GLOBAL RESEARCH AND CONSULTING

LEASING A DATA CENTER: U.S. MARKET COST COMPARISON

NOVEMBER 2014

CBRE

EXECUTIVE SUMMARY

The data center industry is expanding along with the seemingly limitless demand for data and technology. The growing reliance on cloud computing is reshaping traditional network computing and boosting data center demand.

Determining the optimal location for a leased data center requires a careful market-by-market examination of key site selection factors and three primary cost variables—rent, power and taxes.

Among the 23 key markets evaluated for total project cost, including rent, power and taxes, over a seven-year lease, the five least expensive markets were Atlanta, Colorado Springs, Northern Virginia, Portland and Seattle.

The five most expensive markets evaluated for total project cost, including rent, power and taxes, over a seven-year lease were Boston, Des Moines, Kansas City, Northern Florida and Omaha, largely due to high lease rates. Colocation lease rates per kW are heavily driven by both market competitiveness and maturity. Accordingly, lease rates in a less mature and competitive market like Des Moines are higher than in a more competitive and mature market like Silicon Valley.

WHY DOES IT COST MORE TO LEASE A DATA CENTER IN DES MOINES THAN IN SILICON VALLEY?

CBRE EXPOSES THE INTRICACIES OF DATA CENTER SITE SELECTION ELEMENTS AND DEBUNKS COMMON ASSUMPTIONS ABOUT THE LESS AND MORE COSTLY MARKETS FOR A TYPICAL LEASED DATA CENTER REQUIREMENT.

The data center industry is expanding along with the seemingly limitless demand for data and technology. The growing reliance on cloud computing is reshaping traditional network computing and boosting data center demand. Cisco estimates more than two-thirds of all data center traffic will come from the cloud by 2017 and global data center traffic will nearly triple between 2012 and 2017 to 7.7 zettabytes per year.[1] In relative terms, 7.7 zettabytes, or 7.7 trillion gigabytes, is equivalent to 1.6 years of continuous music streaming for the global population. Further, any company that utilizes technology in the execution of their business is a data center user, with technology, financial services and healthcare users leading the pack.

Wholesale data center inventory is steadily increasing across primary and secondary markets in the U.S. to keep up with the growing demand. As of Q2 2014, total inventory in primary[2] markets reached 1,140.9 megawatts (MW), with another 107.3 MW under construction, according to CBRE's Data Center Solutions.[3] Between Q2 2013 and Q2 2014, primary market inventory measured in MW increased 31.3%.

KEY FACTORS IN DATA CENTER SITE SELECTION

Information technology (IT) and real estate decision makers consider several factors in determining the optimal location and solution for their data center and storage needs. Climate and location security are important factors when broadly choosing a location for a data center project, while proximity to a headquarters is often of less concern. Other factors include the cost and availability of power and real estate, latency, fiber and telecom capacity, geographic risk mitigation and climate.

Tax incentives are another factor that may partially or fully offset sales and property tax payments, which can significantly contribute to a project's total cost. According to CBRE's Location Incentives Practice, 19 states currently offer incentive programs that are customized for the data center industry, allowing those markets to be more competitive in attracting data centers. Incentives tend to play a larger role in the evaluation process for projects of significant value or new construction, since these types of projects will likely trigger the minimum eligibility thresholds related to capital investment, direct jobs or payroll levels.

Decision makers also consider whether to lease or own the data center facility. Requirements of 1 MW or less are more commonly satisfied under lease arrangements, whereas larger requirements offer economies of scale and may be more attractive under a build-to-suit or build-to-own arrangement.

SITE SELECTION FACTORS

Power: Cost per kWh, carbon footprint, fuel mix and infrastructure

Telecom: Fiber providers and latency

Geography: Proximity to headquarters or airports, population and market size, labor force, water availability

Climate: Environmental risk (i.e., hurricanes, tornadoes, earthquakes) and free cooling

Real Estate: Secure location, cost and availability

Taxes: Sales taxes on construction and IT equipment, real estate taxes and personal property taxes

Tax Incentives: Sales tax refunds, real estate tax abatements and personal property tax exemptions

[1] Cisco, Global Cloud Index, http://www.cisco.com/c/en/us/solutions/service-provider/global-cloud-index-gci/index.html#~Forecast.

