

Total Cost of Ownership Analysis for Data Center Projects

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Critical Facilities Round Table
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Presented by:

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- 1. Introduction**
- 2. Historical Data Center Market Trends**
- 3. Lease / Purchase / Colocation Options**
- 4. Comparison**

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- Represented 158 Lease/Sale transactions
- 4,369,177 square feet of transactions
- Over \$800,000,000 in consideration
- 10 years of commercial real estate experience

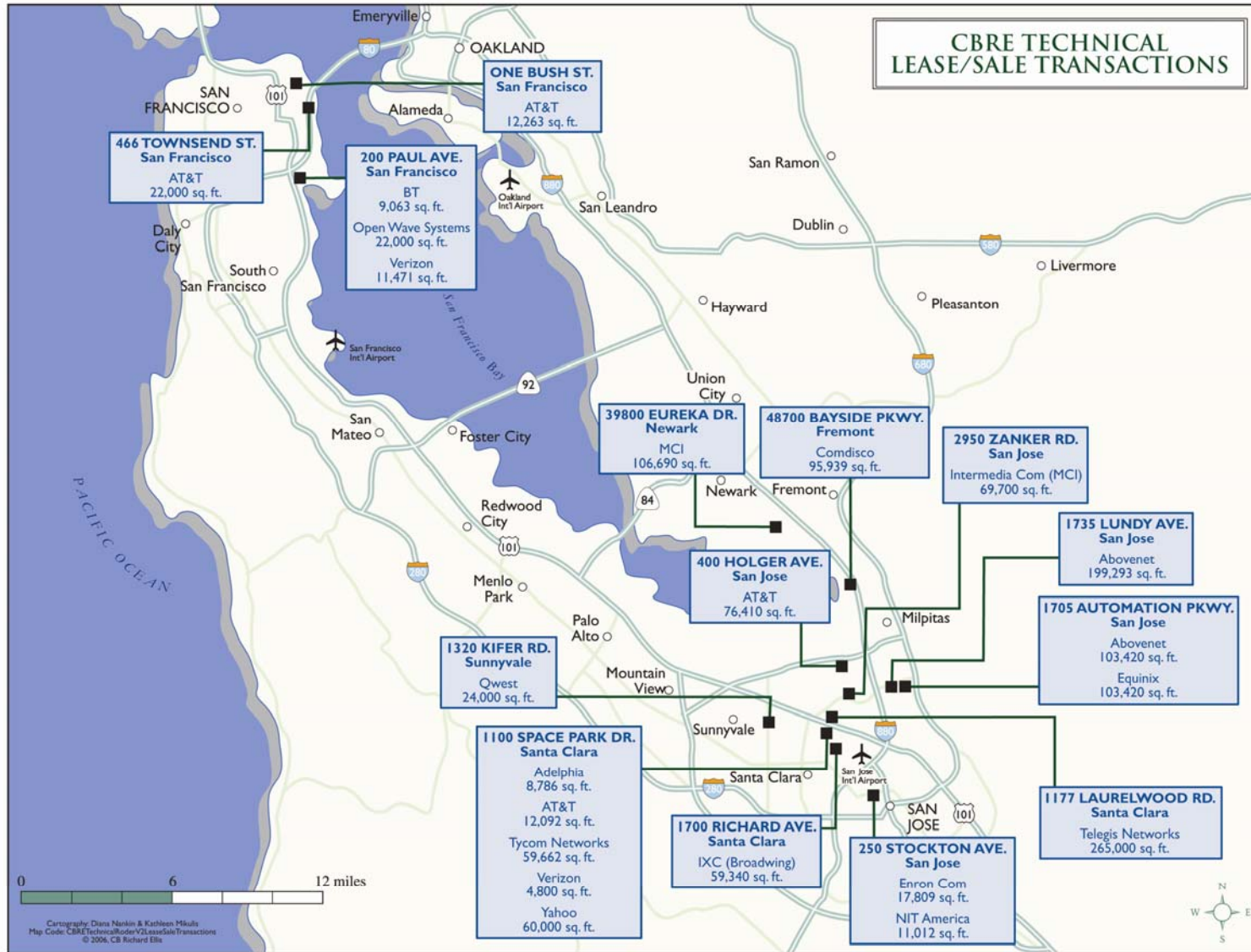
- Represented 98 Lease/Sale transactions
- 2,544,385 square feet of transactions
- Over \$100,000,000 in consideration
- 8 years of commercial real estate experience



