



Photo Credit: <https://www.lennar.com/new-homes/california/san-francisco-bay-area>

Bay Area

Data Center Market Report



About Our Market Reports

The data center market reports are a labor of love for the Open Spectrum team. The information found within is designed to be service provider agnostic, accurate, highly relevant, and actionable for anyone working within the industry. In producing these reports, we pool information from our own dealings around the data center marketplace working directly with hundreds of buyers, sellers, and investors.

We also partner with different experts and aggregators of targeted data sets such as Structure Research, NE Fiber, and Lathrop & Gage, LLP.

FiberLocator



**STRUCTURE
RESEARCH**

LATHROP & GAGELLP

We hope these reports provide value to you in whatever you are trying to accomplish.

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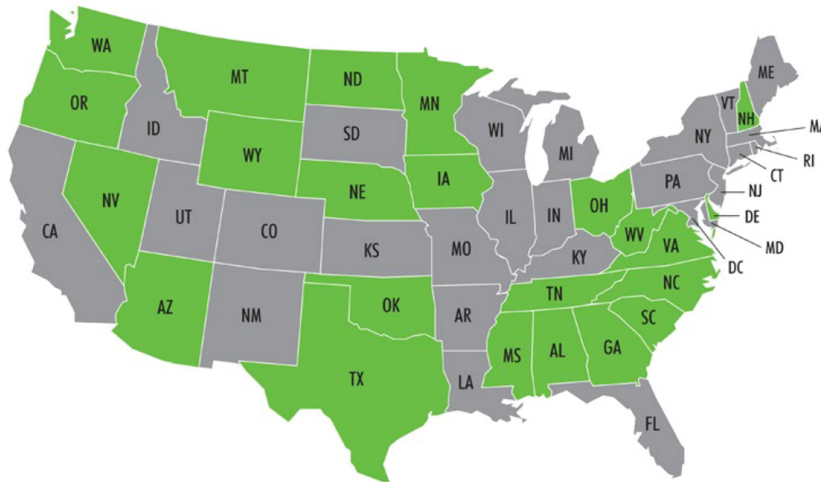
Tax Incentives

Sales and use taxes, property taxes, and real estate taxes all play a role in the total operating costs of data centers. Some states, however, offer incentives that lower the operating cost, or Total Cost of Occupancy (TCO) for both data center developers and clients installing infrastructure within these facilities. Site Selection is typically based on four primary drivers:

1. Power: Cost per kWh, carbon footprint, fuel mix, and infrastructure
2. Telecom: Fiber Providers, Latency
3. Geography: Proximity to headquarters, population size, labor force, water
4. Climate: Environmental risk (i.e. hurricanes, tornadoes, earthquakes, etc), free cooling

SALES TAX INCENTIVES FOR DATA CENTERS

■ States with incentives



Sales & Property Taxes

California currently does NOT offer sales tax incentives that affect data center owner/operators, or their clients, installing hardware and related infrastructure.

Despite this, there are a few cities that DO offer limited sales tax rebates. These cities are San Jose, Los Angeles, and Sacramento.

*Source: Lenio, John and Lynch, Patrick, "Impact of Taxes & Incentives on Data Center Incentives," CBRE..

National Industry Trends

90% Amount as a % of the totality of data generated
*-Expected to **Increase** year after year*

2,500 Number of commercial colocation facilities within the USA
*-Expected to **Increase** year after year*

2,940,000 Number of corporate owned data centers in the USA*
*-Expected to **Decrease** year after year*

611,400,000 Total data center sq. ft. within the USA*
*-Expected to **Increase** year after year*

*Source: IDC trends

National Industry Trends

PRIMARY WHOLESALE COLOCATION MARKET SNAPSHOT

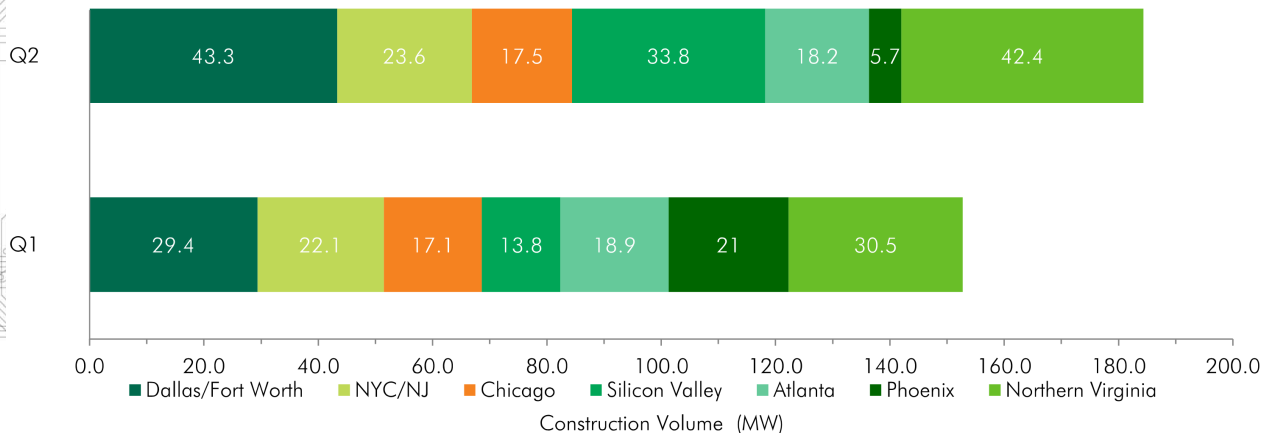
Market	Quarter	Inventory	Vacancy	Absorption	Rental Rates (kW/mo)*
Northern Virginia	Q1	417 MW (▲ 15.0 MW)	21.2 MW / 5.1% (▼ 24.1%)	20.8 MW (▲ 11.9 MW)	\$130-\$145
	Q2	421 MW (▲ 3.6 MW)	15.5 MW / 3.7% (▼ 27.7%)	9.4 MW (▼ 11.4 MW)	\$130-\$145
Phoenix	Q1	218 MW (▲ 5.0 MW)	4.1 MW / 1.87% (▼ 0.1%)	5.0 MW (▲ 2.8 MW)	\$140-\$160
	Q2	228 MW (▲ 10.0 MW)	4.1 MW / 1.87% (▲ 0.0%)	10.0 MW (▲ 5.0 MW)	\$140-\$160
Atlanta	Q1	127 MW (▲ 0.6 MW)	25.7 MW / 20.2% (▼ 2.4%)	0.7 MW (▼ 1.8 MW)	\$125-\$150
	Q2	127 MW (▲ 0.0 MW)	24.3 MW / 19.1% (▼ 5.2%)	1.4 MW (▲ 0.7 MW)	\$135-\$150
Silicon Valley	Q1	131 MW (▲ 14.9 MW)	16.1 MW / 12.3% (▼ 10.7%)	14.7 MW (▲ 11.7 MW)	\$140-\$150
	Q2	134 MW (▲ 3.6 MW)	15.8 MW / 11.7% (▼ 4.6%)	3.9 MW (▼ 10.8 MW)	\$130-\$150
NYC/NJ	Q1	134 MW (▲ 11.4 MW)	21.7 MW / 16.2% (▼ 0.5%)	10.1 MW (▲ 3.8 MW)	\$145-\$165**
	Q2	135 MW (▲ 1.5 MW)	22.2 MW / 16.5% (▲ 1.4%)	1.0 MW (▼ 9.2 MW)	\$150-\$170
Chicago	Q1	117 MW (▲ 2.4 MW)	3.4 MW / 2.9% (▼ 7.9%)	2.6 MW (▼ 1.6 MW)	\$145-\$165
	Q2	130 MW (▲ 13.0 MW)	10.9 MW / 8.40% (▲ 189.7%)	5.5 MW (▲ 2.8 MW)	\$145-\$165
Dallas/Fort Worth	Q1	131 MW (▲ 18.6 MW)	23.7 MW / 18.0% (▲ 68.1%)	7.0 MW (▼ 1.9 MW)	\$125-\$155
	Q2	132 MW (▲ 0.7 MW)	21.5 MW / 16.3% (▼ 9.6%)	2.8 MW (▼ 4.2 MW)	\$125-\$155

*Rental rates are quoted asking rates from providers for 500 kW. CBRE experiences that actual contract rates fall below these numbers.

