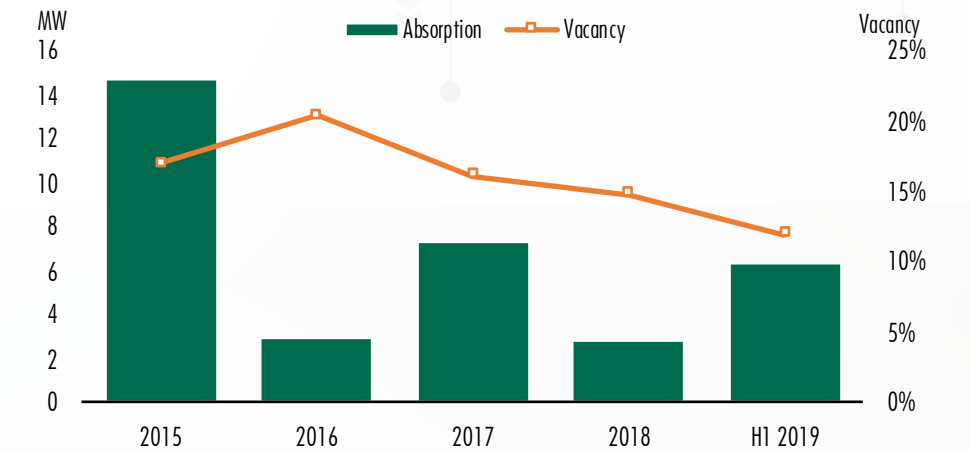
- Several 1+ MW requirements from other financial companies are expected in H2 2019.

MARKET INFORMATION



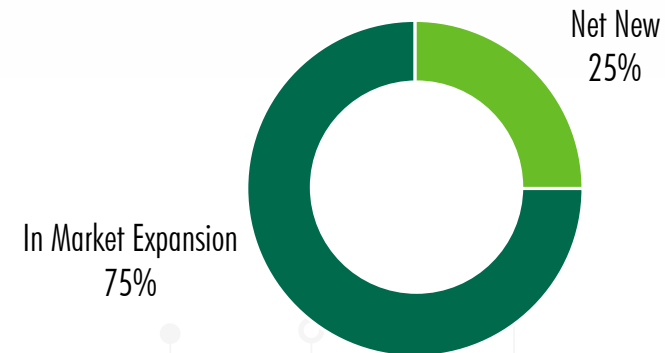
Source: CBRE Research, CBRE Data Center Solutions, H1 2019.

SUPPLY AND DEMAND



Source: CBRE Research, CBRE Data Center Solutions, H1 2019.

HISTORIC DEAL SOURCE



Source: CBRE Research, CBRE Data Center Solutions, H1 2019.

AVERAGE ASKING RATES

	Min	Max
5-10 MW	\$110	\$120
1-4 MW	\$120	\$130
250-500 KW	\$130	\$150

Source: CBRE Research, CBRE Data Center Solutions, H1 2019.

NORTHERN VIRGINIA



COLOCATION INSIGHTS

- H1 2019 deliveries from Digital Realty, QTS and Sentinel were largely preleased in the previous 12 months.
- Providers continue to implement adaptable and flexible solutions for occupiers as they seek to remain competitive and continue to meet delivery commitments.

MARKET TRENDS

- Northern Virginia is the first data center market in the world to surpass 1,000 MW and will grow the market an additional 25% this year.
- Aligned, CloudHQ, Compass, CyrusOne, Digital Realty, Iron Mountain, Raging Wire and Sabey are all adding new capacity.
- Demand accounted for more than 125 MW in H1 2019, which is more than 71% of the record annual total in 2018.
- For the first time in five years, providers are building speculative facilities, land-banking sites in Loudoun and Prince William counties.

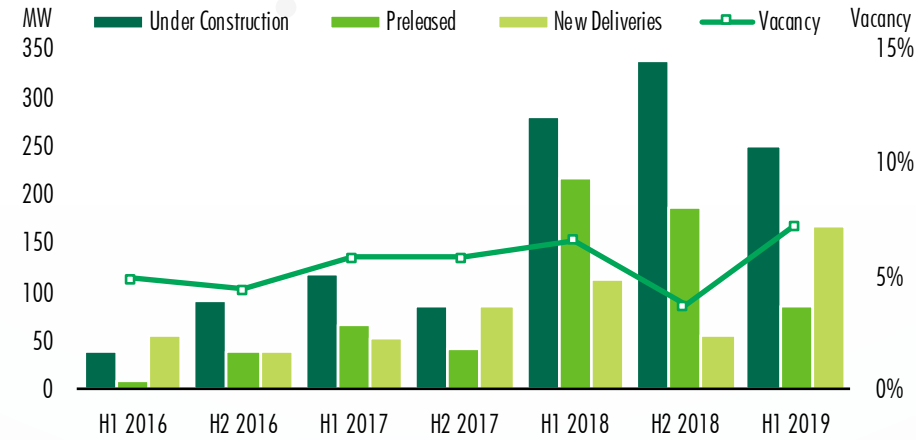
NOTABLE DEALS

- Notable large requirements landed in H1 2019, including a global technology company for 41 MW and a social networking company for 28 MW.

