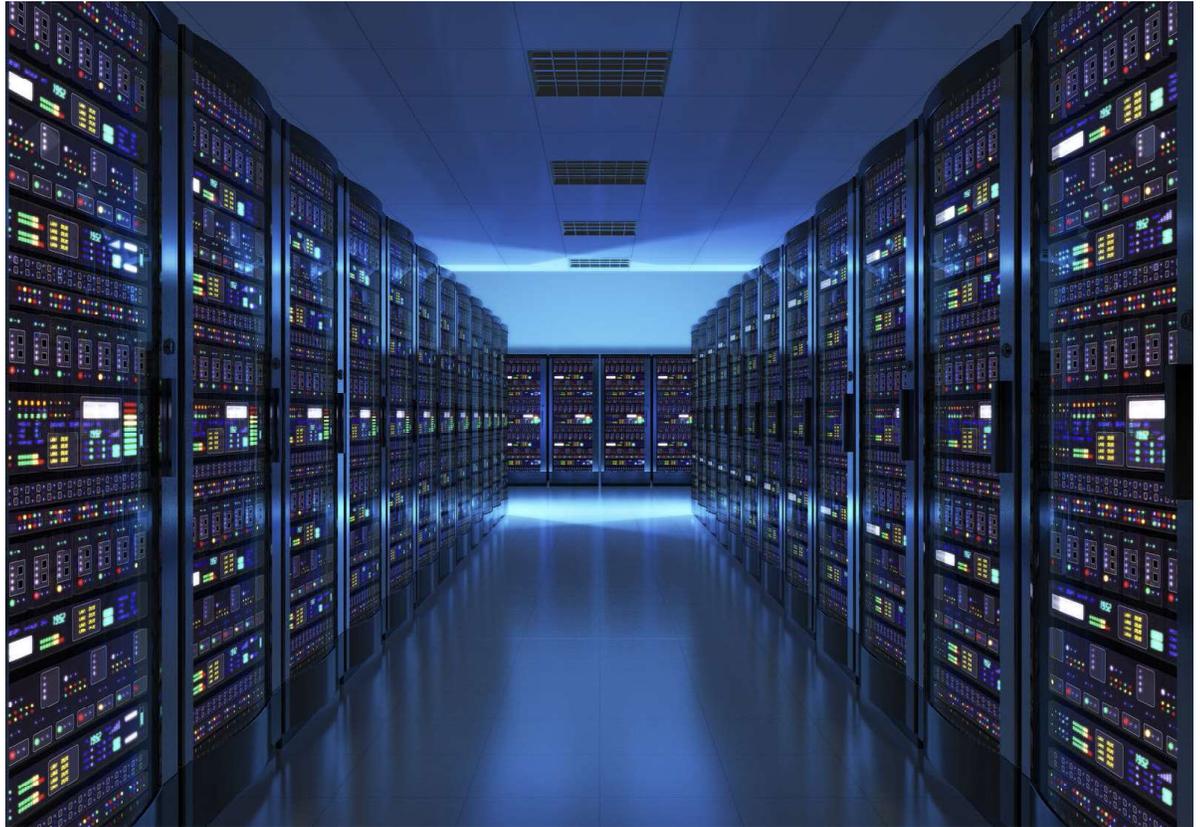


SMALLER AND BIGGER:

**Divergent
Demand Trends
Underpin a
Strong 2016**

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Introduction



KEY HIGHLIGHTS

Multi-megawatt leasing by hyperscale cloud service providers underpinned another exceptionally strong year for multi-tenant data center absorption.

Enterprise-driven requirements are generally shrinking as end users become more sophisticated at scaling or right-sizing their IT needs and incorporating cloud solutions that effectively reduce their need for traditional space and power-based colocation requirements.

More speculative data center capacity is scheduled for delivery in 2017 than in the past several years. This increase in capacity should facilitate increased leasing activity in supply-constrained markets.

Wholesale growth should continue to be robust for the sector, but demand could vary given the amount of capital that is often at risk and the way technology has shifted business needs.

The C-Suite is more focused than ever on ways to monetize under-utilized assets and capitalize on market opportunities for their legacy data center assets.

Market Fundamentals

Figure 1: Market Fundamentals

Market	Inventory (Y/Y)	Vacancy (Y/Y)	Net Absorption	Rental Rates (kW/mo)*
Northern Virginia	557 MW (↑ 97 MW)	25.7 MW / 4.6% (↑ 170 bps)	84.4 MW	\$120-\$145
Silicon Valley	155 MW (↑ 3 MW)	7.0 MW / 4.5% (↓ 580 bps)	11.7 MW	\$145-\$165
Chicago	192 MW (↑ 39 MW)	9.9 MW / 5.2% (↑ 60 bps)	36.2 MW	\$130-\$145
New Jersey/New York	155 MW (↑ 5 MW)	29.7 MW / 19.3% (↑ 70 bps)	2.8 MW	\$135-\$150
Dallas/Ft. Worth	208 MW (↑ 47 MW)	41.1MW / 19.8% (↑ 20 bps)	37.6 MW	\$120-\$145
Phoenix	153 MW (↑ 9 MW)	4.7 MW / 3.1% (↓ 130 bps)	10.3 MW	\$120-\$135
Atlanta	113 MW (↑ 9 MW)	12.9 MW / 11.4% (↓ 430 bps)	12.2 MW	\$120-\$135
Southern California	88 MW (↑ 2 MW)	15.9 MW / 18.0% (↓ 330 bps)	2.6 MW	\$130-\$160
Seattle	105 MW (↑ 3 MW)	21.5 MW / 20.6% (↓ 160 bps)	0.7 MW	\$120-\$150
Boston	60 MW (↑ 2 MW)	15.7 MW / 26.1% (↓ 460 bps)	2.8 MW	\$150-\$180

*Rental rates are quoted asking rates for 250+ kW at N+1/Tier III requirements. Arrows indicate year-over-year changes. Source: CBRE Research/CBRE Data Center Solutions, Q4 2016.

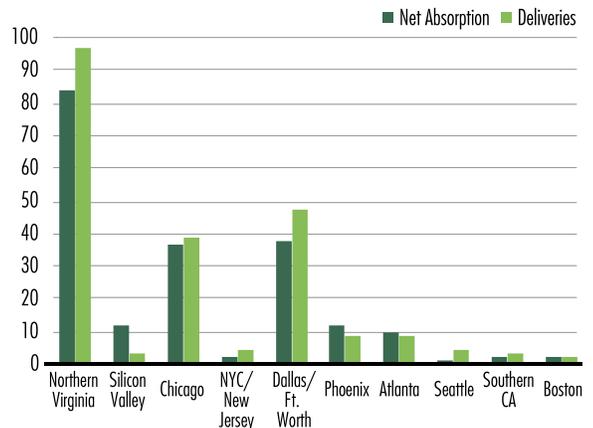
Despite the perception of slowing demand in the second half of the year, net occupancy gains across major data center markets in the U.S. nearly reached the record-highs established in 2015; leasing volume was dominated by a flurry of hyperscale Cloud Service Provider (CSP) requirements that sometimes reached in excess of 25+ megawatts (MW) each. Additionally, the rapid enterprise adoption of network-dependent technologies—mobile devices and networks, the Internet of Things, cloud services, content delivery, etc. —is putting a heightened importance on connectivity and bolstering demand in primary markets.

For the year, net absorption totaled 195 MW across the major data center markets* as tracked by CBRE, slightly below the 200+ MW of absorption in 2015. By a significant margin, the largest data center markets in the U.S. continue to grow at the fastest pace, with demand driven largely by latency

requirements, access to interconnection points and proximity to cloud hubs and large population centers.

(* Major markets in the U.S. are defined by CBRE as Atlanta, Chicago, Dallas/Fort Worth, New York/New Jersey, Northern Virginia, Phoenix and Silicon Valley.

Figure 2: Supply & Demand - 2016



Source: CBRE Research, Q4 2016.