**Quoted rates are outside of NYC proper. NYC (Manhattan) wholesale rates average \$225-\$300/kW/mo.

Arrows reflect quarter-over-quarter changes.

Q1-Q2 DATA CENTER CONSTRUCTION PIPELINE



*Source: CBRE Data Center Solutions,

Regional Industry Trends

CoreSite's 230,000 Square-Foot Sv7 Data Center Opens in Santa Clara

"At 230,000 square feet, SV7 is the largest among CoreSite's five-building, 619,000-square foot Santa Clara campus, emerging as one of the leading hubs of interconnection and cloud services on the West Coast, and the largest among CoreSite's seven-building, 780,000-square foot Bay Area portfolio."*

How Vantage Data Centers 'Created Land' For a 51 MW Santa Clara Expansion Campus

"Vantage announced it was adding 21 MW of capacity adjacent to buildings on its existing 51 MW Santa Clara campus, a four-story facility, which will have one floor for support and office, and three floors containing data center halls. The multi-story V5 data center design allows for higher density, which appears to be a new trend in Santa Clara."**

Equinix Breaks Ground on Eighth Silicon Valley Data Center

"Equinix has kicked off construction of its eighth Silicon Valley data center, expecting to bring online new capacity next year in one of the hottest data center markets. The building, SV10, will be constructed at the company's data center campus on Great Oaks Boulevard in San Jose..***

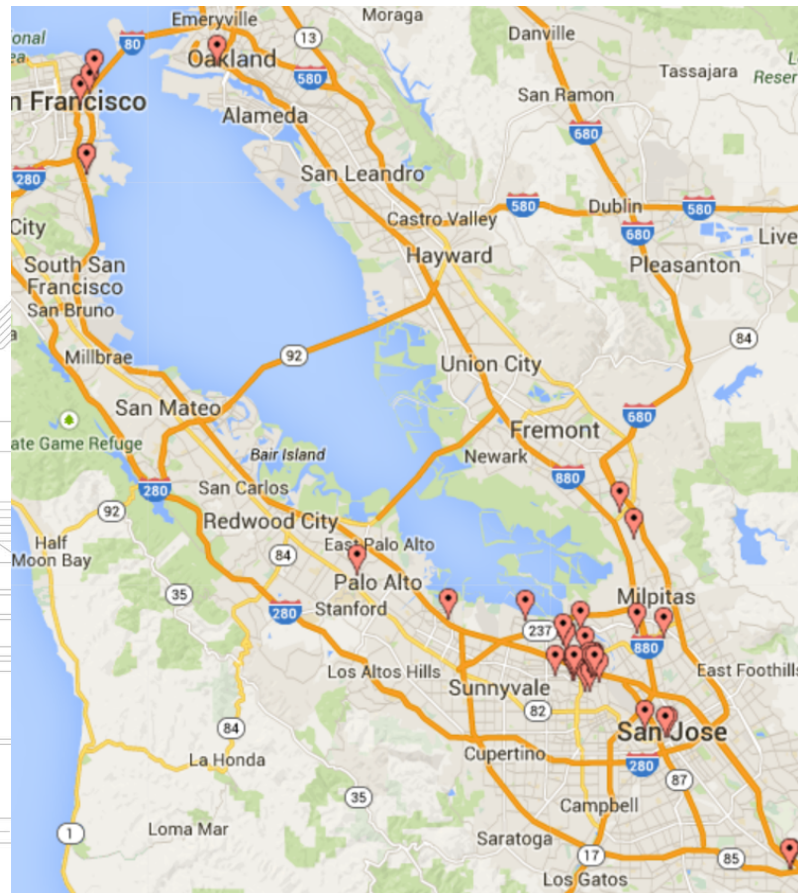
*Source: <http://www.businesswire.com/news/home/20161012005469/en/CoreSite%E2%80%99s-230000-Square-Foot-SV7-Data-Center-Opens>

**Source: <http://www.datacenterknowledge.com/archives/2016/08/04/vantage-data-centers-created-land-51-mw-santa-clara-expansion-campus/>

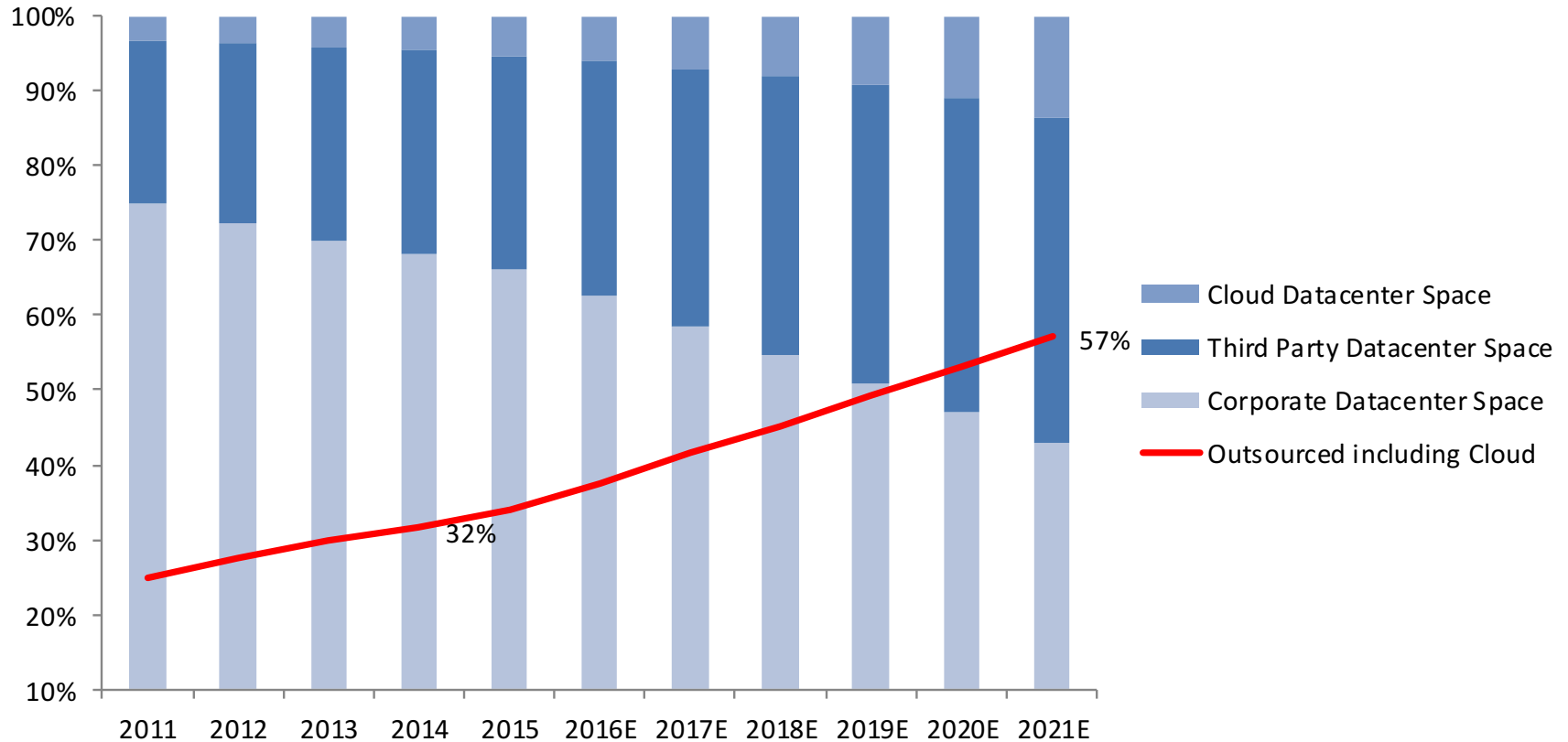
***Source: <http://www.datacenterknowledge.com/archives/2016/06/17/equinix-breaks-ground-on-eighth-silicon-valley-data-center/>