DEVELOPMENT ACTIVITY

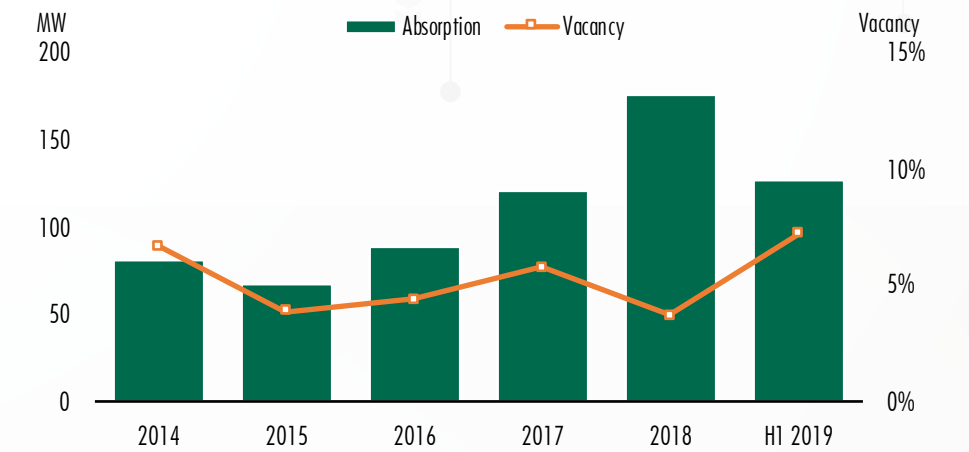
- CoreSite, Digital Realty, QTS, Sentinel and Vantage all delivered capacity in H1 2019.

MARKET INFORMATION



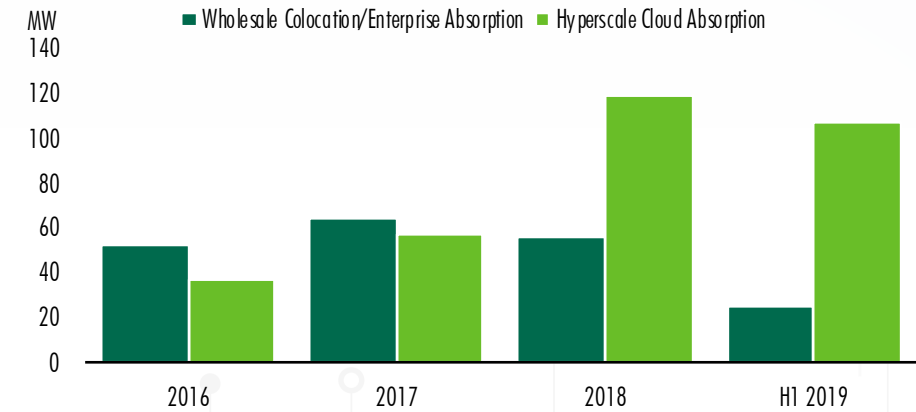
Source: CBRE Research, CBRE Data Center Solutions, H1 2019.

SUPPLY AND DEMAND



Source: CBRE Research, CBRE Data Center Solutions, H1 2019.

COLOCATION VS. CLOUD ABSORPTION



Source: CBRE Research, CBRE Data Center Solutions, H1 2019.

AVERAGE ASKING RATES

	Min	Max
5-10 MW	\$80	\$100
1-4 MW	\$85	\$110
250-500 KW	\$100	\$130

Source: CBRE Research, CBRE Data Center Solutions, H1 2019.

PHOENIX



COLOCATION INSIGHTS

- The market is poised for rapid growth as providers increase deliverable capacity in the second half of the year.
- The number of providers with capacity for sale continues to grow, including Aligned Energy, CyrusOne, Digital Realty, H5, Iron Mountain and phoenixNAP. The market absorbed 6.6 MW of capacity in H1 2019.
- The first delivery of speculative capacity for EdgeCore was 6 MW in Mesa.
- Recent new supply has increased the vacancy rate.
- New developments were announced by Compass, QTS, RagingWire, Stream and Vantage.

MARKET TRENDS

- The Phoenix market is sprawling with new developments in Goodyear, Mesa, Chandler and North Phoenix.
- Phoenix is positioned to capitalize on hyperscale growth and increased average deal sizes.
- Phoenix offers competitive power, tax incentives and a strong labor pool, which has become a regional differentiator.
- The current focus is on in-moment availability and an emphasis on fast-track construction will enable tenants to quickly absorb space in H2 2019.

