



Reducing Earthquake Risks

National Earthquake Hazards Reduction Program

<http://www.fema.gov/plan/prevent/earthquake/nehrrp.shtm>

Established by Congress in 1977, the National Earthquake Hazard Reduction Program (NEHRP) works to reduce risks to life and property resulting from earthquakes. Focusing on research, building code standards, technical guidance, and education, NEHRP is a collaborative effort among the Federal Emergency Management Agency (FEMA), the National Institute of Standards and Technology (NIST), the National Science Foundation (NSF), and the United States Geological Survey (USGS).

A Federal partnership

The NEHRP agencies work together to reduce the Nation’s vulnerability to earthquakes. The agencies research the causes and effects of earthquakes and produce technical guidance; develop earthquake resistant design, construction standards, and techniques; and educate the public about earthquake hazards and mitigation.

Federal Emergency Management Agency

FEMA manages initiatives that increase the chances that people will survive earthquakes, including the following activities:

- Translates research into technical guidance publications and best practices on seismic safety, building design and construction, building codes and standards, and reducing economic losses.
- Assists State and local governments in building capabilities for determining potential damage and reducing the effects of earthquakes before they occur.
- Works with national codes and standards organizations to develop and improve seismic building standards.

National Institute of Standards and Technology

NIST manages the overall NEHRP effort, including these activities:

- Researches building codes, standards, and practices.
- Promotes earthquake resistant building practices, and works with national organizations to improve seismic standards for new and existing infrastructure.
- Chairs the Interagency Committee on Seismic Safety in Construction (ICSSC), which recommends practices and policies for reducing earthquake hazards in Federal facilities.

<p>Earthquakes: 45 States and territories are at risk</p> <p>Earthquakes threaten large regions of the country, including Central and Eastern states, and Alaska. The Northridge, California, earthquake in 1994 killed at least 60 people, injured 5,000, and left more than 25,000 people homeless. Direct economic losses were estimated at \$20 to \$30 billion.</p>
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National Science Foundation

NSF conducts research on the causes and effects of earthquakes, including the following activities:

- Supports research on plate tectonics, and the social and economic aspects of earthquake hazard mitigation.
- Funds engineering research on geotechnical, structural, architectural, and lifeline systems.
- Supports educational initiatives targeting scientists and engineers.

United States Geological Survey

USGS conducts and supports earth science research that increases knowledge about the origins and effects of earthquakes, including these activities:

- Produces national and regional seismic hazard and risk maps.
- Conducts engineering seismology studies of the ground-shaking phenomenon.
- Develops methods and standardized procedures for forecasting earthquakes.
- Supports an external cooperative grants research program.

Technical guidance for stronger and safer buildings

Based on research conducted by NEHRP agencies, FEMA develops technical guidance manuals, handbooks, software, and training materials on seismic safety and construction. State and local governments, building code officials, architects, engineers, and building industry professionals use these materials for designing and building homes, businesses, and infrastructure; retrofitting existing buildings; and developing building codes in at-risk areas. FEMA provides the following types of information:

- Guidance and best practices on seismic design, construction, and upgrade techniques.
- Procedures for identifying, documenting, and ranking earthquake hazards and the resultant risks to buildings and infrastructure.
- Techniques for evaluating different types of structures damaged by earthquakes, such as steel frame buildings, and concrete and masonry buildings.
- Methods for estimating seismic upgrade costs (based on data from more than 2,000 projects), and cost-benefit models for upgrading government buildings.
- Recommended improvements to design and construction standards for structures in earthquake-prone areas.
- Performance-based design and construction guidance to allow building owners, managers, and regulators to more reliably determine how a building will perform in an earthquake of specific parameters.

NEHRP Goals

- Develop effective practices and policies for earthquake loss-reduction and accelerate their implementation.
- Improve techniques to reduce seismic vulnerability of facilities and systems.
- Improve design and implementation of seismic hazards identification and risk-assessment methods.
- Improve understanding of earthquakes and their effects.



FEMA

Public education materials

The NEHRP agencies, with their partners, produce the following types of earthquake safety materials:

- Brochures and electronic materials on earthquake safety for homeowners and businesses.
- Techniques for upgrading homes and reducing hazards within homes and businesses.
- Earthquake curriculum for grades K-6 and 7-12, and a Web site for children (www.fema.gov/kids/quake).
- Tools to assist disaster educators and incident managers to organize earthquake safety programs.