Regional Industry Trends

38 Commercial Data Centers House **21** Different Providers Within the Bay Area Region



Outsourcing Trends



Public Data Centers Comparison

Stock (Ticker)	Ticker	Stock Price	Stock Perf Since YE15	Market Cap. (Mil.)	Firm Value (Mil.)	2016E Revs (Mil.)
Cloud Infrastructure						
Cyrus One (CONE)	CONE	\$52.4	40%	3,437	4,524	521
CoreSite Realty (COR)	COR	\$82.6	46%	3,910	4,409	397
Digital Realty Trust	DLR	\$102.1	35%	14,158	20,017	2,081
DuPont Fabros (DFT)	DFT	\$45.9	55%	3,761	5,279	521
Equinix (EQIX)	EQIX	\$371.0	23%	26,104	32,111	3,615
InterXion Holding (INXN)	INXN	\$38.3	27%	2,703	3,243	478
Landmark Infrastructure (LMRK)	LMRK	\$15.5	6%	1,269	1,497	43
QTS Realty Trust (QTS)	QTS	\$54.7	21%	2,322	3,132	389
Zayo (ZAYO)	ZAYO	\$27.9	5%	6,782	10,663	2,065
S&P 500 (Cons. Ests.)	SP50	\$2,112.0	3%			

Public Data Centers Comparison

Stock (Ticker)	Ticker	Firm Value to '16E EBITDA (Consolidated)	Firm Value to '16E EBITDA (Multiplier)	16E FCF / AFFO Yield	16E Net Debt / EBITDA	Div. Yield %
Cloud Infrastructure						
Cyrus One (CONE)	CONE	272	16.6x	4.9%	4.0x	2.4%
CoreSite Realty (COR)	COR	206	21.4x	3.8%	1.9x	0.0%
Digital Realty Trust	DLR	1,185	16.9x	4.7%	4.9x	3.3%
DuPont Fabros (DFT)	DFT	323	16.3x	6.0%	3.6x	3.8%
Equinix (EQIX)	EQIX	1,653	19.4x	4.1%	3.6x	1.9%
InterXion Holding (INXN)	INXN	215	15.1x	-1.5%	2.5x	NA
Landmark Infrastructure (LMRK)	LMRK	38	39.7x	9.9%	6.1x	8.1%
QTS Realty Trust (QTS)	QTS	177	17.6x	4.6%	4.6x	2.3%
Zayo (ZAYO)	ZAYO	1,054	10.1x	8.3%	3.7x	0.0%
S&P 500 (Cons. Ests.)	SP50					2.1%

Data Center Directory

Name	Retail	Wholesale	Hosting	Location(s)	TYPE (TICKER: ExCHANGE)	Address	City
365 Data Centers	x			National	PE Backed	1400 65th St.	Emeryville
366 Data Centers	x			National	PE Backed	534 Stockton Ave.	San Jose
Century Link - SC9	x		x	Global	Public (CTL: NYSE)	4650 Old Ironsides Dr.	Santa Clara
Colovore	x			Local	Private	1101 Space Park Dr.	Santa Clara
Coresite - SV1	x			National	Public REIT (COR: NYSE)	55 S. Market St.	San Jose
Coresite - SV2	x			National	Public REIT (COR: NYSE)	1656 McCarthy Blvd.	Milpitas
Coresite - SV4	x	x		National	Public REIT (COR: NYSE)	3001 Coronado Dr.	Santa Clara
DataPipe	x		x	Global	PE Backed	150 South 1st St.	San Jose
Digital Realty Trust OAK10	x	x		Global	Public REIT (DLR: NYSE)	720 Second St.	Oakland
Digital Realty Trust SFO10		x		Global	Public REIT (DLR: NYSE)	200 Paul Ave.	San Francisco
Digital Realty Trust SFO12	x	x		Global	Public REIT (DLR: NYSE)	365 Main St.	San Francisco
Digital Realty Trust SJC13		x		Global	Public REIT (DLR: NYSE)	1550 Space Park Dr	Santa Clara
Digital Realty Trust SJC30		x		Global	Public REIT (DLR: NYSE)	3105 Alfred St.	Santa Clara
Digital Realty Trust SJC31		x		Global	Public REIT (DLR: NYSE)	2805 Lafayette St.	Santa Clara
Equinix - SV1	x			Global	Public (EQIX: NASDAQ)	11 Great Oaks Blvd.	San Jose
Equinix - SV2	x			Global	Public (EQIX: NASDAQ)	1350 Duane Ave.	Santa Clara
Equinix - SV4	x			Global	Public (EQIX: NASDAQ)	255 Caspian Dr.	Sunnyvale
Equinix - SV5	x			Global	Public (EQIX: NASDAQ)	9 Great Oaks Blvd.	San Jose
Equinix - SV8 (PAIX)	x			Global	Public (EQIX: NASDAQ)	529 Bryant St.	Palo Alto

*Source: peeringdb.com.

Data Center Directory

Name	Retail	Wholesale	Hosting	Location(s)	TYPE (TICKER: ExCHANGE)	Address	City
Hosting.com	x		x	National	Private	630 3rd St.	San Francisco
Hurricane Electric - 1	x			Local	Private	760 Mission Ct.	Fremont
Hurricane Electric - 2	x			Local	Private	48233 Warm Springs Blvd.	Fremont
iMIntegrated	x		x	National	Private	650 Townsend St.	San Francisco
InfoMart Data Centers		x		Regional	Private	2001 Fortune Dr.	San Jose
Internap SJE011	x		x	Global	Public (INAP: NASDAQ)	2151 Mission College Blvd.	Santa Clara
Internap SJE014	x		x	Global	Public (INAP: NASDAQ)	1525 Comstock St.	Santa Clara
Layer 42	x	x		Local	Private	3080 Raymond St.	Santa Clara
Layer 42	x	x		Local	Private	1555 Plymouth St.	Mountain View
QTS Realty Trust	x	x	x	National	Public REIT (QTS: NYSE)	2805 Mission College Blvd.	Santa Clara
QTS Realty Trust	x	x	x	National	Public REIT (QTS: NYSE)	2807 Mission College Blvd.	Santa Clara
Server Farm Realty		x		National	Private	5101 Lafayette St.	Santa Clara
SV Colo	x			Local	Private	1700 Richard Ave.	Santa Clara
Telx - SCL1	x	x		National	PE Backed	1100 Space Park Dr.	Santa Clara
Telx - SCL2	x	x		National	PE Backed	2820 Northwestern Pkwy.	Santa Clara
Telx - SFR1	x	x		National	PE Backed	200 Paul Ave.	San Francisco
UnitedLayer	x		x	Regional	Private	200 Paul Ave.	San Francisco
Vantage		x		National	PE Backed	2625 Walsh Ave.	Santa Clara
Verizon NAP West	x	x	x	Global	Public (VZ: NYSE)	3030 Corvin Dr.	Santa Clara
vXchnge	x	x		National	PE Backed	2050 Martin Ave.	Santa Clara

*Source: peeringdb.com.

