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Los Angeles

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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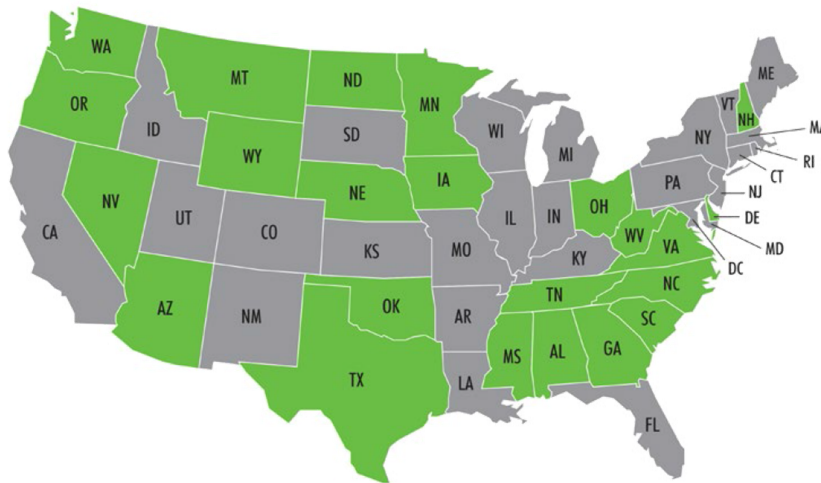
Tax Incentives

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.

Some cities, however, offer limited tax rebates. These cities are Sacramento, Los Angeles, and San Jose.

*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

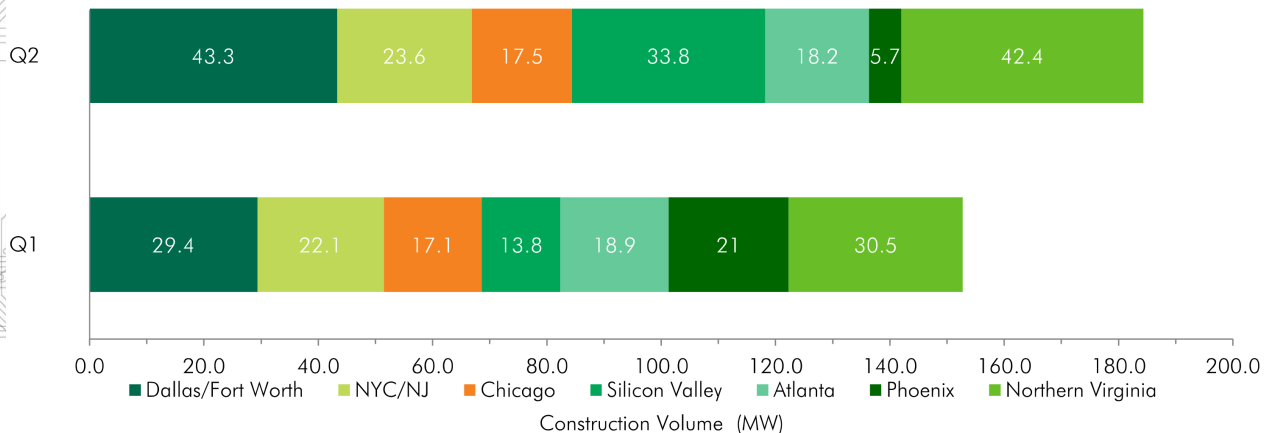
Market	Quarter	Inventory	Vacancy	Absorption	Rental Rates (kW/mo)*
Northern Virginia	Q1	417 MW (▲ 15.0 MW)	21.2 MW / 5.1% (▼ 24.1%)	20.8 MW (▲ 11.9 MW)	\$130-\$145
	Q2	421 MW (▲ 3.6 MW)	15.5 MW / 3.7% (▼ 27.7%)	9.4 MW (▼ 11.4 MW)	\$130-\$145
Phoenix	Q1	218 MW (▲ 5.0 MW)	4.1 MW / 1.87% (▼ 0.1%)	5.0 MW (▲ 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.

Arrows reflect quarter-over-quarter changes.

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

Q1-Q2 DATA CENTER CONSTRUCTION PIPELINE



*Source: CBRE Data Center Solutions,

Regional Industry Trends

Equinix to Power All California Data Centers with Solar Power

“Equinix, the world’s largest data center service provider, has contracted with SunEdison for enough solar energy to offset carbon emissions associated with energy its entire California footprint consumes, including data centers in Silicon Valley and Los Angeles and global headquarters in Redwood City..”*

Facebook and Google to Build Transpacific Submarine Cable

“Facebook has partnered with Google to pay for construction of what will be one of the highest-capacity submarine cable systems stretching across the Pacific Ocean, connecting Los Angeles to Hong Kong.. The Los Angeles-Hong Kong cable will help improve connectivity between both companies’ data centers in the US and Asia.”**

EdgeConneX to Tap into Submarine Cables for Better Data Center Connectivity

“EdgeConneX, which has focused on building data centers in underserved metros where content and cloud companies cache popular content and hand it off to last-mile ISPs for delivery to end users, is planning to make its San Diego data center a hub for accessing landing stations in Southern California, an alternative to carrier hotels in downtown Los Angeles.”***