Supply and Demand

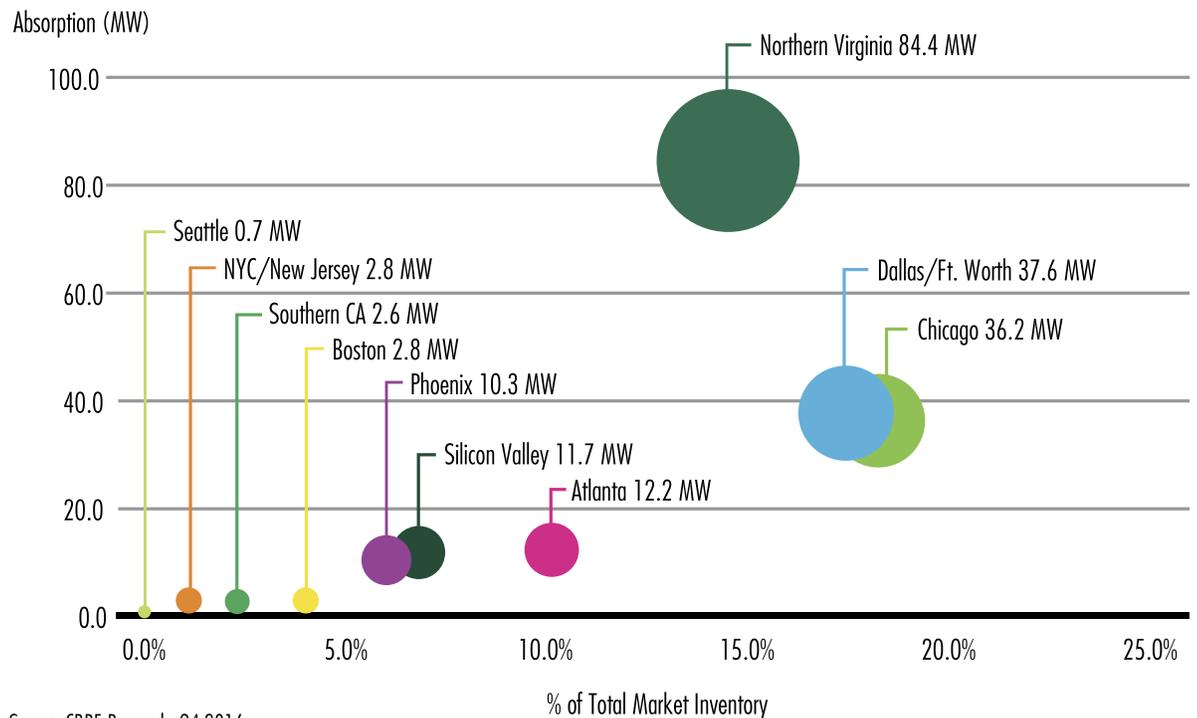
The Northern Virginia market was a clear outperformer in 2016 as net gains tallied a staggering 84.4 MW, eclipsing previous record highs. Taking into account several large pre-leases, gross leasing volume in Northern Virginia nearly exceeded 140 MW in 2016. The next closest markets in terms of net absorption were Dallas/Ft. Worth (+37.6 MW) and Chicago (+36.2 MW).

Consistent with 2015, an enormous amount of activity continues to occur as pre-leasing in future projects. More than 111 MWs of pre-leased capacity is currently under construction and is indicative of the sheer magnitude of leasing being driven by CSPs over the past several quarters. There were only a handful of multi-megawatt-sized transactions in 2016 that were not cloud-related.

While large CSP deployments dominated headlines, this also reflects a fast-evolving transformation in

the size and scope of data center requirements coming from traditional enterprise users. While computing power and information storage needs of this user base continue to soar, the accelerated adoption of cloud and managed services being incorporated into enterprise IT solutions have somewhat reduced the size of historically typical wholesale and retail colocation deals. For example, in a market like Dallas/Ft. Worth, which has yet to see the types of hyperscale CSP-driven demand as in other major markets, transaction sizes averaged 1 MW or less in 2016 despite the high volume of absorption. Given the costs involved with IT migrations, data center operators continued to see steady growth from existing tenants who not only have options to grow their footprint incrementally but also provide valuable potential revenue from increased spend on services and interconnection.

Figure 3: 2016 Net Absorption as % of Total Market Inventory



Source: CBRE Research, Q4 2016.

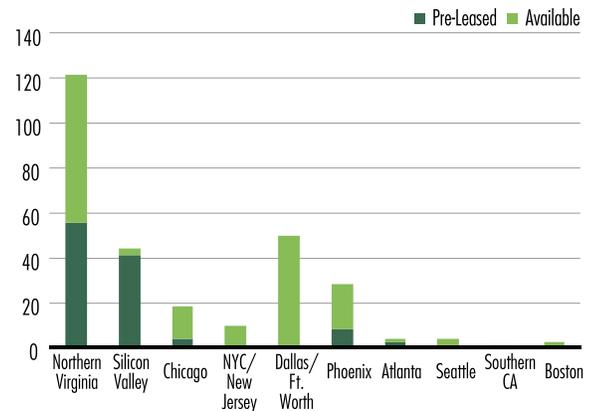
SUPPLY CONSTRAINED IN CORE MARKETS

Vacancy rates of existing/commissioned data center space in a number of major markets—Northern Virginia, Chicago, Silicon Valley and Phoenix—continued to hover at or below 5% in Q4 2016. In Silicon Valley, this translates to a scant 7 MW of available existing capacity, with few first-generation facility options available for even modestly sized wholesale requirements. However, more speculative data center capacity is scheduled for delivery in 2017 than in the past several years. This increase in capacity should facilitate and increase leasing volume in a number of markets that have been severely supply-constrained or underserved for the past several quarters.

There are currently 271 MW under construction in major markets, more than 160 MW of which are being delivered on a speculative basis. While this represents pre-leasing commitments of 41%, that figure is down from the nearly 60%-to-70% highs of earlier in the year. If two hyperscale CSP commitments are removed from the total, pre-leasing falls to only 23% of the current construction

pipeline. The largest volume of construction is in Northern Virginia (121 MW), and upwards of 40 MW of new capacity are expected in markets like Dallas/Ft. Worth and Silicon Valley. Even with the addition of much-needed new supply, market conditions in nearly all major data center markets should remain landlord-favorable in 2017 from a supply-demand balance perspective.

Figure 4: Construction Pipeline — Available & Pre-Leased Supply Under Construction



Source: CBRE Research, Q4 2016.

THE PRICING ENIGMA

Average rental rates for wholesale colocation remained largely unchanged in 2016 from the general range of \$125-to-\$145 per kilowatt per month on a modified gross basis for a typical N+1/Tier III requirement. One trend that has solidified in the past 18 to 24 months is a relatively consistent national pricing that is dictated more by redundancy needs (N vs. N+1 vs. 2N, etc.) and build-out/facility requirements (Tier II vs. Tier III vs. Tier IV) than on a space/power basis. Geographically specific variables—energy costs, taxes, incentives, etc.—continue to play a critical factor as opposed to subtle variances in rent costs market-to-market. The importance of facility configuration can be seen in second-generation space located in extremely supply-constrained markets: Despite limited options, many of these assets remain vacant, highlighting concerns that technology obsolescence

may weigh heavily on the adaptability of certain data center assets.

More importantly, pricing and provider models in the data center space are rapidly changing to the degree that even wholesale-sized (500+ kW) pricing is no longer a simplified function of rent-based space and power. Prevailing contracts now allow tenants to utilize flexible options and premiums that could incorporate cloud and managed services add-ons, interconnection and bandwidth needs, as well as the ability to rightsize their footprint to short-term capacity needs (sometimes even across multiple geographies within a portfolio of deployments). As contracted requirements from large enterprise users continue to become more intricate, pricing trend observations for colocation will likely prove difficult to compare over time.

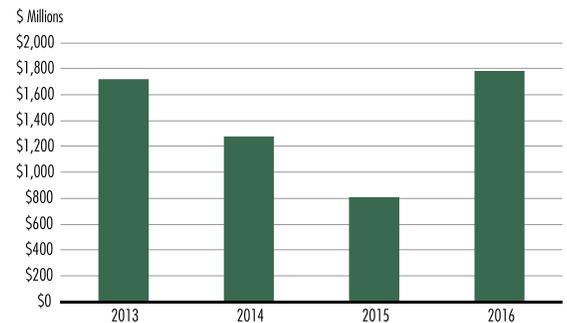
Data Center Sales Poised to Accelerate

The C-Suite at most enterprises has arguably never been more tuned into the costs, potential risks and pitfalls of building and operating their own data centers. The result in 2017 will likely be a wave of enterprise data center facilities becoming available at or near replacement costs in key markets as corporate users look to monetize underutilized assets and capitalize on market opportunities for their legacy data center assets.

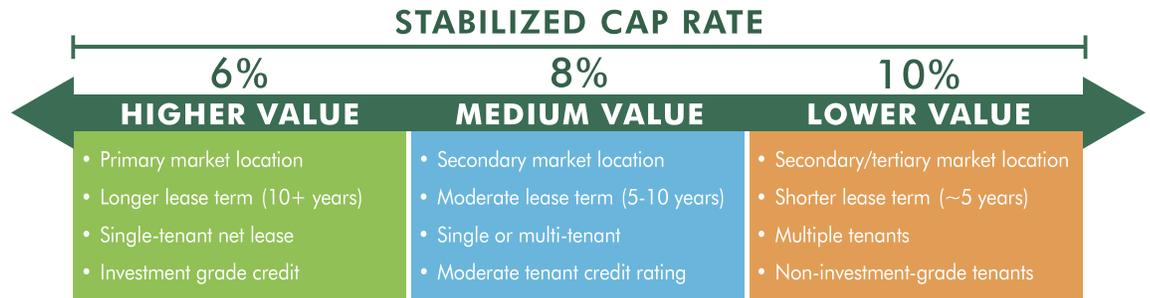
The first signs of this trend have already started to appear: After a lackluster 2015, total sales volume for data center assets increased dramatically to nearly \$1.78 billion in 2016 at an average price per square foot of \$275. This total does not include several announced large portfolio transactions that are slated to close in 2017, including CenturyLink’s

sale of their colocation business of 57 data centers to an investment group led by Medina Capital and BC Partners for \$2.2 billion and the sale of 24 Verizon data centers to Equinix for \$3.6 billion, which includes the NAP of the Americas in Miami.

Figure 5: Data Center Asset Sales Volume



Source: CBRE, Real Capital Analytics, Q4 2016.