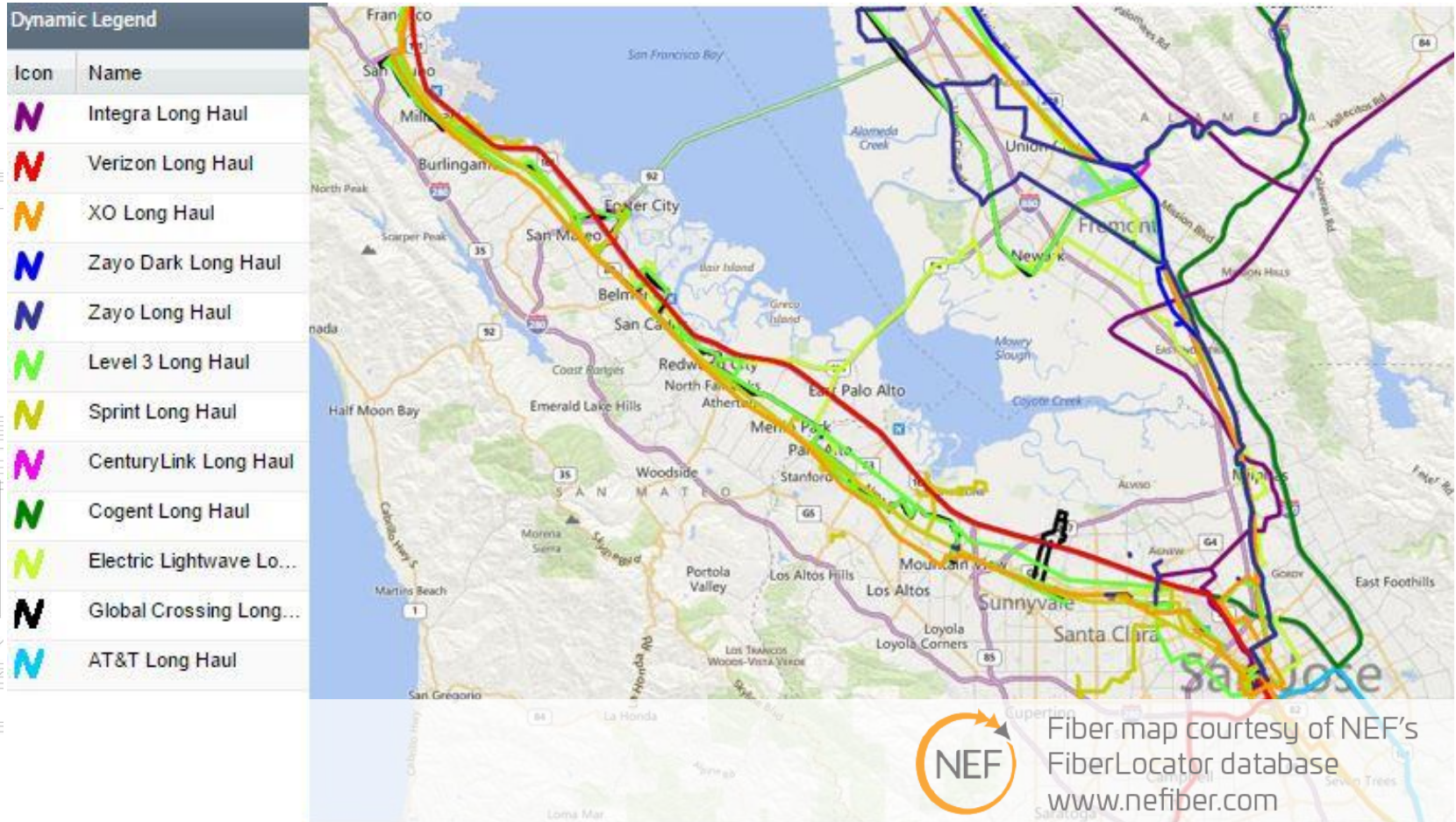
Regional Peering Exchanges

List of Major Peering Exchanges In and Around the Bay Area

Exchange Name	Long Name	City/Region
CoreSite - Any2 California	CoreSite - Any2 California	San Jose
Equinix San Jose	Equinix San Jose / Bay Area Exchange	San Jose
Equinix Palo Alto	Equinix Internet Exchange Palo Alto	Palo Alto
SFMIX	San Francisco Metropolitan Internet Exchange	San Francisco
AMS-IX BAY	AMS-IX Bay Area	San Francisco, San Jose

