

# Strategies to encourage state and local adoption of disaster-resistant codes and standards to improve resiliency: supporting documentation



**ATC** Applied Technology Council

Funded by  
Federal Emergency Management Agency



# ATC 117-1

## **Strategies to Encourage State and Local Adoption of Disaster-Resistant Codes and Standards to Improve Resiliency: Supporting Documentation**

Prepared by

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In Support of

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THE MITIGATION FRAMEWORK LEADERSHIP GROUP (MitFLG)

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**FEMA**

## **Notice**

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Cover Photo: Crenshaw Elementary and Middle School building, located in the Crystal Beach area, Texas, and constructed in 2005 to serve as a hurricane shelter, which it did following 2008 Hurricane Ike (source: Laurie Johnson, October 2010)

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# Preface

In 2012 the Federal Emergency Management Agency (FEMA) awarded the Applied Technology Council (ATC) a five-year task order contract to provide technical guidance and support to reduce the impacts of earthquakes and other hazards. Task order efforts carried out to date by ATC have focused on a broad range of activities, including support of the Federal Mitigation Framework Leadership Group (MitFLG) Building Code Adoption and Enforcement Strategy Workgroup in its identification and development of strategies to encourage adoption of building codes and standards to help improve resiliency nationwide (ATC-117 Project). The task order that authorized this effort required ATC to (1) conduct two workshops to obtain input on the best means to encourage State and local adoption of disaster-resistant building codes and standards and (2) develop an internal FEMA report describing the findings of the workshops by the end of March 2015.

This report provides supporting documentation for the companion ATC-117 Report, *Strategies to Encourage State and Local Adoption of Disaster-Resistant Codes and Standards to Improve Resiliency*, which describes the recommended strategies and the process by which those recommendations were developed. Included in this Supporting Documentation report are the details of the recommendation development process, including documentation on the webinar series undertaken to obtain input and the two workshops of project, stakeholder, and federal agency representatives, as well as the evolution of the recommendations themselves.

ATC gratefully acknowledges the numerous individuals who contributed to the development of this report, including those from various agencies and organizations who participated in the initial webinars and two workshops. Kevin Long of FEMA organized and led the webinars and organized the first workshop. The ATC Project Technical Committee (PTC), which consists of Christopher Jones (Chair and Project Technical Director), Robert Hanson; James Harris; Laurie Johnson (Lead Editor); Richard McCarthy; and Sara Yerkes, led the development of the draft recommendations, organized the second workshop, and developed this preliminary report. Case studies were provided by Robert Paullus (ATC Board representative) and Sara Yerkes. Scott Schiff served as Project Manager, Amber Houchen provided report production services, and Bernadette Hadnagy coordinated logistics and

invitations for the second workshop. The affiliations of these individuals are provided in the list of project participants.

ATC also gratefully acknowledges the efforts and support provided by Michael Mahoney (FEMA Task Order Contract Project Officer).

Christopher Rojahn  
ATC Executive Director

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# Development of Recommendations for ATC-117 Project Report

The ATC-117-1 Project Report is intended to provide a record of the steps that were performed by the ATC-117 Project Team to develop the final 15 recommendations included in the ATC-117 Project Report entitled, *Strategies to Encourage State and Local Adoption of Disaster-Resistant Codes and Standards to Improve Resiliency*. In addition to the general introduction provided in this Chapter, the ATC-117-1 Project Report contains five Appendices and a Participants List. The ATC-117 Project Report was presented to the Federal Mitigation Framework Leadership Group (MitFLG) Building Codes Workgroup on March 31, 2015, and MitFLG will use this information in the development of their larger report that includes many other issues being investigated.

Appendix A provides the detail of the initial webinars that were hosted in order to solicit information from stakeholders on how Federal agencies have encouraged or could encourage the adoption and enforcement of current building codes by States and local jurisdictions. This Appendix explains the organization and execution of the webinars along with a summary of the information collected. Using this summary information, twelve key points were established as the basis for the discussion at the First Project Workshop.

Appendix B provides the details of the First Project Workshop, a forum for the ATC-117 Project Team to present information collected during the webinars and start the process to develop recommendations. The participants of this Workshop included members of the MitFLG, as well as the ATC-117 Project Team. Not only was the MitFLG presented information about the webinars, but they were also provided the opportunity to comment on and augment the information collected from the stakeholders. They also provided feedback on the organization and invitation list for the Second Project Workshop to be attended by them as well as stakeholders in the building construction industry.

Appendix C provides the original 32 draft recommendations that were developed by the ATC-117 Project Team using information collected during the webinars and First Project Workshop. These recommendations were divided into four topical areas to aid in the presentation at the Second Project Workshop,

Appendix D provides the details of the Second Project Workshop, a forum to present an initial set of 32 draft recommendations developed by the ATC Project Team using the information gathered in the webinars and First Project Workshop and also to have all participants vote on the recommendations using established criteria to evaluate each recommendation. The group used this opportunity to edit, delete, create and combine some of the recommendations before the voting was initiated.

Appendix E provides information related to the process of converting the draft recommendations as amended at the Second Project Workshop into the final 15 recommendations that are included in the ATC-117 Project Report.

The Participants List provides the names and contact information for the individuals that participated in the webinars and/or workshops.

## Appendix A

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# Webinar Series Documentation

### A.1 MitFLG Building Code Workgroup Stakeholder Engagement Plan

#### Logistics

- 2-hour conference call/webinars
- 6 scheduled sessions
- Adobe Connect site(s) to be left open until 11:59 pm on 1/23/15
- A Federal Adobe Connect session to be set up and remain live during the same timeframe

#### Session Dates/Times

Session 1 – Friday, January 9, 1pm-3pm

Session 2 – Monday, January 12, 1pm-3pm

Session 3 – Tuesday, January 13, 11am-1pm

Session 4 – Wednesday, January 14, 11am-1pm

Session 5 – Wednesday, January 14, 2pm-4pm

Session 6 – Tuesday, January 20, 1pm-3pm

#### Expected Outcomes

- ✓ Understand the project
- ✓ Capture big ideas
- ✓ Capture best practices on Federal delivery of support (i.e., “helpful mechanisms”)
- ✓ Identify potential opportunities for Federal programs to support the community
- ✓ Identify indicators of success for Federal delivery of support
- ✓ Capture Federal “actions” that create barriers

**Materials**

- Project Summary (1-page) to be distributed with invitations
- Facilitator interview guide
  - Including probing questions for each stakeholder group
- List of stakeholder engagement questions by stakeholder group

**A.2 MitFLG Building Code Workgroup Stakeholder Engagement Session Process Agenda**

The facilitator was responsible for keeping the discussion on-point and completing the agenda. Table A-1 provides the script for the webinars.

**Table A-1 Process Agenda**

Time (2 hours)	Agenda Item	Process Notes
10 mins	Welcome and Introduction	<ul style="list-style-type: none"> <li>• Welcome!</li> <li>• Thank you for taking the time out of your day to participate in this session. We look forward to lots of good discussion and encourage you to be bold and offer any and all ideas that you may have.</li> <li>• I hope you all received the one-pager that I sent describing this effort. To recap, these six sessions are part of an effort called for under Sandy Rebuilding Strategy Recommendation #25 which states the request for a Federal Approach &amp; Mechanisms to Encourage Building Code Adoption and Enforcement at the State and Local Levels. And, before we start working on a draft, we want to get input and ideas from a broad range of stakeholders.</li> <li>• Our outcomes for today’s session are to:                             <ul style="list-style-type: none"> <li>✓ Understand the project</li> <li>✓ Capture big ideas</li> <li>✓ Capture best practices on federal delivery of support (i.e., “helpful mechanisms”)</li> <li>✓ Identify potential opportunities for federal programs to support the community</li> <li>✓ Identify indicators of success for federal delivery of support</li> <li>✓ Capture Federal “actions” that create barriers</li> </ul> </li> <li>• In order to be sure that we capture all your feedback, we are going to work through a series of six questions allowing approximately 15 mins for each question. After we cover all of the questions, we can loop back to any question that the group may want to discuss further. And, if you have additional input or ideas, this Adobe Connect session will remain open until 11:59 pm on 1/23/15.</li> <li>• To facilitate the discussion, we offer a few ground rules.                             <ol style="list-style-type: none"> <li>1. Be as specific as possible when giving us your feedback and ideas.</li> <li>2. State which stakeholder group you are representing when giving us your feedback and ideas.</li> <li>3. Speak one at a time.</li> </ol> </li> </ul>
100 mins +/- 15 mins per question	Questions and Prompts	<ul style="list-style-type: none"> <li>• We are now going to work through the six questions.</li> <li>• See questions and prompts.</li> <li>• Are there any other topics that the group would like to discuss?</li> </ul>
10 mins	Wrap-Up	<ul style="list-style-type: none"> <li>• Thank you for participating.</li> <li>• This Adobe Connect session will remain open until 11:59 pm on 1/23/15.</li> </ul>

### **A.3 MitFLG Building Code Workgroup Stakeholder Engagement Webinars Summary**

#### **Introduction**

To gather input from various stakeholders on how to improve adoption and enforcement of up-to-date, effective building codes, six webinars were scheduled in the month of January 2015. The stakeholders looked back in history, at current initiatives and also into the future to discuss and express critical attributes needed for Federal agencies with the support of state and local government agencies and insurance, financing and development industries to have a broad perspective needed to create a program that creates more sustainable and resilient communities.