There is a strong appetite for sale-leaseback investment opportunities, particularly with strong-credit tenants. This potentially allows an enterprise to have flexibility during any future migration while still maximizing the value of the asset. Sale-leasebacks with longer terms (7-to-10 years) have already seen a significant pricing premium, with cap rates often averaging between 6% and 8%. Assets with shorter in-place lease terms (3-to-5 years or less) or higher vacancy rates in non-core markets are often seeing a wider variance in pricing.

Finally, the growing importance of connectivity as an attribute of investment-grade real estate—fueled

by the expanding need for enterprises and service providers to locate some infrastructure within close proximity to the “edge” of the network or end users—can be seen in one of the closing transactions of 2016. GI Partners, which recently acquired the One Wilshire building in Los Angeles at near-record pricing for the downtown submarket, added the carrier hotel KOMO Plaza in downtown Seattle to its portfolio in December. The site is one of the key internet exchanges in the Western U.S. and sold for \$276 million (\$939 per sq. ft.). The cap rate for the transaction reportedly was less than 6.0%.

Things to Watch in 2017

Will Cloud Service Provider Demand Continue?



The sustained magnitude of market leasing will likely depend on how accurate cloud providers were in forecasting customer demand and subsequently provisioned data center capacity to meet it.

Oversupply risk?

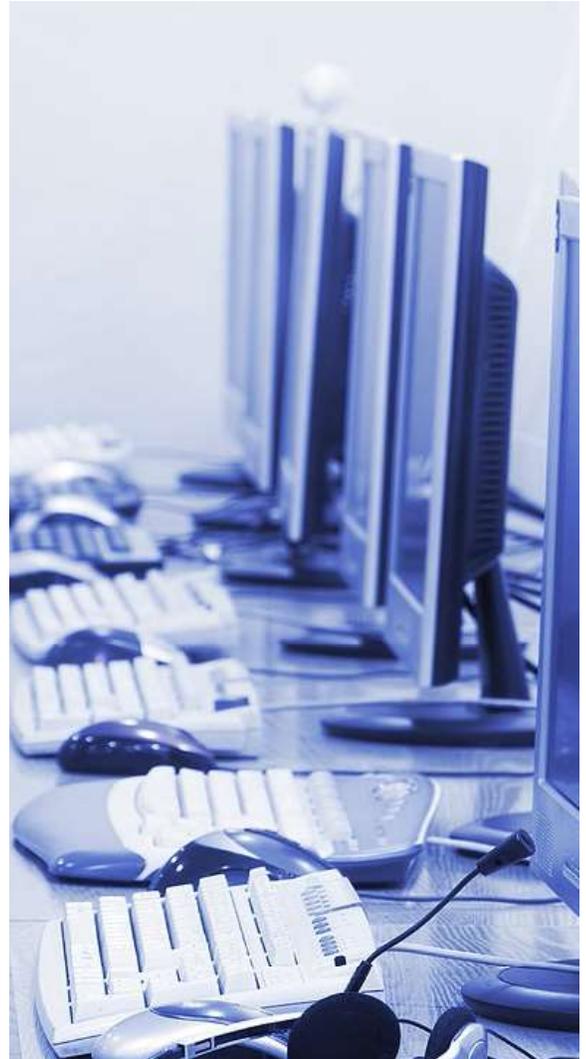


Most supply-constrained markets will see much-needed speculative capacity that helps facilitate increased leasing activity and deal flow.

Investment Surge in 2017?

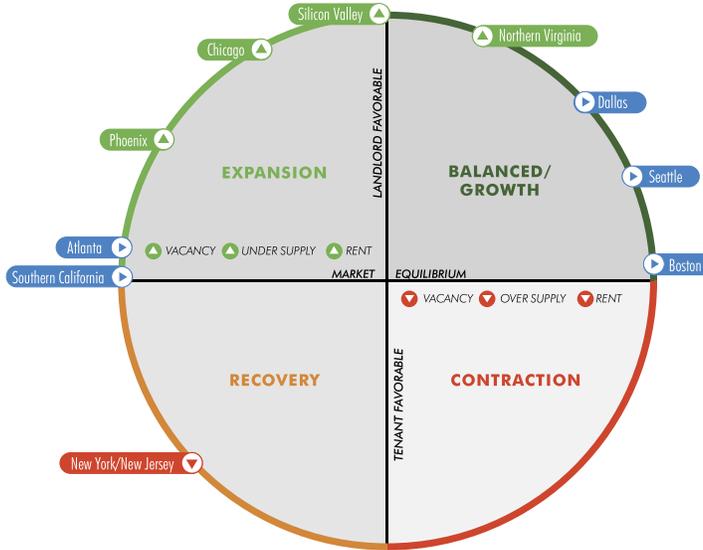


Legacy corporate data center assets are poised to come to the market in 2017 in a big way. While not a supply-side risk to the multi-tenant market, well-connected real estate with strong connectivity and near critical population centers has the potential to command strong demand and pricing.



DATA CENTER MARKET CYCLE AND MATURITY

Figure 7: Data Center Market Cycle*



Source: CBRE Research, Q4 2016.

*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:

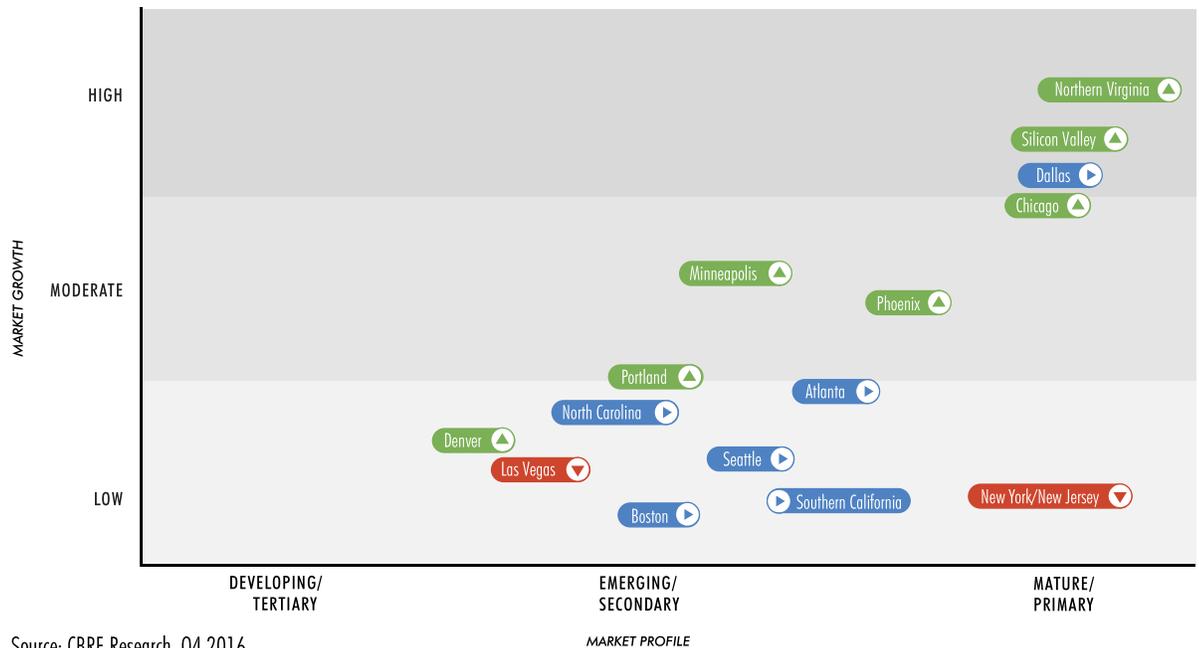
Expansion: landlord/provider-favorable conditions; under-supplied market, strong demand, declining vacancy and upward pressure on pricing

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

Figure 8: Data Center Market Maturity



Source: CBRE Research, Q4 2016.

Silicon Valley

As with virtually every real estate asset class in the Bay Area, the Silicon Valley data center market continues to be extremely supply-constrained heading into 2017. The existing vacancy rate declined to a 10-year historical low of 4.5% at year-end 2016, representing a 580-basis-point decline year-over-year. While net absorption declined from 2015's near record-high of more than 40 MW to only 11.7 MW in 2016, the decline in vacancy was still more than any other data center market in the U.S. This decreased total was more a function of limited supply than indicative of any decline in demand. Only small pockets of largely second-generation data center space are currently built out and available in the Silicon Valley, totaling a scant 6.95 MW of wholesale capacity in the market.

While the current supply pipeline is significant and will represent a nearly 30% increase in wholesale capacity in the Silicon Valley, the 43.5 MW currently under construction is already 95% pre-leased and will do little to ease near-term supply constraints when delivered in 2017. The nearest-term prospect for new wholesale supply is from Vantage Data Centers, which recently acquired a property adjacent to its existing campus in Santa Clara as well as an additional nine-acre expansion site two miles away that could potentially deliver up to 51 MW. However, speculative development at the new site is unlikely to begin until later in 2017, with the first phases likely to be delivered in 2018 at the earliest.

The Silicon Valley data center market has also seen a structural shift due to the impact of cloud adoption and large leases from CSPs, which has negatively affected some of the retail/co-location demand in the market. With a shortage of powered shell and development sites in Silicon Valley and local officials promoting commercial and mixed-use development over historical industrial uses, the

Silicon Valley data center market will likely see more measured absorption in the next several years. This will be driven by one-off, customized built-to-suit opportunities, as market-driven new supply opportunities will be limited.