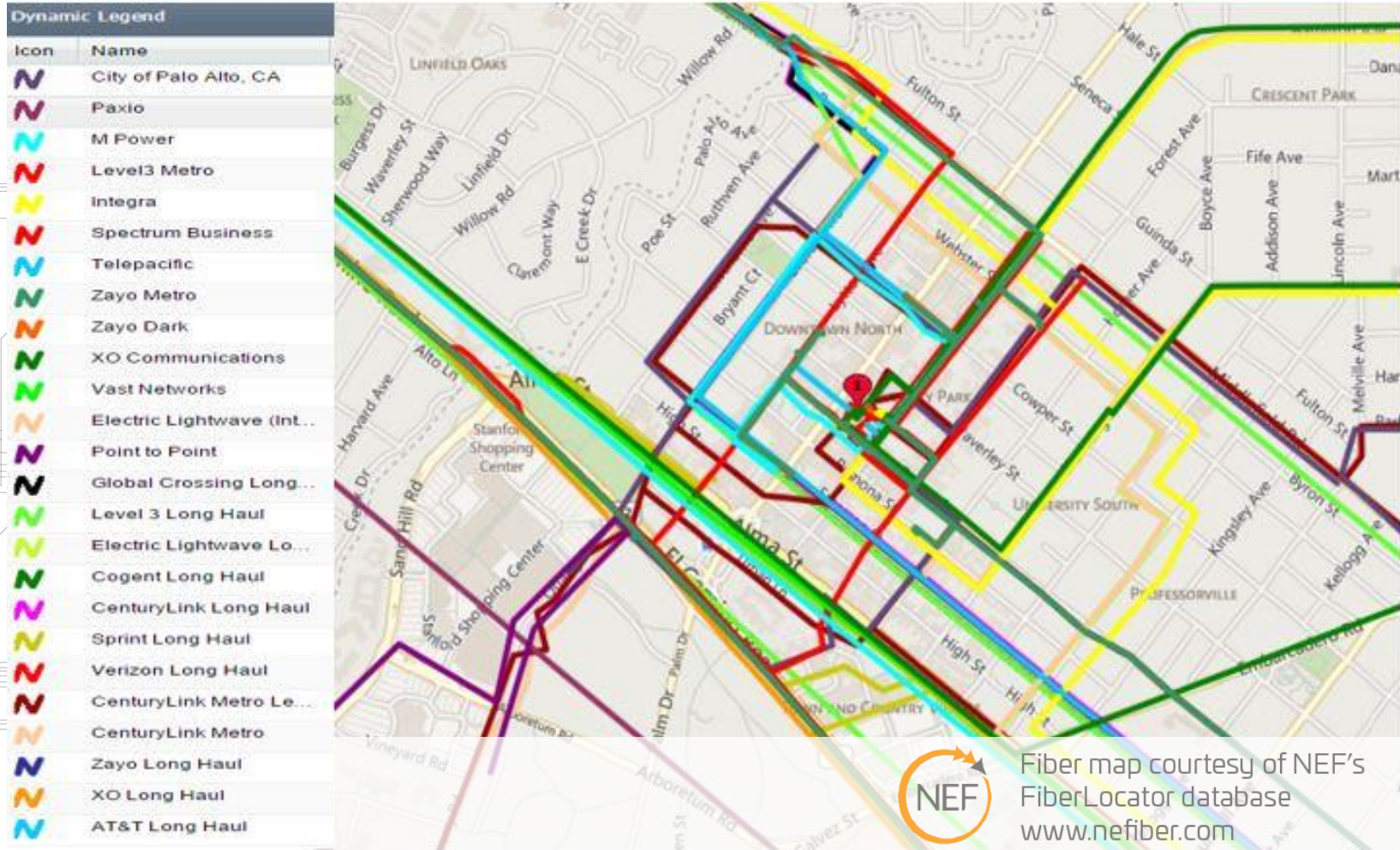
Silicon Valley: Fiber

Silicon Valley 50-Mile Long Haul Fiber

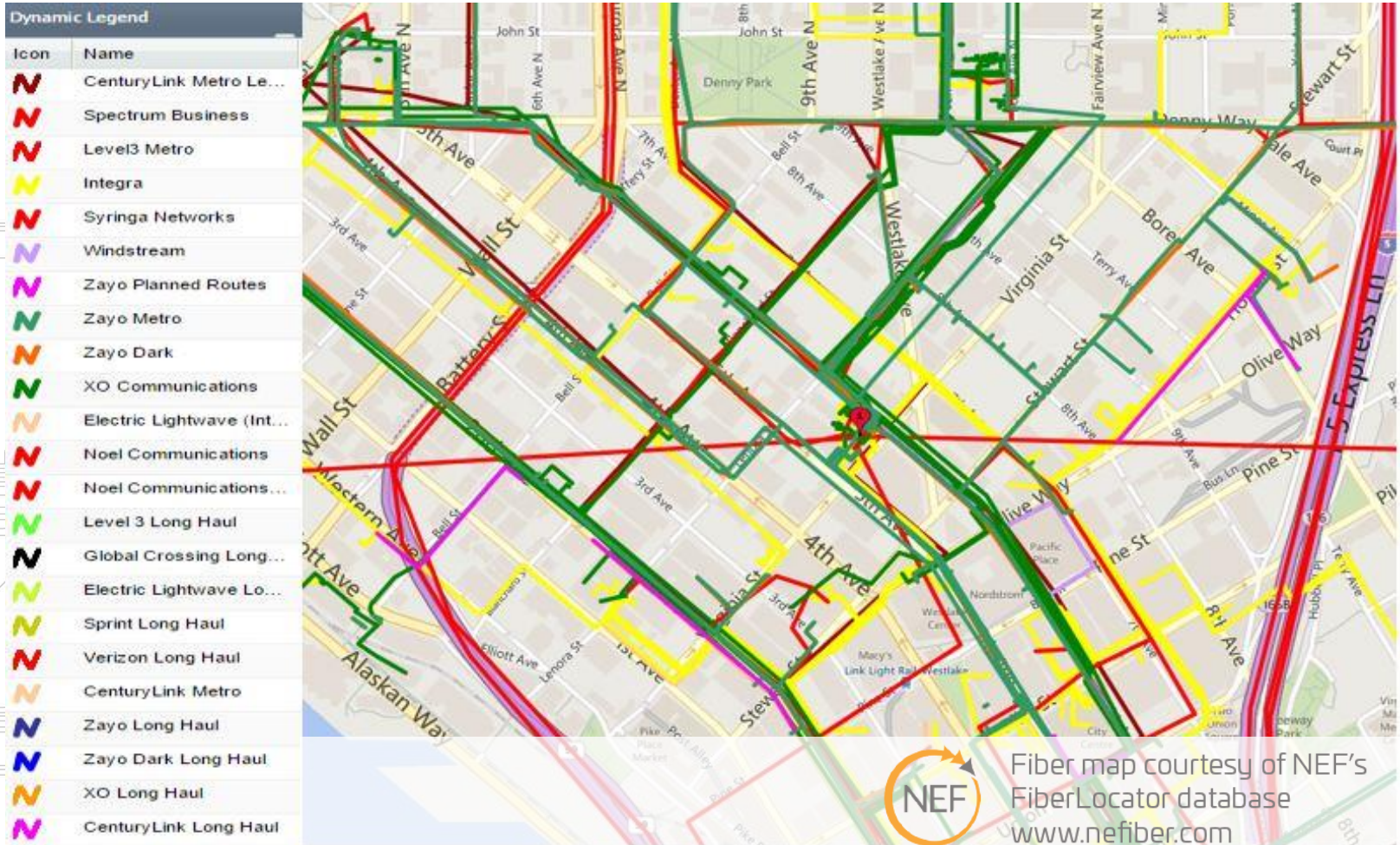


Silicon Valley: Fiber

Silicon Valley 1 Mile Long Fiber View

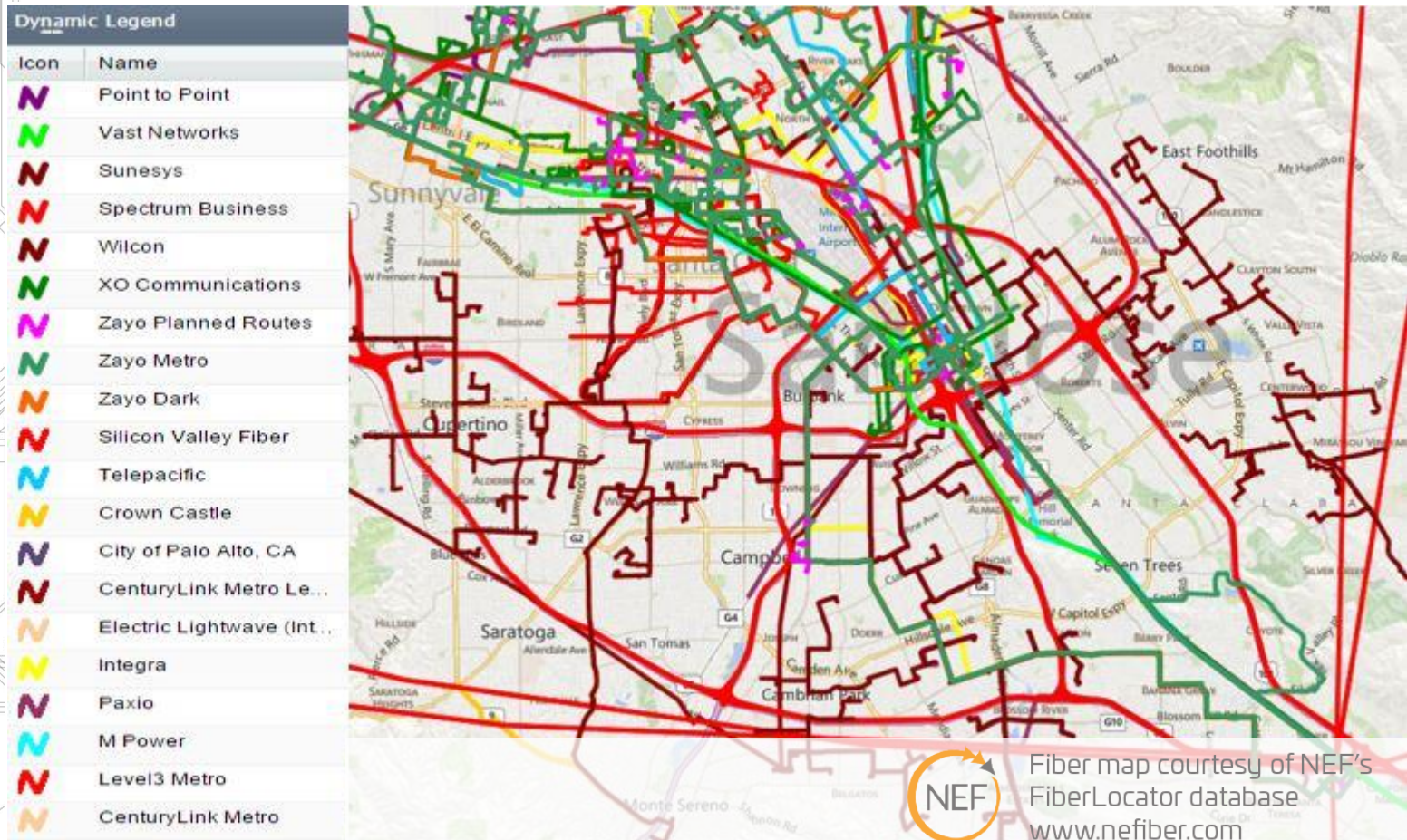


Silicon Valley: Carrier Hotel



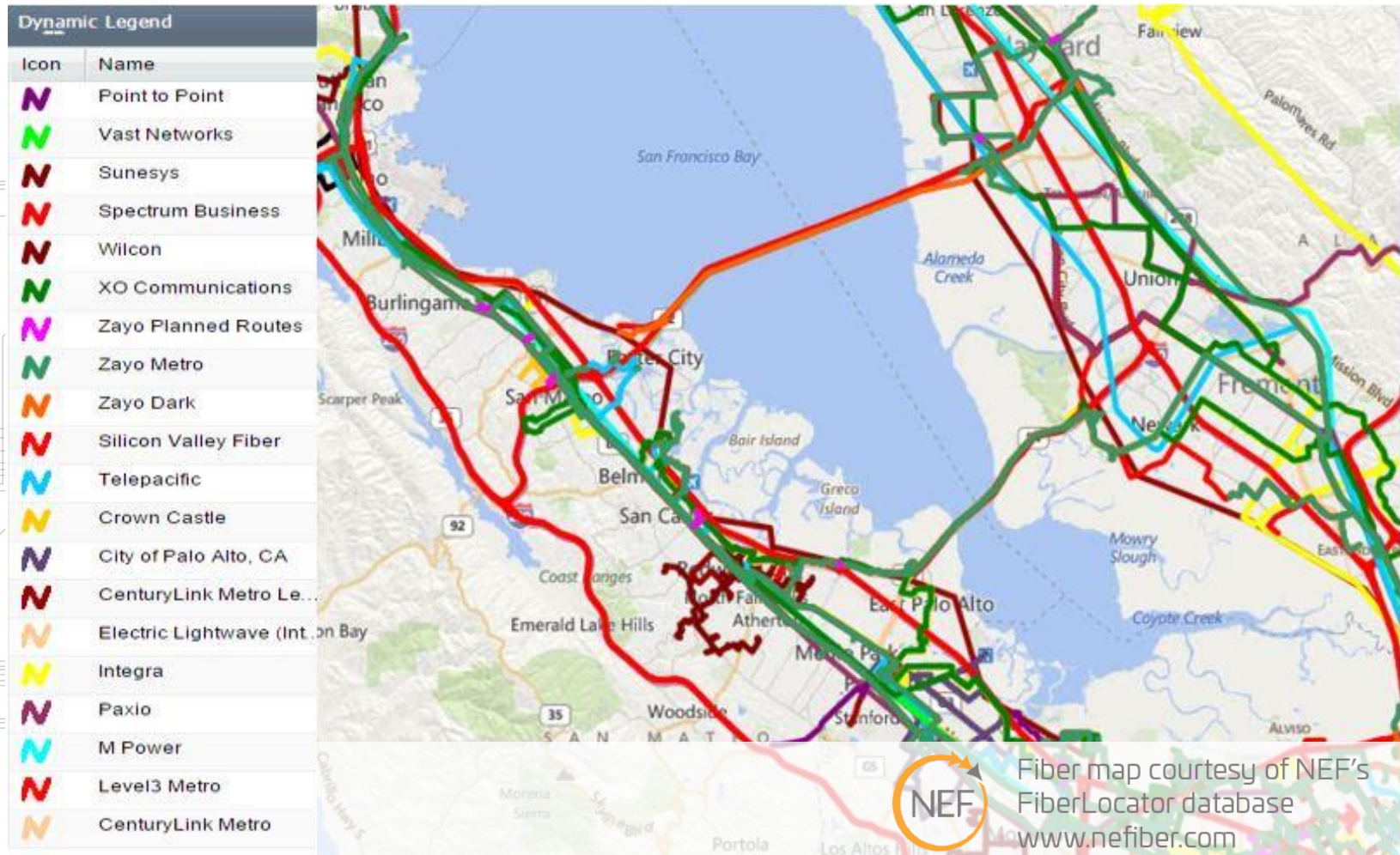
San Jose: Metro Networks

San Jose Area 20 Mile Metro Networks



