

Advisory Committee on Earthquake Hazards Reduction National Earthquake Hazards Reduction Program

March 26, 2018

The Honorable Walter Copan
Director
National Institute of Standards and Technology
Building 101, Room A1134
100 Bureau Drive
Gaithersburg, MD 20899-1000

Dear Dr. Copan:

We submit the following comments to you and the Interagency Coordinating Committee (ICC) as part of the charter to the federal Advisory Committee on Earthquake Hazards Reduction (ACEHR) for the National Earthquake Hazards Reduction Program (NEHRP). This letter is based on an ACEHR meeting held March 12 – 13, 2018.

We are pleased to learn that a meeting of the ICC is being scheduled for the second quarter of 2018. We strongly encourage that all members of the ICC be well-briefed on the basic tenets of NEHRP and the progress and needs of the four lead agencies (Federal Emergency Management Agency (FEMA), National Institute for Standards and Technology (NIST), National Science Foundation (NSF), and U.S. Geological Survey (USGS)). This is especially important given the inevitability of a major earthquake occurrence in the not too distant future. Although it has been a generation since a major damaging earthquake struck the U.S., several catastrophic earthquake scenarios are likely in California, the Pacific Northwest, the western and central U.S. and even parts of the Atlantic seaboard. Each could cause thousands of deaths and widespread disruption and losses in excess of \$100 billion with far-reaching societal and economic implications. When a major earthquake strikes, the ICC and NEHRP agencies must be prepared for a coordinated response as a matter of national security.

We maintain that the ICC must be revitalized as a mechanism for advancing NEHRP. We encourage the ICC and relevant federal agency leaders to use the upcoming meeting to address the issues raised in the [September 11, 2017 ACEHR biennial report \(available at \[nehrp.gov/committees\]\(http://nehrp.gov/committees\)\)](#) concerning NEHRP reauthorization and how the four NEHRP agencies can work together to move the Program ahead, ensure appropriate Program budgets, and strengthen the collaboration and commitments of individual agencies to advancing NEHRP.

In particular, we recommend that:

- 1. The ICC considers the strong concerns raised in our prior reports about the future of NEHRP. The Program's overall effectiveness is weakened by the (a) lack of Congressional reauthorization of the Earthquake Hazards Reduction Act and NEHRP, and (b) inadequate funding levels that are well below the 2004 authorization levels.** Half of the nation's population and \$59 trillion in building-related assets are exposed to strong ground shaking hazards. Many studies, including the recent study "*Natural Hazard Mitigation Saves*" by the National Institute of Building Sciences (2017), show that dollars spent on disaster mitigation pay back multi-fold in terms of reduced loss of life, damage and



disruption. We unequivocally endorse the conclusion of the National Research Council report, "*National Earthquake Resilience: Research, Implementation, and Outreach*" (2011) that annual appropriations of \$306.5 million are necessary to implement the 2008-2013 NEHRP Strategic Plan and to materially improve nationwide earthquake resilience.

2. **The ICC or NEHRP program senior staff initiate the type of implementation gap assessment that we have recommended in the 2015, 2016, and 2017 ACEHR reports.** Prior ICC members acknowledged the value, for the future of NEHRP, of undertaking an assessment of the nation's earthquake risk reduction progress to date. Such an assessment would also identify the remaining gaps and needs in areas such as seismic building code adoption and enforcement, and lifeline system resilience. Absent Congressional action to mandate such an assessment as part of NEHRP reauthorization, we strongly recommend that the ICC, or the NEHRP Secretariat and NEHRP agency leaders, initiate such an assessment to inform future NEHRP direction and funding levels. ACEHR has discussed a range of potential approaches for undertaking such an assessment and is willing to help in the design of the study.