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Experience Map



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Technology Practices Group

- European TPG was formed in 1994. US arm was later formed in 2000 and was originally called Intellisite.
- A global operating unit of CBRE professionals specializing in delivering solutions to companies at the crossroads of technology, telecommunications, and real estate.
- 150 members worldwide in more than 250 global offices.
- Principal aims are to represent the technology business across CBRE's service lines and to offer technical real estate services across industry sectors, with particular focus on data centers.

CB Richard Ellis

- Dating back more than 200 years, CBRE is the world's largest provider of diversified commercial real estate services.
- 17,000 employees
- Offices more than 300 markets across 50 countries worldwide.

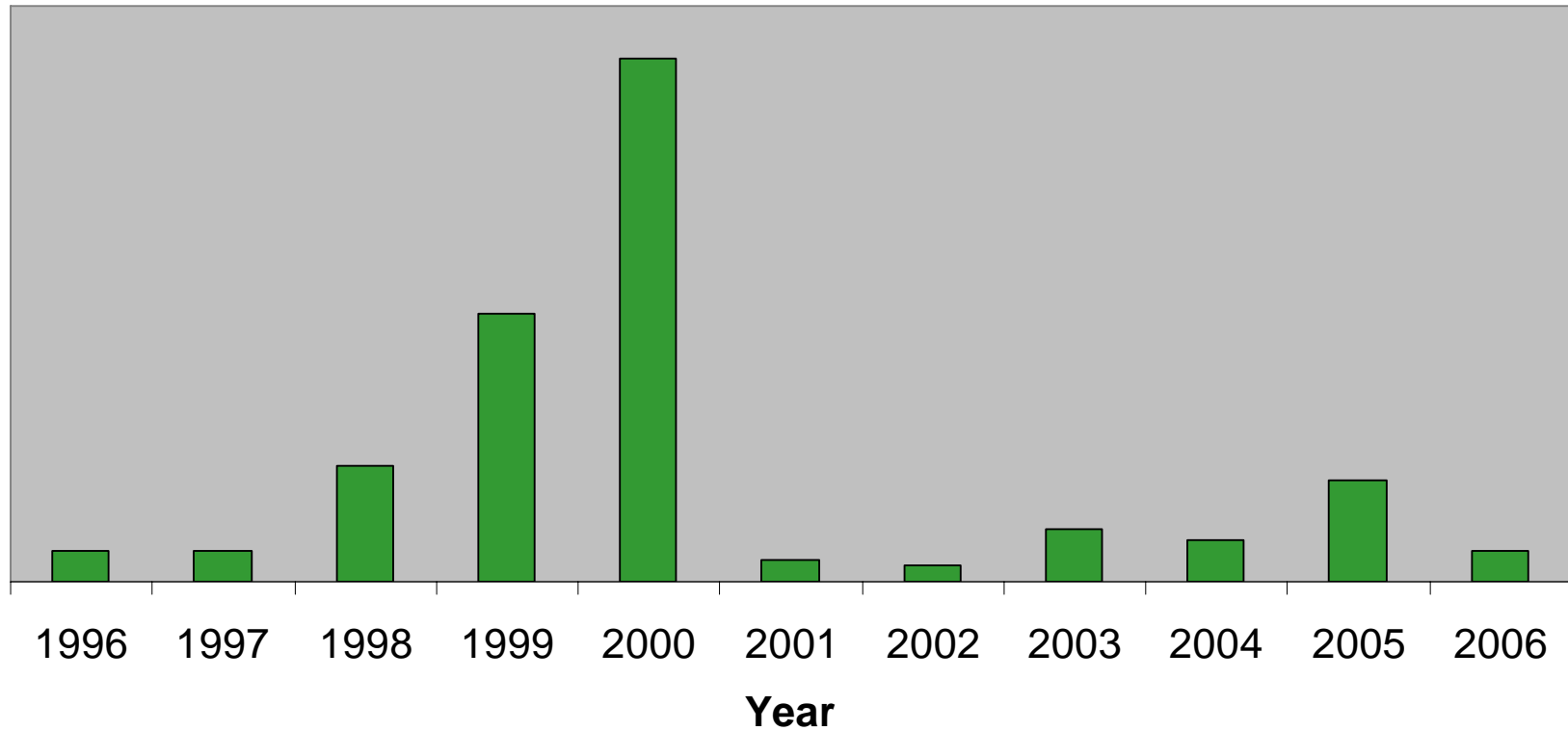


Historical Data Center Market Trends

