Favorable conditions remain but a shift is in sight.
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Data Centers in 2015:
What is changing the market and influencing real estate strategies?

An increase in **tax incentives** from state and local governments looking to attract data center development to their municipalities.

Industry **consolidations** as midsized and large providers acquire other operators to access new geographies, expand business lines and grow service offerings.

Large providers look **overseas** to emerging markets where the mismatch between supply and demand can provide higher returns.

The **internet of things**, **software-defined data centers** and **disaster recovery** emerge as demand drivers.

**Vacancy declines** due to the organic growth of current tenants, trend toward outsourcing and adoption of cloud services.

Transaction activity starts to **spread out** across markets.
National Data Center overview

Economic picture

As JLL reported last year, the third party data center market is in continual growth mode. Businesses continue to outsource their information technology platforms, lease third party data center facilities and adopt cloud services. While reasons vary, most users of third party data center space cite the following three objectives as the primary reasons for engaging with an outside provider.

- Focus on their core business and gain access to upgraded networks, infrastructure and services
- Eliminate overhead and increase efficiency in IT operations
- Lower total cost of ownership, mitigate risk and improve data security

Revenue and employment projections indicate the third party data center market’s expansion will continue over the next few years. Data center employment has seen almost 7.0 percent annualized growth since 2010. Over the next five years, employment growth will slow but remain healthy at 3.8 percent on average. Strong demand and the highly technical nature of these jobs has put upward pressure on wages for database administrators and other IT professionals. With a mean hourly wage of $40.85, some database and systems administrators are seeing salaries that surpass those in law, finance and technical consulting. According to 451 Research, the North American data center market is expected to see its revenue grow by roughly 14.0 percent for the next two years.

Data centers are key economic drivers in markets within which they operate. They generate new jobs, involve significant capital investment and help strengthen the overall business environment. State and local governments look to attract data center development through a multitude of tax incentives. These programs often provide relief from sales tax, based on certain thresholds and can sway final location decisions when other factors are constant. Many states have programs that spur data center development. Two recent examples include:

- **Missouri** passed tax breaks for new data centers that involve at least a $25 million investment and 10 jobs. Expansion projects are eligible for tax breaks if there is an investment of $5 million and five new jobs. These jobs must pay at least 150.0 percent of the county average wage to be eligible for incentives.
- **Texas** passed tax incentive legislation that provides 100.0 percent exemption of sales taxes on business personal property necessary for data center operation over 10 to 15 years for large data center users. This can equate to several million dollars in savings for a qualified project.

Industry insight

The third party data center market continues to see heavy consolidation through mergers and acquisitions. Entering a new market requires both significant time and capital. Therefore, many mid and large sized providers have been acquiring other operators to access new geographies, business lines and service offerings. Acquisitions are mostly strategic and involve the larger provider seeking to increase market penetration, gain capacity and add or expand services. Small single-site data center operators view mergers as an opportunity to join a larger platform and gain efficiencies of scale. Other buyers have traditionally included institutional investors, private equity firms, real estate investment firms and telecom companies. For example, the California State Teachers’ Retirement System (CalSTRS) recently announced it completed its purchase of a 78,000-square-foot data center in Kansas City through DataCore- a $500 million fund targeting technology focused real estate in the U.S. managed by GI Partners. Since its formation by CalSTRS, DataCore has acquired 1.3 million square feet of data center space.

A new buyer last year and one expected to be more active looking ahead is cable companies. Late last year, Shaw Communications, Inc. closed on its purchase of ViaWest, Inc. for an enterprise value of $1.2 billion.

Leading indicator of demand: employment in data processing & hosting services will continue on its growth path

![Employment graph]

Source: IBISWorld, June 2015
Other major mergers that have transformed the provider landscape in 2015 include:

- Digital Realty will buy Telx from private equity firms ABRY and Berkshire Partners in a deal valued at $1.9 billion. The merger will double Digital Realty’s footprint in the colocation sector as Telx managed 1.3 million square feet of data center space across the U.S.
- In May, Equinix announced its largest acquisition to date- plans to purchase the British provider TelecityGroup for $3.6 billion.
- In an effort to grow its presence in the New York and New Jersey markets, CyrusOne acquired Cervalis for $400 million. The transaction also expands the roster of large financial services clients for CyrusOne, a key vertical in the industry.
- QTS Realty Trust closed on its purchase of Carpathia Hosting, an operator based in Virginia with a focus on servicing U.S. government agencies, for $326 million.

We expect industry consolidation will change the market by shrinking the overall number of providers and positioning those left to offer greater geographic coverage and service options.

A new industry trend gaining some traction is buying renewable energy for data centers. This year, both Facebook and Amazon have announced plans to use wind power for their data center facilities. The technology sector is at the forefront of investing in sustainable power with Intel, Microsoft and Google comprising the largest users of renewable energy. So it is logical to expect a continued interest in exploring how the power needs of data centers can be fulfilled by renewable energy. The current challenge is location alignment as the locations that work well for a data center are rarely the same ones that work well for a utility-scale wind farm. Government regulation and technology will need to come together for this trend to really take hold in the future.

Demand drivers

The demand drivers analyzed last year remain dominant in 2015. However, three new trends have emerged this year and they are having an impact on the location, size and specifications users seek when making data center decisions.

- Increased adoption of the “the internet of things.” Transportation companies, local governments and utility companies have all increased their adoption of the ‘internet of things’ - a term used to describe machine-to-machine technology that transforms data into useful information. A study from ABI Research predicts the internet of things market will grow significantly from 1.2 billion business-to-business connections in 2014 to 5.4 billion connections in 2020. The data center market is at the center of this development as the internet of things is dependent on secure network connectivity and cloud infrastructure.

- Software defined data center as an emerging technology. When asked what technology will have the greatest impact on data center operations over the next two years, 42.0 percent of industry insiders selected software-defined data centers according to 451 Research. Described as a unified data center platform that increases flexibility and efficiency, software-driven automation is expected to solve staff shortages and enable the movement of workloads within and outside on premise data centers.

- Disaster recovery jumps to top priority. Discussions over disaster recovery have intensified this year and many data center users are evaluating new strategies to address this critical issue. A 451 Research study reflected that 69.0 percent of organizations use another company-owned data center site for failover, 39.0 percent uses a colocation provider, 21.0 percent uses a managed hosting provider and only 8.0 percent uses a public cloud provider.

The factors above combined with other demand drivers are pushing public cloud and third party data center solutions to the top of the agenda for IT decision makers. Most are looking to decrease their ownership of data center facilities and deploy a hybrid structure with a mix of on-and-off premise capacity. The uptick in overall leasing volume is causing demand to start to spread out and some emerging markets are seeing more transaction activity. We are seeing growing demand for third party data center space in Portland, Toronto and Minneapolis.

While the primary markets continue to see the most leasing activity, secondary markets are starting to catch up.

<table>
<thead>
<tr>
<th>2015 YTD Absorption (MW)</th>
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<tbody>
<tr>
<td>0.0</td>
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<tr>
<td>Atlanta</td>
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<tr>
<td>New York City</td>
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<tr>
<td>2.5</td>
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<td>4.0</td>
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<td>Source: JLL Research</td>
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Supply drivers

Supply in the data center market mainly stems from two channels: enterprise facilities and the third party market. While the overall market continues its movement toward third party solutions, it is important to monitor the enterprise segment as currently most companies rely on a hybrid of internal and external data center space.