Stakeholders logged onto the available webinars were given the opportunity to discuss five reasonably direct questions and one open-ended question. They were also invited to provide written responses to each of the six questions during the webinar or revisit prior to the closing date of the webinars. Important points verbalized during the webinar discussions were captured by a scribe. The six questions presented to the stakeholders are:

1. Under what circumstances have you seen Federal action (e.g., proposition, advocacy, research, etc.) lead to code enhancement?
2. What examples can you provide where you have seen an opportunity for a Federal agency able to offer additional support (e.g., research incentives) to you and for all?
3. What barriers (e.g., access to research) have you encountered as a result of a Federal action?
4. What does the best Federal coordination with you look like?
5. When have you seen communication/messaging from the Federal government or from others work well? And what made the communicator/messenger best positioned to deliver the message?
6. Do you have any other input you would like to provide?

Approximately fifty stakeholders provided rather diverse input from their experiences and beliefs on how to improve adoption and enforcement of up-to-date, effective building codes. Below is a summary of twelve key points that were provided verbally and/or in writing:

1. There needs to be an effective partnership between Federal agencies, state and local agencies and the private sector. The Federal agencies can provide a consistent message across the entire geographic region, but

state and local agencies along with the private sector are best positioned to engage building owners.

2. The overarching program needs to be incentive driven and not simply mandated by Federal agencies.
3. The messages need to be well communicated to a diverse audience and use multiple modes of communication.
4. The program needs to consider multiple hazards and their interaction, so the improvement of resistance to one hazard does not lead to a building becoming more vulnerable to another hazard.
5. The program needs to be data driven with proven suggestion that have a positive cost-benefit analysis.
6. The Federal government can provide information and analyses (technical, economic) that communities and states are unable to provide. This is one of the most important contributions the Federal government can make.
7. Building valuations do not seem to reflect the positive value of modern building codes and hazard resilience. The Federal government should reach out to and partner with the financial, real estate and appraisal industries to develop procedures by which codes and hazard resilience are valued.
8. There are opportunities, such as the aftermath of a natural disaster, where building owners are more receptive to a message, but this window has a finite period of effectiveness.
9. The rollout of this program needs to not only involve technical expertise, but also involve expertise in dealing with the social component of moving a program forward without being mandated.
10. There needs to be a significant education/training program for both building owners and the construction industry, so that they understand the benefits of sustainable/resilient communities and the efforts needed to create them.
11. There needs to be an on-line searchable clearinghouse of information to be used by decision makers, the construction industry, and building owners.
12. There need to be clear goals of the program, a schedule of implementation, and an updated progress report to continue to guide the program.

## Appendix B

# First Project Workshop, February 3, 2015: Agenda, Slides, and Summary

## B.1 Agenda

Agenda		
Joint Meeting of ATC 117 Workgroup and the Mitigation Framework Leadership Group (MitFLG) Building Code Workgroup		
February 3, 2015, 9:00 am-4:00 pm		
National Building Museum (Room: Pension Commissioner's Suite) 401 F Street NW, Washington, D.C. 20001 <i>(F Street NW between 4th and 5th, across the street from the Judiciary Square Metro - Red Line)</i>		
9:00 am	<b>Welcome &amp; Opening Remarks</b> <ul style="list-style-type: none"><li>❖ Opening remarks, review of meeting objectives</li></ul>	ATC (Jones, Rajahn), FEMA (Long, Mahoney)
9:30 am	<b>Overview of January 9-20, 2014 Stakeholder Webinars</b> <ul style="list-style-type: none"><li>❖ 6 questions posed to Stakeholders</li><li>❖ Participants</li><li>❖ Comments received</li></ul>	ATC (Jones, Schiff)
10:30 am	<b>Break</b>	
10:45 am	<b>Workgroup Discussion – Evaluate and Augment Stakeholder Comments</b> <ul style="list-style-type: none"><li>❖ Facilitated discussion of Stakeholder comments</li><li>❖ Additional Workgroup discussion of building code adoption issues, arranged following 6 questions posed to Stakeholders</li></ul>	ATC
12:00 noon	<b>Working Lunch</b> <ul style="list-style-type: none"><li>❖ Workgroup will divide into smaller groups and continue discussions over lunch</li><li>❖ ATC will provide lunch, but is soliciting \$10 contributions to cover cost</li></ul>	
1:00 pm	<b>Small Group Reports</b> <ul style="list-style-type: none"><li>❖ Each small group will report out on its discussions</li></ul>	

# Agenda

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2:00 pm **Final Workgroup Discussion on Building Code Adoption Issues** ATC

- ❖ Reach Workgroup consensus on issues and recommendations

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3:00 pm **Break**

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3:15 pm **Workgroup discussion of March 2015 Workshop** ATC

- ❖ Discuss code adoption issues, strategies and questions to be discussed at workshop
- ❖ Identify possible participants for workshop.

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3:50 pm **Closing Remarks and Next Steps** ATC, FEMA

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4:00 pm **Adjourn**

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4:15 pm **Optional Tour, Designing for Disasters Exhibit**

## B.2 Slides

**Joint Meeting**

Mitigation Framework Leadership Group  
(MitFLG) Building Code Workgroup, and  
Applied Technology Council (ATC) Team

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February 3, 2015  
National Building Museum

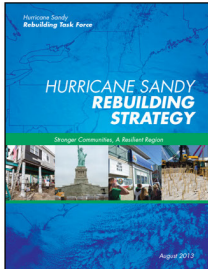
2

**Meeting Purpose:**

1. Advance progress on Hurricane Sandy Rebuilding Task Force Recommendation 25

3

Hurricane Sandy Rebuilding Task Force,  
Recommendation 25



**RECOMMENDATION:**  
States and localities should adopt and enforce the most current version of the IBC and the IRC.

4

**Goal of the MitFLG Building Code Workgroup**

- Develop a *comprehensive approach and standard mechanisms* for all federal agencies with authorities and responsibilities related to building code development, compliance and enforcement to encourage and/or aid State and local communities in the nationwide adoption of the most recent International Building Code (IBC), International Residential Building Code (IRC), and other codes that will increase resilience.

5

**Meaning of Building Codes for the MitFLG Workgroup**

- *Reference to the IBC and IRC and other codes is meant to cover the current model building codes developed by the International Code Council and National Fire Protection Association, as well as the jurisdiction codes adopted at the state or local jurisdiction based on the model building codes.*

6

**Meeting Purpose:**

1. Advance progress on Hurricane Sandy Rebuilding Task Force Recommendation 25
2. Review and augment Stakeholder input

### 6 Stakeholder Webinars, Jan. 9-20, 2015

#### Targeted Stakeholder Groups

- Building Code Developers
- Code Adopters and Enforcers
- Designers, Constructors
- Material and Product Suppliers
- Finance and Insurance
- Other

### 6 Stakeholder Webinars, Jan. 9-20, 2015

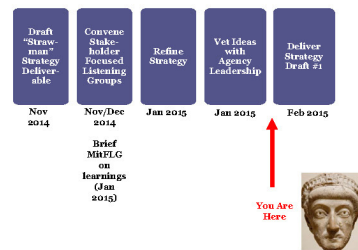
~70 participants (~50 unique)

- 6 federal agencies (FEMA, GSA, HUD, NIST, NOAA, USFA)
- ~ 20 industry and consulting organizations (ASCE, ASFP, ATC, AWC, EERI, FLASH, IBHS, IBTS, ICC, ISO, NAHB, NCMA, NFSA, NIBS, NRMSA, NSSA, other)
- 3 state and regional agencies

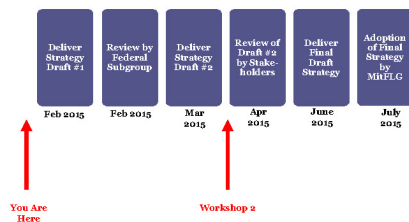
### Meeting Purpose:

1. Advance progress on Hurricane Sandy Rebuilding Task Force Recommendation 25
2. Review and augment Stakeholder input
3. Help plan next Stakeholder Workshop

### Federal Approach and Mechanisms to Encourage Building Code Adoption at State & Local Levels



### Federal Approach and Mechanisms to Encourage Building Code Adoption at State & Local Levels



## Stakeholder Questions (Jan 2015)

1. Under what circumstances have you seen federal action (e.g., proposition, advocacy, research, etc.) lead to code enhancement?

1. Under what circumstances have you seen federal action (e.g., proposition, advocacy, research, etc.) lead to code enhancement?
  - Lead by Example (Executive Orders, Using Model Codes for federal facilities).
  - Use HMGP to Promote Code Use.
  - Support State/Local Code Adoption (e.g., TN, LA, NYC).
  - Support Pre-Standard and Standard Development (e.g., ASCE 24).
  - MAT Reports -> Code Change.
  - Tornado Safe Rooms.
  - MMC "Mitigation Saves" Project.

## Stakeholder Questions (Jan 2015)

2. What examples can you provide where you have seen an opportunity for a federal agency able to offer additional support (e.g., research incentives) to you and for all?

2. What examples can you provide where you have seen an opportunity for a federal agency able to offer additional support (e.g., research incentives) to you and for all?
  - Enhanced Seismic Mitigation Plans.
  - Fund Code Training.
  - Get Research into Practice.
  - Fund Projects that States and Communities Can't: Technical and Economic Analyses.
  - Work with Appraisal/Real Estate/Banking Industry to Achieve Building Valuations that Reflect Value of Codes/Hazard Resistance.

## Stakeholder Questions (Jan 2015)

3. What barriers (e.g., access to research) have you encountered as a result of a federal action?

3. What barriers (e.g., access to research) have you encountered as a result of a federal action?
  - State/Local Pushback to Federal Mandates.
  - Perception (Reality?) that Participation in Federal Program Brings Added Costs/Rules.
  - Different Federal Agencies Use Different Language, Have Different Requirements.
  - Available Federal \$ may not Reach Communities (alignment of state and local priorities).
  - Politics.

