

# Mitigation of Seismic Risk in Older Concrete Buildings

## NEES-R Grand Challenge

Thalia Anagnos, Mary Comerio, Tara Hutchinson,  
Ricky Lopez, Adolfo Matamoros, Peter May, Jack Moehle (PI),  
Khalid Mosalam, Julio Ramirez, Judy Steele, Jon Stewart



# Project background



California, 1994



Turkey, 2003

“50% of the casualties are coming from 5% of the buildings.”

Kircher et al., “Estimated Losses due to a Repeat of the 1906 San Francisco Earthquake, *Earthquake Spectra*, 2006.



# Project thesis

- Available guidelines are too conservative
  - most buildings are found inadequate
  - retrofit costs are high
- This “always bad” message
  - is not credible
  - is impeding action
- Improved procedures
  - can reduce the problem
  - can make retrofit programs feasible
- What we learn, both technical and societal, can be translated to other building types and localities.





# Research program overview

- Inventory one or two major cities
- Test critical components to collapse
- Investigate simple retrofit methods
- Systems studies, including soil-foundation-structure interaction
- Improved computer simulation
- Regional simulation
- Craft and evaluate appropriate policies
  - Identify different classes of the problem
    - Structural configuration
    - Occupancy
    - Economic conditions
  - Identify feasible mechanisms
  - Model risk reduction impacts
  - Evaluate economic impacts



# Collaborations with existing organizations

- ASCE Standards Committees
- American Concrete Institute
- Applied Technology Council
- EERI *Concrete Coalition*