- Enterprise data centers are usually the result of build-to-suit development by the largest organizations in technology, healthcare and financial services. Service firms and small to mid-sized companies are least likely to own their own data center. Users of enterprise data centers have to balance cost management with
The third party data center market is comprised of colocation companies who provide data center space and other IT related services to their customers. Last year, we reported that following a construction boom, colocation providers had pulled back on building services to their customers. This more disciplined approach has allowed providers to stabilize market pricing in these geographies. In other markets such as Dallas, Chicago and Northern Virginia the level of construction activity is high. The third party data center market is comprised of colocation companies who provide data center space and other IT related services to their customers. Last year, we reported that following a construction boom, colocation providers had pulled back on building services to their customers. This more disciplined approach has allowed providers to stabilize market pricing in these geographies. In other markets such as Dallas, Chicago and Northern Virginia the level of construction activity is high.

Access to funding is a critical factor in building new supply due to the capital intensity of the data center market. Construction costs associated with a new data center are high and the IT infrastructure investment can be 2 to 3 times the amount to build. While sources of capital exist, they are largely available to proven providers with strong cash flows and properties in multiple markets. Lenders are reluctant to fund new construction by single-site providers or those entering a market for the first time. This is yet another reason why we are seeing small providers combine with larger firms through mergers and acquisitions. The largest public colocation companies such as Equinix and Digital Realty Trust are increasing capex in 2015 and will lead third party data center construction globally as they have the best access to funds.

The primary markets are seeing lower vacancy despite moderate new construction due to the organic growth of current tenants and the trend toward outsourcing and adoption of cloud services. We believe that pricing has largely stabilized and will be firmer over the near-term. However, favorable rates and terms are still available in many markets for the next year or so. Additional services play a large role in rent negotiations in the data center world and providers are more likely to offer inducements if there is an opportunity to sell other IT offerings. Large providers have the most flexibility to average out revenue between low priced large transactions or contracts and higher margin hybrid customers. This creates an opportunity for users with strong credit to negotiate favorable terms with these providers. Small and mid-sized providers often do not have the service offerings to do this and are less flexible on rates.

### Top 10 markets for data center construction

<table>
<thead>
<tr>
<th>Market</th>
<th>2015 Under Construction (s.f.)</th>
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<tbody>
<tr>
<td>Seattle &amp; Portland</td>
<td>352,000</td>
</tr>
<tr>
<td>Chicago</td>
<td>345,595</td>
</tr>
<tr>
<td>Silicon Valley</td>
<td>236,000</td>
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<tr>
<td>Northern Virginia</td>
<td>203,000</td>
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<td>Houston</td>
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<tr>
<td>Dallas</td>
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<tr>
<td>Las Vegas &amp; Reno</td>
<td>60,000</td>
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<tr>
<td>Austin &amp; San Antonio</td>
<td>53,600</td>
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<td>Atlanta</td>
<td>40,000</td>
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### Real estate insight

The North America data center market is the most established globally and large providers have started to look overseas to emerging markets where the mismatch between supply and demand can provide higher returns. In Asia, Indonesia is an emerging market where information and communication technology growth is expected to surpass neighboring countries. In Europe, increasing demand for high-quality data center space has led to investment interest in Stockholm, Vienna, Madrid and Milan. We expect large colocation providers will direct investment funds toward international markets over the next few years as they compete to establish a foothold in these emerging markets.

Turning back to North America, the top 10 metros each have more than 20 third party providers, illustrating the level of maturity and competition in the market. The primary markets are seeing lower vacancy despite moderate new construction due to the organic growth of current tenants and the trend toward outsourcing and adoption of cloud services. We believe that pricing has largely stabilized and will be firmer over the near-term. However, favorable rates and terms are still available in many markets for the next year or so. Additional services play a large role in rent negotiations in the data center world and providers are more likely to offer inducements if there is an opportunity to sell other IT offerings. Large providers have the most flexibility to average out revenue between low priced large transactions or contracts and higher margin hybrid customers. This creates an opportunity for users with strong credit to negotiate favorable terms with these providers. Small and mid-sized providers often do not have the service offerings to do this and are less flexible on rates.
A few market highlights this year include:

- **Northern Virginia** surpassed the New York/New Jersey region in terms of operational data center square feet in 2014 and is on track to lead the U.S. again in 2015.
- In **Silicon Valley**, pricing is expected to trend upward in the second quarter of 2016 due to a historically low inventory of turn-key product. Although several projects are planned, most have been pre-leased.
- Both **Houston** and **Calgary** may see a slowdown in demand due to the decline of oil prices and contraction in the energy industry. However, absorption has remained stable thus far this year.
- **Chicago** has seen an increase in leasing from west coast technology companies developing latency sensitive sites for cloud hosting strategies. However, a large construction pipeline in the suburbs is keeping the market user favorable.
- In contrast to some other markets, providers in **Dallas** are looking to replenish supply with record development. Conversely, rents have yet to stabilize.
- **Reno** is experiencing an uptick in data center development led by Apple, Switch and eBay due to an abundance of power specifically in renewable resources. Proximity to California and the new Nevada tax bill are also adding to the attractiveness of this market.

As we forecasted last year, the window of opportunity for users to secure favorable rates and terms is open from now until early 2016. When we approach the second half of 2016, it is likely that the market will start to shift toward third party providers and rental rates will be more firm.

**The user perspective:** Larger companies are more likely to increase spending on data center facilities than small-to-mid sized organizations over the next year. Those companies large enough to have enterprise data centers within their portfolio will invest in upgrading existing facilities and expanding on their established campuses rather than take on the high costs of new development. As enterprise data centers age, demand will transition toward the third party market due to the trends we have discussed above. The adoption of cloud technology will not reduce data center demand but boost it and even large cloud providers will need to lease space from the third party market. **We believe that users should look to lease third party data center space in the near term while the construction pipeline and market conditions are more favorable.** Users should seek to build long-term relationships with providers since most companies expect to increase data center capacity over the foreseeable future. Companies should be on the lookout for new geographic markets that provide power and technology supportive of business objectives but at a lower price point.

**The provider perspective:** We expect fundamentals in the third party market will remain healthy as existing tenants look to expand capacity and more companies outsource their IT infrastructure. Services will remain a growing area of differentiation for colocation providers and create opportunities to attract higher margin customers. Providers unable to compete on services will focus on the quality of location, network connectivity, build and price. **We expect supply to increase conservatively in markets where absorption has slowed as providers look to close the gap between available stock and demand.** Large proven colocation companies will have more access to funds than smaller firms and lead in new development. The level of merger and acquisition activity in this sector will remain high as the industry consolidates and large providers look to expand footprints and service offerings. We believe providers will be able to firm up pricing in the second half of 2016. Likewise, strategic providers should be on the lookout for emerging North America markets where demand is underserved and there is an opportunity to grab market share.
Local Data Center markets
**Atlanta**

### Supply
- **Total inventory:** 1.5 m.s.f. / 160.0 MW
- **Total commissioned vacant:** 200,000 s.f. / 28.0 MW
- **Under construction:** 40,000 s.f. / 6.0 MW
- **Planned:** 220,000 s.f. / 29.0 MW

### Demand
- **Net absorption:** 2.5 MW YTD

### Rental rates
- **< 250 kW:** $200 - $350/kW (all in)
- **>250 kW:** $125-$150/kW (+E)

### Data center overview
**Supply** is holding steady with the exception of the expansion space QTS is adding at their Metro and Suwanee facilities (organic growth). Two existing providers have added significant additional capacity and the space should deliver soon. A new entrant to the market, a wholesale provider, has a site under contract for a new competitive alternative for larger users.