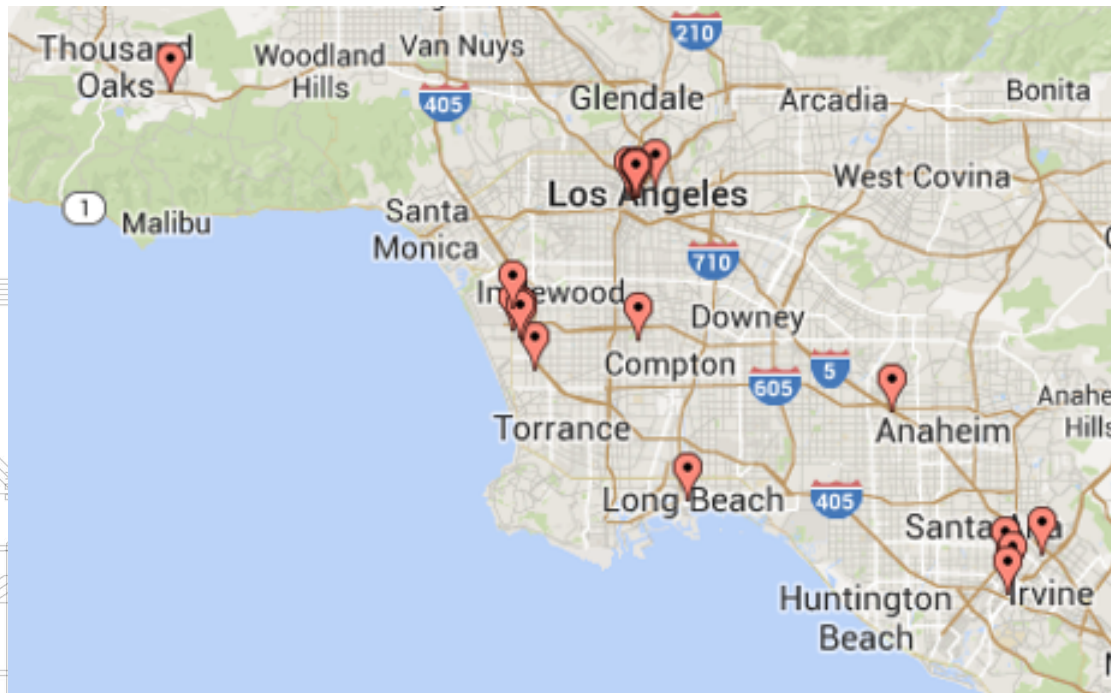
*Source: <http://www.datacenterknowledge.com/archives/2015/09/23/equinix-buys-solar-for-all-data-center-power-it-consumes-in-california/>

**Source: <http://www.datacenterknowledge.com/archives/2016/10/12/facebook-google-build-transpacific-submarine-cable/>

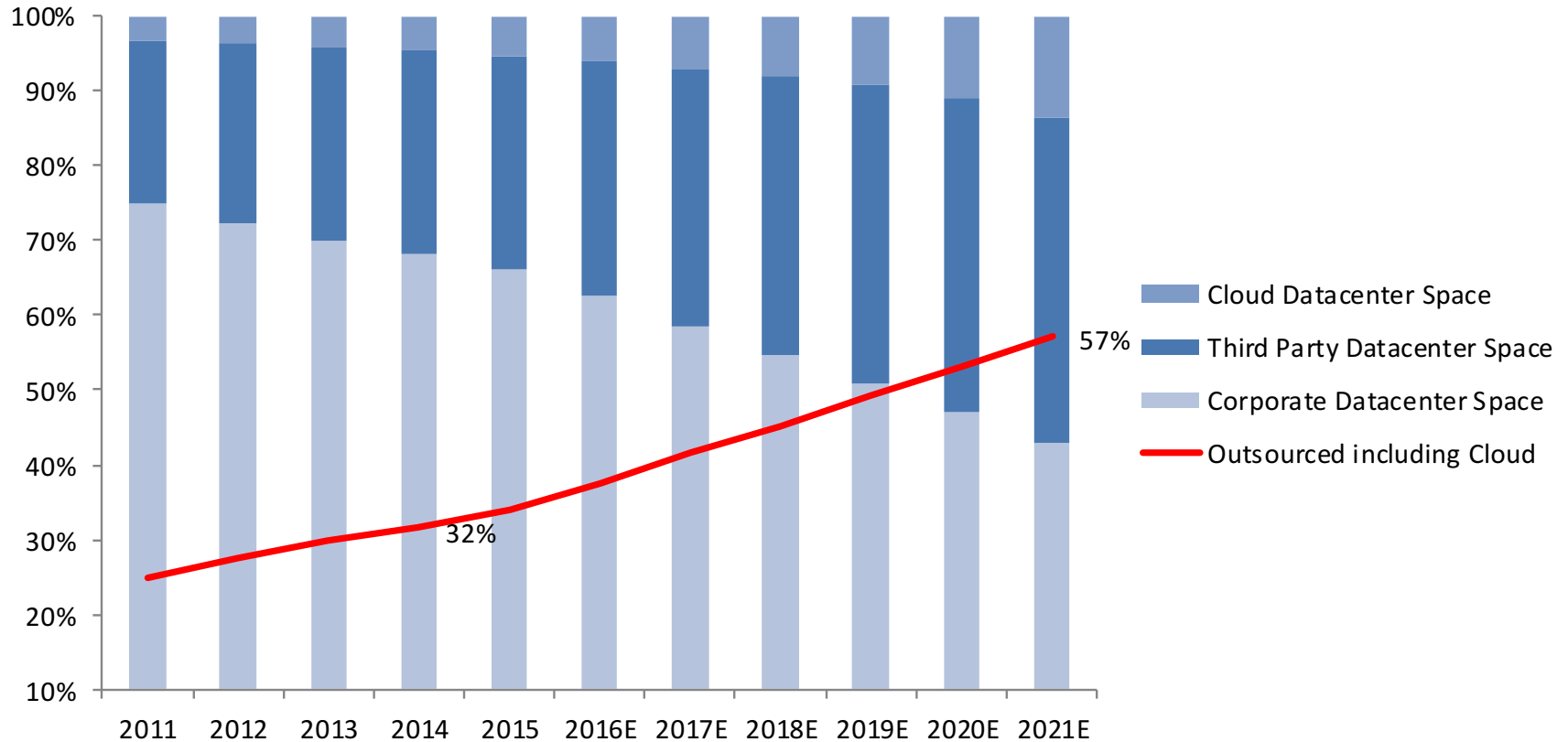
***Source: <http://www.datacenterknowledge.com/archives/2016/10/28/submarine-cable-deal-to-boost-data-center-connectivity-for-edgeconnex/>