## Stakeholder Questions (Jan 2015)

4. What does the best federal coordination with you look like?

4. What does the best federal coordination with you look like?

- Coalition. Partnership. Public-Private. Ongoing.
- Grassroots. Local-State-Federal.
- Data-Driven. Credible. Establish Information “Baseline” to Support Code Adoption.
- Philosophical and Operational Alignment of Pre- and Post-Event Expenditures.
- Delegate Program Administration and Enforcement to States and Communities.

## Stakeholder Questions (Jan 2015)

5. When have you seen communication and messaging from the federal government or from others work well? And what made the communicator/messenger best positioned to deliver the message?

5. When have you seen communication and messaging from the federal government or from others work well? And what made the communicator/messenger best positioned to deliver the message?

- Project Impact.
- Silver Jackets.
- FloodSmart.
- Post-Isabel Fuel Tank Anchoring Video.
- Document Past Hazard Events (e.g., HWM).

## Stakeholder Questions (Jan 2015)

6. Do you have any other input you would like to provide?

6. Do you have any other input you would like to provide?

- Problem: Inability to Access Insurance Databases.
- Codes Have Moved Beyond Life-Safety, and Justification for Adoption is More Difficult.
- Tracking Code Amendments and Weakening of Codes Following Adoption are Problematic.

### **B.3 First Project Workshop Summary**

The First Project Workshop was held in meeting space at the National Building Museum in Washington, D.C. on February 3, 2015. The attendees of the Workshop were either a member of the ATC-117 Project Team or the MitFLG Building Code Workgroup (BCWG). A list of those attending and their contact information is provided in the Participants List. The purpose of the Workshop was to present information collected from a broad range of stakeholders invited to participate in the six webinars held in January 2015 as part of a development effort of strategies for the Federal agencies to encourage State and local adoption and enforcement of current building codes. This development effort is in direct response to Recommendation 25 put forth by the Hurricane Sandy Rebuilding Task Force. Prior to this Workshop, the ATC-117 Project Team developed twelve key points that broadly captured the stakeholder input from the webinars and shared them with the MitFLG BCWG as a means to provide background information to the group prior to this Workshop.

At the First Project Workshop, ATC and FEMA staff provided opening remarks to set the stage for this Workshop and review the objectives of this Workshop as it relates to the overall work plan of the ATC-117 Project. Attendees of this Workshop had the opportunity to give self-introductions and provide linkage between their work activity and the expected deliverables of the ATC-117 Project. Christopher Jones, the ATC-117 Project Technical Director, presented each of the six questions asked during each of the webinars as well as the comments received from the stakeholders participating in the webinars. The Workshop group had the opportunity to discuss these comments and also augment these comments with additional information for the ATC-117 Project Team to consider during the development of the recommendation strategies to be presented in the ATC-117 Project Report.

Towards the end of the Workshop, the group discussed the plans for the Second Project Workshop that would be held in early March as a follow-up forum to present the draft project report and, in particular, discuss, modify, and rank the recommendations developed by the ATC-117 Project Team using the information collected during the webinars and First Project Workshop. Since the plan was to invite a broad representation of stakeholders to the Second Project Workshop to acquire the critical feedback needed to develop a viable list of recommendations, the Workshop group was invited to suggest either names of individuals or associations that should be invited to the Second Project Workshop.



# Preliminary Draft Recommendations

Following the First Workshop, a set of 32 preliminary draft recommendations were developed, outlining strategies and approaches that the Federal government may take to encourage and/or aid States and local communities in the adoption of the most current building codes. These recommendations were organized into the following four topical areas:

- Building Code Education, Training and Outreach;
- Technical and Economic Studies by (or Sponsored by) Federal Agencies;
- Building Code Development; and
- Agency Leadership, Cooperation and Coordination.

These recommendations were then evaluated, augmented, as necessary, and prioritized by the participants at the Second Workshop. (see Appendix D)

### **C.1 Recommendations for Building Code Education, Training and Outreach**

These recommendations address the need to reach out and educate various groups about the importance of building codes.

1. Educate State lawmakers and local elected officials about the importance of building codes.
2. Fund training for designers, building departments, and contractors on proper use and enforcement of building codes.
3. Develop and incorporate building code content (code purpose, development, use, enforcement) into college-level curricula (i.e. engineering, architecture and building science, public administration, finance, real estate).
4. Educate building owners about the importance of building codes and how provisions provide minimum standards for life safety issues and may help to minimize damage from severe events.
5. Engage K-12 students on the general history and importance of building codes with the goal that they will engage their parents in discussions.

6. Brief Congressional staff on building code issues and the purpose they serve.
7. Educate legislative affairs staff within Federal agencies on building code issues so they understand the importance of providing funding to support various initiatives.
8. Develop one-stop location for jurisdictions to see what building code-related grant funds are available, what grant requirements are, timing of grant cycles, etc.
9. Work with the real estate, property appraisal and mortgage banking industries to achieve building valuations that reflect the value of building codes/hazard resistance.
10. Tie building code outreach to disaster event anniversaries and other calendar dates such as the start of hurricane season.
11. Enhance, develop and implement programs to transfer building code adoption knowledge and lessons learned from community to community.
12. Develop and widely disseminate short (1-2 page) documents highlighting key recommendations from post-disaster investigations.

## **C.2 Recommendations for Technical and Economic Studies by (or Sponsored by) Federal Agencies**

The Federal government may be uniquely situated to collect and/or analyze information, assemble nationwide experts, and undertake studies beyond the capabilities of communities and most States. These recommendations pertain to such situations.

13. Study (or update earlier studies regarding) the benefits/costs of building code adoption and enforcement.
14. Assess the implementation effectiveness of prior building code recommendations by Federal agencies: how and why recommendations were implemented, or not.
15. Identify needed technical and economic studies that Federal agencies can conduct, but which may not be achievable by States and communities.
16. Develop code-compliant, engineered solutions to fill knowledge gaps in jurisdictions where building codes have not yet been adopted or where code enforcement is weak.
17. Study decision-making behaviors by individuals and communities regarding understanding risk, hazard resistance and building code adoption.

### **C.3 Recommendations for Building Code Development**

Many Federal agencies, by virtue of their institutional knowledge and experience, can assist in the building code development process and improve the hazard resistance of structures built to those codes. These recommendations address Federal involvement in code development.

18. Increase Federal agency participation in the building code development process.
19. Support development of pre-standards and standards that can be adopted by reference in building codes.
20. Support continuation of three-year code cycles to keep codes up-to-date on best practices.

### **C.4 Recommendations for Agency Leadership, Cooperation and Coordination**

Various Federal agencies have different missions and authorities, and may have different requirements for similar activities. The agencies may interact with each other and outside groups in different ways. Coordinating the work of these agencies to promote building code adoption is desirable.

21. Create a visual comparison of Federal grant program timelines and requirements regarding building code adoption and use, to assist grant applicants in their efforts to understand and select appropriate grants for code adoption and use.
22. Review differences between agency terminology, the treatment of building codes and funding for projects triggering code use, and harmonize to enhance program coordination and effectiveness.
23. Standardize policy and operational aspects of pre- and post-disaster (code-dependent) expenditures within and between Federal agencies.
24. Review how post-disaster mutual aid and assistance resources can be coordinated and communicated to facilitate State and local building code adoption and enforcement.
25. Use Federal funding, other Federal resources and existing Federal programs to facilitate coordination and code adoption (as opposed to creating new programs).
26. Use the National Disaster Recovery Framework to leverage State and local building code adoption.
27. Review agency discretionary funding under the Hazard Mitigation Grant Program (HMGP) and identify ways to promote building code adoption



(i.e. raise the 5% cap on mitigation funds to be spent on building code adoption-related projects deemed important but which do not pass benefit/cost analyses, and broaden mitigation funding to cover all hazards).

28. Use model codes for Federal facilities.
29. Harmonize HUD and Department of Energy (DOE) energy codes.
30. Push for more support of building code adoption by Federal agency senior leadership.
31. Utilize Federal agency regional offices to promote building code adoption.
32. Promote development of a grading system for existing buildings.

## Appendix D

# Second Project Workshop, March 12, 2015: Agenda, Slides, Case Studies, Summary, and Voting Results

### D.1 Agenda



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**2<sup>ND</sup> WORKSHOP TO REVIEW**  
**Strategies to Encourage State and Local Adoption of**  
**Disaster-Resistant Codes and Standards to Improve Resiliency**

March 12, 2015

Hyatt Arlington  
Senate Salon A & B  
1325 Wilson Blvd.  
Arlington, Virginia 22209  
Phone: 703-525-1234

**Agenda**

**March 12, 2015**

8:30 am:	<i>Registration and Coffee</i>	Hadnagy
9:00 am:	<i>Welcome, Introductions of Workshop and Participants</i>	ATC / FEMA
10:00 am:	<i>Overview of Preliminary / Final Report</i>	Jones
10:30 am:	<i>Break</i>	
10:45 am:	<i>Discussion of Recommendations</i>	Jones
12:15 pm:	<i>Boxed Lunch with Small Group Discussions</i>	All
12:45 pm:	<i>Discussion of Recommendations</i>	Jones
2:15 pm:	<i>Voting/Ranking of Recommendations</i>	Schiff
3:15 pm:	<i>Afternoon Break</i>	
3:30 pm:	<i>Discussion of Voting/Ranking</i>	Jones
4:15 pm:	<i>Closing Comments and Next Steps</i>	ATC / FEMA
4:30 pm:	<i>Workshop Closure</i>	

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Applied Technology Council  
201 Redwood Shores Parkway  
Suite 240  
Redwood City, California 94065  
(650) 595-1542

## D.2 Slides

**Workshop #2**  
**Strategies to Encourage State and Local Adoption of Building Codes**

March 12, 2015  
Arlington

In support of Mitigation Framework Leadership Group (MitFLG)  
Building Code Workgroup

Organized by Applied Technology Council

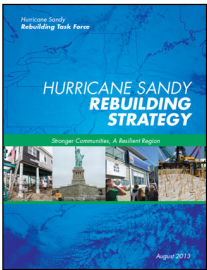
2

**Meeting Purpose:**

1. Advance progress on Hurricane Sandy Rebuilding Task Force Recommendation 25

3

Hurricane Sandy Rebuilding Task Force, Recommendation 25



**RECOMMENDATION:**  
**States and localities should adopt and enforce the most current version of the IBC and the IRC.**

4

**Goal of the MitFLG Building Code Workgroup**

- Develop a *comprehensive approach and standard mechanisms* for all federal agencies with authorities and responsibilities related to building code development, compliance and enforcement to encourage and/or aid State and local communities in the nationwide adoption of the most recent International Building Code (IBC), International Residential Building Code (IRC), and other codes that will increase resilience.

