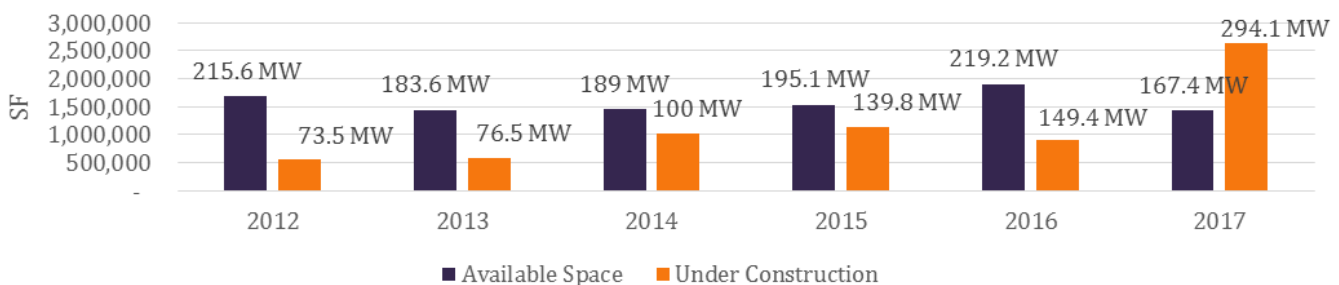


## Overview of Issues Impacting Data Centers During 2017

- Investment activity in data centers surpassed all other years during 2017 at over \$20 BN.
- Multi Tenant Data Center (MTDC) inventory under construction is almost double of what it was 12 months ago led by Northern Virginia.
- Significant uptick in private equity and venture capital looking at data center investments.
- Overall rental rates and concessions continue to hold steady, while construction costs have declined. In addition there are significant variances between resiliency and density.
- While hyperscale leasing is down compared to 2016, there are several properties under contract or recently purchased by MTDC developers that leasing activity from hyperscales may prove to be higher than is divulged.
- Facebook and Apple return to leasing large blocks of MTDC as opposed to building their own after taking several years hiatus.
- There are a significant number of wholesale tenants that have leases expiring in 2018 & 2019.
- Significant uptick of colocation companies looking to lease at MTDC properties in several markets.
- Assimilation of 2017 mergers & acquisitions will likely see some fall out of non-core data centers, and sale-leaseback of large corporate data centers will continue to provide shadow inventory in 2018.
- Amazon coupled with Google expanding outside of MTDC in several projects in Northern Virginia.
- Ashburn continued to dominate leasing activity during 2017.
- Several land acquisitions during 2017 in Loudoun County including; Google (148 acres), QTS (52 acres), Sentinel (100 acres), Vantage (42 acres), and Compass Data Centers (120 acres).
- Land prices in Ashburn have sold as high as \$29/sf (2017) compared to Elk Grove Village at \$27/sf (2013) compared to Plano at \$17/sf. Other sites within various submarkets may be lower.
- Slow down in leasing activity in Chicago in 2016 partly due to lack of inventory much of the year.
- 120 MW expansion of Itasca substation is expected by Mid 2018 with additional 120 MW in 2019/2020 will help spur several new developments in Suburban Chicago.
- Strong leasing activity in Dallas came from tenants expanding not hyperscale users and overall concern that there is a limited number of enterprises in the market.
- Infomart looking to recapitalize portfolio in early 2018.
- QTS purchased 84 acres in Phoenix, AZ for \$25 MM and EdgeConneX purchased 55 acres in Mesa, AZ.
- Santa Clara's new inventory led to increased leasing led by Vantage at 13 MW after being hindered by lack of product.
- Several new MTDC data centers announced in Atlanta but historically there has been less than 6 MW's of leasing activity annually.
- Blockchain and cryptocurrency requirements are driving new N solutions with less expensive power.
- In Canada, U.S. hyperscale companies, and Bitcoin continue to absorb space in Quebec, limited leasing thus far in Toronto.
- Significant multi-market leasing for latency sensitive requirements in MTDC led by YouTube Live. Others include Facebook Live, and POPS for hyperscale users.
- Expect an uptick in demand to absorb space in MTDC by Internet of Things (IOT), Artificial Intelligence (AI), and large Chinese cloud providers (Alibaba, Ten Cent, Baidu and others).
- Offshore capital made several investments in data center properties particularly in single tenant assets driving cap rates lower.
- Apple's \$1.375 BN new data center in Iowa follows major projects by Microsoft and Facebook. Facebook also building \$1 BN property in Virginia.