[2] Tier I markets in the U.S. include Atlanta, Chicago, Dallas/Ft. Worth, New York-Tri State region, Northern Virginia, Phoenix and Silicon Valley.

[3] Data center real estate is primarily measured in megawatts (MW) instead of square feet, reflecting the relative importance of power usage over physical space. Raised floor square feet and building square feet are secondary measurement benchmarks.

This analysis sheds light on the complexities of data center site selection and cost variability by collectively examining the primary cost variables in a leased data center project—rent, power and taxes—to demonstrate that commonly held assumptions about expensive or inexpensive data center markets should be carefully examined.

THE METHODOLOGY—WHAT'S BEHIND THE NUMBERS?

We analyzed a typical 1 MW, or 1,000 kilowatt (kW), data center lease over a seven-year term across 23 key and geographically dispersed markets in the U.S. The lease scenario considers capital expenditures for equipment, sales/use tax for equipment expenditures, annual lease rate expenses at a modified gross rate (as of Q2 2014), cost of power, operating capacity, market-specific power usage effectiveness ratios (PUEs) and likely tax incentives.

Key assumptions include annual inflation for the cost of power and lease rates, 80% annual operating capacity and constant equipment and telecom pricing. Variables not accounted for include employee wages, permit fees, interior finishes, equipment refreshes that typically occur after seven years of use and any costs associated with building the facility that are outside of the lessee's scope.

DEFINITIONS

kWh: Kilowatt hour

MW: Megawatt (1 MW = 1,000 kW)

PUE: Power usage effectiveness, a metric that measures the energy efficiency of a data center

Wholesale Colocation: Wholesale data center operators provide space, power and cooling to tenants; leases are generally demised in units above 250 kW

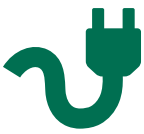
BREAKING DOWN THE PRIMARY COST ELEMENTS

Rent, power and taxes are the primary variable cost factors in a leased data center project. The average total cost for a 1-MW lease across the 23 key markets over a seven-year lease term is $45.9 million, of which over half is tied up in initial equipment costs that are held constant in all markets. After equipment expenses are factored out, a 1-MW leased project costs an average of $22.1 million over the seven-year lease term, or about $3.2 million annually. Over the life of the lease, rent payments account for 64% of the total cost, excluding initial equipment purchases, followed by 27% in power expenses and 9% in taxes.

THE 23-MARKET COST AVERAGES

$158

The average first-year rent among the 23 markets is $158 per kW per month, or $1.9 million per year.



$798,000

The average cost of power among the 23 markets is $0.076 per kWh, or $798,000 per year.

$1.9M

The average total tax payment, including sales/use tax and likely incentives, is about $1.9 million over the life of the project.

TOP LOCATIONS TO LEASE—A $12 MILLION QUESTION

There are vast opportunities within the U.S. to minimize costs at the market level with careful consideration given to the primary variable costs—rent, power and taxes. In fact, there was a nearly $12 million difference in the total project cost between the least and most expensive market when analyzing a seven-year, 1-MW lease.

Among the 23 markets evaluated in this analysis, the five least expensive markets were Atlanta, Colorado Springs, Northern Virginia, Portland and Seattle. As expected, these markets offer some of the lowest lease rates and below-average power costs. Four of the five lowest cost markets also required below-average total tax payments over the life of the project after adjustments are made for likely incentives.

The five most expensive markets were Boston, Des Moines, Kansas City, Northern Florida and Omaha, largely due to high lease rates. Three of the five most expensive markets also had higher-than-average power costs and higher-than-average total tax payments (net of likely incentives). Omaha requires zero taxes after incentives are incorporated and thus had the lowest level of tax payments compared to the 23 markets in this analysis.

Figure 1: Top Locations to Lease by Cost Segment (sorted Alphabetically)

Low	Moderate	High
Atlanta	Denver	Boston
Colorado Springs	Las Vegas	Chicago
Dallas	Minneapolis	Des Moines
Houston	Phoenix	Kansas City
Northern Virginia	Silicon Valley	Northern Florida
Portland	Southern California	Northern New Jersey
Salt Lake City	St. Louis	Omaha
Seattle		Philadelphia

Source: CBRE Research, Q2 2014.