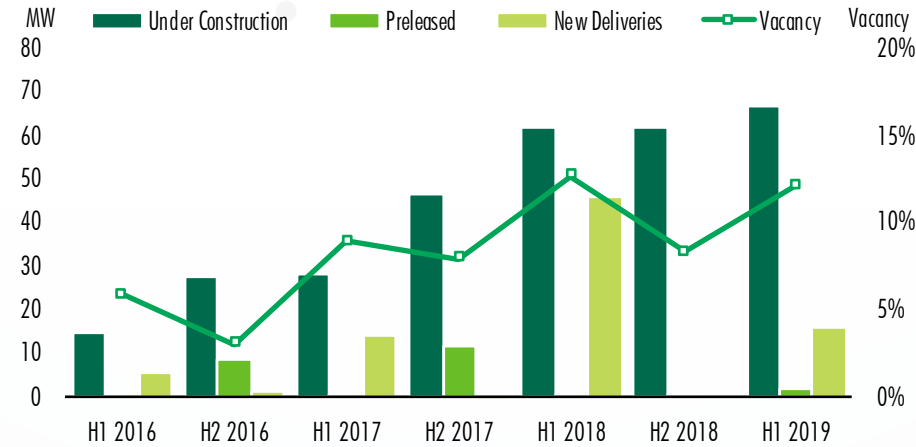
NOTABLE DEALS

- A global technology and transportation company leased new-power large blocks of capacity in Chandler and Phoenix.

DEVELOPMENT ACTIVITY

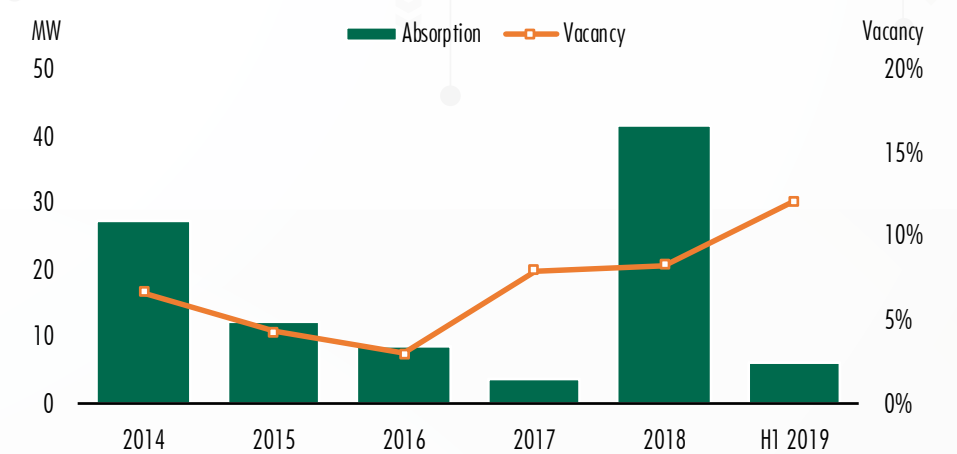
- Iron Mountain is developing a new 300,000 sq. ft. building.
- Aligned Energy is expanding a 100,000 sq. ft. powered shell.
- A global technology company is developing a facility in Goodyear.

MARKET INFORMATION



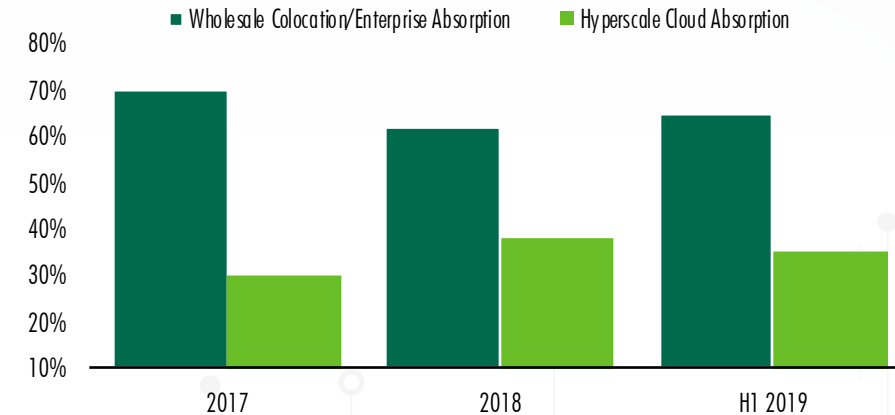
Source: CBRE Research, CBRE Data Center Solutions, H1 2019.

SUPPLY AND DEMAND



Source: CBRE Research, CBRE Data Center Solutions, H1 2019.

COLOCATION VS. CLOUD ABSORPTION



Source: CBRE Research, CBRE Data Center Solutions, H1 2019.

AVERAGE ASKING RATES

	Min	Max
5-10 MW	\$100	\$110
1-4 MW	\$110	\$120
250-500 KW	\$120	\$135

Source: CBRE Research, CBRE Data Center Solutions, H1 2019.