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Gross Absorption Comparison



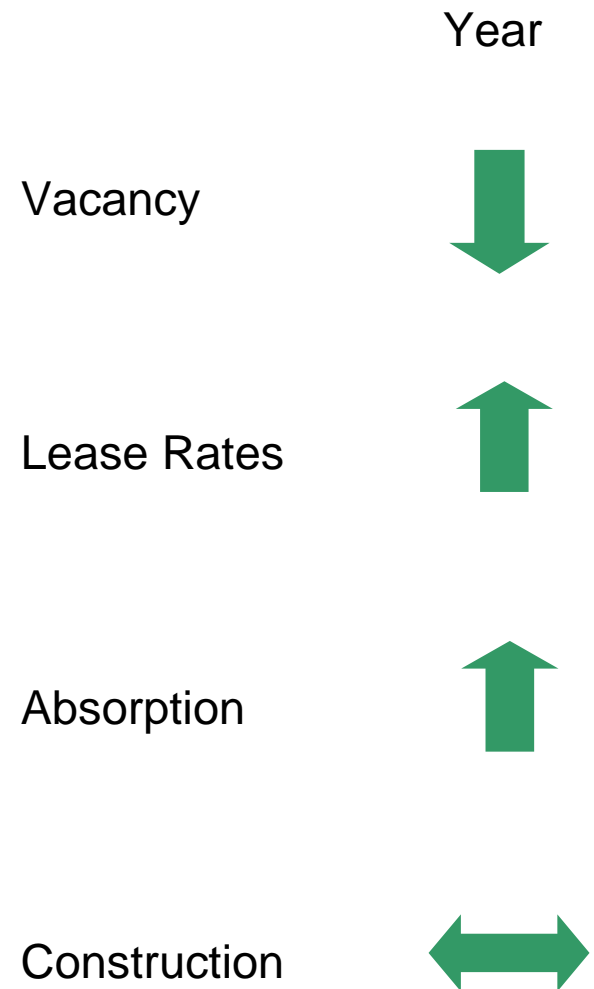
Market Statistics

City	Available Raised Floor	Available Raised Floor as % of Inventory	Combined Industrial & Office Inventory (Million SF)	Industrial Vacancy 2Q'05	Office Vacancy 2Q'05
Atlanta	60,000	0.00011	551.3	15.60%	21.60%
Dallas	199,593	0.00025	810.7	10.10%	21.41%
Denver	213,105	0.00065	326.1	8.70%	17.30%
Northern New Jersey	384,000	0.00041	938.3	6.80%	14.40%
Phoenix	138,000	0.00048	286.5	7.21%	14.50%
Silicon Valley	221,635	0.00071	312.9	10.40%	16.20%

Silicon Valley Market Overview

Area	Silicon Valley*
No.	
Building Size (SF)	
Direct Available	
Sublease Available	
Available SF	
Available %	
Direct Vacant SF	
Direct Vacant %	
Sublease Vacant SF	
Sublease Vacant %	
Total Vacant SF	
Totally Vacancy %	
Under Construction	
Planned	
Low Rent	
High Rent	

(Silicon Valley* is defined as Palo Alto, Mt. View, Sunnyvale, Santa Clara, Cupertino, Saratoga, Los Gatos, Campbell, San Jose, Milpitas, Fremont and Newark.)



