## Market Rankings

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<th>Low-Cost</th>
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What We’ll Cover Today...

- Rise of The Data Center
- The Evolving Role of the Real Estate Executive
- Site Selection Study Overview
- Third-Party Options – Colocation and Cloud
Definitions and Clarifications

**Colocation**
Multi-Tenant Data Center owned by an “operator” or “provider” whose business is the development and operation of multi-tenant data center space.

**Enterprise**
Company or end-user of the data center. An “Enterprise Data Center” is owned and operated by a company for its own purposes.

**Megawatt/Kilowatt vs. Square Footage**
The data center industry measures size and investment by power capacity **NOT** square footage.

**Example:** ABC Company built a 10MW facility instead of a 100,000 SF facility
Minneapolis/St. Paul as a Microcosm

COLOCATION SUPPLY (IN SF) ADDED TO MARKET SINCE Q4 '12

(Data Center Square Footage)

+ 200,000 SF of Enterprise data center development
Minneapolis/St. Paul as a Microcosm

Colocation supply & MPLS/STP market dynamics by the numbers

Q4'12 ♦ Q1'16

7 New Colocation Companies entered the market & built new facilities

- National & Regional providers
- Adding 105,000 SF/12MW of colocation space
Minneapolis/St. Paul as a Microcosm

Colocation supply & MPLS/STP market dynamics by the numbers

4 Expansions by colocation providers

 添加 48,000 SF/5.7MW
Colocation supply & MPLS/STP market dynamics by the numbers

Legacy vacancies repositioned to colocation after tenants vacated

Adding 194,000 SF/5.7MW
Minneapolis/St. Paul as a Microcosm

Colocation supply & MPLS/STP market dynamics by the numbers

Q1’16 ▶ Q1’17

5

Expansions of colocation facilities

Adding 74,000 SF/9MW
As IT and data grow more critical to the success of companies, so does the importance of the data center.

Corporate demand for computing power and information storage has and will continue to grow at almost double-digit rates annually.

Enterprises spent $75B on data center systems in 2016.

Leasing and absorption of colocation space is at an all-time high.

The Need for Data Center Space has Grown Exponentially

$740,000
Average cost of a single data center outage. A 38% increase from the previous year.

$150M
The most expensive outage experienced so far.
The Corporate Data Center: Where IT and Real Estate Meet

Successful data center projects bridge the gaps between IT and Real Estate and combine the expertise of both.
Our study shows a $140M delta over a 10-year period between lowest and highest cost markets.

- Effective site selection can mean Millions in savings
- RE/IT teams need to evaluate numerous scenarios and delivery methodologies:
  - Lease vs. Own
  - Design Bid Build
  - Developer-led
  - Modular, Dedicated Suite, Semi-Prefabricated
- Colocation contracts have transitioned from service agreements to real estate leases
Taxes, Incentives, Power Costs and Facility Construction Costs Drive Cost-Effective Site Selection

Study Methodology

- 5MW Data Center - 10 Years of Operation
- 30 U.S. Markets
- Tier III Design with at least N+1 redundancy
- Key Assumptions:
  - Hardware Costs: Initial Deployment + 2 Refresh Cycles
  - 2% annual inflation
  - 80% annual operating capacity
  - Full critical load deployment day 1 – no ramp
- Excluded Costs:
  - Software
  - Non-IT equipment maintenance

$270.1M
AVERAGE PROJECT COST OVER 10 YEARS
Site Selection Factors

- **[tax incentives]**
  - Sales tax refunds, real estate tax abatements and personal property tax exemptions

- **[taxes]**
  - Sales taxes on construction and IT equipment, real estate taxes and personal property taxes

- **[real estate]**
  - Secure location, availability, land acquisition cost or colocation lease payments

- **[power]**
  - Cost per kilowatt hour, carbon footprint, fuel mix and infrastructure

- **[construction costs]**
  - Availability of construction labor

- **[telecom]**
  - Fiber providers and latency

- **[climate]**
  - Environmental risk (i.e., hurricanes, tornadoes, earthquakes) and free cooling

- **[labor]**
  - Availability of qualified engineers

- **[geography]**
  - Proximity to headquarters or airports, population and market size, labor force, water availability
The Big Picture

Distribution of Total Project Cost with IT Hardware

- Capital Expenses: 73.3%/$198M | Operating Expenses: 26.7%/$72M

Source: CBRE Data Center Solutions, CBRE Research, Q3 2015.
Enterprise Cost Ranges by Factor

<table>
<thead>
<tr>
<th>Factor</th>
<th>low</th>
<th>average</th>
<th>high</th>
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</thead>
<tbody>
<tr>
<td>LAND</td>
<td>$329,000</td>
<td>$6.7M</td>
<td>$33.7M</td>
</tr>
<tr>
<td>STAFFING</td>
<td>$12.7M</td>
<td>$13.2M</td>
<td>$14.6M</td>
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<tr>
<td>TAXES</td>
<td>$0.0</td>
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<td>POWER</td>
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<td>FACILITY CONSTRUCTION</td>
<td>$80.0M</td>
<td>$94.3M</td>
<td>$116.3M</td>
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<tr>
<td>TOTAL PROJECT COST</td>
<td>$227.5M</td>
<td>$270.1M</td>
<td>$370.0M</td>
</tr>
</tbody>
</table>

Source: CBRE Data Center Solutions, CBRE Research, Q3 2015.