Regional Industry Trends

25 Commercial Data Centers House 28 Different Providers Within the Los Angeles 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
Alchemy - LA	x		x	Local	Private	1200 West 7th St.	Los Angeles
Alchemy - LAX	x		x	Local	Private	6171 West Century Blvd.	Los Angeles
Alchemy - Irvine	x		x	Local	Private	2640 Main St.	Irvine
Atlantic Metro - LAX(o)	x		x	Regional	Private	624 South Grand Ave.	Los Angeles
CenturyLink - LA1	x		x	Global	Public (CTL: NYSE)	200 North Nash St.	El Segundo
China Telecom Americas	x	x	x	Global	Public (CHA:NYSE)	600 West 7th St.	Los Angeles
Colo@	x			National	Private	530 West 6th St.	Los Angeles
CoreSite - LA1	x			National	Public REIT (COR:NYSE)	624 South Grand Ave.	Los Angeles
CoreSite - LA2	x	x		National	Public REIT (COR:NYSE)	900 N Alameda St.	Los Angeles
Cyberverse	x			Regional	Private	600 West 7th St.	Los Angeles
Digital Realty Trust		x		Global	Public REIT (DLR: NYSE)	600 West 7th St.	Los Angeles
Digital Realty Trust		x		Global	Public REIT (DLR: NYSE)	2260 E El Segundo Blvd.	El Segundo
Equinix - LA1	x			Global	Public (EQIX: NASDAQ)	600 West 7th St.	Los Angeles
Equinix - LA2	x			Global	Public (EQIX: NASDAQ)	818 West 7th St.	Los Angeles
Equinix - LA3	x			Global	Public (EQIX: NASDAQ)	1920 East Maple Ave.	El Segundo
Equinix - LA4	x			Global	Public (EQIX: NASDAQ)	445 North Douglas St.	El Segundo
Hosting.com	x		x	National	Private	16842 Von Karman Ave	Irvine
IC2NET	x			Local	Private	14351 Myford Rd.	Tustin
Internap	x	x	x	Global	Public (INAP: NASDAQ)	3690 Redondo Beach Avenue	Redondo Beach
ISWest	x		x	Local	Private	30077 Agoura Ct.	Agoura Hills

*Source: peeringdb.com.

Data Center Directory

Name	Retail	Wholesale	Hosting	Location(s)	TYPE (TICKER: EXCHANGE)	Address	City
Morlin Asset Management		x		Local	Private	1200 West 7th St.	Los Angeles
zColo	x		x	National	PE Backed	17222 Von Karman Ave.	Irvine
Level3	x		x	Global	Public (LVLTY:NYSE)	818 West 7th St.	Los Angeles
Net Data Centers	x		x	Global	Private	2260 E El Segundo Blvd.	Los Angeles
Peer1	x		x	Global	Public (CGO: TSX)	600 West 7th St.	Los Angeles
Rocket InterNetWorking	x			Local	Private	200 Oceangate	Long Beach
SMH Colocation	x	x		Local	Private	2463 W. La Palma Ave.	Anaheim
T5 Data Centers		x		National	Private	444 North Nash St.	El Segundo
Telehouse	x			Global	Private (division of KDDI)	626 Wilshire Blvd.	Los Angeles
TelePacific	x			Regional	Private	2001 E Dyer Road	Santa Ana
Telx - LOS1	x			National	PE Backed	600 West 7th St.	Los Angeles
UnitedLayer	x		x	Regional	PE Backed	530 West 6th St.	Los Angeles
USColo	x			Local	Private	800 S. Hope St.	Los Angeles
USColo	x			Local	Private	650 South Grand Ave.	Los Angeles
XO Communications	x			National	Private	600 West 7th St.	Los Angeles
XO Communications	x			National	Private	818 West 7th St.	Los Angeles
Zayo Group	x	x		Global	Public (ZAYO: NYSE)	707 Wilshire Blvd.	Los Angeles

*Source: peeringdb.com.

Regional Peering Exchanges

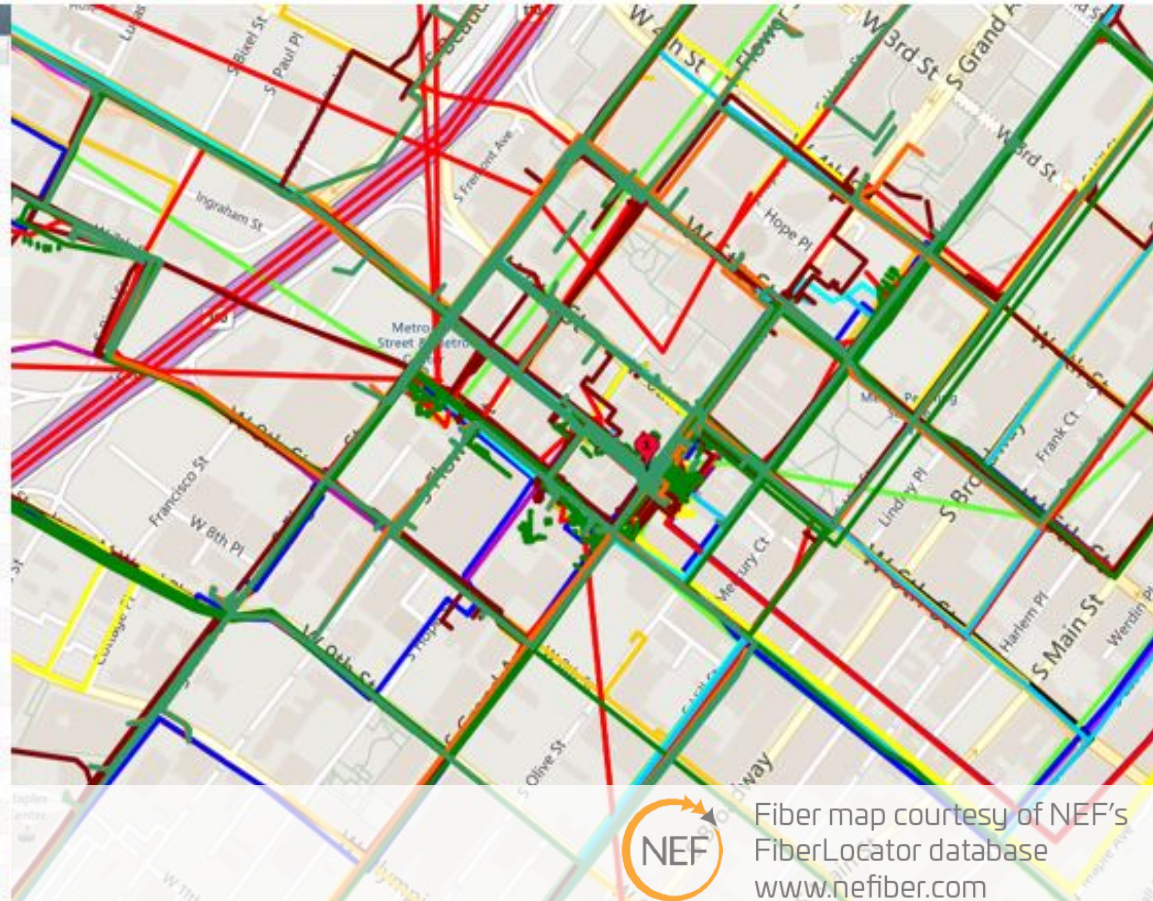
List of Major Peering Exchanges In and Around Los Angeles