Tenant Demand



Date	Square Feet
6/1/00	5,190,000
6/1/01	1,167,000
6/1/02	225,000
10/2/02	85,000
1/13/06	440,000

- **Barriers to Entry**
- **Supply Side Reduced**
- **Government Legislation**
- **Market Pressures**
- **Legacy Facilities / Antiquated Facilities**



- Absorption – Less Supply
 - Users - Organic
 - Reemerge of Colo Operators
- 1st Shell Deal Done in ± 5 years
- Balance Power Shift to Landlord
- 4 Year Window Starting to Shut on Opportunity to Leverage Existing Infrastructure
- Large Deal Ownership
 - 100% Ownership
 - Low Cost of Funds
 - Fed & SEC Compliance

- Higher Lease and Purchase Rates
- More Green Field
- More Competition
- On Up Swing of Curve
- More Inflationary Factors Pushing Up Cost

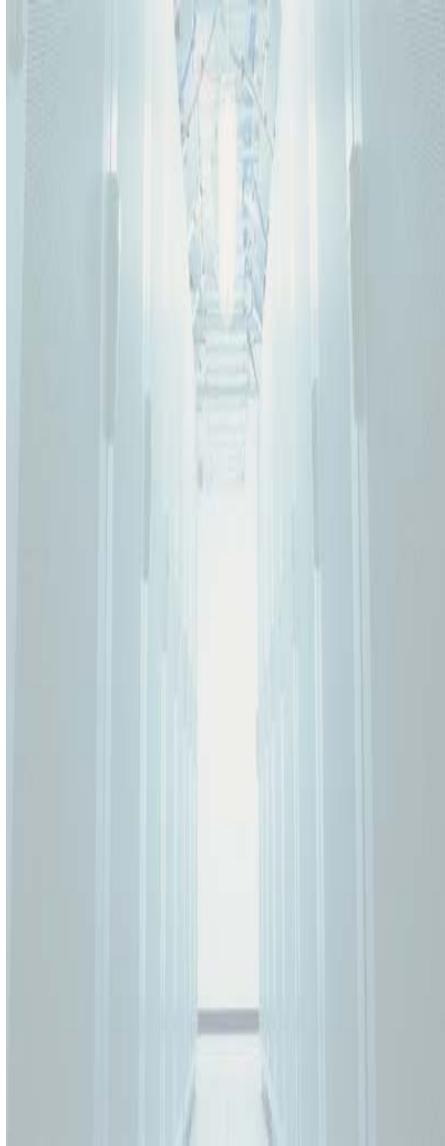
"We are almost full now," says Jackie Fitzpatrick, senior director of sales for Carlyle Realty Group West, which leases the 16-story MAE West building in downtown San Jose that is a mix of data center and office space. "I'm definitely hoping that my boss will buy me another data center... or I'm going to have to refer (new customers) to other people."

Data centers are 'in' -- again

[Andrew F. Hamm](#)

SILICON VALLEY / SAN JOSE
BusinessJournal

From the October 21, 2005 print edition



Lease / Purchase / Colocation Options

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Available Data Center Properties

					
	Address:	3080 Raymond St. Santa Clara	1100 Space Park Dr. Santa Clara	39800 Eureka Dr. Newark	2600 Napa Valley Corporate Dr. Napa
1	Total SF	25,000	150,000	106,690	157,500
2	Available SF	25,000	25,000	106,690	
3	Technical Area	17,600	Shell	72,260	120,000
4	Raised Floor (Y/N)	N	N	Y	Y
5	Vacancy Rate	100%	17%	100%	100%
6	Primary Power	3,200 amps 480 volts	85 WSF	2-50kV Feeds	10 MW
7	Redundancy	N+1	N+1	2-N+1	N
8	UPS	AC- 1,000 KVA DC- 2,400 amps	BTS	Yes	3,000 kW
9	Generators	2 MW	None	6-13.2 KVA	4,500 kW
10	Seismic	SIF= 1.25	SIF=1.5	SIF= 1.5	SIF= 1.25
11	Cooling	20 CRAC Units	BTS	2,184 Tons	572 Tons
12	Tenant(s)	Colo.com	AT&T, Tyco	MCI	Citigroup / Apple
13	Lease/Sale	Lease	Lease	Sale	Sale