### Historical Data Center Inventory



This graph depicts turn-key space that is currently built-out in Multi-Tenant Data Centers (MTDC). This does not contemplate total SF/MW of properties.

# North American Data Centers

DATA CENTER REAL ESTATE REVIEW: 2017

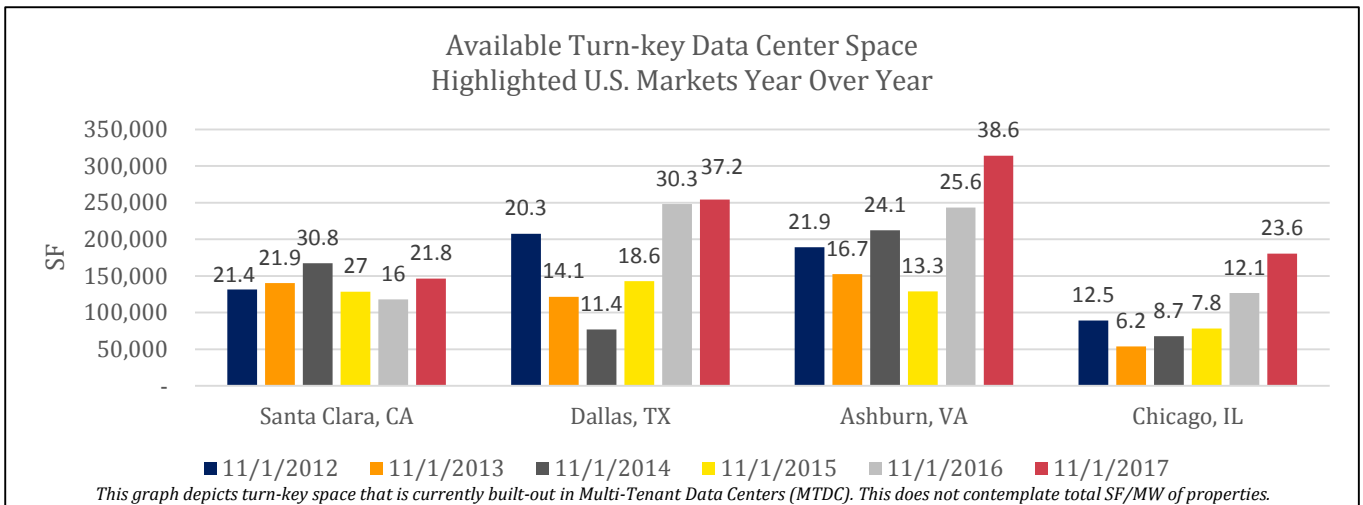
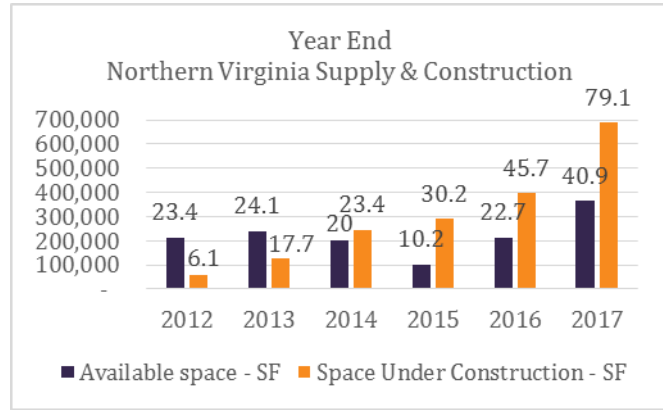
## Investment Activity 2017