Exchange Name	Long Name	City/Region
CoreSite - Any2 California	CoreSite - Any2 California	Los Angeles and Silicon Valley
Equinix Los Angeles	Equinix Los Angeles Exchange	Los Angeles
LAIX	Los Angeles International Internet eXchange	Los Angeles
CIIX (formerly LAAP)	CENIC International Internet eXchange (CIIX) formerly known as the Los Angeles Access Point (LAAP)	Los Angeles

Regional Carrier Hotels

1 Wilshire, Los Angeles, CA
1 Mile View

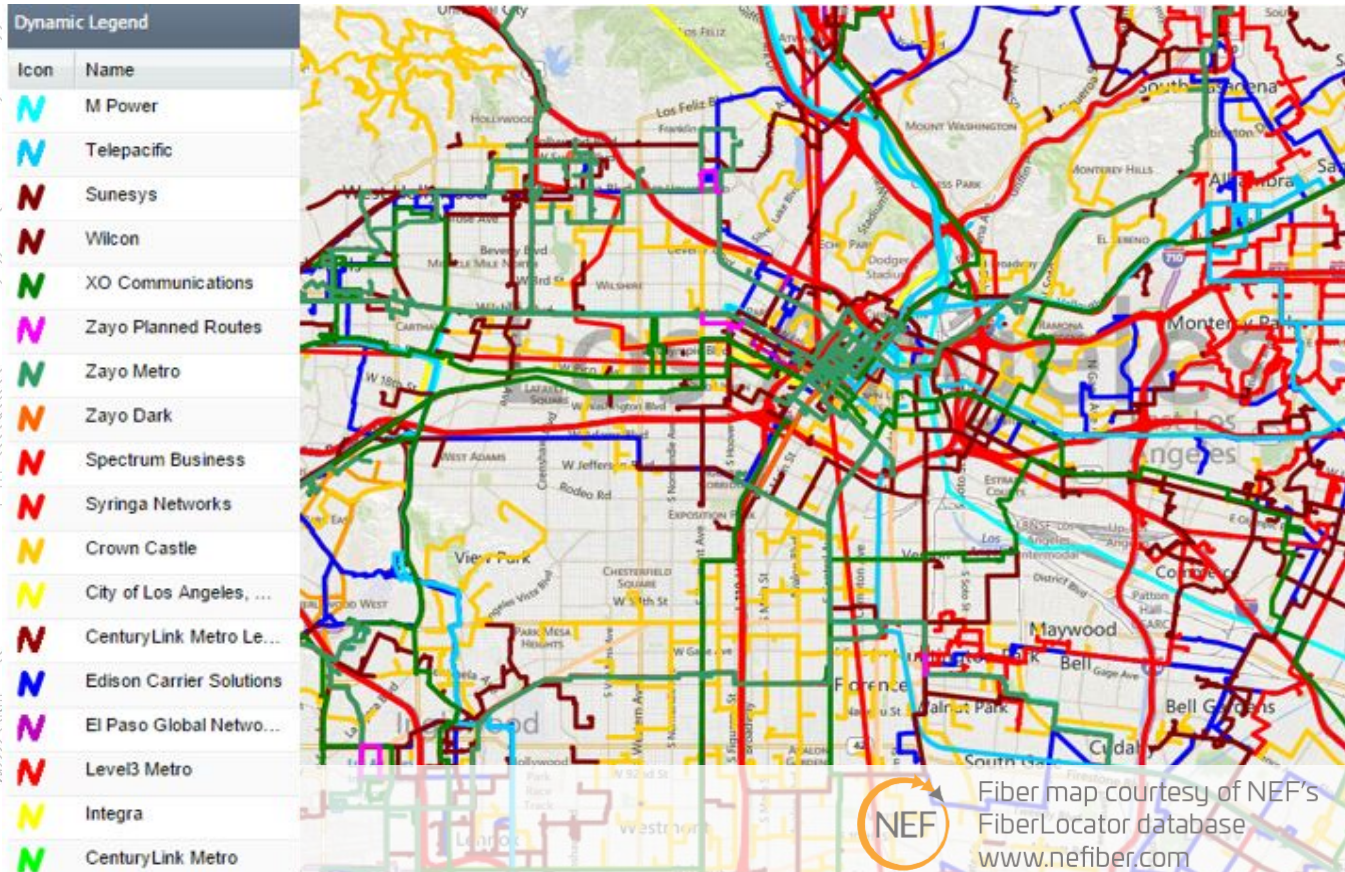
Dynamic Legend	
Icon	Name
	Crown Castle
	M Power
	Level3 Metro
	Integra
	El Paso Global Netwo...
	Sunesys
	Syringa Networks
	Zayo Dark
	Zayo Metro
	XO Communications
	Wilcon
	Telepacfic
	Edison Carrier Solutions
	Spectrum Business
	Level 3 Long Haul
	Sprint Long Haul
	Integra Long Haul
	Global Crossing Long...
	Electric Lightwave Lo...
	XO Long Haul
	Zayo Dark Long Haul
	City of Los Angeles, ...
	CenturyLink Metro Le...
	CenturyLink Metro
	Zayo Long Haul
	CenturyLink Long Haul