- Power Costs and Taxes Pushed Markets From Low to Moderate Costs
- High-Cost Markets effected most by Taxes
Power

Power Costs as a Share of Total Project Cost
### Land

#### Land Costs as a Share of Total Project Cost

<table>
<thead>
<tr>
<th>Location</th>
<th>Percentage</th>
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<tbody>
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<tr>
<td>Buffalo, NY</td>
<td>0.2%</td>
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<tr>
<td>Tulsa, OK</td>
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<td>Omaha, NE</td>
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<tr>
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<tr>
<td>Southern California</td>
<td>9.9%</td>
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Average of 30 Markets: 2.5%

Source: CBRE Data Center Solutions, CBRE Research, Q3 2015.
Staffing

Labor Costs as a Share of Total Project Cost

Average of 30 Markets

- Chicago, IL
- Southern California
- Boston, MA
- Minneapolis, MN
- Denver, CO
- Philadelphia, PA
- Kansas City, KS
- Houston, TX
- Phoenix, AZ
- Nashville, TN
- Jacksonville, FL
- Northern New Jersey
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Data center decision makers face a cost differential of **$140.9M** between the highest and lowest markets.

Source: CBRE Data Center Solutions, CBRE Research, Q3 2015.
Results: Colocation as an Option

- What’s driving 3rd party growth?
  - High initial capital investment for ownership
  - Evolving IT Needs - Desire for Flexibility
  - Increasing sophistication and offerings by Providers

- Forms of 3rd-Party Solutions: Single-Tenant, Dedicated Suite, Multi-Tenant Cage or Suite

- Enterprises may use colocation as a way to qualify for incentives

- At what size requirement does building new start to make sense? It depends...

- National Colocation Site Selection:
  - A $12M delta between the high and low-cost markets for a 1MW/7-year deal
  - Power costs and taxes are biggest cost drivers
CoreNet Global Monthly Meeting
April 11, 2017
SITE SELECTION KEYS AND THE GREATER MSP REGION’S ADVANTAGES

- Power availability and cost
- Telecommunications infrastructure
- Construction Costs
- Natural Disaster Risk
- Climate
- Workforce
- Geography and Available Sites
- Taxes and Incentives
POWER: THE AVERAGE ANNUAL ELECTRICITY PRICE FOR INDUSTRIAL CONSUMERS

21% Cost Savings
Minnesota compared to National Avg.
Average Industrial Electric Bill

GREATER MSP™
TELECOM INFRASTRUCTURE
Since our 2013 Latency Study:
Latency Speed Improvements:
  • NY, NJ, Charlotte and Boston are cut by 50%
  • Philly, N VA, Toronto, Miami, Phoenix are cut by 33%.
  • San Fran, Santa Clara and LA have all improved 20-25%
Internationally, our London route has improved by 20%. Hong Kong, Tokyo and Shanghai have improved.
10 long-haul networks run through the region
Our speeds overall are faster than New York City to Washington D.C, and Miami to Atlanta (ie, lower latency than these markets)
Able to support virtually any latency-sensitive application
CLIMATE: LOW NATURAL DISASTER RISK IS AN ADVANTAGE

Minnesota offers a low risk of severe weather related events. Lack of interruptions means operational savings for you and a safe and secure environment compared to most other locations across the U.S.
MINNESOTA’S CLIMATE CAN BE AN ADVANTAGE

315 DAYS OF FREE COOLING

GREATER MSP™
Greater MSP’s tech sector employs over 79,000 people, and the region boasts a higher location quotient tech sectors in Dallas-Ft. Worth, Houston, Kansas City, San Diego, Philadelphia, New York, Portland, and Chicago.