A CLOSER LOOK

At the regional level, the typical total cost of a seven-year data center lease was estimated at $44.2 million in the West, $46.7 million in Central and $47.3 million in the East. However, there was significant cost variability within the three regions. In fact, there was an $11.1 million difference within the East region between Atlanta (a relatively low cost market) and Northern Florida (a relatively high cost market).

The Central and West regions both displayed about a $6.1 million range from the lowest cost to highest cost market, but even the 71 miles between Colorado Springs and Denver equated to a $4.8 million difference in Colorado Springs' favor. All nine of the West-region markets were in the low or moderate cost segments. Central markets were spread across all three cost segments; whereas East region markets are only present in the low and high cost segments.

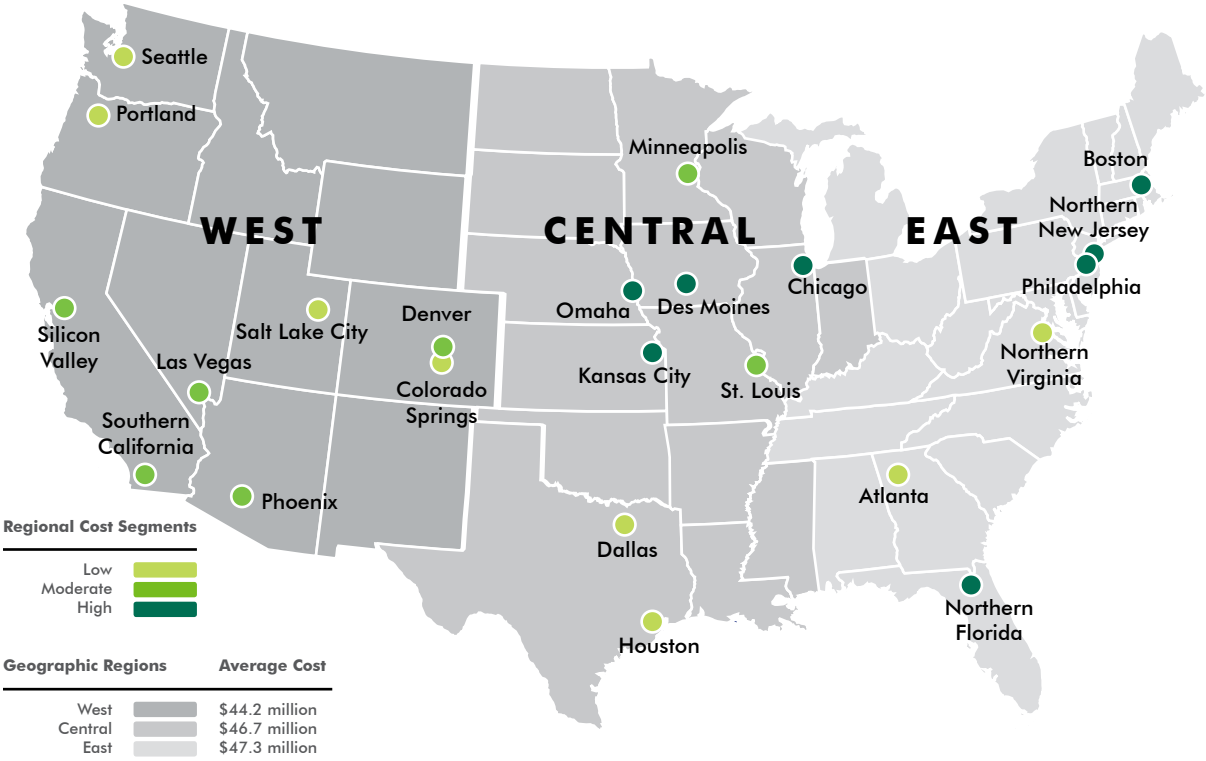
Lease rates varied market by market but, with rent payments accounting for nearly two-thirds of the total leased project cost excluding one-time equipment purchases, it is critical to assess lease rate variability between markets. Colorado Springs, Portland, Atlanta, Southern California and Northern Virginia offered the most affordable lease rates. By comparison, the highest lease rates were found in Boston, St. Louis, Kansas City, Des Moines and Omaha. Typically, the limited supply of data center product relative to demand places upward pressure on lease rates, while markets with average lease rates typically experience more equilibrium in supply and demand.