5

**Meaning of Building Codes for the MitFLG Building Code Workgroup**

- *Reference to the IBC and IRC and other codes is meant to cover the current model building codes developed by the International Code Council and National Fire Protection Association, as well as the jurisdiction codes adopted at the state or local jurisdiction based on the model building codes.*

6

**MitFLG Building Code Workgroup**

- 8 federal agencies
  - DHS – NPPD - Infrastructure Protection
  - DHS – FEMA – FIMA
  - DHS – FEMA – Fire Administration
  - Commerce – NIST
  - Commerce – NOAA
  - HUD
  - GSA
  - White House – CEQ
- 2 state representatives

## Meeting Purpose:

1. Advance progress on Hurricane Sandy Rebuilding Task Force Recommendation 25
2. Review Stakeholder (webinar) input

## 6 Stakeholder Webinars, Jan. 9-20, 2015

### Targeted Stakeholder Groups

- Building Code Developers
- Code Adopters and Enforcers
- Designers, Constructors
- Material and Product Suppliers
- Finance and Insurance
- Other

## 6 Stakeholder Webinars, Jan. 9-20, 2015

~70 participants (~50 unique)

- 6 federal agencies (FEMA, GSA, HUD, NIST, NOAA, USFA)
- ~ 20 industry and consulting organizations (ASCE, ASFPM, ATC, AWC, EERI, FLASH, IBHS, IBTS, ICC, ISO, NAHB, NCMA, NFSA, NIBS, NRMSA, NSSA, other)
- 3 state and regional agencies

## Stakeholder Questions (Jan 2015)

1. Under what circumstances have you seen federal action (e.g., proposition, advocacy, research, etc.) lead to code enhancement?

## Stakeholder Questions (Jan 2015)

2. What examples can you provide where you have seen an opportunity for a federal agency able to offer additional support (e.g., research incentives) to you and for all?

## Stakeholder Questions (Jan 2015)

3. What barriers (e.g., access to research) have you encountered as a result of a federal action?

## Stakeholder Questions (Jan 2015)

4. What does the best federal coordination with you look like?

## Stakeholder Questions (Jan 2015)

5. When have you seen communication and messaging from the federal government or from others work well? And what made the communicator/messenger best positioned to deliver the message?

## Stakeholder Questions (Jan 2015)

6. Do you have any other input you would like to provide?

## Stakeholder Responses (Jan 2015)

See page 2-3 of draft report

## Meeting Purpose:

1. Advance progress on Hurricane Sandy Rebuilding Task Force Recommendation 25
2. Review Stakeholder (webinar) input
3. **Review, Revise and Vote on Recommendations** developed at February 3 MitFLG (BCWG) – ATC Workshop #1 – *see draft report pages 3-1 to 3-5*

## Workshop 1 (Feb 2015)

- Developed over 30 recommendations

19

### Workshop 1 (Feb 2015)

- Developed over 30 recommendations
- Recommendations were grouped into 4 categories:

20

### Workshop 1 (Feb 2015)

- Developed over 30 recommendations
- Recommendations were grouped into 4 categories:
  - Education, Training and Outreach

21

### Workshop 1 (Feb 2015)

- Developed over 30 recommendations
- Recommendations were grouped into 4 categories:
  - Education, Training and Outreach
  - Technical and Economic Studies

22

### Workshop 1 (Feb 2015)

- Developed over 30 recommendations
- Recommendations were grouped into 4 categories:
  - Education, Training and Outreach
  - Technical and Economic Studies
  - Building Code Development

23

### Workshop 1 (Feb 2015)

- Developed over 30 recommendations
- Recommendations were grouped into 4 categories:
  - Education, Training and Outreach
  - Technical and Economic Studies
  - Building Code Development
  - Agency Leadership, Cooperation and Coordination

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### Schedule:

- Initial work by MitFLG
- January 2015 webinars
- February 2015 Workshop #1
- ATC Draft Report
- March 2015 Workshop #2
- ATC Strategy Recommendations (3/31/15)
- Workgroup consideration, additional input
- Workgroup delivery of final Strategy to MitFLG (June 2015)

## Voting on Recommendations

Four, 5-point scales (*see provided handout / draft report page 3-2*):

- Priority
- Effectiveness
- Difficulty-to-Implement
- Time-to-Implement

### D.3 Case Studies

To help inform the discussions on the draft recommendations, two case studies on building code adoption were also presented at the workshop. One case study looked at the status of building code adoption in the State of Louisiana before and after Hurricane Katrina. The other looked at building code adoption in Memphis/Shelby County, Tennessee, and the State of Tennessee. The case studies explored code adoption issues, actions taken to address the issues, results and lessons learned.

#### D.3.1 Case Study 1: Louisiana: Pre- and Post-Hurricane Katrina

##### D.3.1.1 Pre-Hurricane Katrina

Louisiana adopted the Standard Building Code developed by the Southern Building Code Congress International as its first statewide building code in 1992 for all structures other than one- and two-family dwellings.

As part of the consolidation process of the regional model code developers in the early 2000s (BOCA, ICBO and SBBCI) the first International Codes (I-Code) were published in 1999 as the 2000 I-Codes. In 2001 Louisiana updated to the IBC 2000.

In those years, very few local jurisdictions enforced codes on all structures. There was no mandatory enforcement of codes.

The insurance industry and the Office of State Fire Marshal (OSFM) attempted to have residential building codes adopted several times but were met with resistance by the building industry.

The day Hurricane Katrina made landfall there were 55 individuals in Louisiana with current ICC Certifications.

### **D.3.1.2 Post-Hurricane Katrina**

The insurance industry threatened to pull out of Louisiana unless statewide building codes were adopted. That threat generated support from all, including code officials, contractors, homebuilders, municipal and county associations, architects, fire service and others to support the adoption of construction codes.

Act 12 of the 2005, 1<sup>st</sup> Extraordinary Session of the Louisiana Legislature was signed into law by Governor Kathleen Blanco on November 29, 2005. The 2003 IRC and IBC wind and flood mitigation provisions were effective on December 29, 2005 for eleven coastal parishes. With the 2006 *International Building Code, International Residential Code, International Existing Building Code, International Mechanical Code, International Fuel Gas Code, 2005 National Electrical Code* and the *2000 Louisiana State Plumbing Code* (since then replaced by the *International Plumbing Code*) adopted effective statewide 01/01/2007.

The affected parishes and municipalities are given a choice of one of three methods to provide enforcement of the emergency code provisions of Act 12:

1. Continue or establish a method of plan review and inspections (local governments may contract with any other local government),
2. Contract with third-party providers, registered with the Louisiana Department of Public Safety to provide review and inspection services, or
3. Contract with the State Fire Marshal to provide review and inspection services for structures other than one- and two-family dwellings.

Act 12 created the Louisiana State Uniform Construction Council (LSUCCC). LSUCCC functions include:

- Review, amend and adopt the Louisiana State Uniform Construction Code;
- Provide training and education of code officials;
- Establish the requirements for the certification, registration and continuing education of code enforcement officers, code enforcement, third party providers and building officials; and
- Min/Max Code – this means the adopted codes are the minimum that can be used for design and installation and the maximum that local governments can enforce.

There are five LSUCCC committees:

1. Aid to Local Government Committee
2. Code Enforcement Advisory Committee
3. Administrative Advisory Committee
4. Technical Advisory Committee
5. Legislative Advisory Committee

Today, there are 2,202 individuals with ICC Certifications. That is an increase of 2,147 individuals!

To aid with code enforcement, third-party providers may establish contracts with local governments, residential builders, commercial builders or homeowners.

Local jurisdictional requirements include:

- Issue building permits
- Plan review inspections for each discipline
- Inspections for each state of construction
- Issue Certificates of Occupancy

Louisiana is now using the 2012 I-Codes.

### ***D.3.2 Case Study 2: Building Code Adoption in Memphis/Shelby County, Tennessee and Tennessee State Building Codes***

The cost premium for earthquake-resistant construction has long been a hotly contested topic in regions that have significant seismic hazard but have not suffered serious damage from earthquakes in the memories of people now living. Despite the close proximity of Memphis, Tennessee, and the surrounding Shelby County to the southern portion of the New Madrid fault system, much of the population including elected officials does not perceive the level of seismicity in the region. Consequently, there is significant resistance when building code requirements increase the construction costs of buildings to achieve resilient performance during earthquakes.

#### **D.3.2.1 State and Local Jurisdictional Organization Affects Strategies Used**

Tennessee has a building code adoption model that works well in providing flexibility and maintaining standards. In this model, there is an overriding state building code that sets minimums for all counties, municipalities, and

state owned or regulated facilities, such as hospitals and schools. If large municipalities and counties are able to adopt building codes independently, local amendments and requirements must be at least as stringent as the state building code. In addition, the locally adopted building codes and state building codes are mandated to be current within two editions of the latest national model building codes. As long as special interest groups and local lawmakers do not circumvent the process or force a legislative change at the state level, building code requirements in Tennessee keep pace with resilient design requirements in the national model building codes.

