

NEHRP

Functional Recovery Report Project

**Dr. Steven McCabe, NEHRP Director
NIST Engineering Laboratory**

**Michael Mahoney, Senior Geophysicist
FEMA Earthquake Program**



FEMA



NIST

NEHRP Reauthorization Act of 2018

- P.L. 115-307 signed on 12/11/2018 and amends NEHRP by:
 - Authorizes NEHRP through FY2023;
 - Expand NEHRP activities to include: (1) gathering information on community resilience; (2) publishing maps of seismically induced hazards; and (3) continuing the development of ANSS and EEW;
 - Revises or expands the duties of the Interagency Coordinating Committee and all four of the NEHRP agencies;
 - Requires the Government Accountability Office to complete a review of federal earthquake hazard risk reduction efforts, and;
 - Requires NIST and FEMA to jointly convene a committee of experts to assess and recommend options for improving seismic safety standards for functional recovery.
 - (which is why we are here!).



FEMA



NIST

Recent NEHRP Reauthorization

- **SECTION 8: SEISMIC STANDARDS**
- *Not later than December 1, 2019, [NIST and FEMA] shall jointly convene a **committee of experts** from Federal agencies, nongovernmental organizations, private sector entities, disaster management professional associations, engineering professional associations, and professional construction and homebuilding industry associations, to **assess and recommend options for improving the built environment and critical infrastructure to reflect performance goals stated in terms of post-earthquake re-occupancy and functional recovery time.***
- *Not later than June 30, 2020, submit a **report on recommended options***



FEMA



NIST

Terminology?

■ Options?

- The Committee of Experts shall assess and recommend “options”.
- Options is one or more methods that could lead to the stated goal.
- Options should include both the technical methodology as well as what steps would be needed to implement it.

■ Critical Infrastructure?

- “Critical Infrastructure” is defined by the Patriot Act, but it includes national-level and virtual systems that are not applicable here.
- The rest of the NEHRP Reauthorization Act uses the term “lifelines infrastructure” so we are assuming the NEHRP term was intended.
 - *“Lifeline Infrastructure” means public works and utilities, including transportation facilities and infrastructure, oil and gas pipelines, electrical power and communication facilities, and water supply and sewage treatment facilities.”*



FEMA



NIST

Terminology?

- Built Environment?
 - Everything currently covered by the nation's building codes.
- Performance Goals?
 - Current building codes have a life safety performance goal, which will likely not provide adequate performance in a big earthquake.
- Post-earthquake re-occupancy?
 - To safely reoccupy a building; a stage of functional recovery.
- Functional Recovery?
 - This performance target has been called other terms, such as “immediate occupancy” or “functionality”. Each of these terms have issues with accurately describing the intended performance goal.



FEMA



NIST

NIST Resource Material

- Defining Multi-Hazard Performance Objectives for Immediate Occupancy
 - *Research Needs to Support Immediate Occupancy Building Performance Following Natural Hazard Events (NIST SP 1224)*
- Community Resilience Program
 - Develops science based tools and metrics to support and measure resilience at the community-scale and engages community stakeholders for feedback.
- Lifelines Research
 - *Earthquake-Resilient Lifelines: NEHRP Research, Development and Implementation Roadmap (NIST GCR 14-917-33)*
 - *Critical Assessment of Lifeline System Performance: Understanding Societal Needs in Disaster Recovery (NIST GCR 16-917-39)*



FEMA



NIST

FEMA Resource Materials

- “Next Generation Performance-Based Seismic Design Procedures for New and Existing Buildings”, FEMA P-58.
 - Performance-based procedures to assess and design new and existing buildings. State-of-the-art process to determine and design to a specified performance level. This would include using downtime, cost, and casualties to reach functional recovery.
 - FEMA P-58-5 in particular can be used to determine the performance of current code complying buildings or designs.
- *Performance of Buildings and Nonstructural Components in the 2014 South Napa Earthquake* (FEMA P-1024)
 - Documents performance of buildings in South Napa earthquake.
- “Resilient-Based Design and the NEHRP Provisions”
 - White paper being prepared for the 2020 edition. Still being balloted.



