

## Protecting American Lives, Infrastructure, and the Economy Through Resilience

National **Earthquake** Hazards Reduction Program (NEHRP)  
National **Windstorm** Impact Reduction Program (NWIRP)

**National Institute of Building Sciences**  
*in cooperation with the*  
**United States House Committee on Science, Space, and Technology**  
*Invite you to a Congressional Briefing*

**RSVP:** <https://www.surveymonkey.com/r/PHJWNHR> by March 5th

**Date and time:** March 7, 2024, 12:00pm – 1:00pm (light refreshment provided)

**Location:** Rayburn Congressional Office Building, Room 2325

Dear Congressional Members and Partners:

Nearly half of all Americans live and work in high seismic regions throughout the United States. These regions currently have \$108 trillion of national building assets and the work of NEHRP must continue to mitigate risk from earthquakes.

Separately, windstorms are responsible for 60% of the nation's total damage from natural disasters. Human and economic recovery from these events can take years, even decades. The negative impacts from windstorm damage will only increase as "Tornado Alley" creeps eastward, making future risk mitigation from the work of NWIRP just as crucial.

NEHRP and NWIRP rely upon the nation's experts to conduct applied and basic research, share cutting-edge knowledge with community stakeholders, and take action to protect American lives and livelihoods through prevention, preparedness, response, recovery, and mitigation practices. Both programs enable our nation's security and prosperity.

The National Institute of Building Sciences (NIBS), a Congressionally chartered building science organization, along with our partners, invite you to an important and time-sensitive briefing where we will:



**Point of Contact:** Dr. Jiqui (JQ) Yuan, PE, PMP Chief Resilience Officer and Head of Engineering  
**P:** (202) 787-3240 **E:** [jyuan@nibs.org](mailto:jyuan@nibs.org)

- Share and **celebrate some of the success stories** that Congress, lead agencies, and the private sector have collaboratively achieved over the past 46 years. Speaker: John Hooper, a National Academy of Engineering member and leader in building code and standard development (see page 3 for more information).
- **Discuss the future of community resilience requirements.** Speaker: Dr. Daniel Kaniewski, former Deputy Administrator for Resilience with FEMA and leader in emergency management, insurance, and policy (see pages 4-5 for more information).
- **Share and describe recommended Congressional priorities for advancing our nation's safety, preparedness, and resilience.** Speaker: Dr. Lucy Arendt, Chair of the NEHRP Advisory Committee on Earthquake Hazards Reduction (see pages 6-7 for more information).

We look forward to seeing you there!

Sincerely,

*Stephen Ayers*

Hon. Stephen T. Ayers, FAIA, NAC, CCM, LEED AP  
Interim CEO, NIBS  
11<sup>th</sup> Architect of Capitol

## Supporting Organizations *(more to be invited)*

American Institute of Architects (AIA)  
American Institute of Steel Construction  
(AISC)  
American Property Casualty Insurance  
Association (APCIA)  
American Society of Civil Engineers (ASCE)  
Applied Technology Council (ATC)  
BuildStrong America  
California Residential Mitigation Program  
(CRMP)  
Cascadia Region Earthquake Workgroup  
(CREW)  
Central United States Earthquake Consortium  
(CUSEC)  
Concrete Reinforcing Steel Institute (CRSI)  
International Code Council (ICC)

International Institute of Building Enclosure  
Consultants (IIBEC)  
Insurance Institute for Business & Home  
Safety (IBHS)  
Reinsurance Association of America (RAA)  
National Ready Mixed Concrete Association  
(NRMCA)  
National Institute of Building Sciences (NIBS)  
National Society of Professional Engineers  
(NSPE)  
Seismological Society of America (SSA)  
Steel Tube Institute (STI)  
U.S. Chamber of Commerce

# National Earthquake Hazards Reduction Program: A Successful Program for 46 Years

Speaker : John Hooper

Contributors: Charlie Carter, Karl Fippinger, Anna Lang, Robert Pekelnicky, Sara Barrett

The National Earthquake Hazards Reduction Program (NEHRP) is a multiagency program established by Congress **to reduce the risks of life and property from earthquakes throughout the United States.**

## EARTHQUAKE DAMAGE MITIGATION IS A NATIONAL ISSUE

In the nearly 50 years since its authorization in 1977, NEHRP has made great strides to reduce earthquake risk throughout the United States. These strides have positively affected nearly half of all Americans living and working in high seismic regions along with an estimated \$108 trillion in national building assets. NEHRP's 2018 reauthorization **expired in September 2023.**

## ADOPTION OF MODEL BUILDING CODES REDUCES EARTHQUAKE RISK

Model building codes have been protecting the American public for over 100 years. For the past 25 years, the International Code Council (ICC) has led the development of model building codes, including the International Building Code (IBC) and International Existing Building Code (IEBC). State and local jurisdictions throughout the United States adopt these codes to construct earthquake-resistant structures.