**Demand** is coming from all industries (insurance, financial, technology, hospitality, healthcare, etc.) with specific interest from technology and the payment card transaction sectors.

**Utility** rates in the southeast remain very attractive with Atlanta in the $.047 - $.05 per kWh range. GA Power is investing in a large nuclear power plant expected to deliver in 2019. The forecast calls for stable, competitive rates in the future.

**Employment** growth, corporate headquarter relocations including Mercedes Benz, and regional office expansions are contributing to an improving economy which benefits providers of data center space.

We expect users to maintain significant leverage until existing supply and new construction is absorbed- most likely by mid 2016. By late 2016, lower vacancy should give providers the leverage to raise rates and scale back on incentives. Users facing a lease expiration should look to transact 9 to 12 months in advance.

### User demand by industry
- **Banking & Financial Services:** 30%
- **Healthcare:** 30%
- **Telecom:** 15%
- **Technology:** 25%

### Outlook
#### for Users
- There is increasing supply in retail and wholesale categories.
- Aggressive pricing and ramp structures will continue, but rate declines are subsiding.
- Cloud and evolving IT deployment strategies continue to challenge decision makers to right-size their requirements and/or footprints.

#### for Providers
- The data center investment climate remains hot and assets should continue to trade hands at attractive cap rates.
- Several existing providers are considering building new wholesale and retail space in response to market interest from new providers.

### Average power rate (cents/kWh)

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<th>Year</th>
<th>Cents per kWh</th>
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<td>2012</td>
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<td>2014</td>
<td>4.7</td>
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<tr>
<td>2015</td>
<td>4.8</td>
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#### 2015 significant data center transactions
- **Financial Services Company:** T5 @ Atlanta 500 kW
- **Google Lithia Springs:** 30.0 MW
- **Data Center Provider:** 180 Peachtree Street 5.0 MW
Austin & San Antonio

Supply
Total inventory: 365,500 s.f./ 55.5 MW
Total commissioned vacant: 41,500 s.f./ 6.8 MW
Under construction: 53,600 s.f./ 4.5 MW
Planned: 101,587 s.f./ 23.4 MW

Demand
Net absorption: 0.8 MW YTD

Rental rates
< 250 kW: $260-$360/kW (all in)
>250 kW: $140-160/kW (+E)

Outlook
for Users
• Many companies seem to have an ecosystem of managed services and cloud providers as customers.
• Pricing will level out or slightly increase until further space under construction delivers.
• We expect power costs might increase slightly to the end of 2015.

for Providers
• Flexible footprints that include office and business continuity are key.
• Users will expect rent ramps to offset migration costs.
• Additional services for disaster recovery environments are desired.

Data center overview
Supply has been absorbed at a moderate rate in Austin and San Antonio year-to-date. CyrusOne constructed a new powered shell in the San Antonio market, as their existing footprint is nearly 100 percent leased. Stream has a turn-key data hall available for lease in San Antonio. Cyrus is also building out roughly 54,000 square feet of new turn-key colocation space in Austin expected for delivery in the fourth quarter of 2015, as their existing footprint is full. Digital Realty constructed existing turn-key space at 7500 Metro with approximately 2.25 MW available now.

Demand is stemming from mostly regional/local companies in both the Austin and San Antonio markets. Austin sees demand from west coast companies that want a more cost effective presence and value the strong cultural character of Austin. San Antonio sees a lot of government industry demand, as well as companies servicing the industry. Both markets primarily see disaster recovery demand out of industries that have primary locations in Houston or Dallas.

Utilities are regulated in both the San Antonio and Austin markets, and therefore we are seeing increases over previous years compared to deregulated markets in Texas.

User demand by industry
- Government 30%
- Healthcare 15%
- Telecom 40%
- Technology 5%
- Retail & E-commerce 5%
- Insurance 5%

Average power rate (cents/kWh)

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<tr>
<th>Year</th>
<th>Cost Per kWh</th>
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<td>2014</td>
<td>7.0</td>
</tr>
<tr>
<td>2015</td>
<td>7.2</td>
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2015 significant data center transactions
- Technology firm CyrusOne - Austin 250 kW
- Technology firm CyrusOne - Austin 300 kW
Chicago

Supply
Total inventory: 3.4 m.s.f. / 426.0 MW
Total commissioned vacant: 241,948 s.f. / 28.0 MW
Under construction: 345,595 s.f. / 20.0 MW
Planned: 1.4 m.s.f. / 200.0 MW

Demand
Net absorption: 14.0 MW YTD

Rental rates
< 250 kW: $235 - $275/kW (all in)
>250 kW: $145-$165/kW (+E)

Outlook
for Users
• There is significant suburban supply in retail and wholesale categories.
• We expect aggressive pricing and ramp structures to continue in 2016.

for Providers
• There is a significant shortage of turn-key colocation space in the downtown market.
• Several providers are considering second phase builds of wholesale and retail space in both downtown and the suburbs.

Data center overview

Supply is being put on the market in significant quantities due to increased user demand. Several providers are spec building multiple MW’s in the suburban markets whereas downtown remains tight. Specifically, we are seeing significant ongoing investment from DuPont Fabros, Digital Realty, Forsythe and QTS.

Demand is coming from all industries, however, it has been particularly strong from west coast technology companies developing latency sensitive sites for cloud hosting strategies.

Utility rates in the Midwest remain stable at $.067 - $.073/kWh.

Overall increased supply should lead to reduced rates and aggressive deal concessions.

Select providers with spec space will continue to have an advantage for time sensitive requirements. Speculative colocation build-outs have filled vacancy much quicker than build-to-suit options. Nonetheless, we expect users to maintain significant leverage until the pipeline of new construction is absorbed in the suburbs. By mid-2016, lower vacancy will give owners the ability to raise rates and scale back on concessions. Users facing a lease expiration should look to transact 9 to 12 months in advance.

User demand by industry
- Banking & Financial Services: 10%
- Healthcare: 7%
- Insurance: 7%
- Telecom: 5%
- Retail & E-commerce: 20%
- Manufacturing: 50%

2015 significant data center transactions
- Confidential Cloud Company: 5.5 MW
- Amazon (AWS) Multiple Providers: 3.0 MW
- CRM Provider DuPont Fabros: 2.0 MW

2015 significant data center transactions
- Net absorption: 14.0 MW YTD
- Average power rate (cents/kWh)
  - 2011: 7.2
  - 2012: 7.2
  - 2013: 6.7
  - 2014: 6.7
  - 2015: 6.7

Rental rates
- < 250 kW: $235 - $275/kW (all in)
- >250 kW: $145-$165/kW (+E)

User favorable market Neutral market Provider favorable market
Q2 15 Q3 15 Q4 15 Q1 16 Q2 16

Banking & Financial Services
Healthcare
Insurance
Telecom
Retail & E-commerce
Manufacturing

2015 significant data center transactions
Dallas

Supply

Total inventory: 2.9 m.s.f. / 335.0 MW
Total commissioned vacant: 180,000 s.f. / 20 MW
Under construction: 89,000 s.f. / 10.9 MW
Planned: 462,828 s.f. / 65.19 MW

Demand

Net absorption: 16.6 MW YTD

Rental rates

< 250 kW: $250 - $350/kW (all in)
>250 kW: $125-$150/kW (+E)

Data center overview

Supply has been absorbed (16.6 MW year-to-date) at a quick rate in the Dallas-Fort Worth market. CONE, QTS, INFOMART, EQIX and DLR are all delivering additional capacity to their campuses in the third quarter of 2015. Multitenant data center (MTDC) providers have put land sites under contract to establish or expand their presence in the Dallas Fort Worth market where activity is driven by HQ relocations and rapid economic growth.