#### **D.3.2.2 Objections to Resilient Design**

Cost premiums associated with resilient building design requirements are almost always the impetus driving objections to build resilient structures, particularly for low-probability, high-consequence hazards. The most notable objections are:

- There is no payback on the investment.
- Buildings in this area will probably never experience a design event.
- For otherwise identical buildings, there is no difference in the appraised value of a highly resilient building vs. one with no resiliency.
  - This is especially true for one- and two-family dwellings.
- No reduction in insurance premiums is given for more highly resilient buildings.
- There is no difference in either the mortgage interest rate or the maximum loan value for more resilient buildings.
- The increased cost of building drives businesses and homebuyers to jurisdictions with less stringent requirements.
- The money spent on resiliency could better be used for other, more urgent needs.
- Resilient design reduces the useable floor space and more desirable architectural features.
  - This is especially true for one- and two-family dwellings.
- IRC requirements are too complicated to implement.
- Stronger codes require increased inspection and review for which code enforcement staff does not have funding.

#### **D.3.2.3 Currently Adopted Building Codes**

**Tennessee State Building Codes:**

- 2006 IBC (effective 09/2008), 2009 IRC (effective 06/2010), 2006 IFC (effective 12/2008)
  - 2006 NFPA 101 (State Buildings, Educational Occupancies, and Other)
- 2006 IECC (effective 06/2010)
  - 2007 ASHRAE Standard 90.1 (State Buildings) (effective 07/2011)
- Currently considering 2012 or 2015 ICC Codes for adoption in 2015

**Memphis/Shelby County Joint Building Codes<sup>1</sup>:**

- 2012 IBC & IEBC in Effect Oct. 1, 2014, and
- 2012 IRC w/Local Amendment in Effect Jan. 1, 2014
  - Local amendment offers reduced alternate seismic requirements.

**D.3.2.4 Educational Strategies Used**

Over approximately the past fifteen to twenty years, FEMA, NIST, and other Federal agencies have provided speakers for AIA luncheons, engineering workshops, and public information events. Key authors of resiliency requirements in load standards and model building codes have been funded to attend public hearings at both the state and municipal levels when building code adoption is considered. In addition, cost/benefit studies, such as the NIST-funded ATC-89 study (Cost-Benefit Analysis of Codes and Standards for Earthquake-Resistant Construction in Selected U.S. Regions), have been instrumental in demonstrating a drastic increase in hazard mitigation and resiliency for a very low increase in building costs. In addition, state and local chapters of engineers and architects associations have met individually and in group forums to educate building officials and lawmakers about the benefits of resilient design. Education must be a continual and ongoing activity.

**D.3.2.5 Lessons Learned**

The following is a list of strategies that have worked to help in adopting building codes with higher resiliency design requirements and a few strategies that should be avoided:

- Federal and State programs that provide monetary incentives for adoption of more resilient building codes work well.

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<sup>1</sup> Prior to October 1, 2013, Memphis and Shelby County used the 2003 *International Building Code* (ICC, 2003) for critical facilities but allowed the 1999 *Standard Building Code* (SBCCI, 1999) for most structures. The 1999 SBC is based on the 1991 *Edition, NEHRP Recommended Provisions for the Development of Seismic Regulations for New Buildings* (FEMA, 1991). No consistent standard was applied to one- and two-family dwellings.

- The National Disaster Resilience Competition from the U.S. Department of Housing and Urban Development, which will make awards that range from \$1 million to \$500 million per community, is one current example.
- Tax exemptions or credits for incorporation of certain resiliency features into individual buildings, such as a credit for tornado shelters, encourages participation.
  - Application for exemptions or credits must be simple, and compliance requirements must be meaningful.
- Maintaining consistently current codes that promote resiliency for all likely hazards in competing areas must be a requirement for participation in these programs.
- Federal mandates and ‘heavy handed’ approaches to force the use of any code provisions will be met by strong resistance and should be avoided.
- The resiliency of a building to various hazards must be incorporated into both perceived and appraised value.
  - Appraisals must incorporate resiliency into the final property value.
  - Financial institutions must differentiate the worth of a building and its lending risk based on its resiliency.
  - Insurance rates must incorporate the resiliency of buildings into insurance premiums in a way that is readily apparent to owners.
  - Particularly true for one- and two-family dwellings.

#### **D.4 Workshop Summary**

The Second Project Workshop was held in meeting space at the Arlington Hyatt in Arlington, Virginia on March 12, 2015. The attendees of this Workshop were either a member of the ATC-117 Project Team, the MitFLG Building Code Workgroup (BCWG), or invited stakeholders representing the broad spectrum of industries interested in the adoption and enforcement of current building codes. A list of those attending and their contact information is provided in the Participants List (end of report). The primary purpose of this Workshop was to evaluate a set of 32 developed recommendations to help Federal agencies support State and local adoption and enforcement of current building codes. The recommendations were developed by the ATC-117 Project Team from information gathered during six January webinars attended by a variety of stakeholders and the First Project Workshop attended by the MitFLG Building Code Workgroup (BCWG). Prior to this Workshop, the ATC-117 Project Team distributed a draft version of the ATC-117

Project Report that provided the expected organization of the report as well as draft text for the first two chapters. Also included in the draft report was a list of 32 draft recommendations divided into four categories that would be considered during the Second Project Workshop.

At the Second Project Workshop, ATC and FEMA staff provided opening remarks to set the stage for this Workshop and reviewed the objectives of this Workshop as it relates to the overall work plan of the ATC-117 Project. Attendees of this Workshop had the opportunity to give self-introductions and provide linkage between their work activity and the expected deliverables of the ATC-117 Project. Christopher Jones, the ATC-117 Project Technical Director, presented background information on the activity that led to this Workshop and then proceeded to present each of the recommendations, one at a time, and solicit discussion of each recommendation. The discussion was targeted to allow for modification or deletion of a recommendation, and recombination of recommendations. Also stakeholders could suggest new recommendations in each of the four groupings.

During the presentation of all 32 recommendations, the attendees decided to delete one (Recommendation 29) and create three new ones (Recommendations 33, 34 and 35) to be considered during the upcoming voting portion of the Second Project Workshop. The voting was set-up to consider four ranking criteria (Priority, Effectiveness, Difficulty-to-Implement and Time-to-Implement) for each of the recommendations. The ATC-117 Project Team planned to use the results of the voting to develop the final set of recommendations to be presented in the ATC-117 Project Report.

Shortly after the voting started there appeared to be some confusion and difficulty with the Time-to-Implement criteria. The issue was that some of the recommendations would require continual, or at least periodic, activity related to implementation of the recommendation. While this continual/periodic effort may not have been difficult, it made it hard to compare with implementations that required only a one-time initial effort. As consequence, the voters were told to vote without consideration of needing either continual or periodic effort and only consider the time required for the initial effort to get a recommendation activated. Due to time constraint, there was not time to revote the recommendations that were already voted upon.

At the conclusion of the Second Project Workshop, the attendees were encourage to provide additional information to the ATC-117 Project Team that would be considered during the development of the final set of recommendations and the writing of the ATC-117 Project Report.

The ATC-117 Project Team and the MitFLG leadership were very pleased with the engagement of and information provided by the attendees.

### D.5 Draft Recommendations Voting Results

The Workshop participants used four criteria to rate each of the draft recommendations. The voting scale used for each criterion is shown in Table D-1.

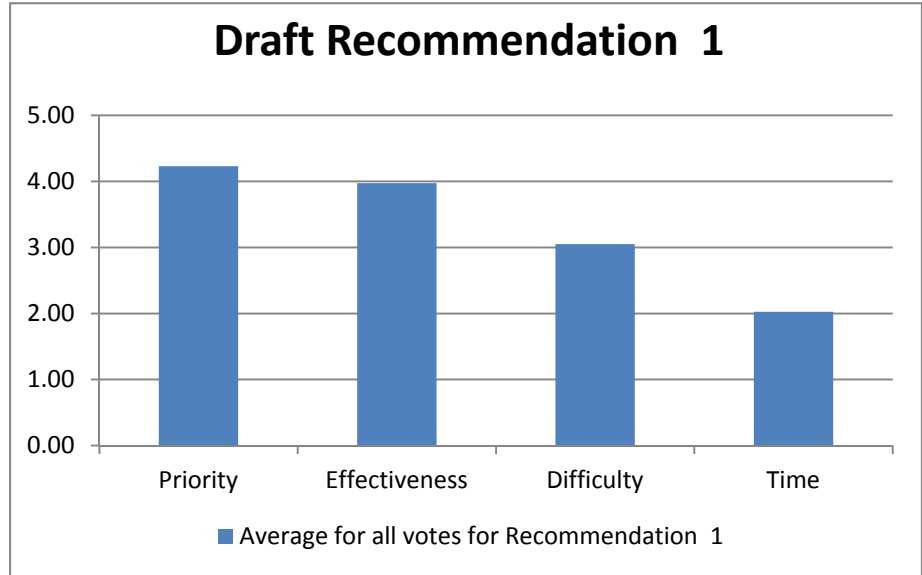
**Table D-1 Voting Process at the Second Project Workshop**

Criteria that participants at the second project workshop used in evaluating the draft recommendations.	
<b>Priority</b>	
Highest (5 points)	Essential, the most important recommendation(s) to implement
Very High (4 points)	Very important, but not at the top of the list
High (3 points)	Important
Medium (2 points)	Good to do if time and resources allow
Low (1 point)	Do only if all other recommendations have been addressed
<b>Effectiveness</b>	
Highest (5 points)	One of the most effective actions that can be undertaken
Very High (4 points)	Effective, almost all goals will be accomplished
High (3 points)	Moderately effective, most goals will be accomplished
Medium (2 points)	Partially effective, a few goals will be accomplished
Low (1 point)	Not effective
<b>Difficulty</b>	
Easy (5 points)	Can be accomplished with little effort and using off-the-shelf materials, available resources, existing ties between partners and target groups
Minor (4 points)	Will require modest effort to develop content and to coordinate between partners and target groups
Moderate (3 points)	Will require moderate effort to develop content and to coordinate between partners and target groups
Difficult (2 points)	Will require significant effort to develop, coordinate and implement
Very Difficult (1 point)	Very hard to accomplish, will require lots of effort, development of new content, lots of partners, and complex coordination
<b>Time to Implement</b>	
5 points	Less than 1 year
4 points	1-2 years
3 points	2-5 years
2 points	5-10 years
1 point	10 years

The following sections of this Appendix provide graphic representation of the voting cast by the Workshop participants for each of the considered recommendations. Each bar within a given bar chart represents the average ranking for one of the four criteria.