Fiber map courtesy of NEF's
FiberLocator database
www.nefiber.com

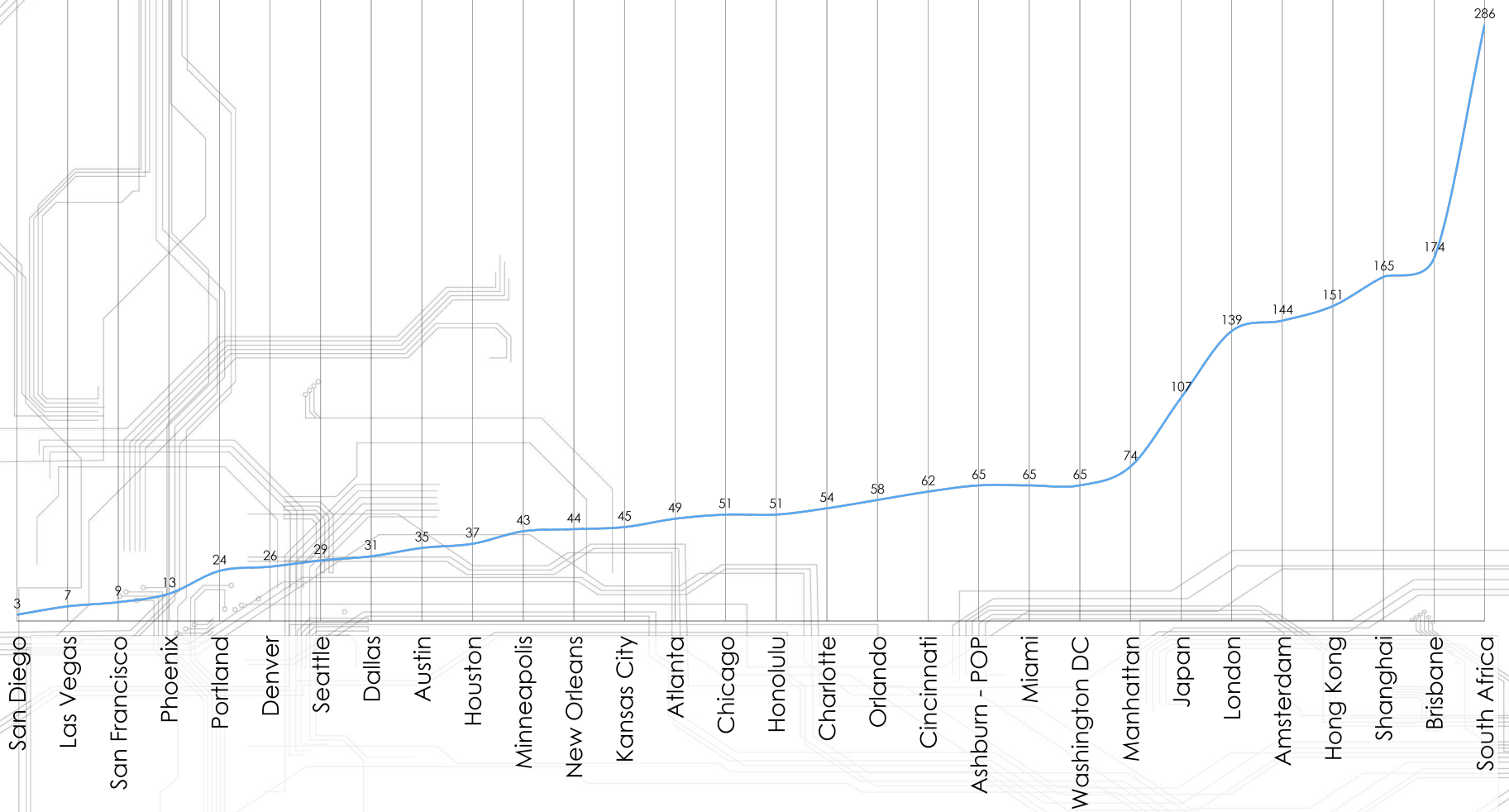
Regional Metro Networks

20 Mile Metro Networks



Network Latency

- Latency in milliseconds, from Los Angeles

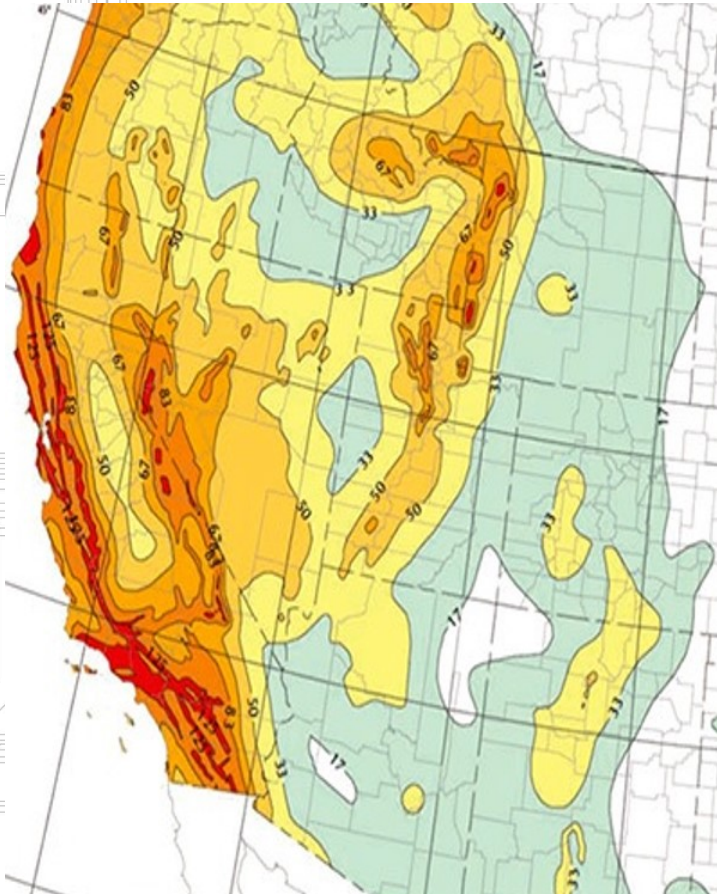


Environment & Industry

Since the dawn of the internet, Los Angeles has served as one of the primary gateways for the Trans-Pacific submarine cables connecting the United States to AsiaPac.

This reality, coupled with a resurgence of startups in the region, and a growing population exceeding 10M within Los Angeles County alone, has caused