Newsworthy

With new development opportunities limited, data center operators have had to explore acquisition options as a way to enter the Silicon Valley market. EdgeConneX recently acquired colocation provider SV Colo and is adding additional capacity to its site at 1700 Richard Avenue. In Q4, Zayo announced it had acquired 5101 Lafayette Street from Server Farm, where it will develop cloud and colocation capacity under its zColo data center brand.

 Vacancy Rate
4.5%

 Net Absorption
11.7 MW

 Under Construction
43.5 MW

 Pricing
\$145-\$165

Dallas/Ft. Worth

Despite a fits-and-starts nature to leasing velocity throughout the year, net absorption in the Dallas/Ft. Worth market totaled 37.6 MW in 2016, only slightly below the roughly 43 MW tallied in 2015. The bulk of activity occurred in smaller increments than is historically usual for the Metroplex. Wholesale transactions averaged slightly more than 1 MW for the year, somewhat atypical of a market that has historically been driven by large multi-MW transactions. Part of this trend is a function of the make-up of available product: While there are currently 41 MW of existing wholesale capacity available in the market, this total is distributed across 15 data center facilities and 10 providers.

The vacancy rate for existing data center space remained relatively static year-over-year, standing at 19.8% in Q4 (from 19.6%). This reflects a fairly balanced market, with just over 47 MW of new supply added in 2016—on par with net absorption. Dallas/Ft. Worth is likely to shift in a more tenant-favorable direction in the next 12 months as a significant amount of new capacity is slated to be commissioned. An additional 49.5 MW is currently under construction, nearly all of which is being delivered on a speculative basis. New projects underway include expansions at existing facilities by the likes of Digital Realty Trust, Infomart Data Centers, QTS, ViaWest and DataBank. New facilities and powered shell options are also being developed by T5 Data Centers, RagingWire, Skybox, Stream Data Centers and Tierpoint (in partnership with Compass Data Centers). All told, new capacity is expected to come online across 11 different projects, providing a diversity of options for tenants looking for data center opportunities in 2017.

The amount of new, first-generation supply being added is expected to help facilitate larger transactions in the market that have potentially been lingering or on hold waiting for brand new product to be delivered. Dallas/Ft. Worth has not yet

seen the level of hyperscale cloud deployments that have dominated activity in similar top-tier markets like Northern Virginia and Silicon Valley, and there will likely be strong competition among data center landlords for these types of requirements when they eventually come to Dallas/Ft. Worth.

Newsworthy

The data center footprint of the Metroplex continues to expand further outward. National operator Tierpoint recently announced it will develop a new facility in the northern Dallas suburb of Allen in partnership with Compass Data Centers. The first 16,000-sq.-ft. phase is expected to be commissioned in 2017. The facility will be Tierpoint's second facility in Dallas and will ultimately be 90,000 sq. ft. at full build-out.



Vacancy Rate
19.8%



Net Absorption
37.6 MW



Under Construction
49.5 MW



Pricing
\$120-\$145

Chicago

For the second consecutive year, the Chicago data center market achieved near-record occupancy gains. Net absorption totaled 36.2 MW in 2016, an increase from the nearly 28 MW tallied in 2015. Gains in each of the past two years are nearly double the prevailing historical average (roughly 15 to 17 MW per year). Chicago’s central location and prominence as a critical network hub have driven enormous demand from cloud service providers, who have leased significant multi-MW capacity from numerous providers in the metro area. Underscoring this ongoing trend, data center operator EdgeConneX recently acquired a 132,000-sq.-ft. industrial facility in Elk Grove Village, with rumored plans to re-purpose the facility for a large cloud provider requirement as large as 15 to 20 MW.

The suburban Chicago market accounted for the large majority of activity in 2016, with Chicago’s longest-tenured wholesale providers—Digital Realty Trust and DuPont Fabros—accounting for nearly 24 MW of net absorption. CyrusOne was also successful in leasing new capacity following the acquisition of the Chicago Mercantile Exchange (CME) facility in Aurora earlier in the year. The provider has already kicked off construction for additional capacity at the site, with plans to potentially add more than 50 MWs in the next several years.

With the addition of new supply, the long-constrained downtown market is seeing an upswing in activity. QTS Realty Trust leased several megawatts of newly commissioned capacity in the first phase of its retrofit of the former Chicago Sun Times printing facility. Colocation provider Zayo announced it was building at its fourth Chicago-area data center—a 23,000-sq.-ft., 2 MW facility in the Server Farm Realty-owned 840 South Canal Street. The partnership of Digital Realty and CentrePoint Properties also announced the

development of a 12-story annex adjacent to 350 East Cermak (one of the most significant carrier hotels in the U.S.). While the final timing and build-out plans will be market driven, there is the potential for 50 MW of critical load to be added when fully built out.

Tight market conditions continue to prevail and will likely be the norm throughout 2017. Existing/commissioned vacancy rates stood at 5.2% at year-end, up slightly from 4.6% a year ago. With only 17.4 MW currently under construction, a lull in demand is likely as data center providers plan to add new supply. Traditional enterprise and financial services firms will continue to slowly migrate from their own data centers and into colocation and cloud-based facilities.

Newsorthy

The Elk Grove Village submarket was a hotbed of activity in 2016. Aside from the previously mentioned EdgeConneX plans, T5 Data Centers formally entered the Chicago market with its acquisition of Forsythe’s recently built 208,000-sq.-ft. facility. DuPont Fabros also announced it would break ground on a new facility on its campus (dubbed CH3), with the first phase likely to add up to 12.8 MW of capacity by 2018.



Northern Virginia

By nearly any measure, the amount of activity in Northern Virginia dwarfed that of any other data center market in the U.S. (if not globally). Net absorption totaled an eye-popping 84.4 MW in 2016, representing a new record-high. This total does not take into account several significant pre-leases that were announced, which would elevate gross wholesale leasing volume to an astonishing 139.4 MW.

With the Ashburn area’s prominence as one of the most densely connected fiber-rich areas in the U.S., cloud service providers have dominated a significant portion of leasing in the region. In many cases, cloud provider requirements are often being deployed in third-party facilities at the same time they are constructing their own significantly sized in-market facilities. Some of this is speed-to-market-driven to meet immediate customer needs (where available space can be leased or built-out quickly). But it is also part of a larger “active-active” cloud infrastructure strategy where redundancy needs are shifted away from each individual data center and spread out to the network and application level.

While cloud providers dominated multi-MW requirements in 2016, enterprise users were equally active in Northern Virginia, albeit on a much smaller-scale. Enterprise-driven requirements are generally shrinking as end users become more sophisticated at scaling or rightsizing their IT needs and incorporating cloud solutions that effectively reduce traditional space and power-based colocation requirements.

While existing/commissioned vacancy rates remain an extremely tight 4.6%, a spate of new speculative development is scheduled for delivery in 2017. The construction pipeline is currently 45% pre-leased and, while an impressive number, could still potentially provide an influx of nearly 66 MW of

speculative capacity. Projects in the pipeline include RagingWire (VA3) and Sabey (Building C), who both continue to expand based on leasing momentum in 2016. Digital Realty is underway on Building H at its Digital Ashburn campus and DuPont Fabros has started phase I of ACC9 after effectively selling out ACC7. Additionally, CyrusOne continues to rapidly expand its Virginia footprint in a significant way: The provider has already delivered more than 40 MW at its Ridgetop Circle campus and, with the mixed-use Kincora development and a separate powered shell (both in Sterling), now boasts a portfolio of five data center projects in the market.

Newsorthy

The Manassas area continues to flourish as an emerging focal point of activity in the broader Northern Virginia market. One prominent “Big 4” cloud provider has a well-known, longstanding data center facility relationship with COPT that continues to grow; recently a new data center operator, CloudHQ Data Centers, landed a 35 MW anchor requirement with another hyperscale “Big 4” cloud provider. Additionally, Iron Mountain broke ground on the first of up to four potential data centers on its 83-acre campus in Manassas. The first facility will add 10.5 MW of power and is slated for delivery in Q3 2017.



Atlanta

The Atlanta data center market continues to see steady growth, albeit much more tempered compared with other major markets like Northern Virginia, Dallas and Chicago. Overall net absorption for wholesale space totaled 12.2 MW in 2016, on par with totals in the past several years. The Atlanta market is still largely driven by smaller-sized retail requirements from companies within the metro area and has struggled to gain sustained traction as a wholesale destination market. Some of this dynamic is driven by the small number of wholesale operators in Atlanta. There are currently only eight data centers in the market that CBRE classifies as wholesale, and nearly 75% of the 113 MW of wholesale capacity in the metro is attributable to QTS Realty Trust.

The overall data center market is comprised of two distinct segments: a downtown core with data centers offering more retail-oriented colocation, network services, cloud and managed services; and the suburban markets (primarily Lithia Springs, Suwanee, Marietta and Alpharetta) with data center providers offering larger-scale wholesale capacity and services. Atlanta is still largely dominated by single-tenant and corporate-owned data centers, the majority of which are located throughout the suburban markets. This has effectively pushed out the geographic boundary of the Atlanta market due to a lack of available sites and higher pricing of closer-in options.