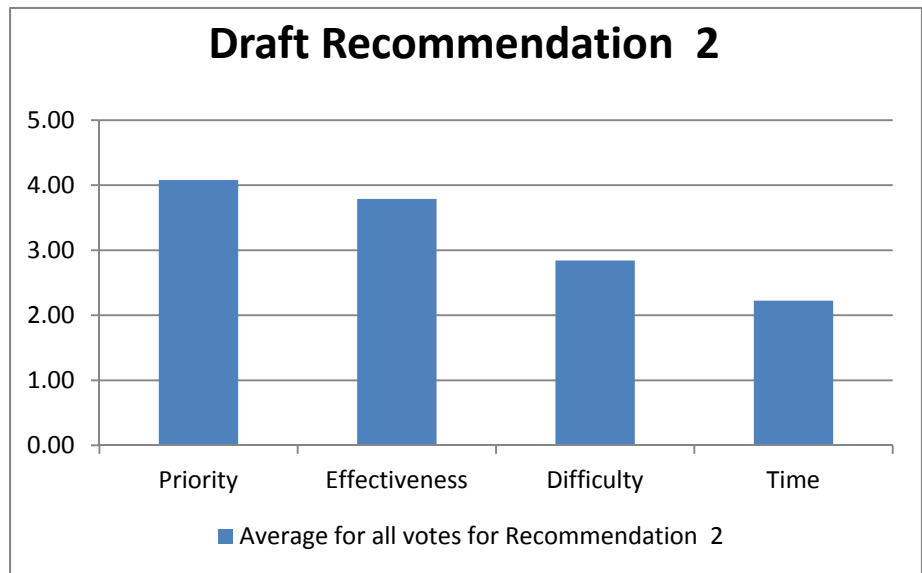
**D.5.1 Draft Recommendation 1**

Educate State lawmakers and local elected officials about the importance of building codes.



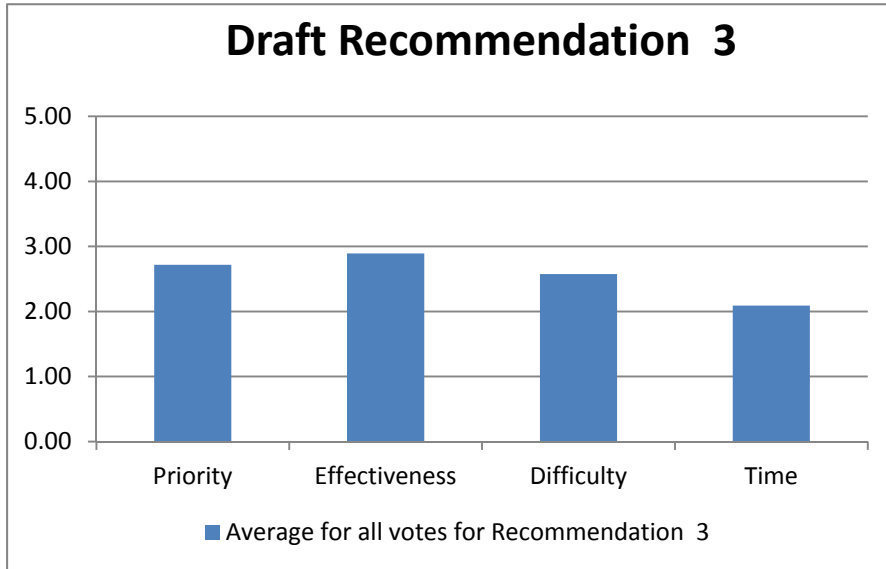
**D.5.2 Draft Recommendation 2**

Fund training for designers, building departments, and contractors on proper use and enforcement of building codes.



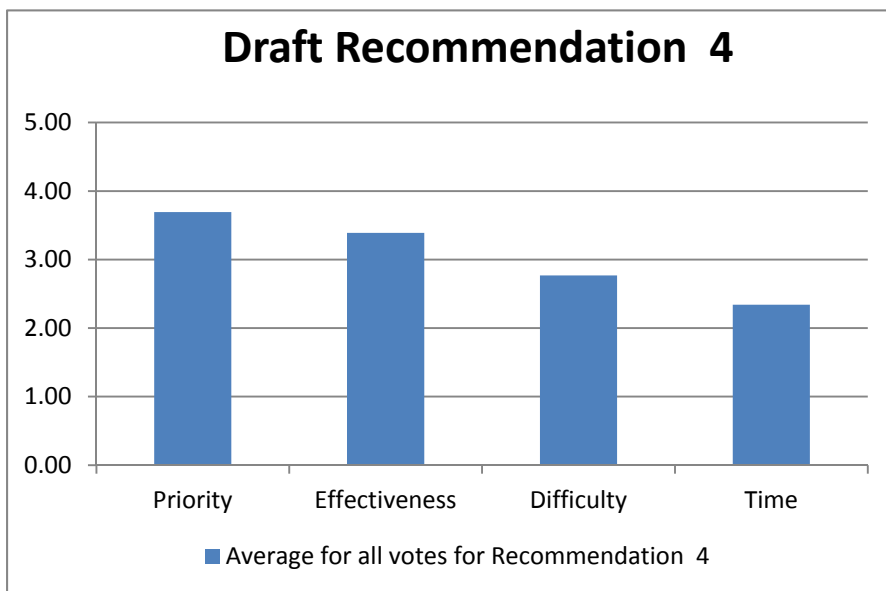
### D.5.3 Draft Recommendation 3

Develop and incorporate building code content (code purpose, development, use, enforcement) into college-level curricula (i.e. engineering, architecture and building science, public administration, finance, real estate).



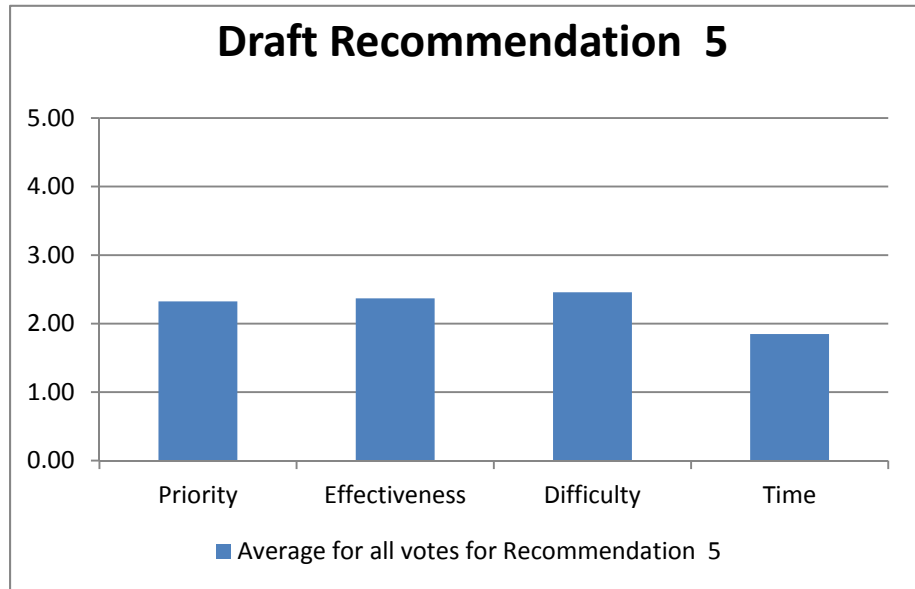
### D.5.4 Draft Recommendation 4

Educate building owners about the importance of building codes and how provisions provide minimum standards for life safety issues and may help to minimize damage from severe events.



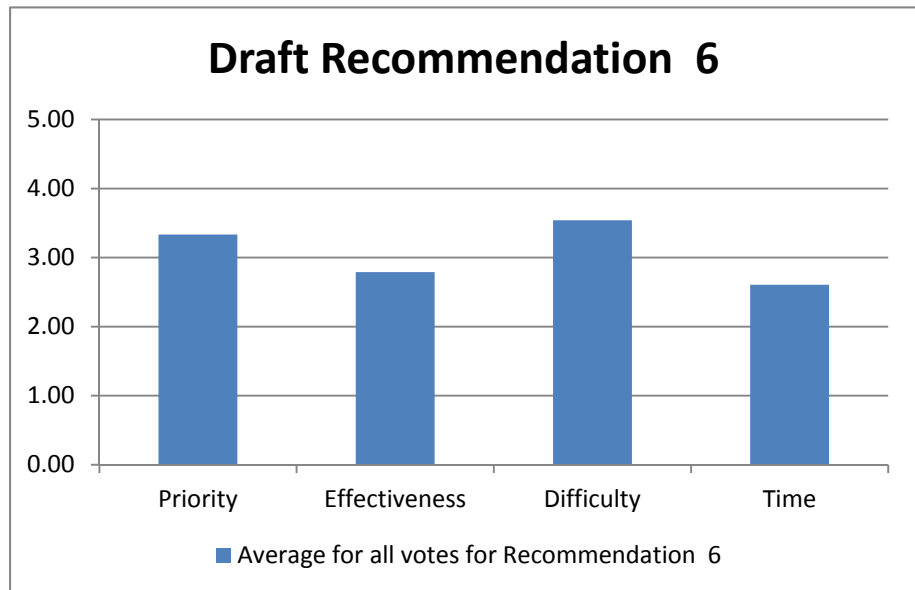
### D.5.5 Draft Recommendation 5

Engage K-12 students on the general history and importance of building codes with the goal that they will engage their parents in discussions.