## NEHRP PROVISIONS ARE THE BASIS FOR THE SEISMIC DESIGN REQUIREMENTS USED THROUGHOUT THE UNITED STATES

Since NEHRP's authorization, the program agencies have supported the development of the *NEHRP Recommended Seismic Provisions for New Buildings and Other Structures* as the source material for the nation's prominent model building codes: *American Society of Civil Engineers Standard (ASCE) ASCE/SEI 7 Minimum Design Loads and Associated Criteria for Buildings and Other Structures (ASCE 7)* and IBC. The *NEHRP Provisions* are continuously updated using lessons learned from earthquakes both in the United States and abroad. This process has been so successful, the **USDA's Wildland Fire Mitigation and Management Commission recommended establishing a Community Wildfire Risk Reduction Program modeled off NEHRP** in its [2023 report](#).

**FACT:** Adopting the 2018 International Residential Code (IRC) and International Building Code (IBC), versus codes represented by 1990-era design, has **saved \$7 billion per year in earthquake losses to new construction** while adding only \$600 million in construction cost, producing an incredible **benefit cost ratio of 12 to 1**. Newer codes focused on enhanced recovery in addition to safety are in the early stages of development and will provide even greater benefit in terms of loss reduction and improved recovery time.

# Community Resilience Requirements: Recovery from Disasters, Building Codes, and Lifeline Infrastructure Services

Speaker: Dr. Daniel Kaniewski

Contributors: Aaron Davis, Natalie Enclade, Ryan Kersting, Alice Yates, JQ Yuan

**“Resilient communities** have an ability to govern after a disaster strikes. These communities adhere to building standards that allow the **power, water and communications networks** to begin operating again shortly after a disaster and that allow people to stay in their homes, travel to where they need to be, and resume a fairly normal living routine within weeks ... (and the disaster) **does not become a catastrophe** that defies recovery.”

[- SPUR, The Resilient City](#)

## WITHOUT SUFFICIENT RESOURCES, NEHRP CANNOT PROVIDE ADEQUATE PROTECTION TO THE AMERICAN PUBLIC AND OUR ECONOMY

The 2018 NEHRP reauthorization (P.L. 115-307) includes a heightened focus on achieving community resilience, recognizing that resilient communities are better prepared and more likely to recover from disasters **faster** and with **fewer negative impacts**. In response to the reauthorization’s requirements, FEMA and NIST developed a series of recommendations for Congress ([Recommended Options for Improving the Built Environment for Post Earthquake Reoccupancy and Functional Recovery Time](#)). Three recommendations specifically direct development of recovery-based performance targets and guidelines for (1) design of new buildings, (2) retrofit of existing buildings, and (3) design, retrofit, and maintenance of lifeline infrastructure. **Since the report’s publication in early 2021, appropriations have been insufficient to support implementation of the report’s recommendations.**

**FACT:** Bringing together national experts, federal agencies, policy makers, and lifeline organizations to build and implement resilience guidance and standards is an important step toward **supporting our nation’s trillion-dollar investment in lifeline infrastructure**. Illustrating the importance of this need, a [southern California magnitude 7.8](#) earthquake could cost businesses \$100B in **downtime losses due to water service outages alone**.

# National Studies Highlight Investment Gap

## National Earthquake Hazards Reduction Program - NEHRP -

[The National Research Council \(NRC\)](#) recommends an annual increase to \$426M (inflation adjusted) from the current \$175M to implement essential NEHRP activities in earthquake resilience. New and existing building and non-building structures, as well as lifelines, need our attention now.