the data center and hosting industries to boom over the past few years... and they are showing no signs of slowing any time soon.

Local Weather Factors



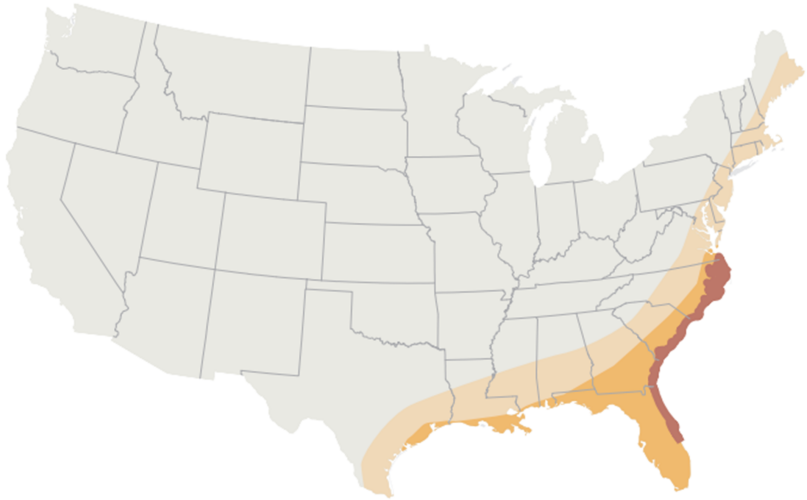
High Earthquake Risk

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.

Local Weather Factors

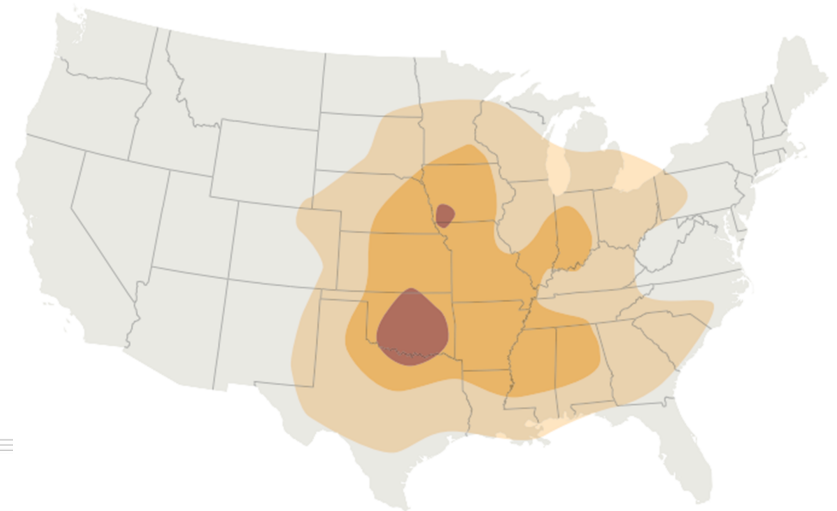
No Hurricane Risk

Lower  Higher



Low Tornado Risk

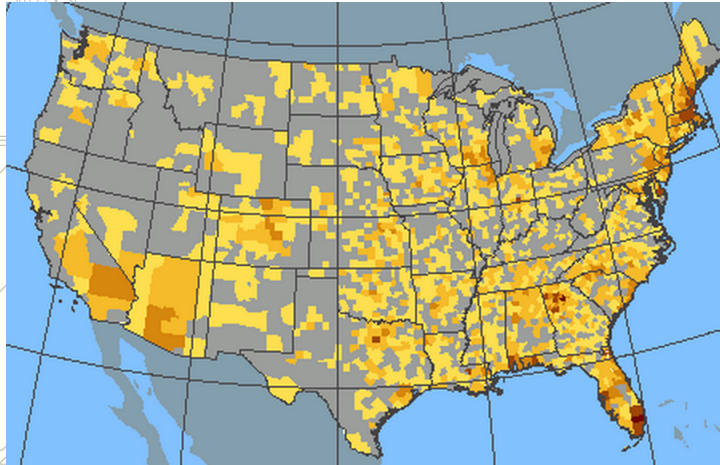
Lower  Higher



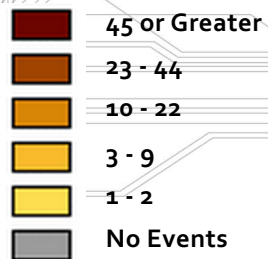
*Source: Matthew Erickson, Joe Burgess, and Bill Marsh of The New York Times. Accessed online, nationalatlas.gov