From a multi-tenant market perspective, Atlanta is currently a well-balanced market considering prevailing supply and demand dynamics. Vacancy rates for existing/commissioned capacity stand at 11.4%, down from 15.7% a year ago. The supply pipeline also is considerably constrained, totaling only 3.5 MW with 2 MW of that total already pre-leased. At this point in time, data center operators in Atlanta are unlikely to build excess speculative capacity until market dynamics shift or tighten.

Only 8.6 MW of new capacity was added in 2016, trailing net occupancy gains.

Wholesale data center pricing in the Atlanta market ranges from \$120 to \$135/kW/month on a modified gross basis for a typical N+1/Tier III requirement, net of electric and cooling—slightly below the U.S. average. Pricing is close to market equilibrium but slowly increasing without any significant pressure, and is a slightly landlord-favorable. As the wholesale market in Atlanta continues to expand and evolve, the availability of custom facility/redundancy configurations, a favorable business climate, abundant and reliable power, and low utility costs will likely make the metro a key market for wholesale data center requirements.



Phoenix

For the first time in nearly two years, the Phoenix wholesale data center market will have multiple MWs of new speculative capacity delivered by a number of different operators in 2017. With an existing wholesale vacancy rate down to a scant 3.1%—the lowest among all primary data center markets tracked by CBRE—new deliveries will provide much needed relief for a market that has been severely supply-constrained since 2015.

The multi-tenant data center supply in Phoenix extends across the metro area, from the northwest Valley through central Phoenix and southeast to Chandler’s Price Road Corridor. The multi-tenant data center market had been a steadily growing sector of Arizona’s commercial real estate market. Starting in roughly 2008, the Phoenix market has seen cyclical growth spurts as capacity was built up to the nearly 153 MW of existing wholesale inventory—ranking Phoenix as the sixth largest wholesale market in the U.S.

However, Phoenix became over-saturated around 2013 as an abundance of wholesale supply was added in a relatively short period of time. This created a fiercely competitive pricing environment and un-balanced market where supply had significantly outpaced demand. But with only measured amounts of new supply since 2013, nearly 50 MW of wholesale capacity has been absorbed, dramatically shifting market fundamentals from tenant- to landlord-favorable and producing the extremely tight market conditions prevailing today. In 2016, net absorption totaled 10.3 MW, although market activity was actually significantly higher. Taking into account the quick turnaround of several sublease offerings and pre-leasing activity, gross leasing totaled nearly 31 MW for the year.

With a delay in construction starts extending through midyear 2016, the lack of immediately available supply has had the short-term effect of

Phoenix often being passed over during multi-market site selections. The supply pipeline is finally showing signs of life with 27.6 MW currently under construction and several other projects planned. The newest market entrant is Aligned Data Centers, which is adding 5 MW of critical capacity in 2017 in the first phase of its retrofit of a former Honeywell facility in North Phoenix. In the coming months, tenants looking for a megawatt of data center capacity will have multiple new options from which to choose, adding a level of competitive diversity that has benefited some of the country’s fastest-growing markets like Northern Virginia, Dallas and Chicago.

With competitive pricing for both construction and power, Arizona’s potential as a destination market for data center development is consistently strong. The passing of Arizona’s Computer Data Center Program, a statutory development incentive program established by the state legislature in 2015, will likely help boost demand. If the market can demonstrate a more consistent cycle absorption of inventory being delivered in the coming months, it’s reasonable to expect a sustained upswing in market velocity going forward. The rollover cycle for many leases written between 2008 and 2012 is also just beginning to occur, which will increase the potential demand of local tenants looking to relocate or consolidate out of second-generation space.



Southern California

After several years of stagnant activity, the Southern California data center market started to show signs of life in 2016. The overall vacancy rate for existing wholesale space declined to 18.0% at year-end, down from 21.1% a year ago. Most notably, net absorption totaled 2.6 MW—not a considerable amount compared with other major markets, but a marked uptick from the past several years. This is a net positive sign given some of the lease expirations and move-outs that are also occurring, often to markets like Las Vegas, Phoenix and Portland.

Much like the dynamics at play in markets like the Greater New York area, the Southern California market has seen a slow, steady shift towards being a predominantly retail-centric market where it's becoming very atypical to see data center deployments larger than 1 MW. Most requirements average less than 300 KW. The region's high power costs, elevated tax rates, lack of incentives and high natural disaster risk are all contributing factors to this shift. As a result, even traditional wholesale operators in the market are shifting their operating models in Southern California facilities: T5 Data Centers recently launched its "Enterprise Services" product—a colocation and cloud/managed services solution at its T5@LA facility—and CoreSite continues to have success with more interconnectivity-driven/retail-sized deployments at its 900 North Alameda site.

However, with an economy and population base as large as Greater Los Angeles', there is a built-in demand for latency-sensitive requirements to be deployed in-market, particularly at facilities with strong interconnection and proximity to key hubs like One Wilshire and 600 West 7th Street. It has been unusual to see new data center supply added to the downtown core, but that appears to be changing. Earlier this year, a partnership of Rising Realty Partners, H.I.G. Realty and Silverpeak Real Estate Partners purchased the Garland Building

(1200 West 7th Street) in downtown Los Angeles. The facility is a mixed-use office and data center building and the new ownership group has publicly acknowledged its intended focus to lease-up the under-utilized data center space. Similarly, GI Partners announced plans to add critical capacity to carrier hotel One Wilshire—potentially up to an additional 9 MW—as well as make capital improvements to upgrade and expand infrastructure



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Q2 2016 National Data Center Market Update

Lots of Cloud But No Rain in Sight: CSPs Drive Strong Leasing 1H 2016

Figure 1: Primary Data Center Market Fundamentals

Market	MARKET FUNDAMENTALS					
	New Deliveries (MW)	Supply Outlook	Absorption (MW)	Demand Outlook	Wholesale Rental Rates (kW/mo)	Pricing Outlook
Northern Virginia	47.8	▲	44.7	▲	\$125 - \$140	▶
Silicon Valley	3	▲	6.5	▲	\$145 - \$165	▲
Chicago	23.2	▲	23.9	▲	\$140 - \$160	▶
NYC/NJ	1	▼	(1.2)	▼	\$145 - \$165**	▶
Dallas/Fort Worth	11	▲	6.7	▶	\$130 - \$150	▶

Source: CBRE Data Center Solutions, Q2 2016.

*Arrows indicate change from Q4 2015.

**Quoted rental rates are outside of NYC proper (Manhattan).

PRIMARY DATA CENTER MARKET OVERVIEW

On the heels of record-setting levels of activity in 2015, demand for data center space remained robust in the first half of 2016. Absorption – measured here as the net change in leased existing/commissioned critical capacity – totaled nearly 80 MW across the five Primary data center markets. Northern Virginia (44.7 MW) and Chicago (23.9 MW) had the largest occupancy gains in 1H 2016 and existing vacancy rates in each market are currently below 5%. Primary markets continue to capture the majority of large deployments and continue to expand, although a growing lack of premium development sites in these markets is slowly pushing the geographic boundaries of how these markets are defined and how they tether together.

RECENT NOTABLE ACTIVITY

- While leasing was sporadic, occupancy gains in Primary markets totaled nearly 80 MW in 1H 2016 – on pace with 2015 levels.
- Year-to-date absorption was strongest in Northern Virginia and Chicago where existing vacancy rates stand below 5%.
- Cloud service providers are driving demand and account for 75+ MW of pre-leasing in projects under construction or recently delivered.
- The supply pipeline still robust – 189 MW of multi-tenant capacity currently under construction in Primary markets.

PRIMARY DATA CENTER MARKET OVERVIEW

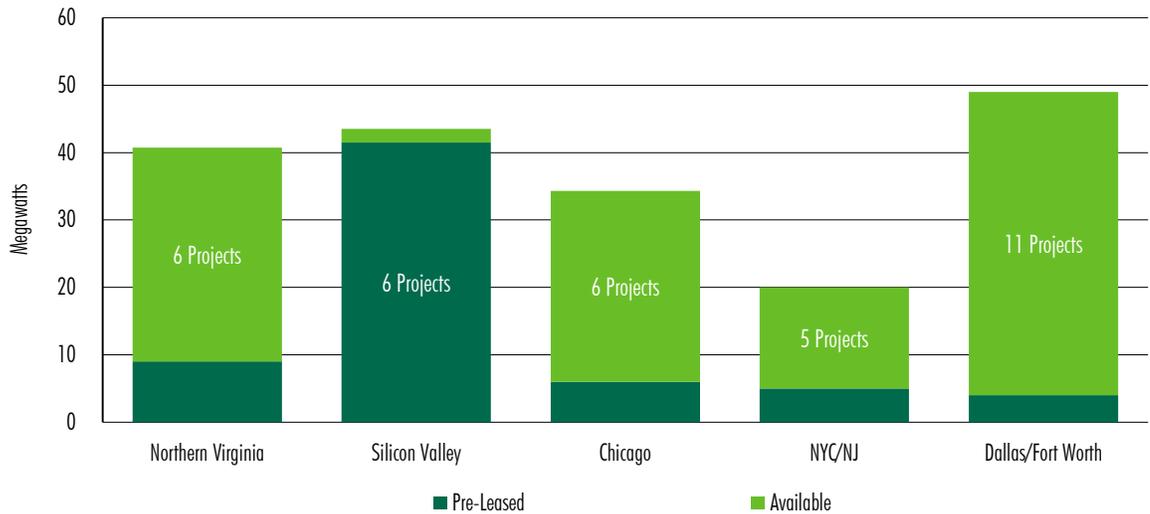
INDUSTRY DEMAND

Cloud service providers (CSP) have been a key driver of activity and demand as CSPs account for more than 75 MW of pre-leased capacity across projects recently delivered or currently under construction. These CSP deployments into third-party/multi-tenant facilities are likely as much “speed-to-market” driven as they are strategic – the adoption of cloud among enterprise users occurring at an even faster rate than cloud providers had anticipated. Many CSPs also appear to be adopting a “tripod” (or active-active-active) strategy in key markets as they build and expand their cloud infrastructure, in many cases leasing similar-sized requirements in multiple third-party facilities that may be in addition to data centers they’re constructing themselves.