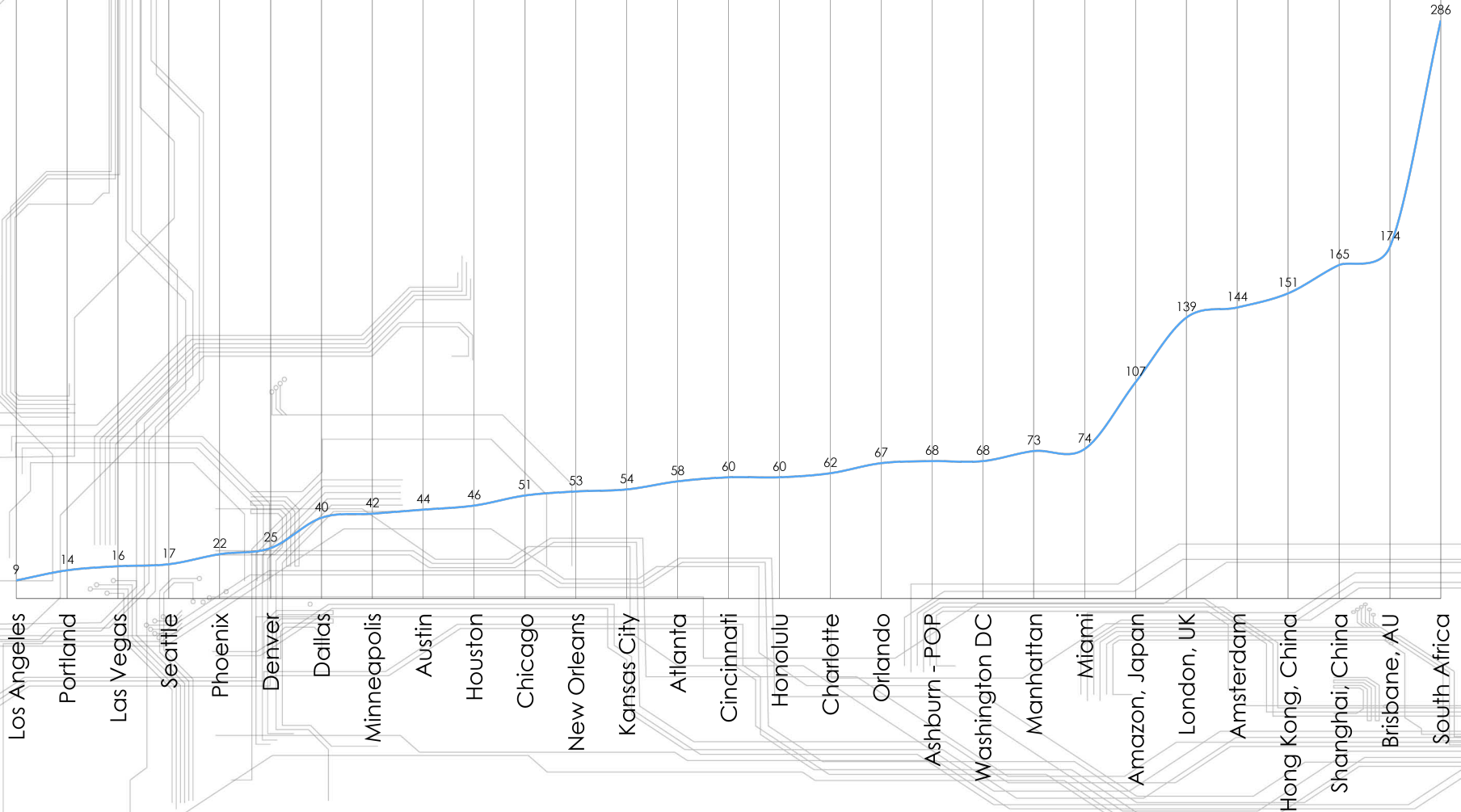
Palo Alto: Metro Networks

Palo Alto Area 20 Mile Metro Networks



Network Latency

-Latency in milliseconds, from San Francisco



Environment & Industry

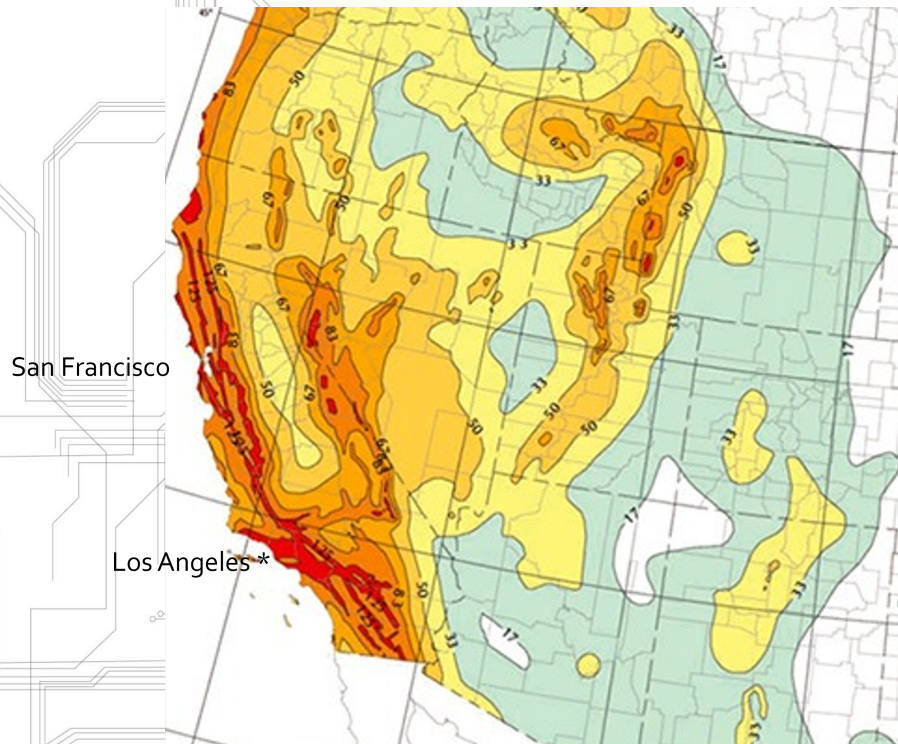
Silicon Valley and the Bay Area at large is home to some of the largest and oldest peering exchanges and data centers in the world.

