

What Direct Impacts Do We Face?



Business, Insurance, & Financial Implications of the next Northridge EQ
Tom Larsen, Product Architect, EQECAT



**The 1994 Northridge Earthquake:
Impacts, Outcomes, and Next Steps**

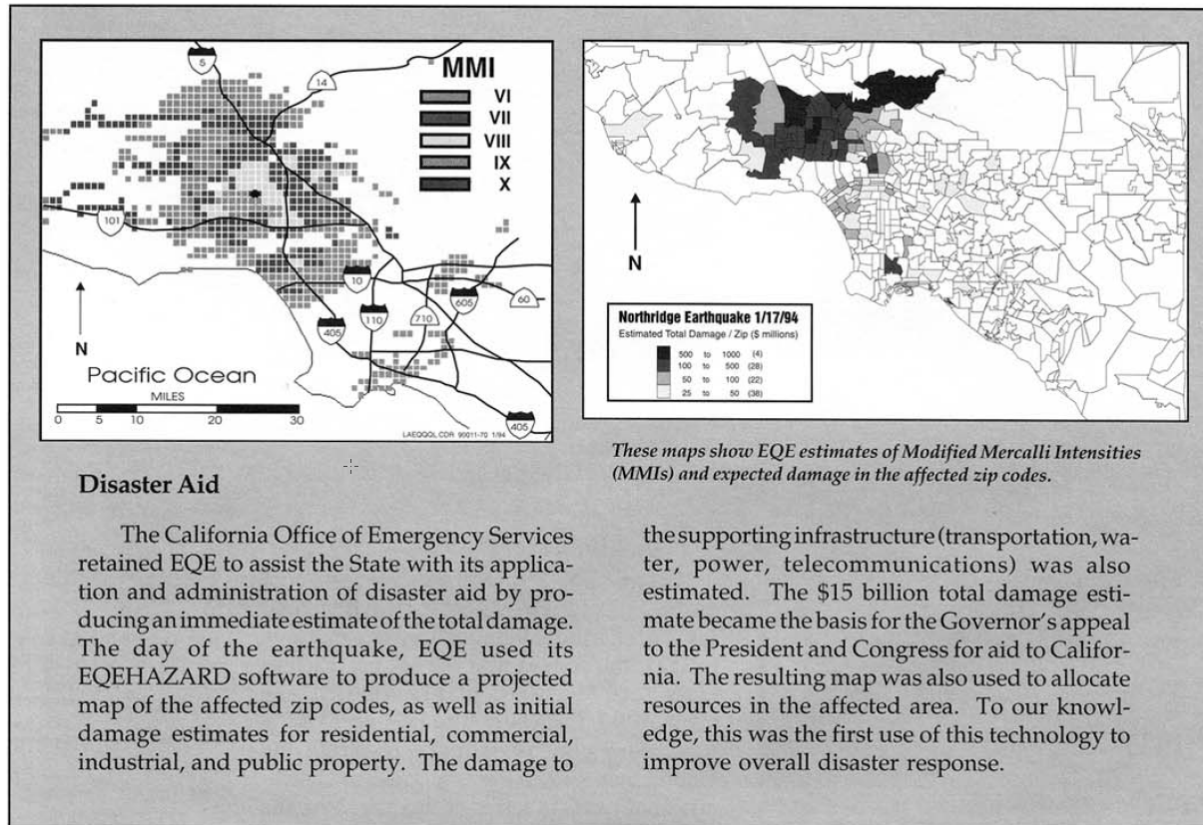
January 16-17, 2014
Los Angeles, CA



EQECAT™

The Northridge EQ

A seminal moment for Cat Modeling



- The 1994 EQ was one of the earliest demonstrations of modeling
- EQE (a prior company to EQECAT) provided immediate post-event guidance to help Governor Wilson expedite the recovery

From: The January 17, 1994 Northridge, CA Earthquake. An EQE Summary Report

Earthquakes affect many aspects of buildings



2nd story collapse,
Concrete Frame
Building



Collapsed interior,
Northridge Fashion
Center (retail)