Local Weather Factors

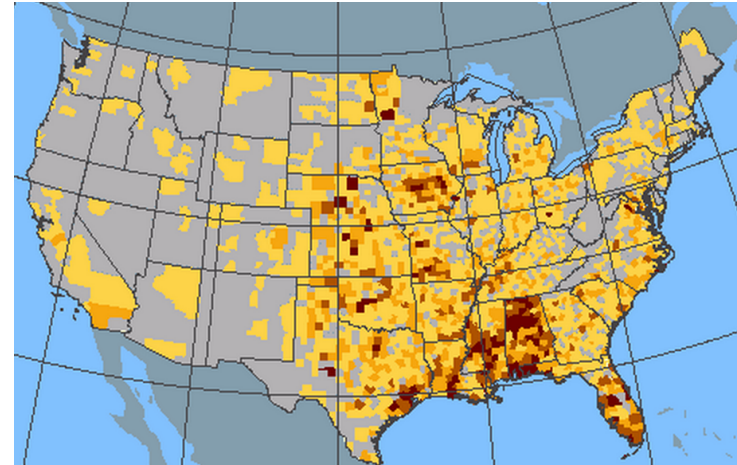
Moderate Lightning Risk



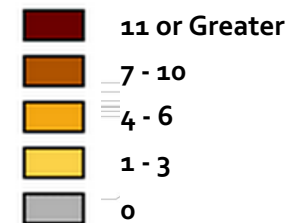
Lightning: Number of events that resulted in damage



No Thunderstorm Risk



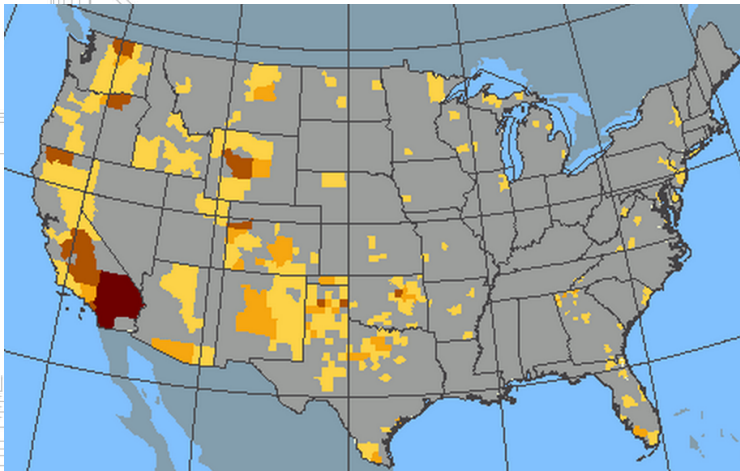
Thunderstorm: Number of damage-causing events



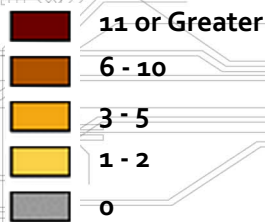
*Source: nationalatlas.gov

Local Weather Factors

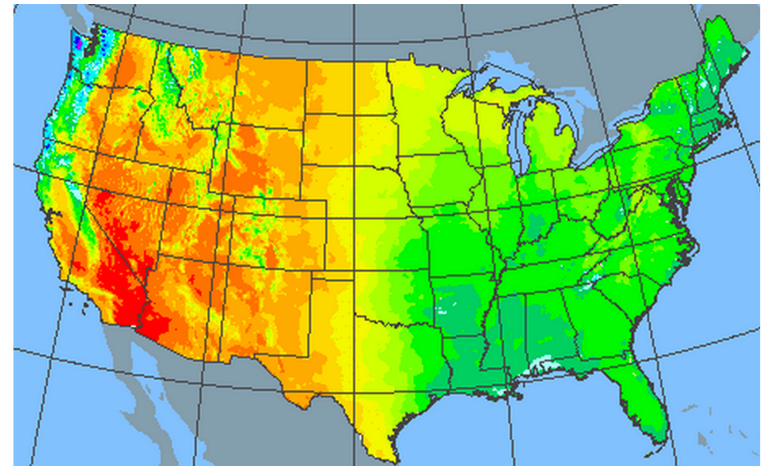
High Wildfire Risk



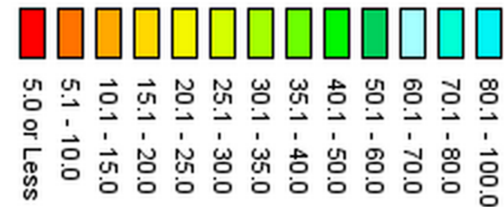
Wildfires: Number of events that resulted in damage