Minnesota lead the nation with a 8.4% annual growth in tech jobs, according to Forbes in 2015.
<table>
<thead>
<tr>
<th></th>
<th>2000-2005</th>
<th>2006-2011</th>
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</thead>
<tbody>
<tr>
<td>76%</td>
<td>72%</td>
<td>&quot;Greenfield&quot; New Construction</td>
</tr>
<tr>
<td>24%</td>
<td>28%</td>
<td>Existing Structure</td>
</tr>
</tbody>
</table>

May spend same amount or more upgrading existing structure as building new and still be forced to make compromises.
REAL ESTATE: AVAILABLE SITES AND BUILDINGS

- Available Green Field Sites (yellow)
- Fiber Rich Buildings (red)
- Shovel Ready Data Center Sites
  - Xcel Energy
  - Great River Energy
  - DEED
TAXES AND TAX INCENTIVES FOR DATA CENTERS

• No Personal Property Tax
• Large data centers: Investments of $30 million over years
  • Sales tax rebate on equipment, software, software maintenance contracts.
  • Sales tax exemption electricity.
  • For initial purchases and for 20 years or 2043.
• Small data centers:
  • MN provides a sales tax exemption on data center equipment that is used primarily for electronically transmitting results retrieved by a customer of an online computerized data retrieval system or medial records management.
IN THE PAST FOUR YEARS:

• Data Center Projects
  – 25 data center projects with in the region access the state’s incentive
    • 15 refurbished facilities
    • 10 new construction
  – $2.4 billion in total initial spending on construction and equipment
  – Average of $86 million per project
  – Creating over 4,500 new direct, indirect and induced jobs in the region.
Thank You

PROSPER:
MOMENTUM IS BUILDING

GREATER MSP™
City of Chaska
Economic Development: Data Centers
April 11, 2017
Background on Chaska

- Located 25 minutes southwest of Downtown Minneapolis
- 26,000 residents
- Home to Hazeltine National Golf Course
  - Ryder Cup, PGA Championship, US Open, US Amateur
- City is over 160 years old, with a core historic downtown, as well as traditional suburban development
- Over 13,000 jobs in the community
- Twice n Money Magazine’s List of Top 20 Cities in US to Live over past decade
- Had had its own Electric Utility since the 1920s
- Mission is to be “The Best Small Town in Minnesota”
Chaska on Economic Development

- Community has traditionally been very aggressive on business growth in the community
  - Have provided incentives strategically to grow community, while also meeting community’s goals
  - Have very diverse mixture of businesses in community—from manufacturing to bio-science industries
- Completion of 212 freeway in 2006 brought with it new opportunities for Economic Development
- While already having over 13,000 jobs in community, more than 500 acres of available Corporate/Industrial opened up with addition of new freeway
- Have partnered well with State and Regional organizations to help attract businesses to Twin Cities (ie. Greater MSP, DEED, etc...)
- Have seen Data Centers as a good growth industry in our community, given our natural advantages of location and our utilities
2010-Present: Growth of Data Centers in Community

- United Health Group
- Stream Data
- Via West
- Future Kelzer Property
Why Data Centers?

- Allowed City to develop a use that fully leverages the capacity of our Electric Utility.
- Allowed City to develop a use that will create a large future tax base in the community with fewer municipal services needed.
- While Data Centers have fewer jobs/square foot than most uses, it has allowed us to create jobs that are high in pay and education level.
- Has allowed City to develop uses that are low-impact from a land-use perspective; conducive with our surrounding land uses.
- There is a large demand for these facilities all over the country with the change in how we store information and data.
Chaska’s Competitive Advantages

- New development area served by a new 50 MW Substation, expandable to 100 MW
  - Also under construction of new substation in 2017 to help create more redundancy in system
- Have 4 substations in a 16 square mile town
- Sub-Stations served from multiple transmission points
- Chaska Electric Discounts to Primary-Metered Customers
  - Chaska Electric rates cheaper than Xcel
- New development area served by 3 independent fiber lines
- Abundant supply of water to meet cooling needs (also natural cooling in Minnesota)
- Sites adjacent to freeway interchange, but free from risk impediments
- City aggressive with incentives and “fast-tracking” approvals through system
- Developers/Brokers able to talk one-on-one with the decision-makers-eases information flow and reduces certainty in development process
Lessons in Attracting Data Centers

- Be ready to provide information as quickly as possible
  - They all ask same questions-have answers ready before RFPs arrive
- Provide support first to regional economic development groups (Greater MSP, DEED, etc...) to attract Data Centers to region-be happy if we get the added benefit of project coming to Chaska
- Have a dedicated “point person” to be able to quarterback all questions that come through-don’t make them chase information
- Have the Electric Utility Involved from the very inception of the project to help the Data Center develop creative solutions to dealing with their needs
- Be ready to provide consistent incentives on projects-if you are going to provide them, provide them. Give all clients the same courtesy
- One success helps develop future successes-All data centers are looking for similar things-they will feel comfortable if they see other data centers have seen success
- Help coordinate any assistance coming from other levels of government-don’t make them chase this information-be an advocate for them
Observations on Minnesota Issues

In order for Minnesota to be competitive with large “Cloud” data center groups—will have to look at how to make electricity more competitive

- Differences in rates across country seems to come from utilities in other areas of the Country providing “real time” pricing

Minnesota does have large number of fortune 500 companies, but many may be looking at outsourcing their data/server services instead of building their own data center facilities

With pressure from customers to reduce “carbon footprint” because data centers use so much electricity, will put more pressure on our electric utilities to provide affordably-priced renewable energy products
Questions??

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