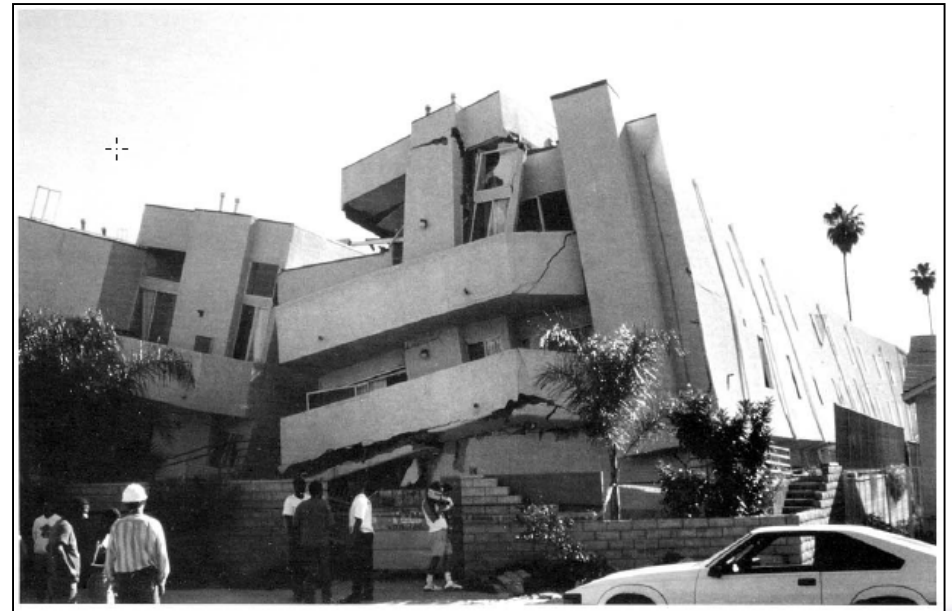


Cooling towers damaged (no occupancy)

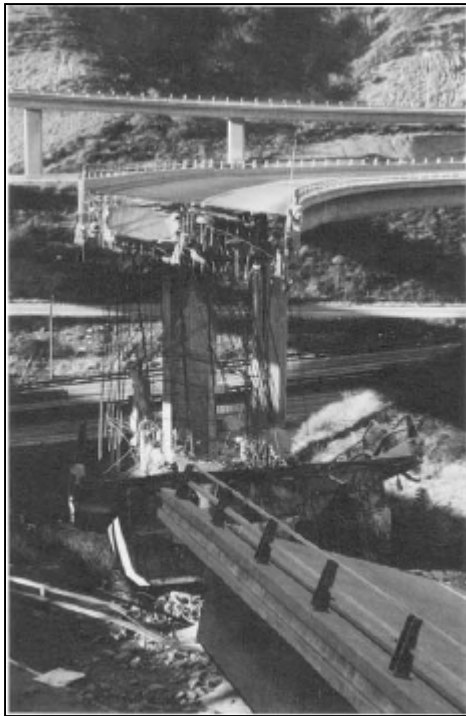


Collapsed Parking

Damaged Housing

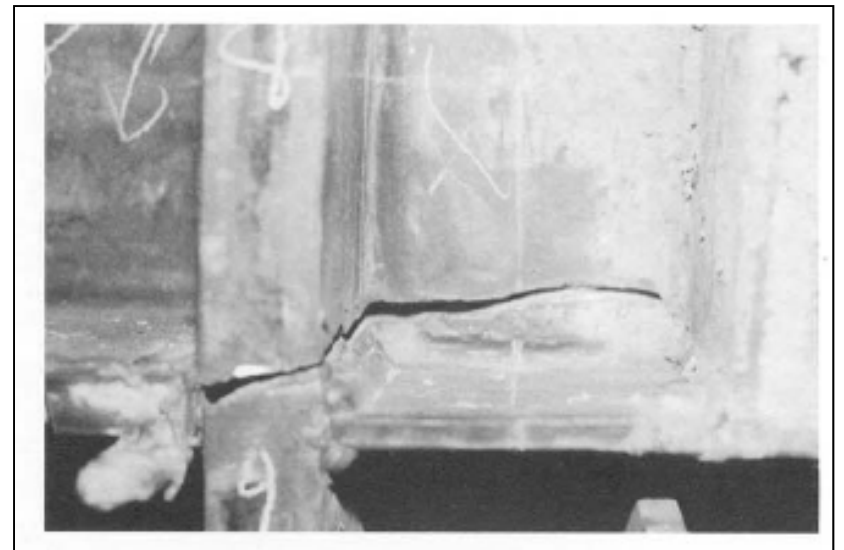


Transportation



Not all damage is immediately visible

- The construction practice of leaving backing bars in welded connections led to brittle behavior
- Damage to steel buildings was only discovered after expensive inspection of ALL steel joints in a building