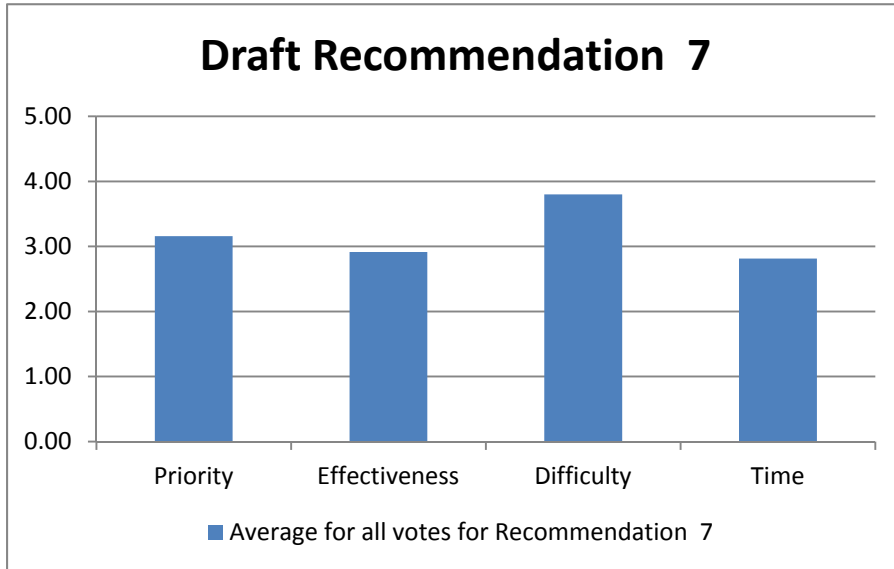
### D.5.6 Draft Recommendation 6

Brief Congressional staff on building code issues and the purpose they serve.



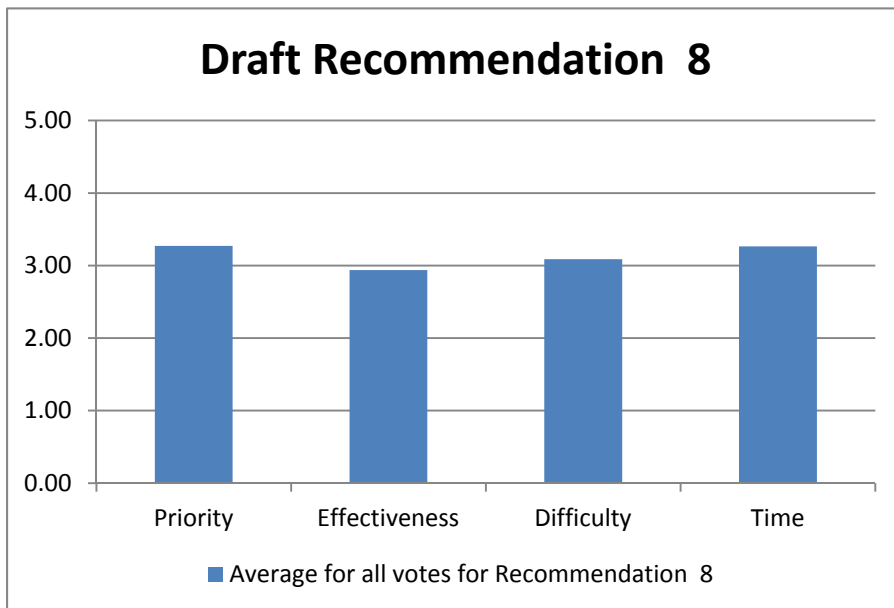
**D.5.7 Draft Recommendation 7**

Educate legislative affairs staff within Federal agencies on building code issues so they understand the importance of proving funding to support various initiatives.



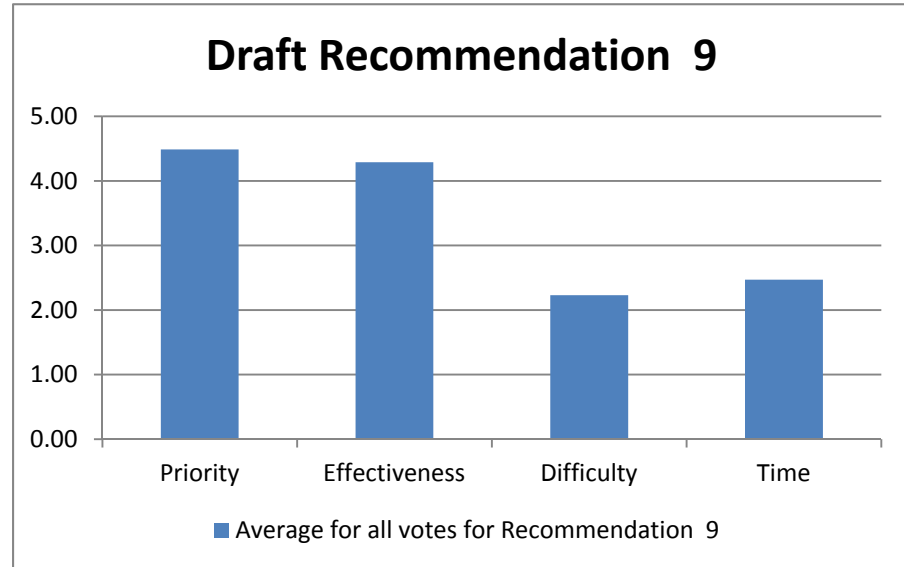
**D.5.8 Draft Recommendation 8**

Develop one-stop location for jurisdictions to see what building code-related grant funds are available, what grant requirements are, timing of grant cycles, etc.



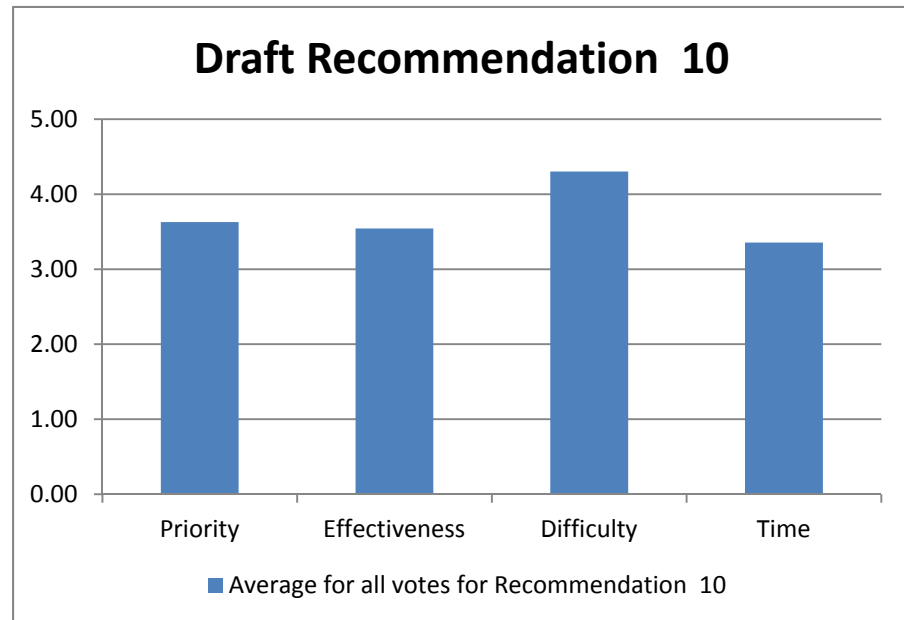
**D.5.9 Draft Recommendation 9**

Work with the real estate, property appraisal and mortgage banking industries to achieve building valuations that reflect the value of building codes/hazard resistance.



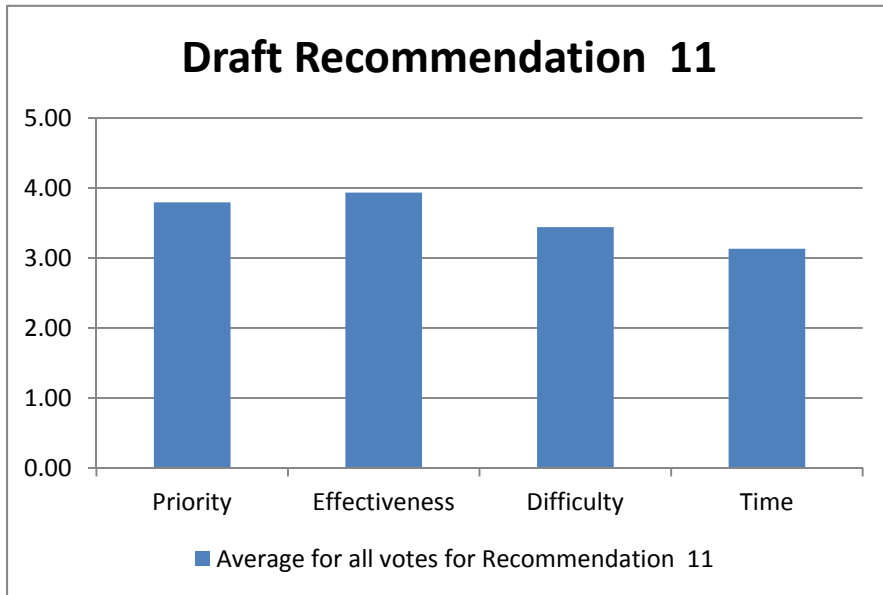
**D.5.10 Draft Recommendation 10**

Tie building code outreach to disaster event anniversaries and other calendar dates such as the start of hurricane season.



