

# D Data Center

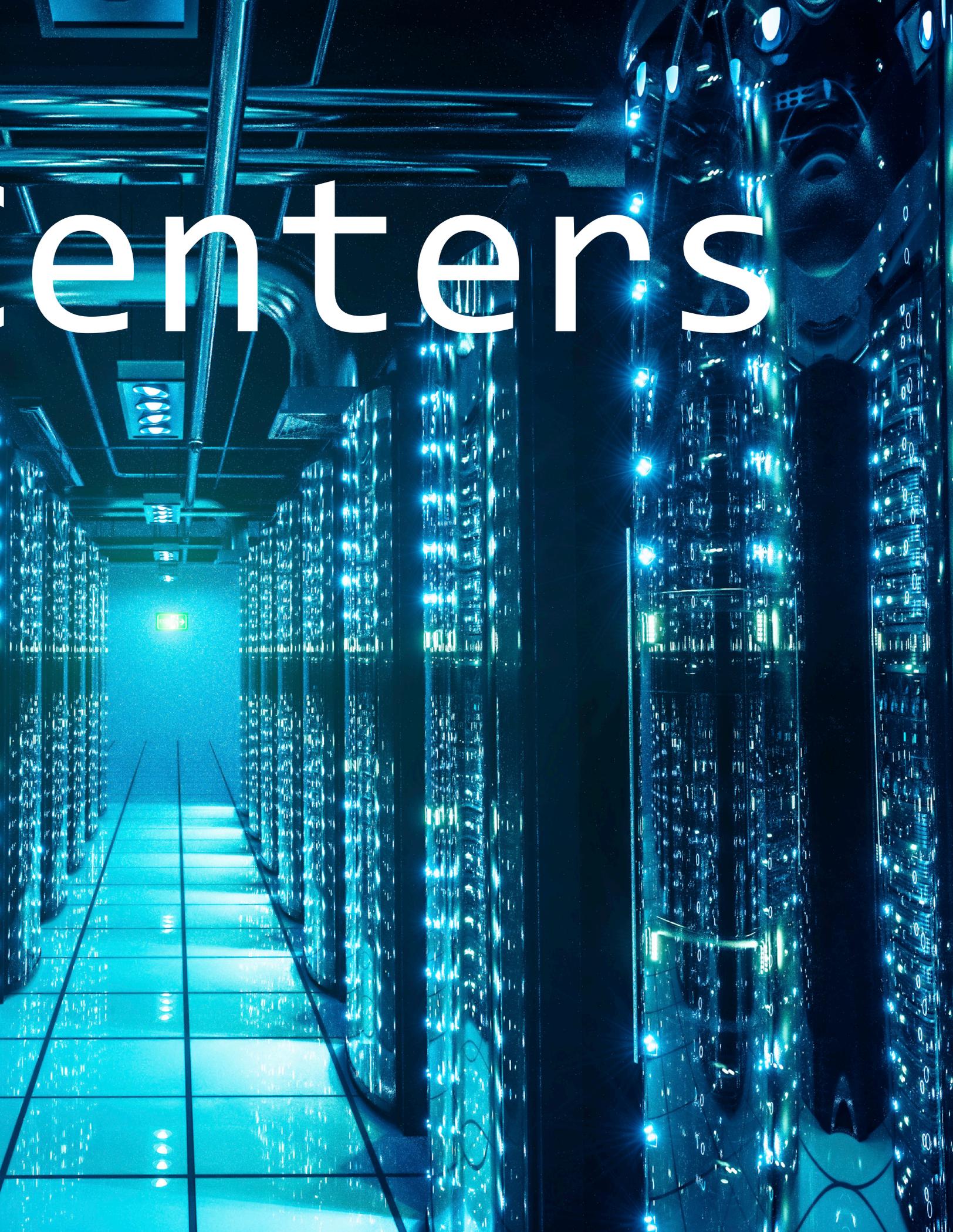
The basic components, operations, and key factors for data center site selection.

Earlier this year, Seattle-based Sabey Data Centers broke ground on its second data center in Quincy, Wash. The new facility will be about 135,000 square feet and will join other data centers in the area operated by such tech giants as Dell, Microsoft, and Yahoo.

At one time there were just three, primary, data center markets in the United States, in the Washington, D.C. area, northern New Jersey, and the Silicon Valley. This was due to the presence of fiber-optic networks, but today fiber-optics have permeated the country and new clusters of data centers can be found from Miami to Chicago to Quincy, Wash. Indeed, most major metro areas have at least a small data center presence.

A brokerage company like Newmark Grubb Knight Frank boasts a dedicated data center group that works out of six markets: London, New York, Chicago, California, Denver, and Dallas. Also, there are a group of companies such as Equinix and Digital Realty Trust that are third-party builders of data centers, which then lease this expensive space to other companies. This model is referred to as co-location, or in industry lingo, “co-lo.”



A perspective view of a server room aisle. The room is filled with rows of server racks on both sides, illuminated by a cool blue light. The floor is a light-colored tile, and the ceiling has various pipes and lights. In the distance, a green exit sign is visible on the wall. The overall atmosphere is futuristic and high-tech.