As a supplement to the agency-specific recommendations in our [September 11, 2017 ACEHR biennial report](#), we also offer the following interim recommendations related to the four NEHRP agencies:

1. **The proposed FY19 funding level that reduces the USGS NEHRP budget by 20 percent would severely hinder nationwide capabilities to prepare for and respond to earthquakes and perform necessary life-critical functions during a major crisis.** The functions of the USGS are essential to emergency management, public health, regional risk assessment, and hazards education for the public. Even if Congress restores the Survey's budget to current levels, the continued erosion of support and resultant loss of scientific staff are jeopardizing the Survey's crucial role in NEHRP. The consequences of a major budgetary reduction would be to immediately derail the implementation of an Earthquake Early Warning System and it would negatively impact other core USGS functions, including the maintenance and expansion of regional and global seismic networks and the production and dissemination of scientific tools and products, like the national seismic hazard maps, that are vital to earthquake risk reduction.
2. **The NIST earthquake engineering program must have more funding and resources to fulfill its crucial role in NEHRP for research and development to improve the seismic performance standards and practices for structures, critical infrastructure, and lifeline systems.** Additional funding and resources are essential to support the development of nationally-applicable seismic performance objectives, assessment procedures and design criteria for lifeline systems, and the applicability of building seismic rating systems to evaluate the expected performance of a portfolio of building types. These two initiatives are singled out because these are foundational areas of research and development that impact numerous other earthquake hazards reduction efforts by a multitude of stakeholders. Immediate focus should be on establishing a partnership with other key organizations, such as the American Society of Civil Engineers (ASCE), to develop a framework for nationwide lifelines system performance objectives, assessment procedures and design criteria similar to what has been done for the seismic design of new buildings (ASCE 7) and the seismic evaluation and retrofit of existing buildings (ASCE 41). Enhanced lifeline system performance and a building seismic rating system are crucial to ensuring that buildings are able to serve community functions and needs after damaging earthquakes. All of this work should be consistent with recommendations coming from the Congressionally-requested assessment by NIST of what is required to develop immediate-occupancy building performance objectives.

3. **FEMA is significantly underfunded to fulfill its preparedness and implementation mission under NEHRP.** While 2004 authorization levels for FEMA NEHRP efforts were set at \$21 million, annual funding allocations within the agency have hovered around \$8 million. This has resulted in a severe lack of progress on building and lifeline codes and standards development, essential publications, and state and local earthquake preparedness and risk reduction efforts. The Department of Homeland Security needs to provide FEMA with sufficient funding to fulfill its critical preparedness and implementation role within NEHRP.
4. **FEMA must continue to make seismic building code development, adoption and enforcement a priority, emphasizing the known, but unquantified, risk that the vast stock of existing buildings poses to communities across the nation.** While the seismic provisions in building codes and standards continue to evolve, they generally address new construction. More effort is needed to promote the adoption and implementation of standards to evaluate and mitigate the seismic vulnerability, including collapse risk, of existing buildings. These efforts need to target and motivate action by state and local governments and private building owners. In particular, building seismic rating systems should be embraced as a mechanism to evaluate existing buildings, communicate risk in terms the public can understand, and motivate action.
5. **NSF must continue to stimulate broad-based earthquake research within its own programs and engage more effectively with other NEHRP agencies.** ACEHR recognizes that NSF is different from the other NEHRP agencies in several ways, most notably in its primary responsibility to fund basic research through external grants and awards. With the breadth of its research portfolio, NSF has significant opportunities to coordinate multiple disciplines including the geosciences, engineering, economics, and social and behavioral sciences. We urge NSF to better engage across its Directorates and with NEHRP partner agencies in the design of interdisciplinary programs and solicitations that advance the mission of NEHRP.
6. **NSF should engage the earthquake research community in a cross-disciplinary workshop that culminates in a synthesis report that takes stock of the major contributions that have emerged from NSF NEHRP-related activities and sets future earthquake research priorities.** For decades, NSF has funded research that has fundamentally altered the scientific trajectory of the primary disciplines involved in earthquake mitigation, response, and recovery. ACEHR appreciates these numerous contributions, but remains deeply concerned that the contributions are not widely recognized and acknowledged by the broader public. The recommended workshop should lead to a community-generated report that clearly articulates the fundamental value and return on the investment of NSF-supported activities that contribute to earthquake hazards risk reduction.

Submitted on behalf of the ACEHR members who fully endorse these comments.

Respectfully,



Laurie A. Johnson, PhD AICP
Chair
Advisory Committee on Earthquake Hazards Reduction
National Earthquake Hazards Reduction Program

Cc: Kent Rochford, Associate Director for Laboratory Programs, NIST