Buyer	Seller	Size	Market	Sales Price	Comments
Equinix	Verizon	Portfolio	Various	\$3.6 BN	13.3x EBITDA
GI Partners	Hines	290,000 sf	Seattle, WA	\$276 MM	5.9% cap rate
QTS	Health Care Serv.	260,000 sf	Dallas, TX	\$50 MM	BCBS – 1 MW
Central Colo & Legacy	Meridian Group	200,000 sf	Vienna, VA	\$96 MM	Leidos & GSA leased
Carter Validus	El Dorado Holdings	44,244 sf	Tempe, AZ	\$16.4 MM	T-Mobile 6.7% cap rate
Carter Validus	Spear Street Capital	153,000 sf	Andover, MA	\$37 MM	7.3% cap rate
Digital Bridge Holdings	365 Data Centers	Portfolio	Cleveland & Pittsburgh		
Digital Bridge Holdings	C7 Data Centers	Portfolio	Various	\$130 MM	
Peak 10	Cbeyond Communications	33,000 sf	Louisville, KY	\$5.4 MM	
H5 Data Centers	ByteGrid	333,215 sf	Cleveland, OH	\$30.58 MM	
CyrusOne	Sentinel	11 MW 10 MW	Sentinel, NJ & Raleigh-Durham, NC	\$245 MM \$245 MM	14.4x EBITDA
Cologix	Stonepeak Partners	Portfolio	Various	\$1.35 BN	17.7x EBITDA
Ascent	Kimball Bridge Partners	5.5 MW	Alpharetta, GA	\$30 MM	
Digital Bridge Holdings	Vantage Data Centers	Portfolio	Various	\$1.308 BN	17.0x EBITDA
Chirisa Investments	365 Data Centers	126,000 sf	8 properties		
Zayo	KO Networks	10,000 sf	Various	\$12 MM	9.6x EBITDA
Green House Data	Cirracore		Various		
Cyxtera	CenturyLink	Portfolio	Various	\$2.8 BN	9-10.0x EBITDA
Carter Validus	CyrusOne	75,000 sf	Norwalk, CT	\$57 MM	Cervalis 6.67% cap rate
Carter Validus	IT Provider	60,000 sf	Charlotte, NC	\$16.112 MM	ATOS
Digital Realty Trust	Private Investor	264,000 sf	Franklin Park, IL	\$14.4 MM	2 year warehouse lease
Digital Realty Trust	DuPont Fabros	Portfolio	Various	\$7.594 BN	21.2x EBITDA
Peak 10	ViaWest	Portfolio	Various	\$1.675 BN	16.4x EBITDA
DataBank	Stream Realty	145,000 sf	Dallas, TX		
Carter Validus	250 Williams Street	995,728 sf	Atlanta, GA	\$166 MM	
Lincoln Rackhouse	Coca Cola	88,000 sf	Atlanta, GA	\$19 MM	
Iron Mountain	Fortrust	210,000 sf	Denver, CO	\$128 MM	13.0x EBITDA
Carter Validus	Westcore Properties	76,573 sf	Sunnyvale, CA	\$36.8 MM	Qwest 6.5% cap rate
Carter Validus	CF Equipment Loans	58,000 sf	Cincinnati, OH	\$10.3 MM	GE 7% cap rate
Carter Validus	Red Sea Group	49,800 sf	King of Prussia, PA	\$19.2 MM	Verizon 6.5% cap rate
Carter Validus	Lexington Realty Trust	58,560 sf	Tempe, AZ	\$15.2 MM	Wipro 7.4% cap rate
CyrusOne		48 acres	Quincy, WA		
Zayo	Stream Realty	29,500 sf	Denver, CO	\$3.5 MM	
1547 / CIM Group	400 Paul Avenue	7.3 acres	San Francisco, CA		
Digital Realty Trust	Carter Validus	251,141 sf	Northlake, IL	\$315 MM	7% cap rate
Mapletree Investments	Carter Validus	Portfolio	Various	\$750 MM	
Peak 10/ViaWest	Glaxo Smith Kline	203,000 sf	Philadelphia, PA		
Global Securitization	COPT	193,000 sf	Chesterfield Cty, VA	\$44 MM	11% cap rate
Microsoft	Chevron	202,000 sf	San Antonio, TX	\$80 MM	
1547	ICE	41,225 sf	Markham, Ontario		
Server Farm Realty	AMD	151,588 sf	Suwanee, GA		
Iron Mountain	IO Data Centers	Portfolio	Various	\$1.3 BN	15.6x EBITDA
Stream Realty	Seefried Properties	107,000 sf	Elk Grove Vlg., IL	\$18.86 MM	Warehouse sold for \$175/sf
Digital Realty Trust	Centerpoint Properties	3.67 acres	Chicago, IL	\$25 MM	Adjacent to 350 E Cermak
Carter Validus	BP	103,200 sf	Houston, TX	\$74.78 MM	6.8% cap rate
GI Partners	Ericsson	215,000 sf	Montreal, Quebec		