## National Windstorm Impact Reduction Program - NWIRP -

Reauthorization with a funding level similar to NEHRP would enable NWIRP agencies to fulfill their plan to update wind hazards maps and design codes to safeguard communities. These tasks stopped in 2018 with the expiration of the NWIRP reauthorization.

**THE NATION URGENTLY NEEDS STRATEGIC GUIDANCE AND FUNDING TO IMPROVE THE DISASTER RESILIENCE OF OUR COMMUNITIES**  
*through the buildings and lifeline infrastructure that support them*

### IT'S ALL CONNECTED

Community resilience relies on adequate pre-disaster preparedness and post-disaster performance of a **system of interdependent systems**, including social systems, buildings, and lifeline infrastructure—water, wastewater, electricity, natural gas, liquid fuel, communication, and transportation. The interdependence of social systems, buildings, and lifeline infrastructure means we must integrate and coordinate activities along **parallel paths** to achieve meaningful progress toward community resilience.



NEHRP's funding gap has led to **disparate progress** in the four key areas—buildings, lifeline infrastructure, planning/preparedness, and fundamental science/research. While the NEHRP agencies have made progress on aspects of their authorized activities despite limited funding, the 2011 NRC report makes clear that **the funding gap must be closed** to achieve community resilience.

Funding should be strategically distributed based on a review of the progress made since the NRC report in each of the four areas. Although NEHRP budgets for NSF and USGS have increased over the past couple of decades, the budgets for FEMA and NIST have decreased. This has resulted in **less progress** being made in critical areas, hampering advancements in buildings, lifeline infrastructure, and social systems and the resilience of our communities. For example, the **American Lifelines Alliance (ALA)** was an efficient public-private collaborative platform providing technical standards and guidelines to build resilient lifeline infrastructure—until **a lack of resources ended its operations 20 years** ago.

# In Brief: Recommended Congressional Priority #1

Speaker: Dr. Lucy Arendt

Contributors: Ron Eguchi, Karl Fippinger, Ryan Kersting, Don Scott, Yumei Wang, Kent Yu

**Reauthorization of NEHRP and appropriation of additional funding will allow the NEHRP agencies to:**



- **Develop, advance, and implement** functional recovery guidelines and standards to expedite **recovery from disasters** for buildings and for **lifeline infrastructure**, thereby improving community resilience
- Provide direct technical assistance and enhanced access to FEMA-NEHRP programs and grants to **tribal, vulnerable, and underserved communities**
- Coordinate synergistic NEHRP agency efforts to **incentivize retrofits** of existing buildings and **lifeline infrastructure**
- Provide financial and technical support to further incentivize and enable **local governments** to implement earthquake risk reduction programs
- Incorporate capability- and capacity-building activities for **building code departments** as an eligible activity in FEMA-NEHRP grants, complementary to FEMA's BRIC program



**The distribution of additional funding should support those items that have lacked sufficient funding and attention since the 2011 NRC report—lifeline infrastructure is one critical example**

With additional funding, both FEMA and NIST will be better positioned to advance recovery-based design and construction guidelines, standards, and codes that reduce **post-earthquake downtime** for buildings and lifeline infrastructure services—so people can safely **stay in their homes** and businesses **can stay open** and continue to provide jobs and services

**RESILIENCE DEPENDS ON CLOSING THE INVESTMENT GAP  
IN SUPPORT OF ESSENTIAL NEHRP ACTIVITIES**



# In Brief: Recommended Congressional Priority #2

Speaker: Dr. Lucy Arendt

Contributors: Ron Eguchi, Karl Fippinger, Ryan Kersting, Don Scott, Yumei Wang, Kent Yu



**Reauthorizing NWIRP** with a funding level similar to NEHRP's would enable the lead and program agencies to more adequately **protect the nation's people, communities, and businesses** from wind damage by updating windstorm hazard design maps and construction requirements using the latest science and technology



With reauthorization, **NWIRP** can use NEHRP's model for supporting fundamental research and **consensus code development** to:

- Build collaborative platforms that **bring together the nation's researchers and practitioners** to promote wind-resistant design and construction of buildings and lifelines
- Support atmospheric sciences research to **better understand windstorm impacts** on buildings and lifelines
- Guide the development of risk assessment tools and **effective mitigation** techniques

**RISK MITIGATION PAYS OFF FOR  
THE NATION, ITS CITIZENS, AND ITS COMMUNITIES**