# enters

All this would seem to be fabulous news for industrial brokers, as data centers, due to the considerable cost to construct, would be desirable transactions. However, the field is so exacting and deals are often done away from the spotlight that the number of brokers, including SIORs, that do these kinds of deals are surprisingly limited.

“Not every broker can deal with data centers,” notes **Thomas Cafferty, SIOR, CRE**, president of Cafferty Commercial Real Estate Services, McLean, Va., and a 30-year veteran of data center construction and brokering. “This is a true specialization. Here in the DC region, where we have 160 million square feet of industrial space and perhaps 1,500 industrial and office brokers, I would guess only four or five truly know data centers. More importantly, the Fortune 500 and federal government know that too and they go to four or five trusted names.”

Normal brokers “got no shot,” at data center business, asserts **Geoffrey Kasselmann, SIOR, LEED AP**, executive managing director for Newmark Grubb Knight Frank in Chicago. “If there are 2,000 brokers in the Chicago area, there are about 20 who can do a data center deal, but there are 10 to 12 who do 80 percent of the deals. It’s a small group; they all know each other and hang out with each other. Then there is another dozen (I’m part of the second dozen) of people who can and have done data center deals but don’t do them every day.”

Kasselmann estimates he’s done 30 data center deals in the Chicago area. The data center exclusivity is due to a number of factors.

“Industrial, office, and retail real estate transactions are completed between two cooperating brokers,” Kasselmann explains. “This is not true with data centers because the people who make data center decisions are not real estate-centric folk. Many deals are not done through brokers.”

Although there is a specialization in data centers, Cafferty adds, brokers representing industrial buildings with 20 feet

or greater clearance, in close proximity to major fiber-optic infrastructure and sites that meet TIA-942 (Telecommunications Infrastructure Standard), may find a new marketing avenue through the major users data centers users such as Amazon, Microsoft, and DuPont Fabros, etc.

The other problem with data centers is that it is still a highly confidential arena. Companies, such as banks, investment banks, and other financial firms, don’t like to publish where their data centers are located or what each firm might do differently than another firm. “Do you think JP Morgan Chase wants everyone to know where its data centers are?” Cafferty rhetorically asks.

“Data centers want to be anonymous,” adds **Howard E. Greenberg, SIOR**, founder and president of Howard Properties Ltd. in White Plains, N.Y. “Their operations are not interested in being on a prominent road, and they are not interested in signage. Anonymity to the outside world is just one small part of the full package of security they provide to their clients.”

Greenberg works in an area that is fairly unique for data centers, the exurbs surrounding New York City. The reason data centers are located there, for the most part, is to serve Manhattan financial firms, trading firms, credit and debit card companies, and any business that requires production and/or back-up facilities.

“The old model used to be to put data centers as close to Manhattan as possible, but after the attacks on the World Trade Center, the new model is to build them in what is called the Synchronous Replication Band, which is 30 to 50 miles from midtown Manhattan,” Greenberg explains. “That’s not road miles nor as the crow flies, but fiber miles. If someone, for example, inserts a credit card in a slot in midtown Manhattan it has to get to the primary server in the SRB in a certain number of nanoseconds. If it doesn’t, there is the possibility of data being lost.”

Being located with the SRB gives the data centers enough distance to be safe in the event of another 9/11 type attack, but keeps them close enough to their clients to avoid any loss of data during transmission.

## THE WIDER WORLD

The good news for those interested in data centers is that the product and locations are beginning to proliferate. That’s due to a number of reasons, including storage redundancy of data, the ever-present “cloud” which sounds ethereal but is actually servers storing data, and a changing market.

The need for data centers is driven by so many different, overlapping things, software and services, e-commerce and e-tailing, cloud services and video-on-demand, and streaming videos.



The industry is evolving, Cafferty adds. “Until about five years ago, companies would control – as if it was a valuable corporate jewel – their data centers. No one could go in, it was high security because that’s where all the sensitive data of the company was held. That’s all changed over the last decade. Companies and the federal government routinely outsource their data operations.”

Then there is the rise of co-location companies.

**Austin Newman, SIOR**, a senior vice president for Cushman & Wakefield/Thalhimer in Glen Allen, Va., has done greenfield and conversion site selection for data centers in the Richmond area, which is not a primary data center marketplace.

“About four to five years ago there was an explosion of urban conversion co-location development,” Newman says. “Richmond is not a big market for that, but we had a lot of end-users looking down here as the first-tier markets got picked over.”

Among the companies opening new, ground-up construction data centers in the Richmond area were Bank of America with 400,000 square feet and Northrup Grumman, an outsource provider handling the state of Virginia’s IT functions. Northrup Grumman built a 190,000-square-foot data center.

Newman recently ran a multi-market, data center, site selection search for Capital One, which ended up choosing a central Virginia technology park site, purchasing 75 acres to build an expandable facility with the first phase at 150,000 square feet.