## Big Red Wines We Really Enjoyed During 2017

- Obisidian The Slope Cabernet Sauvignon 2015 (N)
- Charles Smith Substance Cabernet Sauvignon 2015 (N)
- Freemark Abbey Cabernet Sauvignon 2012 (N+1)
- Shafer One Point Five Cabernet Sauvignon 2014 (N+1)
- Boesch Estate Cabernet Sauvignon (N+1)
- Neyers AME Cabernet Sauvignon 2013 (N+1)
- Joseph Phelps Bacchus Cabernet Sauvignon 2006 (2N)
- Far Niente Cabernet Sauvignon 2014 (2N)



## Largest Wholesale Turn-Key Leases During 2017

Tenant	Market	Provider	(MW)
Facebook	Ashburn, VA	DFT	22 MW
Microsoft	San Antonio, TX	CyrusOne	18 MW
Apple	Ashburn, VA	DFT	14.5 MW
Apple	Chicago, IL	DFT	14.5 MW
Microsoft	Phoenix, AZ	CyrusOne	12 MW
Google	Ashburn, VA	CyrusOne	10 MW
Facebook (renewal)	Santa Clara, CA	DLR	6 MW
Uber	Phoenix, AZ	Aligned	5 MW
Uber	Ashburn, VA	DLR	4.8 MW
Existing cust.	Dallas, TX	DLR	4 MW
Healthcare	Dallas, TX	DLR	4 MW
Softlayer	Dallas, TX	DLR	4 MW
NVIDIA	Santa Clara, CA	Vantage	3.5 MW

Tenant	Market	Provider	(MW)
Zayo	Los Angeles, CA	GI Partners	2.5 MW
Two Sigma	Chicago, IL	CyrusOne	2.2 MW
PayPal	Phoenix, AZ	Aligned	2.1 MW
SunGard	Boston, MA	109 Brookline	2 MW
Oracle	Dallas, TX	CyrusOne	2 MW
Oracle	Dallas, TX	DLR	2 MW
Cloud Firm	Irving, TX	QTS	2 MW
Vanguard	Ashburn, VA	CyrusOne	2 MW
Alibaba	Ashburn, VA	DLR	2 MW
Georgia Tech	Atlanta, GA	DataBank	2 MW
NVIDIA	Santa Clara, CA	Colovore	2 MW
Google	Dallas, TX	Infomart	2 MW
Apple	Austin, TX	Data Foundry	2 MW
SAP	Ashburn, VA	DLR	1.8 MW