Tax incentives can offset high lease rates and rent payments more commonly found in less mature wholesale colocation markets. Moreover, while the highest rents were typically found in the Central and East regions, several of the Central region's less mature markets offered the greatest potential tax incentive offset. Incentive savings represented more than a 10% reduction in the total rent payment over the life of the lease or an average of just over $2.0 million in nine markets: Atlanta, Dallas, Houston, Kansas City, Northern Virginia, Omaha, Phoenix, Seattle and St. Louis.

Despite healthy incentive packages, high lease rates in Kansas City, Des Moines and Omaha of 120% to 140% above the average proved difficult to overcome in the highly competitive colocation marketplace. No tax incentives were available for leased data centers in nine of the 23 markets, including both California markets and several markets in the East.

Finally, power costs were slightly lower in the Central and West regions, although there was less of a coherent regional relationship trend in this cost variable. Four of the six East markets required above-average total power costs, while all of the Central markets offered below average total power costs with the exception of Houston. Markets in the West were more evenly distributed between below- and above-average total power costs.

Figure 2: Market Costs by Cost Segment and Region



Source: CBRE Data Center Solutions; CBRE Location Incentives; ASHRAE, Inc., "2011 Thermal Guidelines for Data Processing Environments – Expanded Data Center Classes and Usage Guidelines."

CONCLUSION

So why is a 1-MW leased data center more expensive in Des Moines than in Silicon Valley?

The average asking lease rate in Des Moines is $200 per kW per month compared to $147 per kW in California's Silicon Valley, reflecting the difference in colocation supply between Silicon Valley's 116-MW wholesale inventory and Des Moines' less extensive inventory. Higher tax incentives and lower power costs in Des Moines are not significant enough to overcome Des Moines' above-average lease rate compared to Silicon Valley.

As the data center industry expands, IT and real estate executives will continue to grapple with complex site selection decisions, including whether to lease or own the facility. However, the opportunity to preserve capital will remain available so long as the leased data center site selection process carefully considers the primary cost variables of rent, power and taxes, and recognizes the variability that exists from market to market.

The site selection process for an owned data center, meanwhile, will hinge more on the relative costs of power, real and personal property taxes, sales taxes, available incentives, land costs and construction cost variability.

CONTACTS

Pat Lynch
Managing Director
Data Center Solutions
t: +1 303 628 1765
e: pat.lynch@cbre.com

Hilary Faulk
National Business Development Associate
Data Center Solutions
t: +1 303 628 1764
e: hilary.faulk@cbre.com

John Lenio
Economist and Managing Director
Location Incentives Practice
t: +1 602 735 5514
e: john.lenio@cbre.com

Jeremy Meyers
Business Development Analyst
Data Center Solutions
t: +1 303 628 1788
e: jeremy.meyers@cbre.com

Spencer Levy
Americas Head of Research
Global Research and Consulting
t: +1 410 951 8443
e: spencer.levy@cbre.com
Follow Spencer on Twitter: @SpencerGLevy

Jessica Ostermick
Director, Research and Analysis
Global Research and Consulting
t: +1 720 528 6338
e: jessica.ostermick@cbre.com

Additional information about data center incentives programs by state can be found here.

The latest national Market Update can be found here.

Stay tuned for the upcoming "3 MW Owned Data Center Market Comparison Study" that examines the same 23 markets but produces notably different results.

FOLLOW CBRE

GLOBAL RESEARCH AND CONSULTING

This report was prepared by the CBRE U.S. Research Team which forms part of CBRE Global Research and Consulting – a network of preeminent researchers and consultants who collaborate to provide real estate market research, econometric forecasting and consulting solutions to real estate investors and occupiers around the globe.

Additional U.S. research produced by Global Research and Consulting can be found at www.cbre.us/research.

DISCLAIMER