PRICING & SUPPLY

The “just-in-time” delivery model providers have adopted is perceived as a reaction aimed to help stabilize pricing trends and introduce additional supply to the market in a disciplined manner. Over the past several years the most drastic pricing compression has often been seen as a result of aggressive competition for available spec space. Market pricing for wholesale colocation transactions has stabilized over the past 12 months with several markets starting to experience moderate year-over-year increases to the magnitude of 3-5%. Although the downward trend in pricing feels at odds from what one would normally expect to find in such a vibrant, high growth market, there are several contributing factors at play. Technology advancements and the evolution of data center designs have contributed to lowering data center build and operating costs, as have the inherent economies of scale achievable by third-party providers who build, own and operate data centers as their core business.

Figure 2: Construction Pipeline – Available & Pre-Leased Supply Under Construction



Source: CBRE Research, Q2 2016.

*Numbers indicate change from Q4 2015.

PRIMARY DATA CENTER MARKET OVERVIEW

CONSTRUCTION

With demand showing no near-term signs of slowing, the construction pipeline continues to expand. As of Q2 2016 there are currently 189 MW under construction in CBRE’s core markets alone, with pre-leasing levels typically hovering at or above 50%*. This is reflective of a recent shift in philosophy from data center providers who have adopted a “just-in-time” delivery model to adding new capacity, a model that has resulted in most U.S. markets currently being very landlord-favorable from supply and demand perspectives.

DATA CENTER STRATEGY

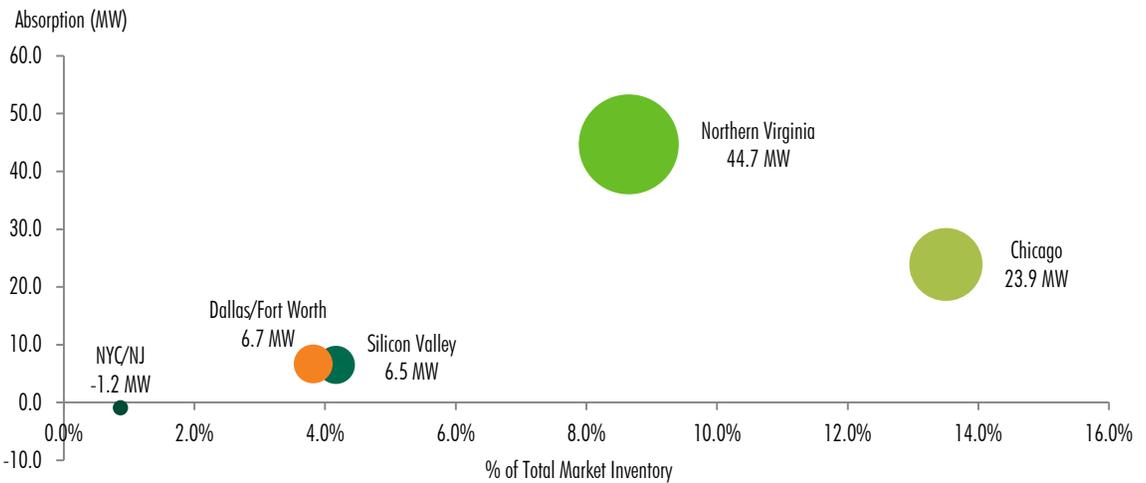
With the growing adoption of cloud and colocation into enterprise IT strategies, many end users are exploring various options to monetize existing assets, minimize data center costs, and shift the burden of those costs from capital expenditures to operating expenses and in turn redeploying capital from cost savings to support core business initiatives. With no one-size-fits-all strategy, enterprises are employing a myriad of solutions to streamline their data center and IT portfolios. These solutions can include sale leasebacks, in-house to off-site migration, a hybrid of owned and leased solutions including cloud and even leveraging geographies in multi-region site selection projects to achieve cost savings through variables like power rates and available tax incentives.

INVESTMENT & CAPITAL MARKETS

The data center industry continues to attract investor attention as public data center REITs consistently outperform other core real estate asset types. While there is an enormous appetite from investors looking for opportunities in the data center space, end users with legacy assets should be cautious when considering sale leaseback and disposition strategies. Not all data centers are created equal, and not all facilities are “diamonds in the rough” ripe with investment potential.

*The delivery of two large projects in Q2 temporarily pushed current aggregate pre-leasing down to 35% at mid-year, although several pending transactions are expected to quickly increase that total.

Figure 3: 2016 Net Absorption as % of Total Market Inventory



Source: CBRE Research, Q2 2016.

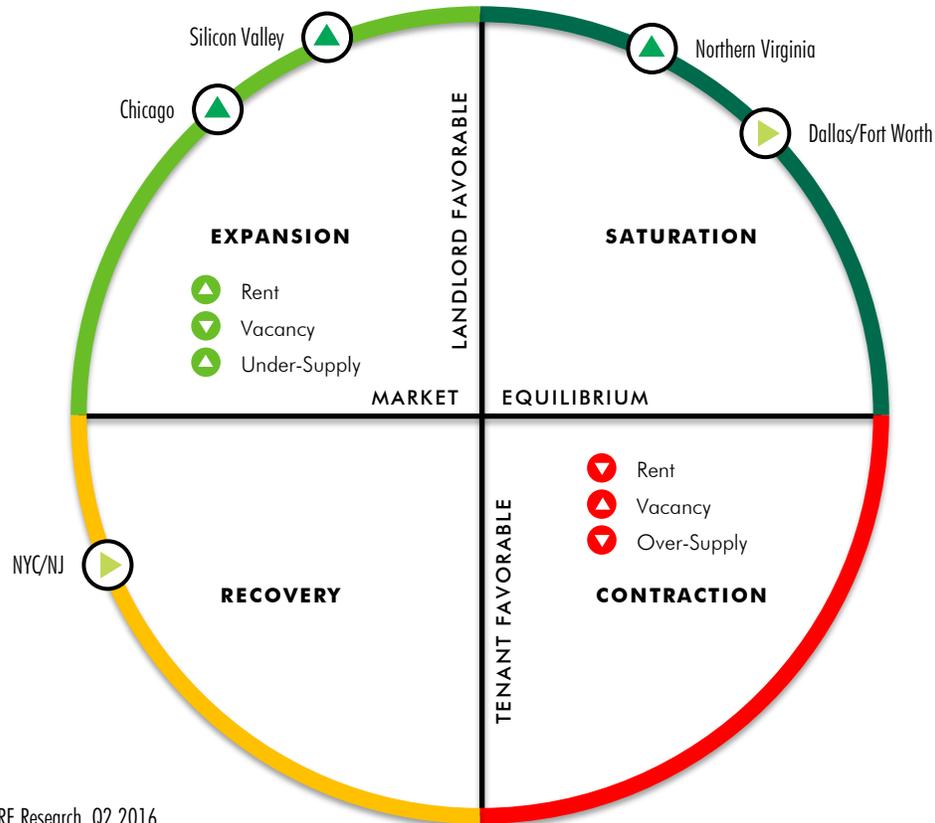
*Numbers indicate change from Q4 2015.

PRIMARY DATA CENTER MARKET OVERVIEW

MARKET DYNAMICS

Network and connectivity is one of the fastest emerging (and perhaps most critical) attributes of investment-grade real estate. A building with redundant power and superior bandwidth becomes increasingly more marketable as replicating connectivity ecosystems and power configurations is often prohibitively expensive, if not impossible altogether. The importance of connectivity can only be underscored as the number of connected devices grows exponentially, a byproduct of technology and interactive capabilities being integrated into nearly everything – from autonomous cars to smart appliances and augmented reality apps. With the proliferation of IoT (Internet Of Things) proximity to end users is becoming paramount and should only fuel the race to the “edge” – the need for content delivery proving key for future data center demand.

Figure 4: Data Center Market Cycle Graph*



Source: CBRE Research, Q2 2016.

*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 trend. 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
 Saturation: landlord/provider-favorable conditions; new supply more evenly balanced with demand, 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

Primary Market – Northern Virginia

MARKET FUNDAMENTALS								
Market	Vacancy (%)	Vacancy Change	Absorption (MW)	Demand Outlook	Under Construction (MW)	Construction Pipeline	Wholesale Rental Rates (kW/mo)	Pricing Outlook
Northern Virginia	4.9%		44.7		40.7		\$125 - \$140	

Source: CBRE Data Center Solutions, Q2 2016.