FEMA



NIST

FEMA Resource Materials

- “Mitigation Saves 2.0”, NIBS report prepared for FEMA.
 - <https://www.nibs.org/page/mitigationsaves>
 - Provides cost benefit for higher building performance levels.
- FEMA Community Lifelines Implementation Toolkit
 - <https://www.fema.gov/media-library/assets/documents/177222>
- American Lifelines Alliance (ALA)
 - Organization formed to develop standards for specific lifelines systems
 - Formerly funded by FEMA but discontinued due to resource cuts.
 - Past reports still available; <https://www.americanlifelinesalliance.com/>
- FEMA National Recovery Framework
 - Helps effective recovery support to disaster-impacted jurisdictions.
 - <https://www.fema.gov/national-disaster-recovery-framework>



FEMA



NIST

Plan for Report Development

- NIST and FEMA have already met and developed a one year plan to meet this new Congressional requirement, and have begun to implement this plan.
- NIST and FEMA have identified the “Committee of Experts”. This has been broken into two parts:
 - FEMA has already funded the Project Technical Panel through a task order with the Applied Technology Council (ATC) to do the bulk of the report developmental work.
 - NIST will be funding contractor to support a Project Review Panel in FY 2020 to provide review input throughout the process.
- The FEMA-funded PTP will collect information, develop a draft expanded outline / first draft for public review.



FEMA



NIST

Plan for Report Development

- NIST will also be funding a series of Stakeholder Workshops in early 2020 to solicit and collect public input.
 - Proposed Stakeholder Workshop locations are: St. Louis, Salt Lake City, Seattle, San Francisco, and Los Angeles.
- Based on Public Workshops, direct input, and PRP input, the PTP will complete the Report of Options by early April and submit it to NIST and FEMA for finalization.
- NIST and FEMA will submit the final Report of Options to OMB for approval and then to Congress by June 2020.
- FEMA and NIST will then publish a joint final Report of Options for public distribution.



FEMA



NIST

Project Technical Panel

- The FEMA-funded PTP consists of 20 members from the interest areas listed in the NEHRP Reauthorization Act.
- The selection process identified organizations from those interest areas and then specific individuals from those organizations with experience to participate on the Panel.
- The PTP will meet multiple times, in-person and remotely, from summer 2019 through spring 2020 to research and identify a series of options for the required report.
 - In-person meeting schedule: 2x in FY 2019 and 3x in FY 2020.
 - PTP met virtually on 6/28 and will be meeting in person tomorrow.
 - Some members are participating in this ICC roundtable today.
 - The PTP and PRP will hold joint meetings later in the process.



FEMA



NIST

<u>Act Section 5 Category</u>	<u>Organization</u>	<u>Individual</u>
Federal Agencies	FEMA	Michael Mahoney (unfunded) Jack Hayes, FEMA SME (unfunded)
	NIST	Siamak Sattar (unfunded) Katherine (Jo) Johnson (unfunded)
	GSA	Ron Larson
Nongovernmental Organizations	EERI	Chris Poland
	PEER	Mary Comerio
	Stanford Urban Resilience Initiative	Greg Deierlein
	MCEER	Tom O'Rourke (not yet confirmed)
Private Sector Entities	Applied Technology Council	Jon Heinz
Disaster Management Professional Associations	Natural Hazards Center	Lucy Arendt
Engineering Professional Associations	AIA	Rachel Minnery (not yet confirmed)
	SEI	Ron Hamburger
	SEAOC	Ryan Kersting (Chair)
	SEAONC	David Bonowitz
	SEAO Oregon	Kent Yu
Construction and Homebuilding Industry Associations	International Code Council	Susan Dowty
	NAHB	Gary Ehrlich (not yet confirmed)
	Intel	Jeff Soulages
Governmental Agencies	LADPW	Craig Davis
	Building Official	Jonathan Siu

Project Technical Panel

- The PTP will prepare an expanded outline / first draft of possible options in late 2019. This product will serve as input for the five Stakeholder Workshops in early 2020.
- The PTP will receive input from several sources for consideration in developing the Options Report
 - They will primarily receive input from five Stakeholder Workshops.
 - They may also receive input directly from outside interests.
 - The PRP will also be reviewing drafts and providing input.
- PTP will complete the draft Options Report in early April 2020. The report cannot be available to the public until after it has been submitted to Congress the end of June.



FEMA



NIST

Conclusion

- Congress wants a “report of recommended options for improving the built environment and critical infrastructure to reflect performance goals in terms of post-earthquake re-occupancy and functional recovery time.”
 - What is meant by each of these terms is up to the PTP.
 - It is not a plan, a roadmap or a solution. It is the first step to that.
- The PTP has the autonomy to investigate, document and recommend options they feel meets this criteria.
- There are opportunities for synergies and benefits in connection with States and design community activities.
- Getting involvement from the public in the Stakeholder Workshops is important to us, and we encourage input.



FEMA



NIST