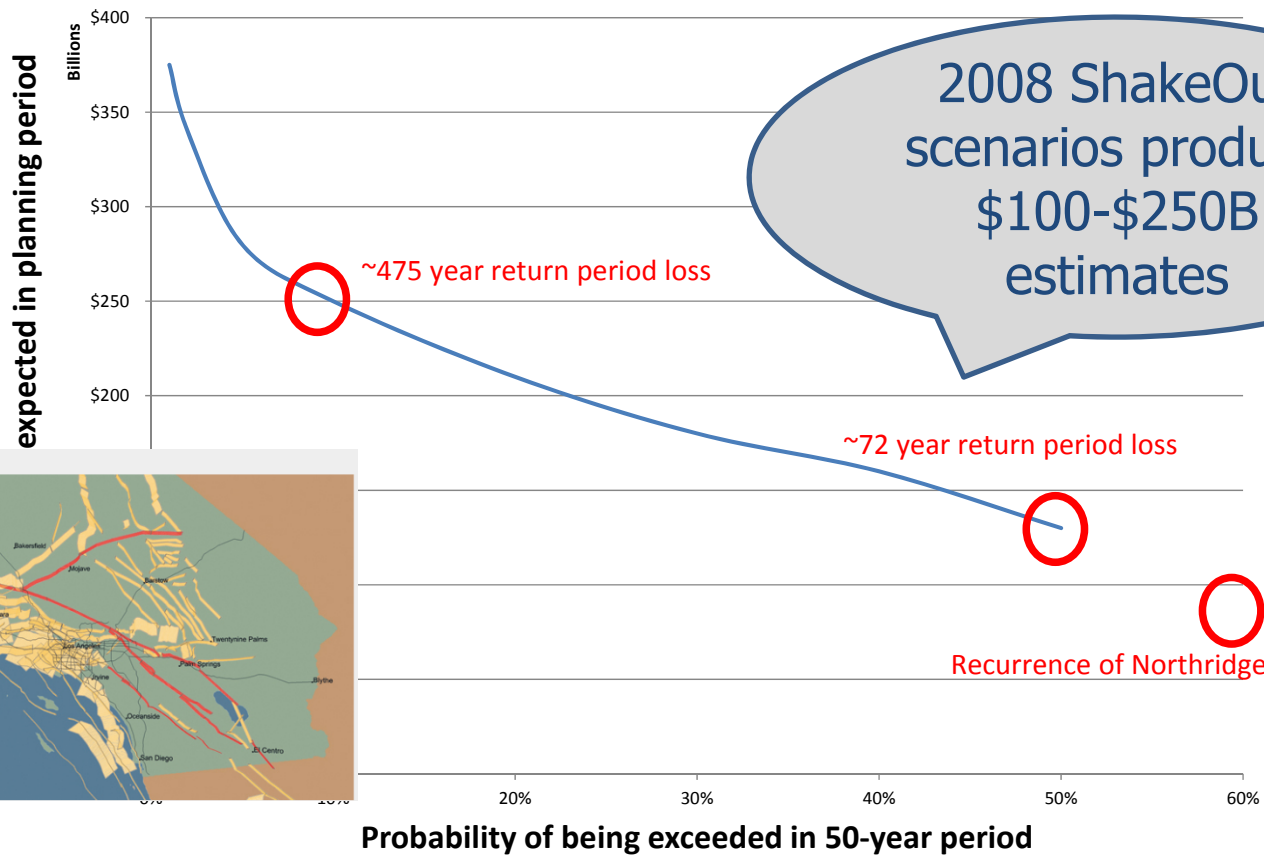
What to expect for the next one?

- A recurrence of the Northridge EQ today **\$90 B (80-\$140B)**
 - ~10 seconds of ground shaking \$85 B (\$75 -\$110)
 - Displaced lodging / Business Interruption \$6 B (\$5 - \$30)
- Direct Insurance Recoveries \$15 B (\$12 - \$30B)
- Cash shortfall **\$75 B**

The ground-up damage estimate for Northridge today is about twice what was observed in 1994. Consumer inflation and population growth are the primary drivers, but a 4:30 AM occurrence time reduced the loss potential

Is "Northridge" the right planning scenario?

Estimated Ground-up Loss from Earthquake Shaking in LA Basin 2014

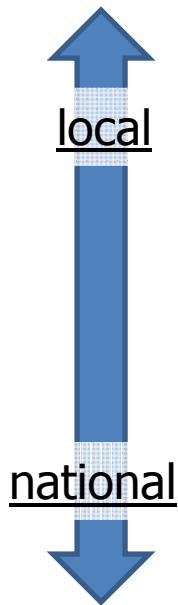


2008 ShakeOut scenarios produce \$100-\$250B estimates

SCEC Community Fault Model



What else to expect?



Issue:

- **Extended power outages** (Hurricanes Ike & Irene)
- **Direct hit/Damaging Aftershock** (Christchurch NZ)
- **Parallel disasters / CBI** Tohoku
- **Residential Mortgage default** (seen in Hurricane Katrina)
- **Commercial Mortgage-back securities default** (Sandy)

Potential Solution:

- Keep improving mutual aid agreements
- Super-hardening of selected facilities?
- Mandatory EQ Insurance? Alternative to Insurance?

“Things always become obvious after the fact”
— [Nassim Nicholas Taleb](#), author of the Black Swan



Northridge Earthquake, 20 years later

- Northridge EQ demonstrated the value of catastrophe models for immediate response
- Catastrophe models can help us identify and anticipate reasonable planning scenarios
- The next disaster will include everything that we have seen in past catastrophes, plus much more

Tom Larsen
tlarsen@eqecat.com
www.eqecat.com