Colocation Operators



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Pricing Variables

1. Rent (Rack vs. Square Foot)
2. Electric (Connected Amp vs. Separately Metered)
3. Cooling (1/2 Electric Costs)
4. Environment / Services (Racks, Hosting)

Colocation Requirement Criteria

LEASE TERM	5 Years
AREA	5,000 square-feet
SPACE IMPROVEMENTS	Space shall be improved with access/raised floor, electrical branch circuits, and cooling. Space shall be protected with a building-wide security system.
RACKING	150 Cabinets ¹
ELECTRICAL	Two 208VAC 30A circuits per Cabinet
MECHANICAL	HEAT REJECTION 3,000W per Cabinet
TECHNICAL SERVICES	No technical services
NETWORK CONNECTIONS	One 1Gbit WAN Circuit to San Francisco One 1Gbit WAN Circuit to Sacramento

1 – Cabinets will be Tenant-provided. "Cabinet" includes footprint for floor-mounted equipment (such as storage equipment).



Comparison

Data Center Construction Costs

Raised Floor (SF)	Racks	Support Space	Load	Redundancy Configuration	Mechanical Redundancy
6,000	180 +/-	1,600	0.5mW IT Load 1.2 mW Total Load (83.33 w/SF)	2N UPS	N+1
40,000	860 +/-	13,000	5.6mW IT Load 9.0mW Total Load (140 w/SF)	"6 makes 5" with Static Switched PDU UPS	N+1
12,000	-	3,600	1.6mW IT Load 2.8 mW Total Load (133 w/SF)	N+1	N+20%

Price Comparison Build vs. Outsourcing

Startup Expenses			Build 200 Sq Ft Facility	Outsource Solution
	1	# of Cabinets	12	12
	2	# of T-1's	12	12
Design Engineering		\$50 per sq ft	\$ 10,000	\$ -
Permit & fees			\$ 1,500	
HVAC	3	\$1500/ton	\$ 9,000	\$ -
Power				
Power Distribution	4	\$41 per sq ft	\$ 8,200	\$ -
UPS	4	\$28 per sq ft	\$ 5,600	\$ -
Generator & Bus	4	\$55 per sq ft	\$ 11,000	\$ -
Fire Suppression	5	\$20 per sq ft	\$ 4,000	\$ -
Pre-action @ sprinklers	13	\$7,500 min	\$ 7,500	
Security Systems		\$3 per sq ft	\$ 600	\$ -
Environmental monitoring		\$5 per sq ft	\$ 1,000	\$ -
Other Construction	11	\$45 per sq. ft.	\$ 9,000	
Builder overhead & fee		15%	\$ 10,110	
Network Termination Equip	6	\$1,000 per T1	\$ 12,000	\$ -
Network Install		\$600 per T1	\$ 7,200	\$ -
Network Install - Outsourced		\$460 per T1		\$ 5,520
Cabinets		\$1500 per cab	\$ 18,000	\$ 18,000
		Total	\$ 114,710	\$ 23,520
		Startup Savings		\$ 91,190

Price Comparison Build vs. Outsourcing

Recurring (per year)				
Rent		\$20 per sq ft	\$ 4,000	\$ -
Power	12	\$0.007 per KWH	\$ 10,484	
Power - Outsourced	7	\$5 per Amp/mo		\$ 9,360
Network Access	8	\$400 per T1/mo	\$ 57,600	
Network Access Outsourced	9	\$320 per T1/mo		\$ 46,080
Staff/Labor	10	\$37,500/person/yr	\$ 37,500	\$ -
Tech Support		\$5,000 per year	\$ 5,000	
Cost of Capital		10% per year	\$ 11,471	\$ -
Depreciation		15 yr straight-line	\$ 4,720	\$ -
Colocation Rent		\$50/sf/mo		\$ 120,000
Total			\$ 130,775	\$ 175,440
Yearly Savings			\$	(44,665)

Total 1st Year Savings \$ 46,525

- **More Inflation to Push Rents Up**
- **Build Out Inventory Going Away**
- **Burden Pushed to Tenant**
- **Lease Rates - \$1.25-\$3.00 NNN**
- **Purchase Rates - \$190-\$515/psf**

Thank You

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