In some regards, Richmond might be considered a further extension of the Washington, D.C. market. Metro-wide clustering is also a recent phenomenon and where a company locates depends on what it does and its technology requirements.

In Chicago, Kasselmann explains, there are three cluster locations. The closest to downtown is at the peripheral, interstate loop, where data centers

are established by wholesalers and companies with “latency” issues – how long it takes data to pulse from one location to another.

Then there is a cluster around the Elk Grove Village/Des Plaines/Naperville area, where Microsoft built a 500,000 square-foot data center. Finally, another 30 miles out, around Aurora, are data centers focused on disaster recovery.

**BASIC NEEDS**

If most real estate is driven by the concept of “location, location, location,” data centers are driven by the concept of “power, power, power.”

Some people in the industry refine the axiom for data centers a little more deeply, changing the three words to “power, fiber, water.”

Kasselmann is a power, power, power advocate. “Since fiber is almost everywhere now, it’s really about how much dedicated power, how much redundant power is available? If the first infrastructure connection goes down, will you still have power? In a normal building you would have one heating, cooling, and source of power; data centers really have two of everything and they have to be designed so one can tip to the other source without a blip.”

Or as Newman says, “in regard to power, typically you want to be within two miles of two substations so you can get redundancy.”

A key factor for site selection includes the ability to have two remote sources of electricity, Greenberg explains. “You have to be right on or near an electrical substation in order to accomplish this. If you are running electricity, even above ground from a substation, it is going to cost over \$1 million a mile to get that electric from the substation to the data center, so you certainly want to be as close to that substation as possible, and secondly, you want to avoid new construction because anything that a public utility does is costly and time consuming. You don’t want to go to that public utility and say, ‘I need you to run new poles two miles away to get to my data center site.’ Ideally, you want to be close to a substation.”

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**THOMAS CAFFERTY,**  
SIOR, CRE



**HOWARD E. GREENBERG,**  
SIOR



**GEOFFREY KASSELMAN,**  
SIOR, LEED AP



**AUSTIN NEWMAN,**  
SIOR

Some sources say that it's helpful to be near multiple sources of fiber optics. Again, that's because, for data centers, it's all about redundancy. There is even a separate industry group, the Uptime Institute, which sets tier performance standards and established a four-tier classification approach to redundancy.

Under the strict Uptime Institute Standards with Tier I you have one generator, one Uninterruptible Power Supply, one set of batteries, one main Switchgear and one set of Data Center air condition/ CRAC units serving the Data Center, Cafferty explains. "You then increase with the redundancy, being N, as the industry standard. Under Tier IV, Uptime Institute does not absolutely require four levels of redundancy, technically the description of Tier IV is a minimum of N+1, which means every component of the Data Center's infrastructure, the Switchgear, batteries, UPS, generator, all must have at least one level of redundancy."

Few buildings qualify for Tier IV, says Cafferty. "In the state of Virginia, there may be three buildings that are Tier IV. It's hard to achieve."

Some companies such as Amazon achieve redundancy by having a cluster of data centers in one infrastructure area, Cafferty notes. "Amazon has become a very large player in our market having bought or built 10 separate data centers in the last three years. That's millions of square feet of data center space."

It's also helpful to be near a good water source. Data centers require a lot of cooling capacity given the computer equipment, which creates heat, so the buildings also need to be cooled or "chilled" and that requires significant water. Some data centers require as much as 16 million gallons per month.

When Newman was doing site location work for Capital One, it had specific water requirements mostly tied to cooling. Water was a significant factor for selecting a site.

"You have these massive cooling towers and they suck up a lot of water but they don't discharge a lot because it evaporates," says Newman. "That said, you do get into issues with counties about how to sub-meter water as most municipalities are under the assumption that if you are using 16 million gallons of water per month, they assume you are discharging, but that is not the case."

Another thing that is nice to have is a well for back-up. A lot of times a data center will have dual water coming into the site, and then run a ring around the building, so if it loses water from one source, it is going to get a continuous stream from another source.

"I've done some deals where the local municipality requires an on-site detention pond for storm water management, which to a data center is great because they can capture the water that is being retained, circulate it to and from the retention pond and still satisfy municipal codes," says Kasselmann.

Finally, Greenberg points out, "There are neighborhood issues. You have to have multiple chillers on the roof, or aside the building, for the air conditioning, which are noisy and throw off water vapor. More importantly, you have to have back-up generators that have to be tested weekly and can be noisy. None of that sits well when you have residential neighborhoods close by."

Data centers are complex to understand and often expensive buildings to create. Most people in the business rely on a small group of specialists in the field and for good reason. The commercial brokers who know this esoteric world understand the structural complexities of the physical data centers, the power and online issues, the need for redundancy and, equally as important, the politics of getting one built. ■

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Bobbi Miracle  
CCIM, SIOR  
Senior Vice President  
Bobbi@CEVegas.com



Sozzi Jones Walker  
CCIM, SIOR  
Broker/President  
Sozzi@CEVegas.com

f t in

**(702) 316-4500**  
7219 W. Sahara, Suite #100, Las Vegas, NV 89117

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