Low Precipitation



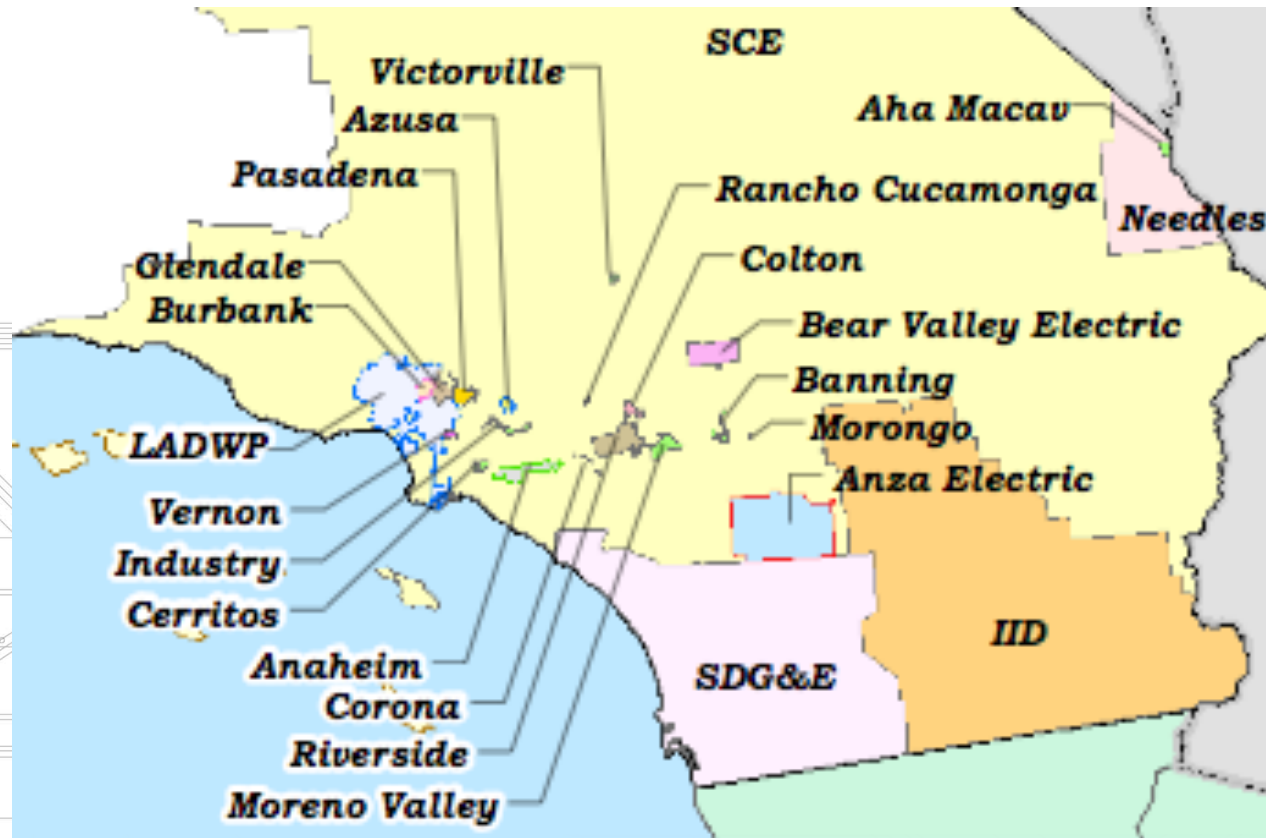
Average Annual Precipitation (in inches)



*Source: nationalatlas.gov

Utility Service Territories

Southern California Energy Service Area Map



National Power Connections

EXISTING LINES

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

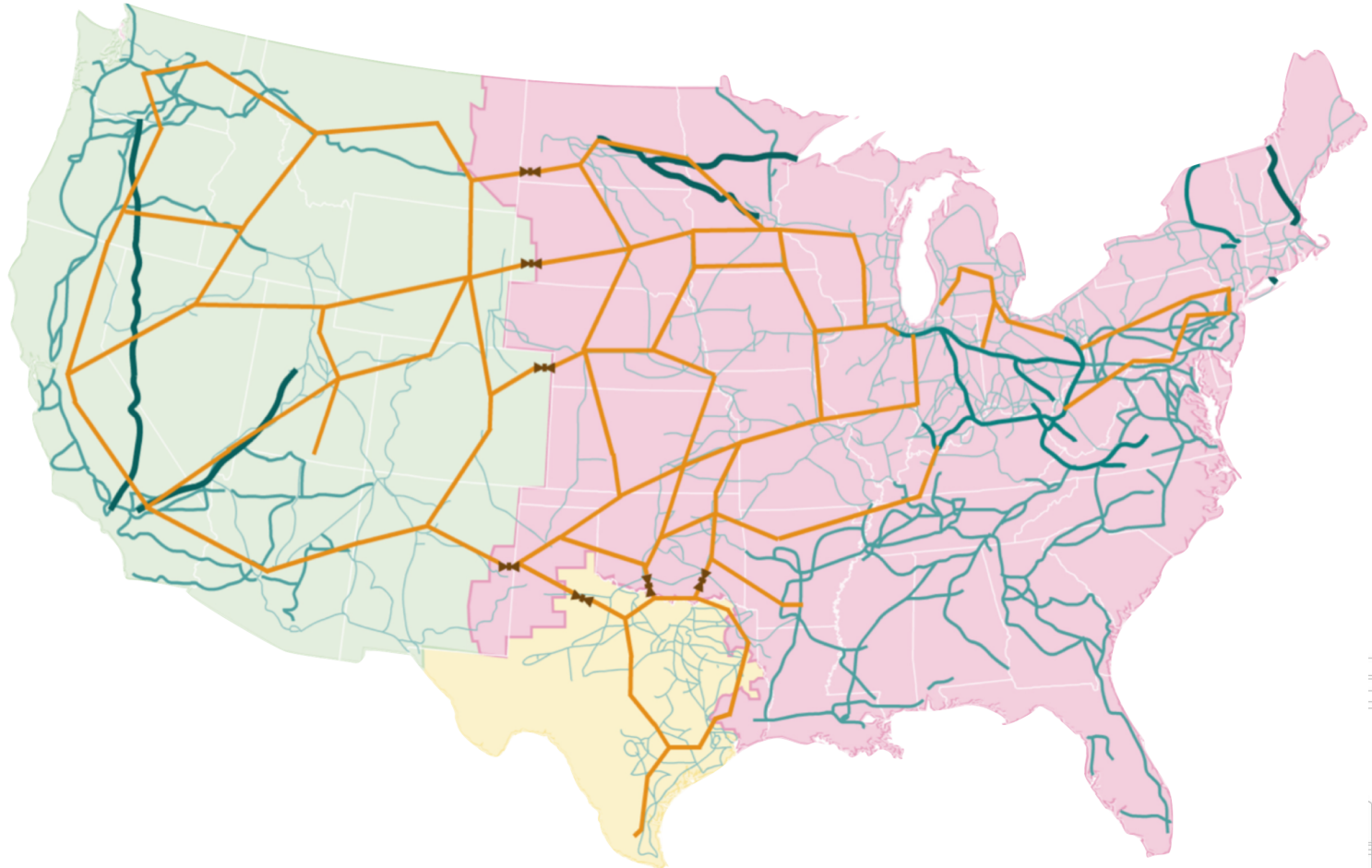
PROPOSED LINES

- 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 Systems
Clorox
Core-Mark Holding
DirecTV 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 Life Corp

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

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