Demand is coming from all industries (insurance, financial, technology, hospitality, etc.) with over 30 MW of requirements in the marketplace. Facebook confirmed a roughly $1 billion data center build-to-suit project in the Alliance/Fort Worth area that will reportedly run entirely off wind energy. In addition, State Farm will deliver their purpose built data center later this year. Dallas-Fort Worth providers have answered market demand by offering a full spectrum of services (cloud, managed, etc.) in their facilities.

As utilities become more important in the Central and Southwestern U.S., providers are locking in longer term electrical pricing. As providers renegotiate their utility contracts, they’re finding more favorable pricing due to lower fuel cost and the competitive nature of a deregulated energy marketplace. Rates are at an all-time low ranging from $.048-$.06/kWh.

Overall workforce growth, corporate headquarter relocations, and regional office expansion has created significant demand for more data center supply. We have seen job growth in excess of 100,000 year-over-year since 2011 and more than 20 corporate relocations thus far in 2015.

User demand by industry

- Banking & Financial Services
- Healthcare
- Telecom
- Technology
- Retail & E-commerce
- Insurance

Outlook

for Users

- We expect a small window in 2015 where there is a deficit in supply.
- Aggressive pricing and ramp structures will continue in 2015.
- For users, flexibility with infrastructure and contracts are key.

for Providers

- Providers are racing to get inventory to the market.
- Users will expect rent ramps to offset migration costs.
- Price compression will be less than 5.0 percent in 2015.

Average power rate (cents/kWh)

<table>
<thead>
<tr>
<th>Year</th>
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<td>2014</td>
<td>5.8</td>
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<tr>
<td>2015</td>
<td>5.6</td>
</tr>
</tbody>
</table>

2015 significant data center transactions

- Fortune 500 IT Outsourcing
- QTS
- 1.0 MW
- Fortune 500 Consulting/Accounting
- DataBank
- 500 kW
- High Frequency Trading
- CyrusOne
- 1.5 MW
Denver

**Supply**
- **Total inventory:** 660,003 s.f. / 98.0 MW
- **Total commissioned vacant:** 43,112 s.f. / 8.0 MW
- **Under construction:** 0 s.f. / 0 MW
- **Planned:** 173,500 s.f. / 25.0 MW

**Demand**
- **Net absorption:** 2.2 MW YTD

**Rental rates**
- **< 250 kW:** $220 - $325/kW (all in)
- **>250 kW:** $155 - $190/kW (+E)

**Data center overview**

**Demand** continues to be driven by users with disaster recovery requirements due to the region’s low likelihood of natural disasters and accessibility to airports. Denver’s favorable climate allows users to take advantage of numerous hours of free cooling throughout the year.

The **business climate** has a heavy concentration of users in high growth sectors including oil and gas, technology and healthcare.

**OneNeck IT Solutions** opened the first phase of its $20 million, 35,000-square-foot project. The overall project is designed to accommodate up to five phases totaling 160,000 square feet. The facility meets demand for managed services in the Rocky Mountain region and will serve as a disaster tolerance and avoidance location for those outside the region.

**Colorado Springs** continues to be an attractive city for enterprise data center operations. HP and Progressive Insurance have been operating their data centers in this market. T5 is looking to anchor their first development in Colorado Springs. The proximity to Denver, as well as local colleges and military installations, gives access to talent and local resources.

**User demand by industry**

- **Media & Entertainment**
- **Technology**
- **Banking & Financial Services**
- **Telecom**
- **Healthcare**
- **Insurance**

**Average power rate (cents/kWh)**

<table>
<thead>
<tr>
<th>Year</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cents per kWh</td>
<td>6.7</td>
<td>6.7</td>
<td>6.9</td>
<td>7.1</td>
<td>7.1</td>
</tr>
</tbody>
</table>

**2015 significant data center transactions**

- **OneNeck 35,000 s.f. Denver**
- **Telecom Company CenturyLink 300 kW**
- **Retail Clothing Co. FORTRUST 250 kW**

**Outlook**

**for Users**
- As a top connectivity hub for the Midwest, the market provides ideal access for both East and West coast based enterprises.
- Competition amongst providers enables price stability, flexibility for expansion, and multiple managed service options.

**for Providers**
- The market will continue to grow as large enterprises seek to fulfill more hybrid cloud deployments.
- Demand continues to stem from retail colo and managed services requirements.
**Houston**

### Supply
- **Total inventory:** 762,300 s.f. / 119.0 MW
- **Total commissioned vacant:** 64,200 s.f. / 7.3 MW
- **Under construction:** 155,000 s.f. / 26.3 MW
- **Planned:** 425,484 s.f. / 69.6 MW

### Demand
- **Net absorption:** 5.5 MW YTD

### Rental rates
- **< 250 kW:** $255 - $355/kW (all in)
- **> 250 kW:** $135-$155/kW (+E)

### Data center overview

**Supply** has been absorbed (approximately 5.53 MW) at a stable rate, much of which is still growth driven by oil and gas firms. Skybox delivered their first building in the Energy Corridor with immediate pre-leasing success. New supply is being built-out with CyrusOne delivering 50,000 square feet in the third quarter of 2015 with runway for significantly more space. DataFoundry brought a 250,000-square-foot building online with 2 MW but with up to 50 MW of future capacity available. Westland Bunker is developing speculative data center space to meet the disaster recovery demand for users looking for distance from the coastline.

**Demand** is coming from all industries due to the population growth in the Houston market. The largest amount of demand is still coming out of the oil and gas sector. Technology is helping drilling and exploration efforts dramatically, but we are seeing data center interest peaking in the healthcare sector.

As HPC (High Performance Computing) becomes more important in the oil and gas exploration sector, companies are outsourcing more and more of this technology to colocation operators that can handle the high density computing environments to run seismic data. Much of the HPC companies are utilizing on-demand computer resources in order to control spiking demand needs to process jobs.

### Outlook

**for Users**
- New providers are introducing more flexibility in infrastructure and design.
- Pricing will compress slightly in the second half 2015 as new supply becomes available.
- We expect power costs might increase slightly to the end of 2015.

**for Providers**
- New entrants are focused on flexible design with varying redundancy environments.
- Users will expect rent ramps to offset migration costs.
- Price compression will be roughly 5.0 percent in 2015.