SEATTLE



COLOCATION INSIGHTS

- Absorption totaled 1 MW in H1 2019, primarily from enterprises seeking localized capacity.
- As a top technology employment center, Seattle is a strategic market for providers.
- With a 15.6% vacancy rate, slightly below historic averages, the market has many tenant-ready options for occupiers.

MARKET TRENDS

- With strategic Northwest regional access for connectivity, Seattle is drawing investors like Lincoln Rackhouse, which recently purchased Bytegrid's 50,000-sq.-ft. facility.
- Providers and investors have been pursuing sale-leasebacks of under-utilized legacy assets. This allows for a potential supply increase to compete with existing providers and offer new capacity.

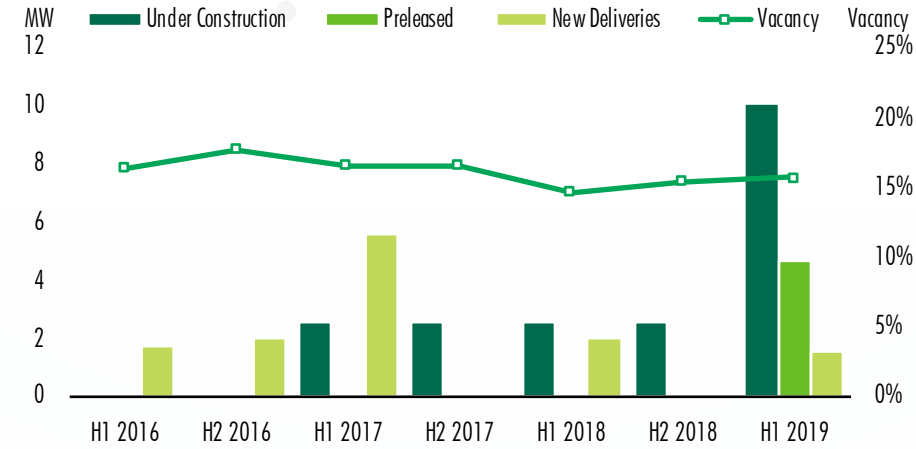
NOTABLE DEALS

- Sabey Data Centers added two new 1 MW+ tenants at Intergate.East.

DEVELOPMENT ACTIVITY

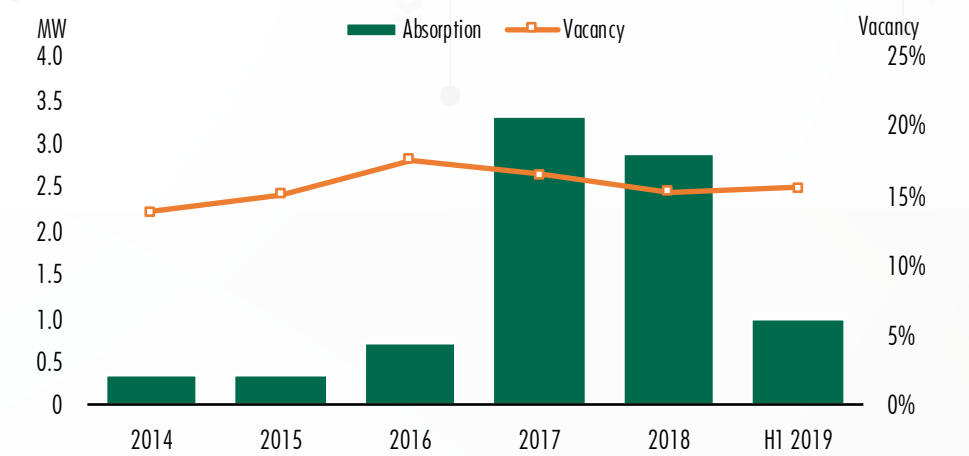
- Sabey Data Centers is developing an additional 6 MW of capacity at Building 3 of Intergate.East.

MARKET INFORMATION



Source: CBRE Research, CBRE Data Center Solutions, H1 2019.

SUPPLY AND DEMAND



Source: CBRE Research, CBRE Data Center Solutions, H1 2019.

HISTORIC DEAL SOURCE



Source: CBRE Research, CBRE Data Center Solutions, H1 2019.

AVERAGE ASKING RATES

	Min	Max
5-10 MW	\$105	\$115
1-4 MW	\$115	\$125
250-500 KW	\$125	\$145

Source: CBRE Research, CBRE Data Center Solutions, H1 2019.

SILICON VALLEY



COLOCATION INSIGHTS

- Strong demand continues to keep Silicon Valley vacancy constrained at 7.0%.
- Positive market sentiment exists for the 30+ MW currently being built by CoreSite, Cyxtera, Element Critical and Vantage.
- Demand has been dominated by large cloud operators and price points have remained above industry averages.

MARKET TRENDS

- New entrants to the marketplace are well into the entitlement process, including CyrusOne, EdgeCore, Lightstone and RagingWire.
- Digital Realty is seeking approval for a new 100-MW development on Walsh Avenue.
- New offerings include hybrid shell and alternative infrastructure that focus on improving redundancy and resiliency.