The industry here is booming, as nearly every startup in the region or company at scale houses or clears their data through the facilities in this region.

This is despite having some of the highest real estate and power costs in the country while sitting on one of the most active and dangerous fault lines on the planet.

Source: <https://www.austinchamber.com/economic-development/key-industries/data-management>

Local Weather Factors



High Earthquake Risk

SDC	EARTHQUAKE HAZARD
A	Very small probability of experiencing damaging earthquake effects.
B	Could experience shaking of moderate intensity.
C	Could experience strong shaking.
D0	
D1	Could experience very strong shaking (the darker the color, the stronger the shaking).
D2	
E	Near major active faults capable of producing the most intense shaking.

*Source: FEMA Earthquake Hazard Maps, <http://www.fema.gov/earthquake/earthquake-hazard-maps#1>.

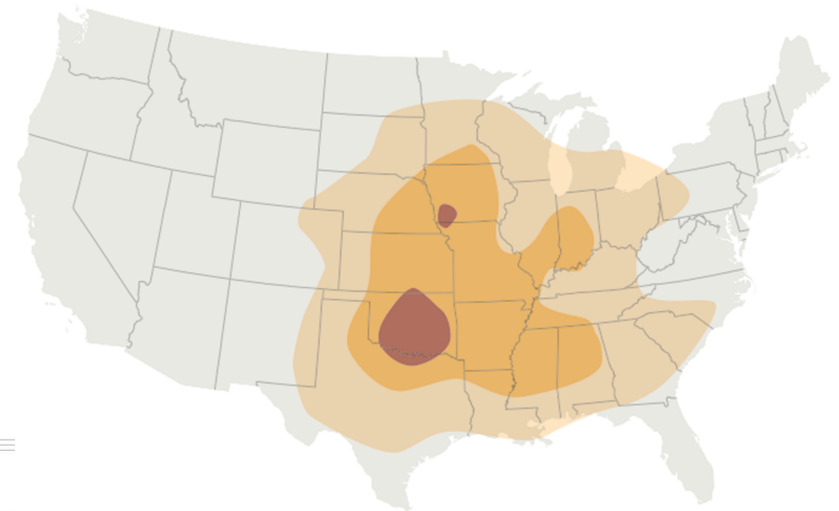
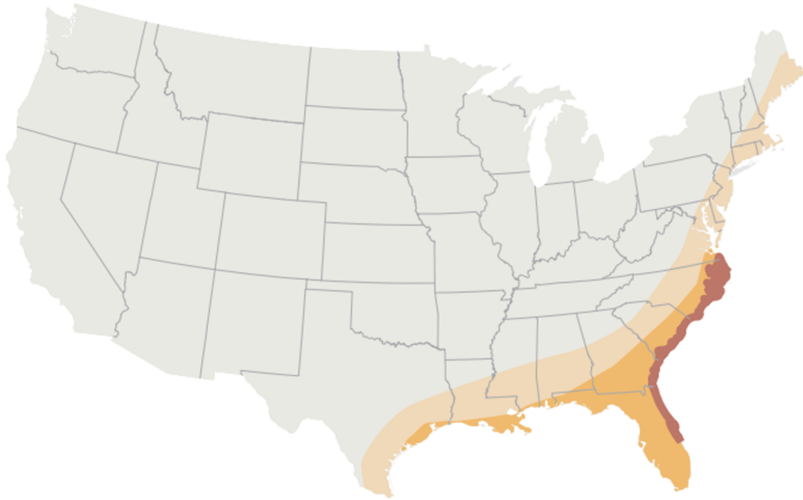
Local Weather Factors

No Hurricane Risk

Low Tornado Risk

Lower  Higher

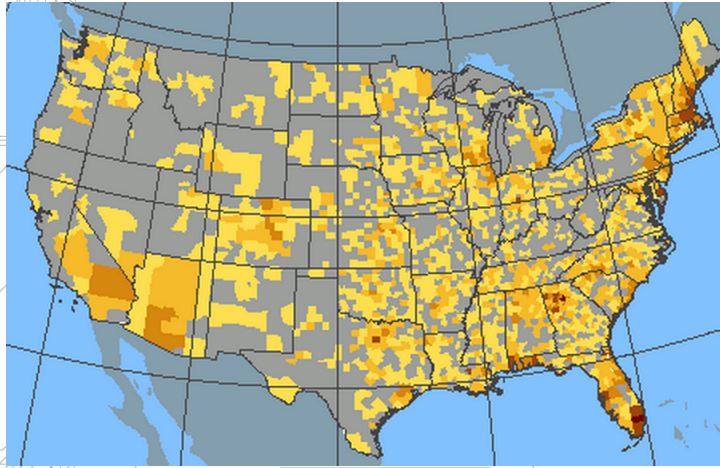
Lower  Higher



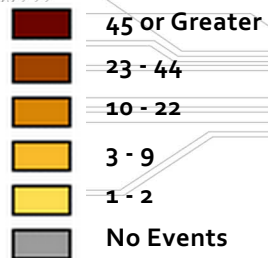
*Source: Matthew Erickson, Joe Burgess, and Bill Marsh of The New York Times. Accessed online, nationalatlas.gov

Local Weather Factors

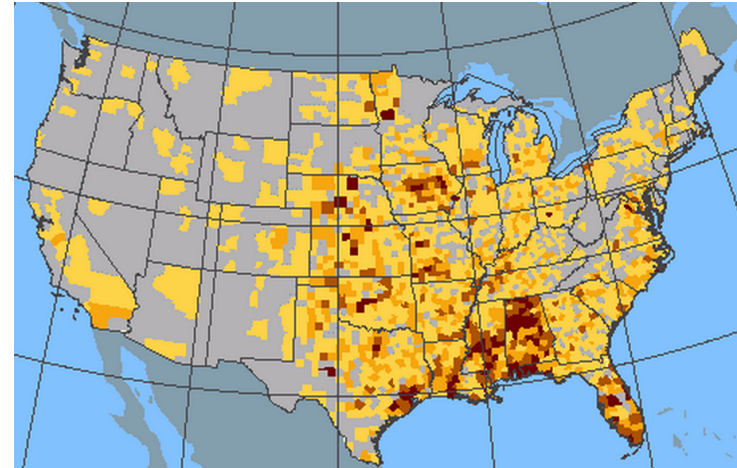
No Lightning Risk



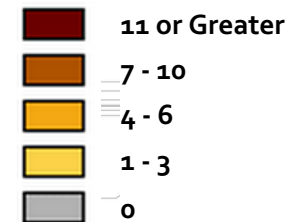
Lightning: Number of events that resulted in damage