### Average power rate (cents/kWh)

<table>
<thead>
<tr>
<th>Year</th>
<th>Cost per kW</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>6.9</td>
</tr>
<tr>
<td>2012</td>
<td>6.9</td>
</tr>
<tr>
<td>2013</td>
<td>6.7</td>
</tr>
<tr>
<td>2014</td>
<td>6.6</td>
</tr>
<tr>
<td>2015</td>
<td>6.5</td>
</tr>
</tbody>
</table>

### User demand by industry

- 50% Banking & Financial Services
- 15% Healthcare
- 20% Telecom
- 5% Oil & Gas
- 5% Retail & E-commerce
- 5% Insurance

### 2015 significant data center transactions
- Oil and gas firm
  - CyrusOne 1.8 MW
- HR firm
  - Stream 1.2 MW
- Energy firm
  - Skybox 1.0 MW
Los Angeles

Supply
- Total inventory: 4.0 m.s.f. / 210.0 MW
- Total commissioned vacant: 30.0 m.s.f. / NA MW
- Under construction: 0 s.f. / 0 MW
- Planned: 0 s.f. / 0 MW

Demand
- Net absorption: 4.0 MW YTD

Rental rates
- < 250 kW: $215 - $275/kW (all in)
- >250 kW: $135-$145/kW (+E)

Data center overview

The market has begun to tighten as users are once again considering Los Angeles as a viable option. El Segundo continues to be the primary choice as options are limited in Downtown Los Angeles.

The data center facility at One Wilshire is fully occupied. This is forcing users to seek alternative solutions and putting upward pressure on rents.

The market has seen few large deals but we expect that to change as several 2.0-5.0 MW deals are active in the market and expected to land shortly.

Costs across the board continue to rise in California. DWP rates will remain stable as Edison expects an increase.

The failed Comcast/Time Warner merger halted one of the larger deals at T5 in El Segundo bringing 2.0 MW back to the market. 500 kW of the space will be used for smaller users and is expected to fill up quickly.

User demand by industry

- Entertainment & Media: 35%
- Technology: 15%
- Telecom: 10%
- Healthcare: 5%
- Banking & Financial Services: 5%
- Retail & E-commerce: 5%

Outlook

for Users
- Users are looking more at powered shell opportunities as quality built out options are minimal.
- Entertainment, media and technology continue to be the driving force of the market.

for Providers
- Providers continue to compete for tenants.
- Aggressive pricing structures still exist for credit tenants.

Average power rate (cents/kWh)

<table>
<thead>
<tr>
<th>Cents per kWh</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q2 15</td>
<td>13.0</td>
<td>13.0</td>
<td>13.0</td>
<td>13.0</td>
<td>13.0</td>
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<tr>
<td>Q3 15</td>
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<tr>
<td>Q4 15</td>
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<tr>
<td>Q1 16</td>
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<td></td>
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<tr>
<td>Q2 16</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

2015 significant data center transactions

- 900 Alameda
  - LADWP
  - 750 kW
- Symantec
  - CenturyLink
  - El Segundo
  - 250 kW
- 900 Alameda
  - Confidential
  - Coresite -Los Angeles
  - 2.0 MW

User favorable market
Neutral market
Provider favorable market

JLL | North America | Data Center Outlook | 2015 | 15
Las Vegas & Reno

Supply

Total inventory: 1.1 m.s.f. / 128.0 MW
Total commissioned vacant: 93,000 s.f. / 13.0 MW
Under construction: 60,000 s.f. / 10.0 MW
Planned: 300,000 s.f. / 55.0 MW

Demand

Net absorption: 7.6 MW YTD

Rental rates

< 250 kW: $200 - $320/kW (all in)
> 250 kW: $130 - $170/kW (+E)

User demand by industry

- Technology
- Healthcare
- Retail & E-commerce
- Banking & Financial Services
- Media & Entertainment
- Telecom

Data center overview

Reno is emerging as a data center market for new development led by Apple, Switch and eBay because of the abundance of power specifically in renewable resources.

Land availability, geographic redundancy and low latency for applications are important drivers for Reno data center development. Switch recently acquired 1,000 acres to develop a multi-tenant data center campus in the Reno Tahoe industrial park. The first phase of this development is scheduled to open in the second quarter of 2016 with eBay (10 MW) as the anchor tenant.

In Las Vegas, Switch continues to be the dominant provider and is currently constructing its first phase (60,000 square feet / 10 MW) of Supernap 9 which is over 80.0 percent preleased.

Nevada has well established IT industry anchors, world class internet infrastructure and locational advantages. Lured by reliable electrical grid, business friendly environment and proximity to California, several companies continue to see southern Nevada as an ideal spot to meet the fast growing demand of data storage and computing.

In addition, the new Nevada tax bill (SB-170), which provides a sales tax reduction on computer equipment for qualified data center users, suggests that the state supports data center development.

Demand

Net absorption: 7.6 MW YTD

Outlook

for Users

- Users will find a favorable tax climate, payroll and property tax incentives including abatements and deferral programs.
- Las Vegas will continue to prosper as a major data center hub for the West region due to presence of Switch’s robust connectivity infrastructure.

for Providers

- Continued attraction from California companies due to geographic redundancy and low latency.
- Sustainable and clean energy sources continue to be deployed within the state of Nevada.

Rental rates

< 250 kW: $200 - $320/kW (all in)
> 250 kW: $130 - $170/kW (+E)

Average power rate (cents/kWh)

<table>
<thead>
<tr>
<th>Year</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cents per kWh</td>
<td>5.7</td>
<td>5.5</td>
<td>5.3</td>
<td>6.2</td>
<td>6.1</td>
</tr>
</tbody>
</table>

2015 significant data center transactions

- Gaming Company Switch 5.4 MW
- SLED Company ViaWest 120 kW
- Switch 1,000 acres Reno Tahoe Industrial Center
Supply of multitenant data center and colocation space has never been higher in the Minneapolis/St. Paul market. The trend of new entrants and expansions by existing providers has continued into the second quarter of 2015 with approximately 245,000 square feet of vacant, commissioned data center space coming onto the market. The supply increase has come in a variety of different forms including three new colocation providers, the expansion of existing footprints and previously leased space becoming available.

Demand is increasing significantly as end-users explore a variety of new potential solutions.

State data center tax incentives allow companies to abate sales tax on hardware, software and power by housing their data center in a qualifying facility. The incentives are significantly contributing to demand as decision makers factor potential savings into their data center strategy. Absorption has steadily increased with deals ranging from single-racks to 1 MW during the last four quarters.

We expect users to maintain significant leverage through 2016 until absorption catches up with supply. Until then, downward pressure on pricing and increased concessions will be the norm.
New York City

Supply

<table>
<thead>
<tr>
<th>Total inventory: 122.0 MW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total commissioned vacant: 20.4 MW</td>
</tr>
<tr>
<td>Planned: 19.6 MW</td>
</tr>
</tbody>
</table>

Demand

| Net absorption: 6.0 MW YTD |

Rental rates

| < 250 kW: $300-$700/kW (+E) |
| > 250 kW: $300-$500/kW (+E) |

Data center overview

Retail colo providers maintain a firm stance on pricing due to strong absorption and limited supply of quality space offerings. The only wholesale players with product in NYC are Sabey, DLR and DataGryd. Sabey is operating in an unproven property at 375 Pearl. Sabey has significant vacancies which has lowered starting rates at 375 Pearl.

Users continue to have a high volume of specialty requirements and it is driving demand at various premium interconnect buildings.

Recent commercial utility rates in the state of New York were $.158/kWh, down $.0169/kWh year-over-year but 53.1 percent higher than the national average of $.103/kWh.

Overall employment growth (2.9 percent year-over-year), fueled by the creative sectors, retail, education and healthcare, contributed to an improving economy and directly benefited providers of data center space.

We expect providers to maintain significant leverage as the lack of incentives, high power costs and high property costs discourages new data center construction and keeps supply limited.