*Arrows indicate change from Q4 2015.

With net absorption totaling nearly 45 MW in the first half of 2016, Northern Virginia has maintained its top ranking as the most active data center market in the country. Existing vacancy rates stood at 4.9% in Q2 2016 reflecting extremely constrained conditions for a market of this size and vibrancy. While this represents a slight increase in vacancy year-over-year, its more indicative of the ebb and flow of new capacity being added and leased – it’s worth noting that vacancy rates have essentially hovered between 4-6% in Northern Virginia since the end of 2013.

Cloud service providers continue to lease a significant amount of third-party space in Northern Virginia in addition to their own builds in the region – reflective of the Ashburn and Dulles corridor areas being some of the most richly-connected network locations in the world. While some of the third-party leases are driven by “speed-to-market” considerations, some large cloud providers are also adopting a more strategic “tripod” or active-active-active backbone for their cloud infrastructure in key markets; usually comprised of a blend of third-party deployments and owned or single tenant/build-to-suit facilities.

However, demand is not just limited to cloud service providers. Enterprise users spanning a wide array of industry verticals have been active in the market, although the size of deployments from these segments have been trending smaller, typically below 1 MW. Smaller enterprise requirements are in part reflective of the rapid adoption of cloud and hybrid cloud solutions, which will likely have the near-term effect of dampening the volume of traditional colocation deployments but by no means undermining the fundamental net shift to cloud and outsourced/third-party solutions.

Given the tight market conditions and levels of activity, the supply pipeline in Northern Virginia is extremely active. CyrusOne (Sterling II), Digital Realty (Ashburn Building J) and DuPont Fabros (ACC7, Phase IV) all continue to build out remaining capacity. New projects from RagingWire (VA2), InfoMart Data Centers (retrofit of former AOL facility) and Sabey Data Centers will also commission new capacity in the next few quarters. In aggregate there are currently 40.7 MW under construction; while this space was only 22% pre-leased at close of Q2 2016, speculative space has historically been absorbed quickly and there are several sizeable leases expected to close before year-end.

RECENT NOTABLE ACTIVITY

- Outside of the traditional development pipeline, there is a considerable amount of activity for both land sites and powered shell/build-to-suit development. Corporate Office Properties Trust (COPT) recently announced it had signed leases to deliver two powered shell buildings in Manassas by mid-year 2017 totaling 368,000 sf total. DBT DATA also acquired two sites – a 10 acre site (with existing shell) in Sterling and a nearly 24-acre site in Ashburn. CyrusOne and Digital Realty recently acquired land sites to accommodate future development, totaling 40 and 120 acres respectively.

Primary Market – Silicon Valley

MARKET FUNDAMENTALS								
Market	Vacancy (%)	Vacancy Change	Absorption (MW)	Demand Outlook	Under Construction (MW)	Construction Pipeline	Wholesale Rental Rates (kW/mo)	Pricing Outlook
Silicon Valley	7.3%		6.5		43		\$145 - \$165	

Source: CBRE Data Center Solutions, Q2 2016.

*Arrows indicate change from Q4 2015.

As expected, market conditions in Silicon Valley continued to tighten in the first half of 2016. Existing vacancy rates declined to 7.3% at mid-year, representing a 440 basis point decline from second quarter 2015. While net absorption tallied only 6.5 MW during the first six months of the year that total is not indicative of the market’s overall activity or performance. As of Q2 2016 there are currently 43.5 MW under construction in the Silicon Valley, all but 2 MW of that total construction volume have already been pre-leased. When these new projects are completed and commissioned later this year, absorption totals for 2016 are likely to surpass those of 2015.

As one of the most mature data center markets in the country, Silicon Valley is one of the first markets to have almost completed a full peak-to-trough market cycle in the multi-tenant data center space. After the spike in demand generated by the rapid ascension of social media, content and big data/analytics in the late-00s, Silicon Valley has fully recovered from the right-sizing and transition of those requirements to near record-low vacancy in this new cycle of prolific cloud demand. These low vacancies have severely limited providers’ abilities to accommodate larger requirements. Currently only a small number of providers with first-generation space could immediately accommodate a requirement larger than 2 MW. However, as many legacy leases continue to expire and be re-evaluated, there may be a handful of larger-sized availabilities over the next several quarters in second-generation facilities that have historically been positioned as retail/colocation inventory.

Given the landlord favorable market conditions and prevailing imbalance of supply and demand, both new and existing data center operators have been scouring the Santa Clara area for expansion and growth opportunities. Despite increasing appetites for these opportunities, powered shell or development sites in Santa Clara’s current data center cluster remain scarce which will only be exacerbated by pressures from the existing construction pipeline of office and mixed-use projects being developed in the area. City officials have also stated their preference to promote commercial and mixed-use projects which could result in re-zoning historical industrial areas, further limiting data center development. Regardless, opportunities are sparse throughout the Valley – industrial vacancy rates declined to a staggeringly low 1.4% in Q2 2016 and nearly 2 million square feet of industrial product is expected to be delivered this year. Considering these factors, it’s likely that longer-term growth in the Silicon Valley data center market will be forced to migrate to new areas such as South San Jose or Fremont.

RECENT NOTABLE ACTIVITY

- Vantage Data Centers recently acquired a property adjacent to its existing campus in Santa Clara on which it plans to develop its new V6 facility. While detailed plans have yet to be announced, V6 will be developed in tandem with an additional facility (V5) on its existing campus that could add in upwards of 20 MW of capacity as early 3Q 2017.

Primary Market – Chicago

MARKET FUNDAMENTALS								
Market	Vacancy (%)	Vacancy Change	Absorption (MW)	Demand Outlook	Under Construction (MW)	Construction Pipeline	Wholesale Rental Rates (kW/mo)	Pricing Outlook
Chicago	4.3%		23.9		32.6		\$140 - \$160	

Source: CBRE Data Center Solutions, Q2 2016.

*Arrows indicate change from Q4 2015.

The Chicago market continued its leasing hot streak during 1H 2016 with net absorption totaling nearly 23.9 MW during the six month period. The metro’s two largest wholesale providers – Digital Realty and DuPont Fabros – accounted for the lion’s share of activity, although nearly all providers saw incremental occupancy gains. Cloud providers have been the driving force behind leasing velocity over the past several quarters and numerous other significant sized requirements are still rumored to be circling the Chicago market.

With the strong pace of recent absorption, market fundamentals in Chicago have shifted toward an increasingly landlord-favorable market with demand firmly outstripping the pace of new supply. Existing wholesale vacancy rates plummeted to 4.3% in Q2 2016, representing a 410 basis point decline year-over-year with just over 7.5 MW of existing wholesale capacity currently available for lease.

Chicago runs the risk of becoming supply-constrained for the next several quarters as the supply pipeline is not as robust compared to other Primary data center markets like Northern Virginia and Dallas. There are currently 32.6 MW under construction, although nearly half of that total is comprised of the final building of Digital Realty’s existing Franklin Park campus. Digital Realty hasn’t clarified whether they intend to deliver capacity as a turn-key product in multiple phases, or reserve capacity as a powered shell option. In the second quarter, QTS commissioned its first 2 MW at the former Sun Times printing facility – a retrofit project just outside of downtown – with plans to deliver an additional 6 MW of capacity by early 2017.

Chicago’s retail market is comparable in size to its wholesale segment, with nearly 114 MW of existing capacity. Existing retail vacancies are just below 18% with approximately 20 MW of capacity distributed across 17 different providers located in both downtown and suburban markets.

RECENT NOTABLE ACTIVITY

- CyrusOne announced a significant expansion of its Chicago footprint with the acquisition of the CME Group data center in Aurora for \$130 million in Q2 2016. The CME will continue to host its trading platform in a portion of the 428,000 sf facility as part of a 15-year sale leaseback tied to the acquisition. Also noteworthy, CyrusOne acquired 16 acres of adjacent land and a 184 MW substation that it’s marketing could provide up to 92 MW of critical load at 2N build out. While plans have yet to be announced, it’s likely any expansion could accommodate up to 500,000 sf, consistent with the size and scale of other recent builds in their portfolio.

Primary Market – New York City/New Jersey

MARKET FUNDAMENTALS								
Market	Vacancy (%)	Vacancy Change	Absorption (MW)	Demand Outlook	Under Construction (MW)	Construction Pipeline	Wholesale Rental Rates (kW/mo)	Pricing Outlook
NYC/NJ	16.6%	▶	(1.2)	▼	21	▶	\$145 - \$165	▶

Source: CBRE Data Center Solutions, Q2 2016.

*Arrows indicate change from Q4 2015.

Data center leasing activity in the greater New York/New Jersey region virtually ground to a halt in the first half of 2016. Year-to-date wholesale absorption totaled a net negative 1.2 MW with existing vacancy rates increasing slightly to 16.6% year-over-year. After recovering from a height of nearly 30% in 2013, wholesale vacancy rates have been relatively static as the demand for large wholesale transactions has slowed considerably. While there is still a market for wholesale product in New Jersey, larger-size deals have been migrating to more cost effective geographies and this trend is expected to continue for the foreseeable future. There is still sustained demand for small retail and wholesale requirements (up to 350 kW), largely being driven by the financial services sector and large regional/headquarter offices in the greater New York metro region.