No Thunderstorm Risk



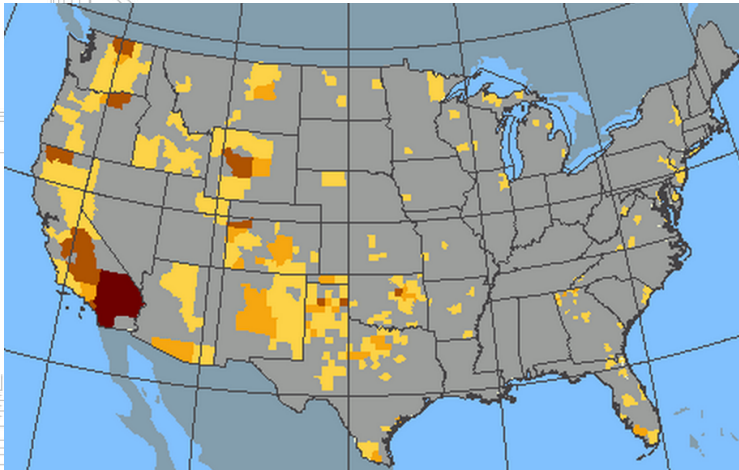
Thunderstorm: Number of damage-causing events



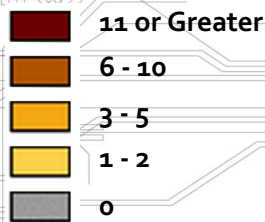
*Source: nationalatlas.gov

Local Weather Factors

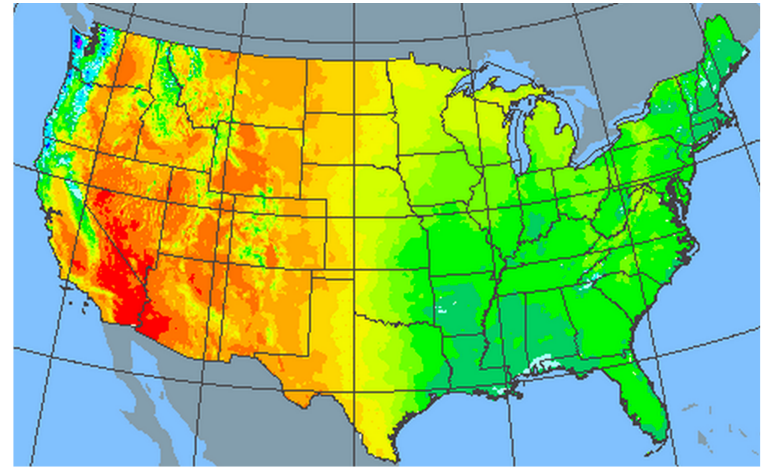
Moderate Wildfire Risk



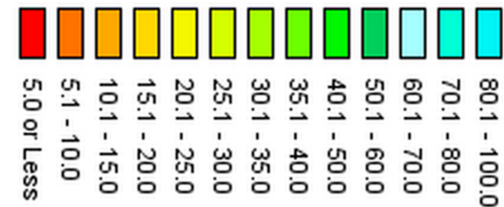
Wildfires: Number of events that resulted in damage



Low Precipitation



Average Annual Precipitation (in inches)



*Source: nationalatlas.gov

Utility Service Territories

Bay Area Energy Service Area Map



*Source: California Energy Commission, Electric Service Areas Detail map.

National Power Connections

EXISTING LINES

- 345-499 kV
- 500-699 kV
- 700-799 kV
- 1,000 kV (DC)

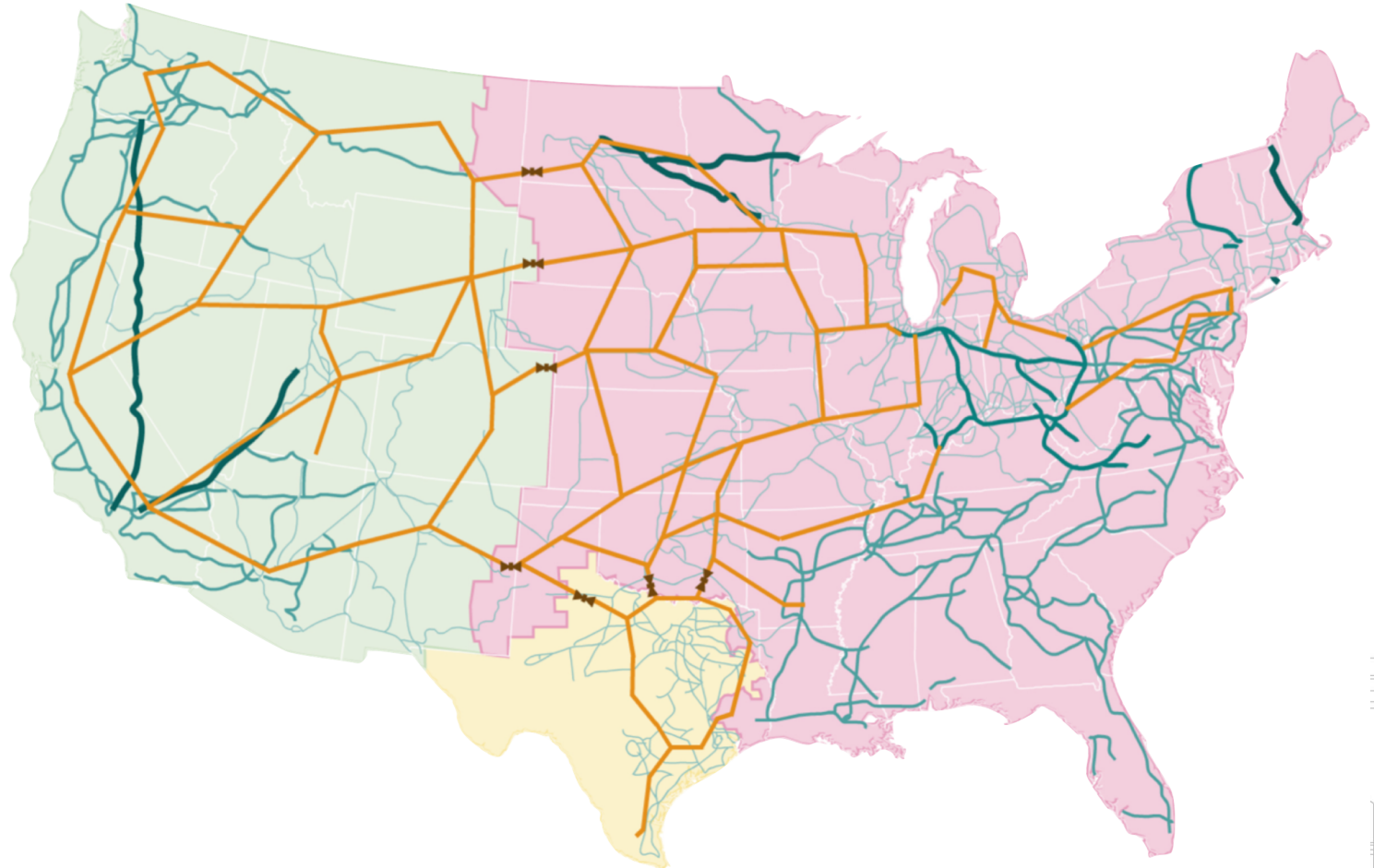
PROPOSED LINES

- New 765 kV
- AC-DC-AC Links

INTERCONNECTIONS

Major sectors of the U.S. electrical grid

- Eastern
- Western
- Texas (ERCOT)



Leading Businesses

Fortune 500 Companies in California

AECOM Technology

Agilent Technologies

Allergan

Amgen

Apple

Applied Materials

Avery Dennison

Broadcom

CB Richard Ellis Group

Charles Schwab

Chevron

Cisco System

Clorox

Core-Mark Holding

DirectTV Group

Dole Food

Edison International

EBAY

Facebook

Franklin Resources

Gap

Gilead Sciences

Google

Health Net

Hewlett-Packard

Ingram Micro

Intel

Jacobs Engineering Group

Live Nation Entertainment

Mattel

McKesson

Molina Healthcare

NetApp

Occidental Petroleum

Oracle

Pacific LifeCorp

PG&E Corp.

Qualcomm

Reliance Steel & Aluminum

Ross Stores

Safeway

SanDisk

Sanmina-SCI Corp.

Sempra Energy

Spectrum Group

International

Symantec

Synnex

URS Interactive

Visa Interactive

Walt Disney

Wells Fargo

Western Digital

Yahoo

*Source: <http://www.buyandhold.com/bh/en/research/states/CA.html>

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