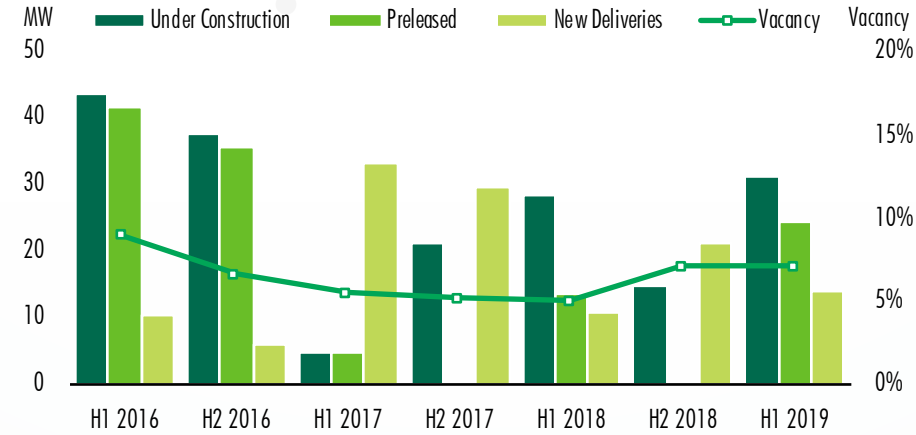
NOTABLE DEALS

- Vantage landed a 21-MW requirement from a cloud operator.
- CoreSite signed a 12-MW deal with a cloud operator.
- Stack Infrastructure completed a 4-MW deal with a cloud operator.

DEVELOPMENT ACTIVITY

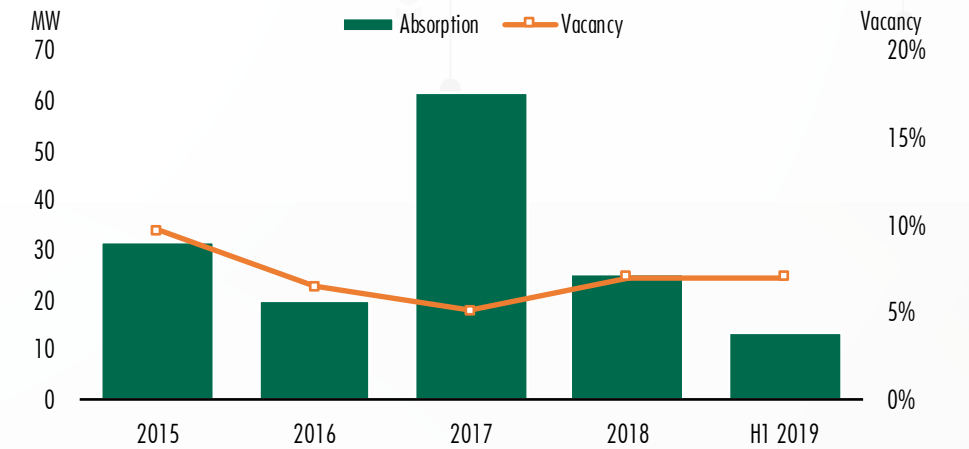
- Vantage and CoreSite are underway with 12 MW and have additional capacity planned.

MARKET INFORMATION



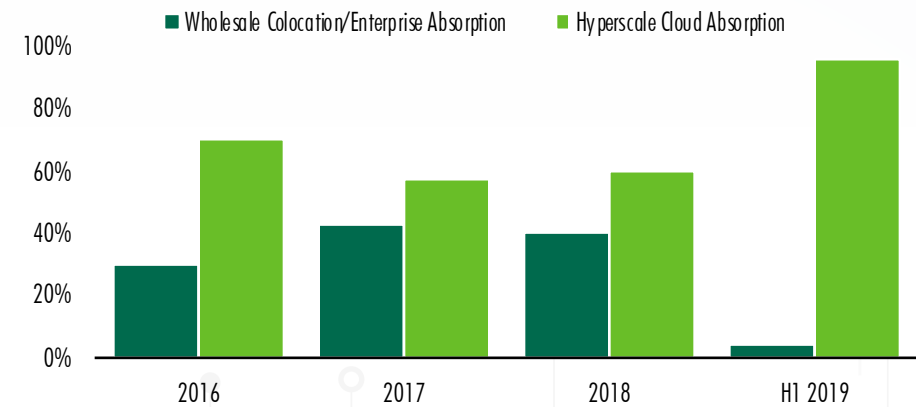
Source: CBRE Research, CBRE Data Center Solutions, H1 2019.

SUPPLY AND DEMAND



Source: CBRE Research, CBRE Data Center Solutions, H1 2019.

COLOCATION VS. CLOUD ABSORPTION



Source: CBRE Research, CBRE Data Center Solutions, H1 2019.

AVERAGE ASKING RATES

	Min	Max
5-10 MW	\$110	\$125
1-4 MW	\$125	\$150
250-500 KW	\$135	\$165

Source: CBRE Research, CBRE Data Center Solutions, H1 2019.