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RECENT NOTABLE ACTIVITY

- In early June, QTS acquired DuPont Fabros' NJ1 facility in Piscataway, NJ for \$125 million equating to \$347 psf or approximately \$7 million per MW. As has been widely reported, the 360,000 sf facility is currently 46% leased with roughly 9.6 MW of available capacity. The provider announced preliminary plans to add an additional 8 MW of capacity and will likely reposition the facility as a more retail/managed services focused offering; similar to other facilities in QTS' portfolio, flexible resiliency solutions (N, N+1, 2N, etc.) will be offered to accommodate the evolving demand profile of the New Jersey data center market. This is QTS' second investment in the New Jersey market in recent years, following the acquisition of a 58,000 sf facility in Princeton, NJ that included a long-term lease with global IT firm Atos and a 50-acre, 14.1 MW solar farm.

Primary Market – Dallas/Fort Worth

MARKET FUNDAMENTALS								
Market	Vacancy (%)	Vacancy Change	Absorption (MW)	Demand Outlook	Under Construction (MW)	Construction Pipeline	Wholesale Rental Rates (kW/mo)	Pricing Outlook
Dallas/Fort Worth	20.5%		6.7		49		\$130 - \$150	

Source: CBRE Data Center Solutions, Q2 2016.

*Arrows indicate change from Q4 2015.

In a market historically dominated by large multi-MW requirements, data center leasing activity in 1H 2016 was somewhat stunted by the makeup of existing wholesale availabilities. There are roughly 26 MW of first generation wholesale space currently available in the Metroplex, but this capacity is divided among twelve existing data centers at an average size of just over 2 MW per provider – more or less bite-size chunks by Dallas standards. Net absorption totaled 6.7 MW in 1H 2016, with vacancy rates increasing to 20.5% at mid-year. A handful of customer move-outs and the right-sizing of previously reported leases contributed to some of the variance in market activity, as did the ongoing delivery of new capacity.

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In fact, the delivery of new supply will weigh heavily on market dynamics in Dallas-Fort Worth over the next 18 months. There are currently 49 MW under construction throughout the Metroplex, only a small fraction of which has been pre-leased. The pipeline includes new facilities by ViaWest and RagingWire and new powered shell opportunities by Stream Data Centers and Skybox. Additional new wholesale capacity will also be delivered at existing facilities by the likes of QTS, Digital Realty, DataBank and Aligned Data Centers. All told, competition among providers for tenants is likely to be aggressive as these projects begin to come online in late 2016 and into 2017, especially for tenants who would serve as anchors for new projects. While leasing volume is expected to increase substantially with the delivery of new capacity – there are over 40 MW of active requirements in the Metroplex – the expectation is that Dallas-Fort Worth will trend in a more tenant-favorable direction in the near-term. This competitive environment will also keep downward pressure on pricing into 2017.

RECENT NOTABLE ACTIVITY

- In partnership with TIAA, Allstate Investments and Edgewater Funds, communications infrastructure investment firm Digital Bridge acquired Dallas-based data center provider DataBank in Q2 2016 as its first foray into the data center sector. While details of the transaction were not disclosed at the time of this report, the acquisition will likely accelerate a growth strategy for the operator. DataBank operates two facilities in Dallas (at the former Federal Reserve Bank building in downtown Dallas and on Digital Realty’s campus in Richardson).

Markets to Watch – Minneapolis

The performance of the Minneapolis market – a secondary data center market by any measure – has been closely watched over the past several years as a potential benchmark for other emerging markets. For a market of its size, Minneapolis was historically under-served from a data center perspective – prior to 2013, only three national data center operators had any kind of presence in the Twin Cities and virtually no wholesale colocation options existed in the market, effectively forcing local enterprise users to build their own facilities or look outside of the Minneapolis area.

Sensing the shortfall and existing opportunity, both new and existing data center operators have since committed an influx of new data center projects and capital to the metro area, effectively doubling the existing operational inventory in Minneapolis to over 600,000 sf and 51 MW in Q2 2016. Local, regional and national providers alike have planted their flag in the market, with facilities developed by new entrants including Stream Data Centers, DataBank, ViaWest, CenturyLink (in partnership with Compass Data Centers) and IronGate Data Centers. Additionally, existing local market providers Level 3, Cologix and OneNeck responded with significant expansions to their data center facilities.

Not surprisingly, with a diverse, competitive inventory of enterprise-quality wholesale colocation options now available, net absorption has quickly started to pick up momentum.



Not surprisingly, with a diverse, competitive inventory of enterprise-quality wholesale colocation options now available, net absorption has quickly started to pick up momentum. Occupancy gains have totaled nearly 6 MW since mid-2015, constituting a 6X increase in demand compared to recent years prior to Q2 2015. Nearly all of the new development projects in the market have filled at least their first phases over the past 18 months and providers are beginning to speculatively add additional capacity. Current demand is of a similar magnitude, with around 5-6 MW presently identified in the market. Notably, lease-sizes have averaged between 500 kW – 1 MW and activity has been driven largely by regional enterprise users, including financial services and healthcare systems. At present there is 19.7 MW of available third-party capacity in the market, however the available capacity is distributed across fourteen providers and facilities making large chunks of contiguous space a rare commodity. Given the number of new projects in this burgeoning market, wholesale pricing remains highly competitive, averaging \$120-\$140/kW/month on a modified gross basis.

Markets to Watch – Denver/Colorado

Similar to Minneapolis, Denver has been a historically under-supplied market from a third-party data center perspective given the size of the metro economy and robust growth of local/regional enterprise and technology firms. However, organic growth over the last several years and the entrance of several new providers has positioned the Denver metro area as a potential future data center hub.

Demand for colocation space has primarily been locally driven with a handful of Denver-based operators dominating market share. Net absorption totaled just over 5 MW in 2015, a slight increase from the last several years. Although demand has historically been limited by available supply, recent activity has been bolstered by new facilities from ViaWest, OneNeck, EdgeConneX and H5 Data Centers that are able to accommodate wholesale-type deployments. There are currently around 9 MW of existing wholesale capacity available in the Denver metro area.

This influx of new supply and the emergence of a more diversified, competitive landscape has resulted in downward pressure on wholesale pricing and resulted in Denver currently being a somewhat tenant-favorable market. Wholesale rates currently average between \$140-\$160/kW/month, with retail rates averaging between \$225-\$240/kW/month (all-in/gross).

Organic growth over the last several years and the entrance of several new providers has positioned the Denver metro area as a potential future data center hub.



Situated about an hour south of Denver, Colorado Springs had previously been a magnet for several enterprise data center builds. Recently however, enterprise build activity has reemerged with global software company SAP's announcement in Q2 2016, for plans to develop a data center as the first user on T5 Data Center's @Colorado campus. While plans have not been released, it's rumored to be modeled after the software firm's award-winning design for energy efficiency achieved at their St. Leon-Rot facility in Germany.

The addition of new premium wholesale colocation options in both Denver and Colorado Springs will only serve to bolster Colorado's profile as a destination data center market and will be watched as key indicators for future demand, particularly as multiple data center providers are currently evaluating expansion and/or entry into the market. Colorado's geographic separation, somewhat central location and highly skilled tech workforce are likely to prove attractive to large enterprises looking to fulfill hybrid cloud deployments and could begin to challenge markets like Atlanta and Phoenix as a preferred lower cost option.

ABOUT CBRE DATA CENTER SOLUTIONS

CBRE has the world’s only fully integrated data center real estate team, offering strategy, acquisition and disposition representation, project management and facilities management from a single provider. Our Data Center Solutions has experience in primary, secondary and tertiary mission critical markets across the globe. We have the tools and knowledge to make your project successful regardless of location. With over 100 data center acquisition/ disposition specialists, 4,700 engineers, and over 300 project managers in over 75 global markets, CBRE has the global reach, resources, expertise and relationships to provide our clients with end-to-end market analysis, planning, construction, operations, maintenance, and execution capabilities. The DCS completed over 225 MW of transactions globally in 2015, has managed over 2.5 MSF of projects over the last five years, and has over 65 million square feet of raised floor across 560 Tier I to Tier IV data centers under management.



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GLOSSARY OF TERMS

DC

Abbreviation for data center

POWERED SHELLS

Purpose built or hardened shell; Power and Fiber to site; no equipment included

CARRIER HOTEL

Single buildings with multiple fiber providers and generally support retail colocation providers

WHOLESALE COLOCATION

Building shell & infrastructure to PDU providing space, power & cooling; Generally in demised suites above 250 kW

VACANCY

Available capacity built out/commissioned, does not include capacity under construction or pre-leasing associated with these projects

ABSORPTION

Net change in existing/commissioned leased capacity, does not account for leasing on projects until capacity is commissioned

RFSF

Abbreviation for raised floor square footage

RETAIL COLOCATION

Building shell and infrastructure in shared environment, space generally divided by racks or cages; May include IT hardware as well as a menu of services

ENTERPRISE CENTERS

Hardened data center; Houses “mission critical” operations of individual companies

GREENFIELD SITES

Areas/Sites identified to suit data centers; Typically close to power/fiber

UNDER CONSTRUCTION

Only includes active projects where construction is taking place, does not include planned capacity or projects not actively under construction