Outlook

for Users

- We expect high rates to continue through 2015 as limited quality space is slated to come to market in the near future and demand remains strong.

for Providers

- An opportunity exists for providers looking to capture the overflow of demand at 111 8th Ave by establishing a new interconnect option.
- DLR has agreed to acquire Telx for $1.89 billion, including the provider’s space at 111 8th Ave, 60 Hudson St, and 32 Avenue of the Americas.

Average power rate (cents/kWh)

<table>
<thead>
<tr>
<th>Cents per kWh</th>
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<tbody>
<tr>
<td>2011</td>
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<td>2012</td>
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<tr>
<td>2013</td>
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<tr>
<td>2014</td>
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<tr>
<td>2015</td>
</tr>
</tbody>
</table>

2015 significant data center transactions

- Bell Canada
  - 32 Avenue of the Americas
  - 25,000 s.f.
- Zayo
  - 111 8th Avenue
  - 6,396 s.f.
- Level 3
  - 60 Hudson St
  - 13,276 s.f.
Northern New Jersey

Supply
Total inventory: 3.2 m.s.f. / 334.0 MW
Total commissioned vacant: 257,000 s.f. / 34.0 MW
Under construction: 20,000 s.f. / 2.0 MW
Planned: 814,000 s.f. / 113.0 MW

Demand
Net absorption: 9.0 MW YTD

Rental rates
< 250 kW: $175 - $350/kW (all in)
>250 kW: $125-$170/kW (+E)

Data center overview
Supply in and around the NYC metropolitan market has stabilized.

In Northern New Jersey, the past two years were shaped by third party data center providers entering the market and building significant new supply. We have not seen that trend thus far in 2015. Instead, owners are increasing supply very judiciously. The days when several megas of turn-key space hit the market all at once seem to have come to an end. Today, providers will add about a meg at a time, only after there is a commitment for what was built already.

Demand in the market has historically been dominated by financial services tenants, however, this sector has been less active in 2015. Alternatively, demand from data center tenants now appears to be much more diversified by industry type. Additionally, except for a few outliers, the general size of new requirements is smaller than in the past.

Outlook
for Users
- Supply has leveled out.
- Rates are starting to trend upward.
- We expect to see more industry diversification.
- H5 Data Center to provide powered shell building option to Ashburn marketplace.

for Providers
- Supply will be added judiciously.
- Inventory has stabilized.
- We expect user demand to be below the three year running average.
- Financial services demand is down significantly.

Average power rate (cents/kWh)

<table>
<thead>
<tr>
<th>Year</th>
<th>Cents per kWh</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>9.0</td>
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<tr>
<td>2012</td>
<td>8.5</td>
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<tr>
<td>2013</td>
<td>8.5</td>
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<tr>
<td>2014</td>
<td>9.0</td>
</tr>
<tr>
<td>2015</td>
<td>9.0</td>
</tr>
</tbody>
</table>

User demand by industry

- Banking & Financial Services: 45%
- Technology: 22%
- Healthcare: 11%
- Media & Entertainment: 12%

2015 significant data center transactions
- Secaucus, NJ: Financial Services CoreSite
  - 900 kW
- Piscataway, NJ: Technology Digital Realty
  - 1.0 MW
- Piscataway, NJ: Healthcare Digital Realty
  - 562 kW
Northern Virginia

Supply

<table>
<thead>
<tr>
<th>Category</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total inventory</td>
<td>6.6 m.s.f. / 592.0 MW</td>
</tr>
<tr>
<td>Total commissioned vacant</td>
<td>202,000 s.f. / 39.0 MW</td>
</tr>
<tr>
<td>Under construction</td>
<td>203,000 s.f. / 232.7 MW</td>
</tr>
<tr>
<td>Planned</td>
<td>781,000 s.f. / 161.0 MW</td>
</tr>
</tbody>
</table>

Demand

<table>
<thead>
<tr>
<th>Category</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net absorption</td>
<td>31.8 MW YTD</td>
</tr>
</tbody>
</table>

Rental rates

- < 250 kW: $140-$180/kW (+E)
- >250 kW: $120-$140/kW (+E)

Outlook

for Users

- Historic pricing and concessions will continue into 2016.
- Retail colo pricing will compete aggressively with wholesale colo.
- Power costs remain steady and will be predictable for several years.
- Managed services and cloud offering are a significant consideration.

for Providers

- Price compression will continue into 2016 as operators aggressively compete for user deals, market share and participation in market velocity.
- The breadth of competition will widen with new market entries and comprehensive service offerings.

Average power rate (cents/kWh)

<table>
<thead>
<tr>
<th>Year</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>6.0</td>
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<tr>
<td>2012</td>
<td>6.1</td>
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<td>2013</td>
<td>6.0</td>
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<tr>
<td>2014</td>
<td>5.7</td>
</tr>
<tr>
<td>2015</td>
<td>5.7</td>
</tr>
</tbody>
</table>

User demand by industry

- Technology: 30%
- Banking & Financial Services: 25%
- Insurance: 25%
- Healthcare: 25%
- Telecom: 10%
- Retail & E-commerce: 5%

2015 significant data center transactions

- Facebook DFT – ACC7 7.4 MW
- AWS COPT DC-6 11.3 MW
- InfoMart (former AOL data center) 180,000 s.f./ 5.4 MW Q2 16

Data center overview

Northern Virginia led the nation in 2014 in total demand with nearly a 25.0 percent market share and 56.0 MW. Demand in 2015 is on par (30.8 MW year-to-date) and the market is expected to lead the U.S. into 2016.

Cloud computing, Dot-com 2.0 and new SaaS users dominate market growth. AWS and Azure are growing at a rapid pace.

New operators are entering the Northern Virginia market because of the strong demand and quality of enterprise users.

Users are drawn to Northern Virginia for low latency as compared to Tier 1 U.S. and international markets.

Operators are aggressively delivering new turn-key data center space with new progressive designs to meet user demand.

The market has cost competitive utility rates and an abundance of available power compared to other Tier 1 MSAs.

There are limited powered shell building options and H5 Data Centers recently entered Ashburn.

We are seeing new quality land sites enter the marketplace.

Total inventory: 6.6 m.s.f. / 592.0 MW
Total commissioned vacant: 202,000 s.f. / 39.0 MW
Under construction: 203,000 s.f. / 232.7 MW
Planned: 781,000 s.f. / 161.0 MW
Phoenix

Supply

Total inventory: 1.0 M s.f. / 112.0 MW
Total commissioned vacant: 56,500 s.f. / 9.0 MW
Under construction: 110,000 s.f. / 14.0 MW
Planned: 395,000 s.f. / 56.0 MW

Demand

Net absorption: 7.9 MW YTD

Rentals rates

< 250 kW: $250 - $325/kW (all in)
>250 kW: $135 - $165/kW (+E)

Outlook

for Users

- We expect an increasing number of wholesale options.
- A deficit in supply will exist until Aligned Data Centers and CyrusOne deliver new product in early 2016.
- New supply will result in a competitive pricing matrix and flexibility.
- Users will continue to be attracted to the AZ Data Center Tax Exemption.

for Providers

- Increased competition by new providers will influence deal velocity.
- With a deficit in supply, new entrants will see a window of opportunity to deliver new inventory to the market to fulfill timely requirements.

Data center overview

Supply will increase in 2015 with new provider, Aligned Data Centers, who plans to retrofit a 550,000-square-foot facility in the Deer Valley submarket of North Phoenix. This development has been driven by fairly high occupancy rates of competitive providers within the market and strong user demand.