SOUTHERN CALIFORNIA



COLOCATION INSIGHTS

- Market churn was offset by tenant expansions.
- CoreSite remains the market leader in total supply.

MARKET TRENDS

- While activity has consisted of predominantly retail colocation type transactions, hyperscalers are increasingly interested in the market. Providers remain optimistic for a hyperscaler expansion into the market as in 2017 and 2018.
- Upcoming market churn will increase the near-term vacancy rates.

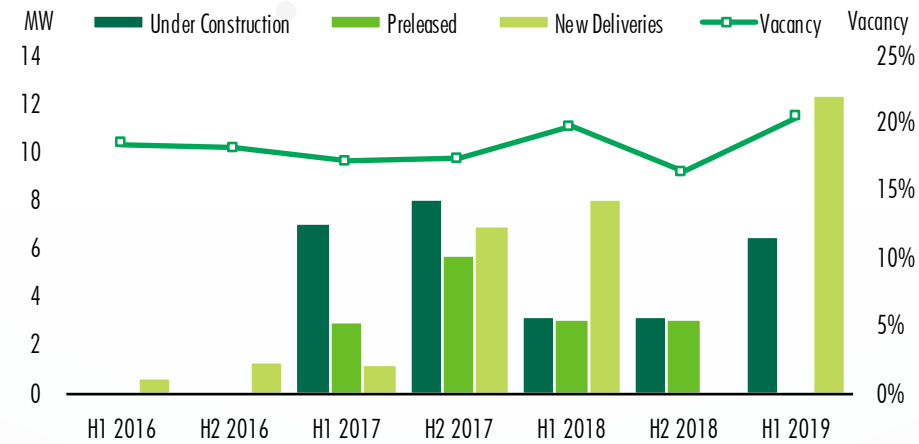
NOTABLE DEALS

- Activity consisted of predominately in-market expansions.

DEVELOPMENT ACTIVITY

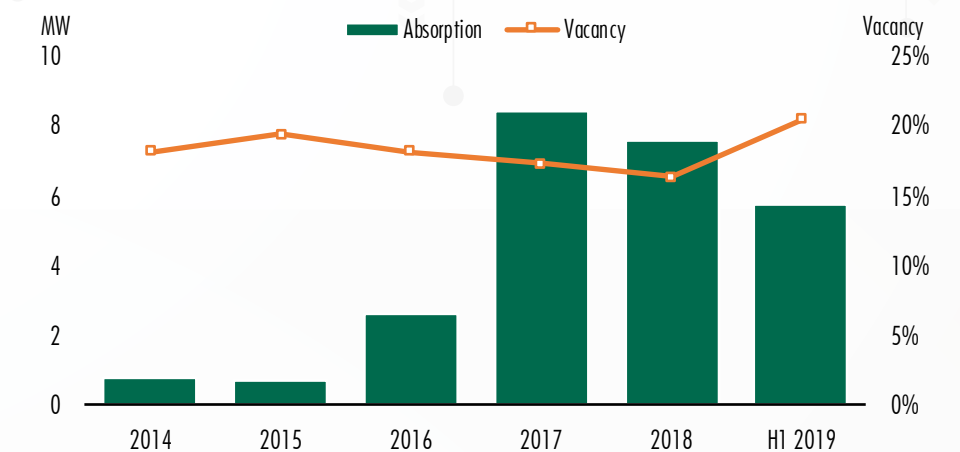
- CoreSite began construction on LA3 Phase 1 for 51,000 NRSF and planned for a total of 160,000 sq. ft. NRSF. LA3 is adjacent to CoreSite's existing LA2 building in downtown Los Angeles.

MARKET INFORMATION



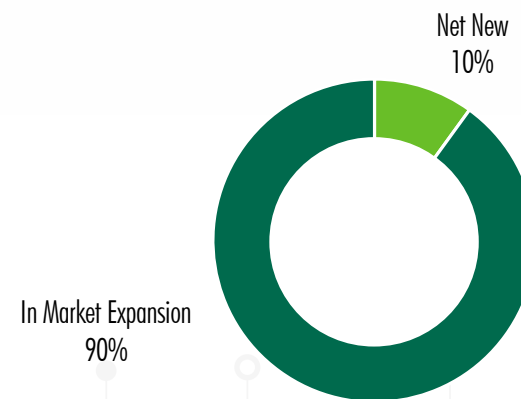
Source: CBRE Research, CBRE Data Center Solutions, H1 2019.

SUPPLY AND DEMAND



Source: CBRE Research, CBRE Data Center Solutions, H1 2019.

