

Achieving National Disaster Resilience
through Local, Regional, and National Activities

Advisory Committee on Earthquake Hazards Reduction
National Earthquake Hazards Reduction Program

A community's disaster resilience is defined by its ability to absorb disaster impacts and rapidly return to normal. Communities in the United States are generally quite resilient to most natural hazards. Many households and businesses have significant financial resources to support their disaster recovery, and U.S. disasters generally have small impact ratios. In addition, disaster-stricken communities have horizontal and vertical socioeconomic linkages to extra-community institutions that provide substantial amounts of the resources needed for recovery.

Disaster resilient communities, however, need to have a credible disaster response plan that assures a place and ability to govern after a disaster has struck. Their power, water, and communication networks need to begin operating again shortly after a disaster and residents need to be able to stay in their homes, travel to where they need to be, and resume a fairly normal living routine within weeks. The return to a “new” normal can then occur within a few years.

The Advisory Committee on Earthquake Hazards Reduction (ACEHR) initiated a conversation with the White House Senior Director for Resilience Policy at the committee's November 23, 2009, meeting in Arlington, VA. This white paper briefly presents the committee's opinions about current conditions, argues for fundamental changes, and offers a series of broad-based recommendations.

Current Status of the Nation with Regard to Disaster Resilience

Unfortunately, and much to the surprise of anyone outside of the earthquake professions, disaster resilient communities do not exist anywhere in the United States.

The contemporary building code is effective safeguarding life and protecting first responders and has been adopted in every state to some extent, however state and local adoption is not universal or comprehensive. There is enormous diversity in the way codes are adopted in the United States, from full attainment, to limited adoption, to areas that strip out disaster-resisting provisions, to communities that actually prohibit building codes for homes. The best code in the world is of little use if it is not adopted and enforced by well-qualified inspectors.

Furthermore, if a major earthquake strikes a U.S. city being built in compliance with current building codes new buildings may not kill many people, but the quake could cripple if not destroy the city's ability to recover. Even the code-compliant city cannot



recover, because its buildings and lifeline systems have not been designed in terms of post disaster performance. Instead, they have only been designed to codes intended to safeguard life and support emergency response.

And, of course, there is no such thing as a code-compliant city since every city is filled with older buildings that were designed using outdated building codes or no codes at all. Every major city includes a subset of “killer” buildings that will collapse and destroy life and antiquated lifeline systems that will fail and take years to restore.

Change Is Needed

Resilience starts with individuals, families, and communities and includes organizations, businesses, local and state governments, supply chains, and infrastructure. Everyone in this country has a stake in creating resiliency. Further, resilience of the built environment is only a part of the challenge. It must also encompass the socioeconomic and cultural aspects of communities.

Resilient cities form resilient regions, which in turn build a resilient nation. While the nation can promote resilience through improved design codes and mitigation strategies, implementation and response occur at the local level. The nation cannot achieve resilience without motivating and supporting local measures that achieve resilience. Support for such activities is currently lacking.

If national resilience is to be achieved, the nation must enact legislation that empowers cities to build resilience neighborhood by neighborhood. State grants that support the identification and retrofit of “killer” buildings are required. Funds are required to develop the human infrastructure for responding to and recovering from natural hazards. A region’s infrastructure needs to be seen as a combined system that must take the punch and respond effectively. Understanding and planning for effective lifeline response after extreme events is a key part of developing community resilience. Building codes need to move towards performance-based earthquake engineering so that resilience, not “life safety,” is the primary objective.

In many ways, the tools and procedures to create disaster resilient cities exist and are continually being refined. Achieving resiliency nationwide, however, will require a new application. Modifications to current building codes, alignment of lifeline systems around common performance objectives, and strong community support for adopting such policies are needed. Deficient buildings and systems need to be mitigated, and new buildings and systems need to be designed to the performance levels needed.

Making such a shift to resilience focused codes and generating community support for new policies are not possible without solid, unified support from all levels of government. The federal government needs to set performance standards that can be embedded in the design codes, be adamant that states adopt contemporary building codes including provisions for rigorous enforcement, provide financial incentives to stimulate



mitigation that benefits the nation, and continue to support research that delivers new technologies that minimize the cost of mitigation, response, and recovery. Regions need to identify the vulnerabilities of their lifeline systems and set in place programs for their mitigation to the minimum level of need. Localities need to develop mandatory programs that mitigate their built environment as needed to assure survival.

Recommended Actions to be Taken at the Federal Level

The White House has a role as a ringmaster in the resilience circus, giving visibility to the multi-dimensional and multi-sector aspects of the challenge, and challenging the various sectors to join the resiliency movement. The key actions that are needed immediately include the following:

- Support state and local governments by providing incentives to develop mitigation, response, and recovery programs. The federal government must target incentives to enable state and local governments to develop and implement mitigation programs. Some programs exist, such as the State Hazard Mitigation Grants, but they are tiny and need meaningful funds.
- Put into practice the knowledge we have gained over the past several decades by employing the technology and tools that have been created through NEHRP and other hazards programs. The National Institute of Standards and Technology (NIST) and the Federal Emergency Management Agency (FEMA) have the responsibility to transfer research into practice, codes, etc., but are critically underfunded for this work. A line item at a level comparable to that used for research needs to be added to the President's budget to fund programs that implement knowledge in all the hazard areas through national codes, standards, training, education, guidance materials, and technical and continuing education.
- Conduct an independent study to determine the costs and benefits associated with investments in resiliency. An independent study (validated by OMB and CRO) would give public and private leaders the hard-dollar justification needed to make investments in long-term resiliency for the benefit of their companies and communities.
- Require hazard mitigation in exchange for disaster assistance eligibility (ex ante) or actual disaster assistance (ex post).
- Examine and estimate the cost to strengthen the federal building stock (which has already been done for earthquakes) and develop a plan to address those areas of greatest vulnerability to ensure that government functions are resilient—that they function effectively after a major disaster, with minimal disruption, so that the impact on government operations is not itself a contribution to the problem.



- Create coherent interaction between disaster-relevant federal agencies and individual states, which are key political jurisdictions. In the long term, effective local resilience depends on enabling local activists under a state program.

The advisory committee appreciates the opportunity to comment on how the nation should be guided towards improved security and resiliency. We are looking forward to collaborating with the White House to reach our common goals. As we agreed at our November 23, 2009, meeting, like terrorist attacks, earthquakes pose a serious and real threat to the nation's security on multiple scales—national, regional, and local. Earthquakes and other hazards threaten our people, our physical infrastructure, and our economy.