Demand has been modest during the first half of 2015 compared to the considerable activity achieved in the fourth quarter of 2014. As a top market, Phoenix continues to attract predominantly West Coast-based companies because of the low risk of natural disasters, the low cost of power and the favorable Computer Data Center Tax Program.

Utility rates in the southeast remain very attractive based on Arizona’s diverse fuel supply mix. The Solana Generating Station supplies Arizona with 280 MW of electricity. It is the largest parabolic trough system in the world.

Data Center investment sales were strong with the American Express data center selling at $91.5 million and State Farm data center selling at approximately $38.0 million.

User demand by industry

- Retail & E-Commerce: 20%
- Technology: 20%
- Banking & Financial Services: 15%
- Telecom: 20%
- Healthcare: 15%
- Insurance: 10%

2015 significant data center transactions

- Online Retailer
  - Digital Realty Trust 4.4 MW
- Technology Content Delivery
  - IT Content Delivery Co. NextFort 800 kW
- Cloud Computing
  - Cloud Computing Co. CyrusOne 2.5 MW

Average power rate (cents/kWh)

<table>
<thead>
<tr>
<th>Year</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cents per kWh</td>
<td>6.6</td>
<td>6.5</td>
<td>6.2</td>
<td>6.3</td>
<td>6.2</td>
</tr>
</tbody>
</table>

Cloud Computing Co. CyrusOne

Cloud Computing Co. CyrusOne 2.5 MW
Seattle & Portland

Supply

Total inventory: 2.9 m.s.f. / 270.0 MW
Total commissioned vacant: 554,000 s.f. / 82.0 MW
Under construction: 352,000 s.f. / 35.0 MW
Planned: 200,000 s.f. / 20.0 MW

Demand

Net absorption: 24.0 MW

Rental rates

< 250 kW: $250 - $350/kW (all in)
>250 kW: $125-$145/kW (+E)

Outlook

for Users

- There is a significant amount of new construction under way.
- Central and eastern Washington are seeing high demand.
- Power costs are stable, ranging from $.02 to $.07 per kWh.
- Large number of options exist for users with smaller requirements.
- Sales and use tax abatement was extended through 2025.

for Providers

- We are seeing a hot investment market for stabilized core assets.
- There is high demand for land in data center markets; particularly Hillsboro.
- We expect increasing demand with telecommunication grid enhancements.

Average power rate (cents/kWh)

<table>
<thead>
<tr>
<th>Year</th>
<th>Rate (cents/kWh)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>6.2</td>
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<tr>
<td>2012</td>
<td>6.3</td>
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<tr>
<td>2013</td>
<td>6.3</td>
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<tr>
<td>2014</td>
<td>6.4</td>
</tr>
<tr>
<td>2015</td>
<td>6.4</td>
</tr>
</tbody>
</table>

2015 significant data center transactions

- CenturyLink Server Farm Realty 8.0 MW
- ViaWest Majestic Realty 18.0 MW
- Costco Sabei 1.0 MW

Data center overview

Major data center markets include central Washington, Hillsboro, Oregon and Seattle, Washington.

We have seen a continued increase in data center demand, absorption and construction. The focal points of the demand have been central and eastern Washington and Hillsboro, Oregon. Demand remains stable in other markets such as Seattle and central Oregon.

Data Center rental rates have not yet increased as there are a variety of colocation options for users.

Cloud and SaaS companies along with content delivery networks continue to expand here. In addition, telecommunications companies continue to expand their robust grids in these markets.

The market is a major technology hub and that is resulting in immediate data center requirements.

User demand by industry

- Technology: 55%
- Healthcare: 25%
- Telecom: 15%
- Other: 5%
Silicon Valley

**Supply**

- **Total inventory:** 3.9 m.s.f. / 376.0 MW
- **Total commissioned vacant:** 56,000 s.f. / 14.0 MW
- **Under construction:** 236,000 s.f. / 29.0 MW
- **Planned:** 200,000 s.f. / 18.0 MW

**Demand**

- **Net absorption:** 27.6 MW YTD

**Rental rates**

- **< 250 kW:** $250 - $325/kW (all in)
- **>250 kW:** $120-$145/kW (+E)

**Outlook**

**for Users**

- We expect supply will remain constrained and inventory will become very tight.
- Pricing will remain stable over the short term and start to trend upward later in the year.
- Larger contiguous space will be priced at a premium.

**for Providers**

- CoreSite, Vantage, Dupont Fabros and Digital Realty Trust will need to find new locations to build new product.
- Users will be looking for flexibility of N and N+1.
- Inventory will be key to ensuring the continued organic growth of users.

**Inventory** remains at historically low levels for turn-key product and although several projects are planned most have been leased prior to construction. Absorption in the third and fourth quarters was above last year’s average with multiple megawatt deals signed by cloud providers and software companies. Rates have held steady and the market has turned toward a more landlord driven market. There is continued demand for new product and there is opportunity for new entrants to capture market share.

**Demand** has been robust in 2015 and has seen increased activity over 2014. Low inventory levels and a lack of construction suggest pricing will climb on wholesale and colocation leasing rates. Local technology companies, mobile applications and cloud requirements have continued to drive growth as well as new lab requirements utilizing lower redundancy.

**Power** costs in Santa Clara (SVP) remain the lowest in the region and are the driving factor making the market attractive for users. Power rates are $0.2 to $0.05 per kWh less than PG&E.

**Average power rate (cents/kWh)**

<table>
<thead>
<tr>
<th>Cents per kWh</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q2 15</td>
<td>8.9</td>
<td>9.4</td>
<td>9.8</td>
<td>10.3</td>
<td>10.3</td>
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<td>Q3 15</td>
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<td>Q4 15</td>
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<td>Q1 16</td>
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</tr>
</tbody>
</table>

**User demand by industry**

- Retail & E-commerce: 20%
- Technology: 20%
- Banking & Financial Services: 15%
- Telecom: 20%
- Healthcare: 15%
- Insurance: 10%

**2015 significant data center transactions**

- **SoftLayer**
  - Digital Realty Trust: 2.6 MW
- **Alibaba**
  - Centurylink: 3.0 MW
- **VMWare**
  - Vantage Datacenters: 2.0 MW

---

**User favorable market**

**Neutral market**

**Provider favorable market**
Greater Toronto Area (GTA)

Supply
- Total inventory: 1.5 m.s.f. / NA MW
- Total commissioned vacant: 180,000 s.f. / 26.0 MW
- Under construction: NA s.f. / 7.0 MW
- Planned: 430,000 s.f. / 100.0 MW

Demand
- Net absorption: 15.0 MW YTD

Rental rates
- < 250 kW: $225 - $800/kW (all in)
- > 250 kW: $150-$190/kW (+E)

Data center overview
- **Supply** has been a historical challenge not only within the Toronto market but within the Canadian data center market as a whole. Traditional local real estate developers have been hesitant to build without prior commitments from users despite strong demand.
- **Demand** continues to be strong and the diversification of local providers over the last 36 months has helped to elevate local market demand for outsourcing critical infrastructure. However, net new supply that has come to market over the last 12 months has been limited. We expect significant new developments planned for the market to be received positively as they will continue to diversify the options for users.
- **Utility** rates in Ontario have risen slightly. However, significant capital investment by Toronto Hydro within the financial core will help improve some of the historical challenges with the city’s aging utility infrastructure.
- Stable **employment** growth as reflected in the 5.6M square feet of new office construction in the GTA helps underline the stability that Toronto represents as the economic engine of the Canadian market.
- **Headcount** growth at companies like Cisco, Amazon and Google continue to position the Greater Toronto Area and Southern Ontario as a hub to recruit a skilled technical workforce. Data center activity should remain strong over the foreseeable future.