HISTORIC DEAL SOURCE

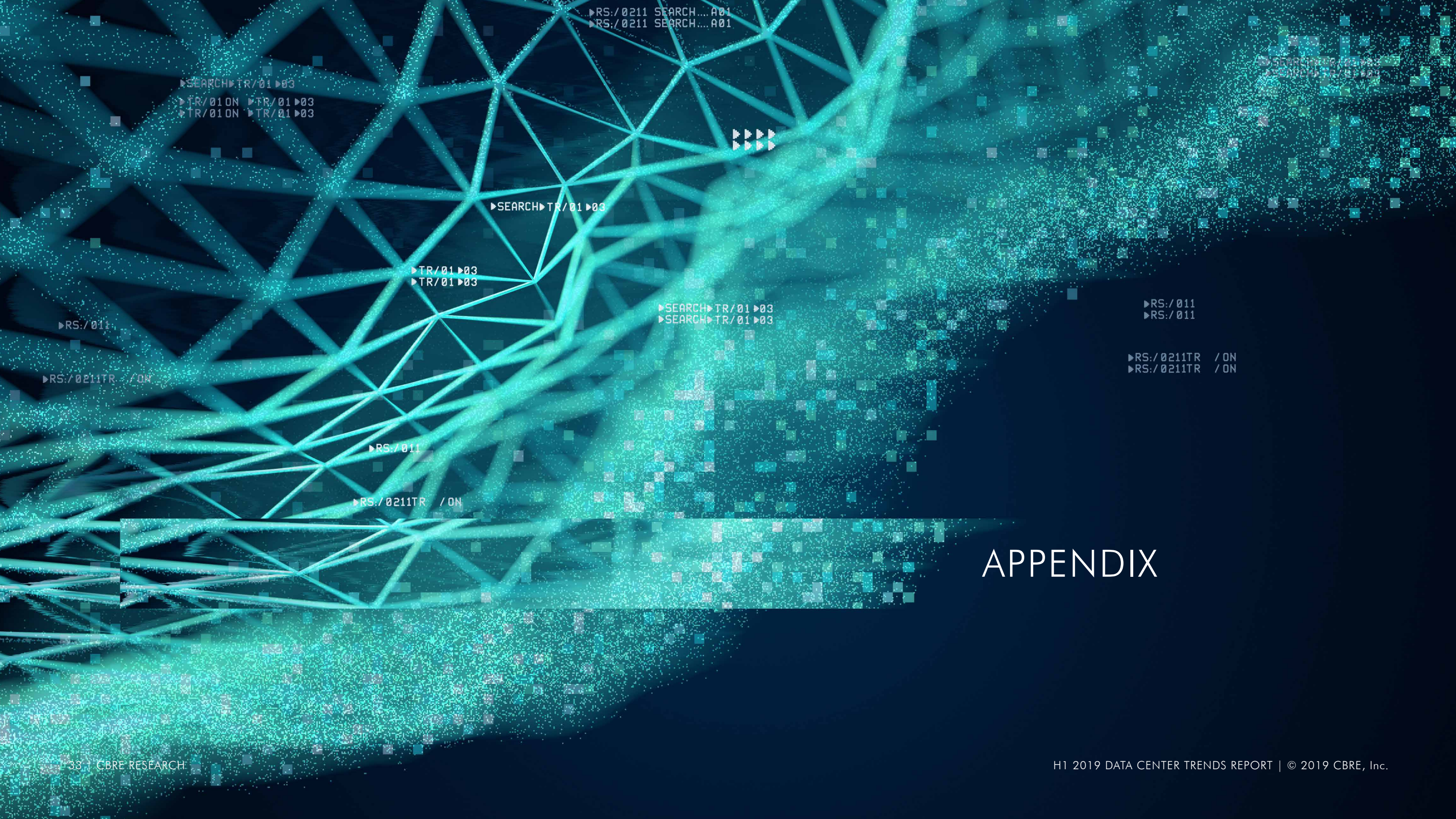


Source: CBRE Research, CBRE Data Center Solutions, H1 2019.

AVERAGE ASKING RATES

	Min	Max
5-10 MW	\$60	\$115
1-4 MW	\$80	\$115
250-500 KW	\$100	\$145

Source: CBRE Research, CBRE Data Center Solutions, H1 2019.



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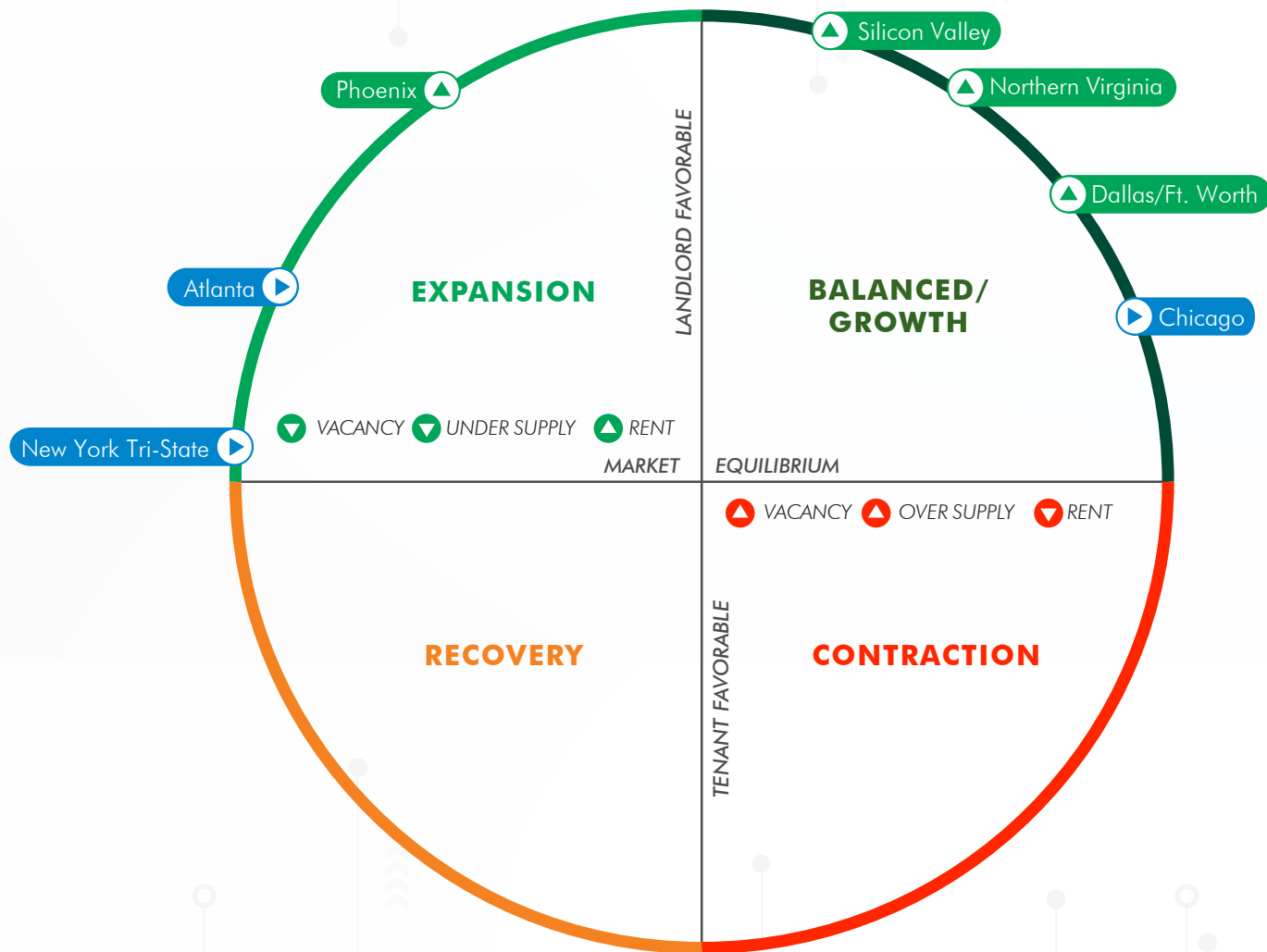
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APPENDIX

FIGURE 9
Data Center Market Cycle: Primary U.S. Markets



*The Data Center Market Cycle Graph reflects the current wholesale market conditions, taking into consideration the following variables:

- Demand (leasing, absorption, requirements in the market)
- Supply (existing vacancy, future availabilities, construction pipeline)
- Rental rate trend

Distance from the horizontal market equilibrium line generally implies the relative strength and/or weakness of a market relative to each other and their historical trends. Arrows indicate most recent trend.

Categories typically represent the following conditions:

Expansion: landlord/provider-favorable conditions; under-supplied market, strong demand, declining vacancy and upward pressure on pricing.

Balanced/Growth: landlord/provider-favorable conditions; new supply more evenly balanced, stable or slightly increasing vacancy, rent growth slowing or flat.

Contraction: tenant-favorable conditions; over-supplied market, increasing vacancy, weak demand, downward pressure on pricing.

Recovery: tenant-favorable conditions; stable or slightly declining vacancy, moderate but improved demand, rent growth flat or increasing.

Source: CBRE Research, CBRE Data Center Solutions, H1 2019.

Market Definitions

Term	Definition
Powered Shells	Purpose built or hardened shell; power and fiber to site; no equipment included.
Hyperscale Cloud Service Provider	Multi-megawatt user, typically 5+ MW and larger.
Wholesale Colocation	Building shell & infrastructure to PDU providing space, power & cooling; generally in demised suites above 250 KW.
Retail Colocation	Building shell & infrastructure in shared environment, space generally divided by racks or cages; may include IT hardware as well as a menu of services.
Hybrid IT	A combination of cloud services, third-party colocation and owned, on-premise infrastructures.
Enterprise Data Centers	Hardened data centers; houses "mission-critical" operations of individual companies.
Data Center Net Absorption	Net change in existing/commissioned wholesale power capacity.
Data Center Power	Measured in kilowatts (kW) and megawatts (MW).

Source: CBRE Research, CBRE Data Center Solutions, H1 2019.

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