**User demand by industry**
- Banking & Financial Services: 45%
- Healthcare: 11%
- Insurance: 12%
- Telecom: 8%
- Retail & E-commerce: 22%
- Manufacturing: 2%

**Outlook**
- **for Users**
  - Despite limited new supply, some providers are writing aggressive deals to fill existing space.
  - We expect aggressive pricing and ramp structures to continue in 2015.
- **for Providers**
  - There are limited existing data center investment opportunities.
  - HP’s vacant data center has been slow to sell which demonstrates the market’s appetite for newer facilities with greater power densities.
  - Several providers are considering new builds of wholesale and retail space but most require anchor tenants.

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<td>7.5</td>
<td>7.8</td>
<td>8.6</td>
<td>9.4</td>
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**2015 significant data center transactions**
- Microsoft
  - Up to 2.0 MW
- Bell Canada
  - Markham District Energy 1.0 MW
- TeraGo Networks
  - Spear Street Capital 2.0 MW
Vancouver & Calgary

**Supply**

- Total inventory: 341,000 s.f. / 33.0 MW
- Total commissioned vacant: 6.0 MW
- Under construction: 17,200 s.f. / 4,440 kW
- Planned: NA

**Demand**

- Net absorption: 2.0 MW

**Rental rates**

- Under 250 kW: $385.00 / kW / month
- Over 250 kW: $175.00 / kW / month

**Data center overview**

**Vancouver**

While forestry and tourism remain the dominate sectors, Vancouver is seeing [IT related industries](#) such as gaming and biotechnology expand.

The market is driven by demand from small deployments, primarily 200 kW + requirements, and serviced by [boutique colocation](#) operators.

Vancouver faces competition from Seattle for data center requirements but pricing is high due to capacity constraints.

**Calgary**

Similar to Houston, demand for multitenant data center space in Calgary is primarily driven by the oil and gas industry. Energy is the largest contributor to Calgary’s GDP and the industry has seen its growth slow significantly due to the drop in oil prices.

Despite the contraction of the energy sector, demand in the market remains steady, while supply is constrained by few providers and incremental building.

The market is comprised primarily of telecommunications providers offering colocation services.

**Outlook**

**for Users**

- Options are limited due to the small amount of supply.
- A limited number of providers have a presence in the markets.
- Rates are increasing and on the higher end of the industry.

**for Providers**

- We expect new operators to enter Vancouver over the next several quarters.
- Boutique acquisition opportunities exist for those providers looking to grow market share.

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</tr>
</tbody>
</table>

**User demand by industry**

- Oil & Gas: 45.0%
- Banking & Financial Services: 12.0%
- Government: 22.0%
- Other: 11.0%

**2015 significant data center transactions**

- TeraGo acquisition of Rack force for $33 Million
- ViaWest Shaw Communications 40,000 s.f., raised floor
- Hostway Bentall Kennedy 2.0 MW

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Local Data Center contacts
Contacts

For more information, please contact:

**Americas Research**
Lauren Picariello  
+1 617 531 4208  
lauren.picariello@am.jll.com

**Atlanta**
Mike Dolan  
+1 404 995 2432  
mike.dolan@am.jll.com

Ryan Fetz  
+1 404 995 2132  
ryan.fetz@am.jll.com

**Chicago**
Matt Carolan  
+1 312 228 2513  
matt.carolan@am.jll.com

Andy Cvengros  
+1 312 228 3202  
andy.cvengros@am.jll.com

Sean Reynolds  
+1 312 228 3091  
sean.reynolds@am.jll.com

**Austin, Dallas, Fort Worth, Houston, San Antonio**
Bo Bond  
+1 214 438 6238  
bo.bond@am.jll.com

Ali Greenwood  
+1 214 438 6237  
ali.greenwood@am.jll.com

Curt Holcomb  
+1 214 438 6240  
curt.holcomb@am.jll.com

**Denver / Phoenix**
Mark Bauer  
+1 602 282 6259  
mark.bauer@am.jll.com

**Las Vegas / Reno**
Mark Bauer  
+1 602 282 6259  
mark.bauer@am.jll.com

Chris Sumter  
+1 650 480 2176  
chris.sumter@am.jll.com

**Los Angeles**
Darren Eades  
+1 213 239 6061  
darren.eades@am.jll.com

Jordan Gaffney  
+1 213 239 6041  
jordan.gaffney@am.jll.com

**New York City**
James Quinn  
+1 212 812 5952  
james.quinn@am.jll.com

Gary Youm  
+1 212 812 5943  
gary.youm@am.jll.com

Sumner Putnam  
+1 973 404 1513  
sumner.putnam@am.jll.com

**Northern New Jersey**
Jon Meisel  
+1 973 404 1475  
jonathan.meisel@am.jll.com

Sumner Putnam  
+1 973 404 1513  
sumner.putnam@am.jll.com

**Northern Virginia**
Allen Tucker  
+1 703 891 8396  
allen.tucker@am.jll.com

Jeff Groh  
+1 703 485 8833  
jeff.groh@am.jll.com

**Minnesota / St. Paul**
Brian Ginkel  
+1 612 217 5127  
brian.ginkel@am.jll.com

**Greater Toronto Area**
Stuart Cox  
+1 416 525 4132  
stuart.cox@am.jll.com

**Seattle / Portland**
Conan Lee  
+1 206 607 1723  
conan.lee@am.jll.com

Danny Jackson  
+1 206 607 1798  
danny.jackson@am.jll.com

**Silicon Valley**
Chris Sumter  
+1 650 354 3346  
chris.sumter@am.jll.com

**Vancouver / Calgary**
Conan Lee  
+1 206 607 1723  
conan.lee@am.jll.com

**Thomas Reilly**  
+1 973 404 1476  
thomas.reilly@am.jll.com

**Mark Stratman Jr**  
+1 602 282 6260  
mark.stratmanjr@am.jll.com

**Northern Virginia**
Allen Tucker  
+1 703 891 8396  
allen.tucker@am.jll.com

**San Antonio**
Bo Bond  
+1 214 438 6238  
bo.bond@am.jll.com

**Sumner Putnam**  
+1 973 404 1513  
sumner.putnam@am.jll.com

**Greater Toronto Area**
Stuart Cox  
+1 416 525 4132  
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Conan Lee  
+1 206 607 1723  
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Chris Sumter  
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Mark Bauer  
+1 602 282 6259  
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Chris Sumter  
+1 650 480 2176  
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**Los Angeles**
Darren Eades  
+1 213 239 6061  
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Jordan Gaffney  
+1 213 239 6041  
jordan.gaffney@am.jll.com

**New York City**
James Quinn  
+1 212 812 5952  
james.quinn@am.jll.com

Gary Youm  
+1 212 812 5943  
gary.youm@am.jll.com

Sumner Putnam  
+1 973 404 1513  
sumner.putnam@am.jll.com

**Northern New Jersey**
Jon Meisel  
+1 973 404 1475  
jonathan.meisel@am.jll.com

Sumner Putnam  
+1 973 404 1513  
sumner.putnam@am.jll.com
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