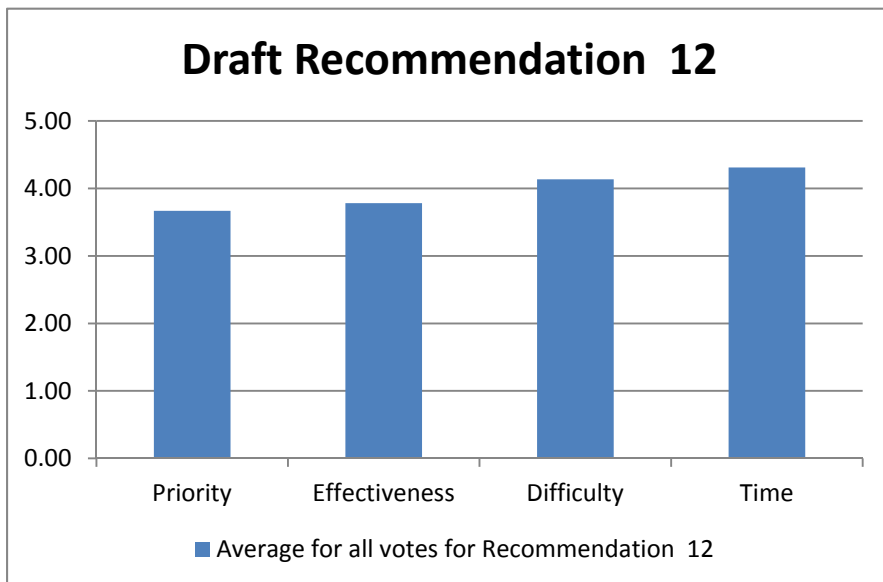
**D.5.11 Draft Recommendation 11**

Enhance, develop and implement programs to transfer building code adoption knowledge and lessons learned from community to community.



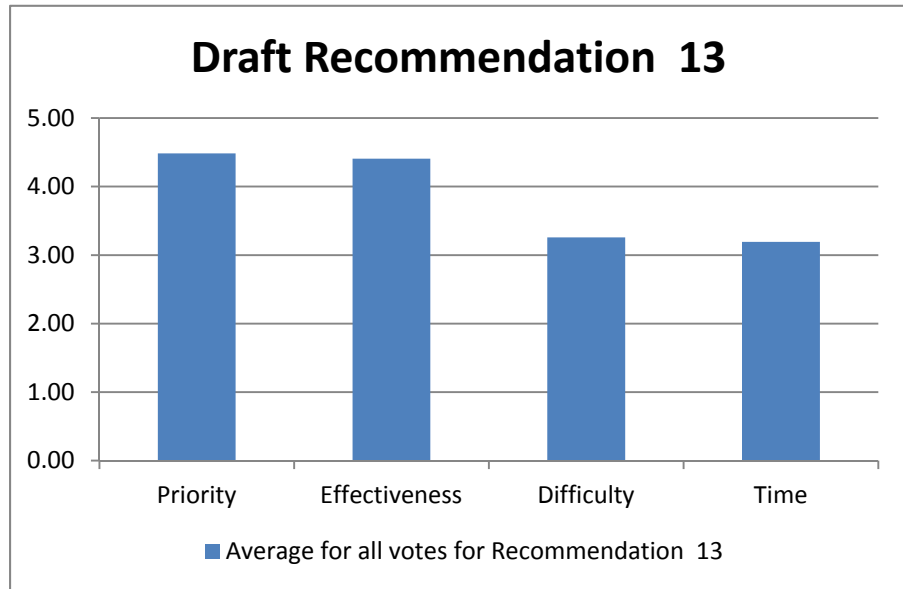
**D.5.12 Draft Recommendation 12**

Develop and widely disseminate short (1-2 page) documents highlighting key recommendations from post-disaster investigations.



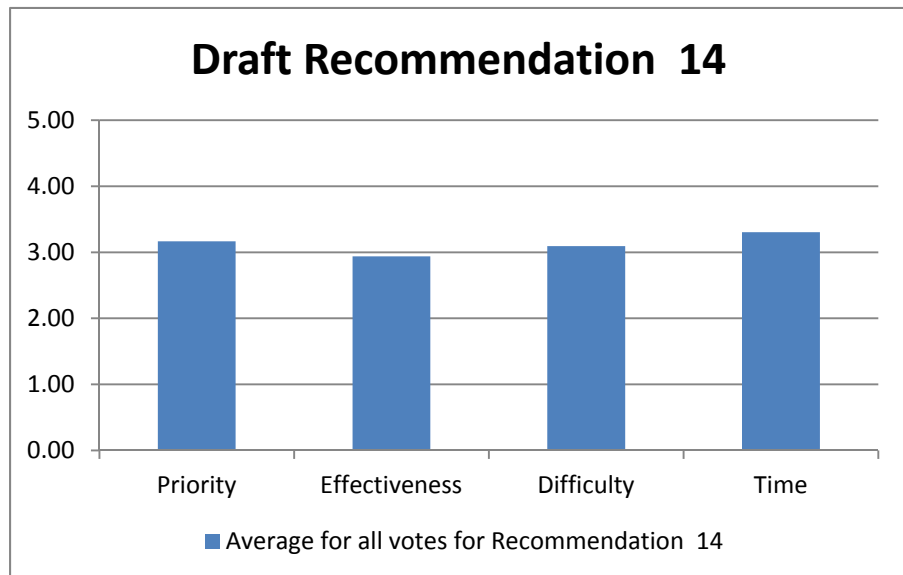
**D.5.13 Draft Recommendation 13**

Study (or update earlier studies regarding) the benefits/costs of building code adoption and enforcement.



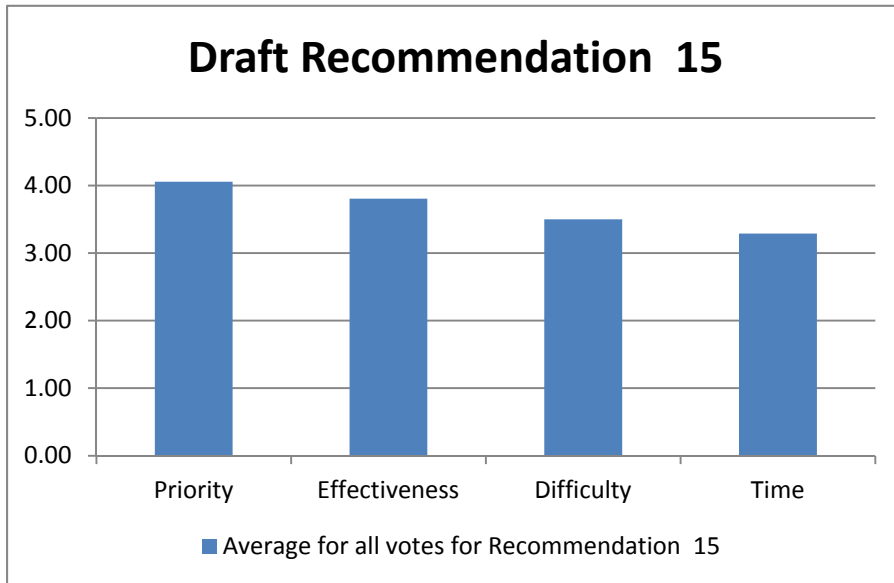
**D.5.14 Draft Recommendation 14**

Assess the implementation effectiveness of prior building code recommendations by Federal agencies: how and why recommendations were implemented, or not.



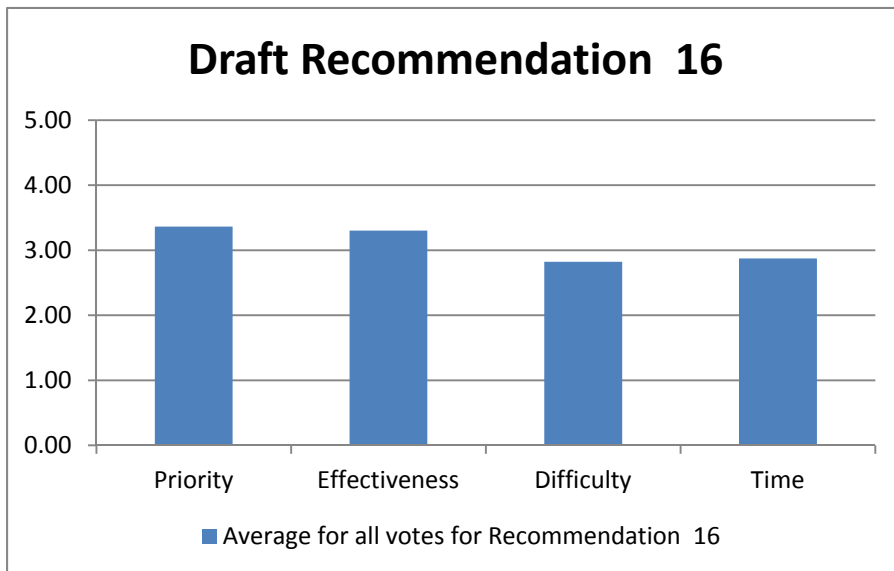
**D.5.15 Draft Recommendation 15**

Identify needed technical and economic studies that Federal agencies can conduct, but which may not be achievable by States and communities.



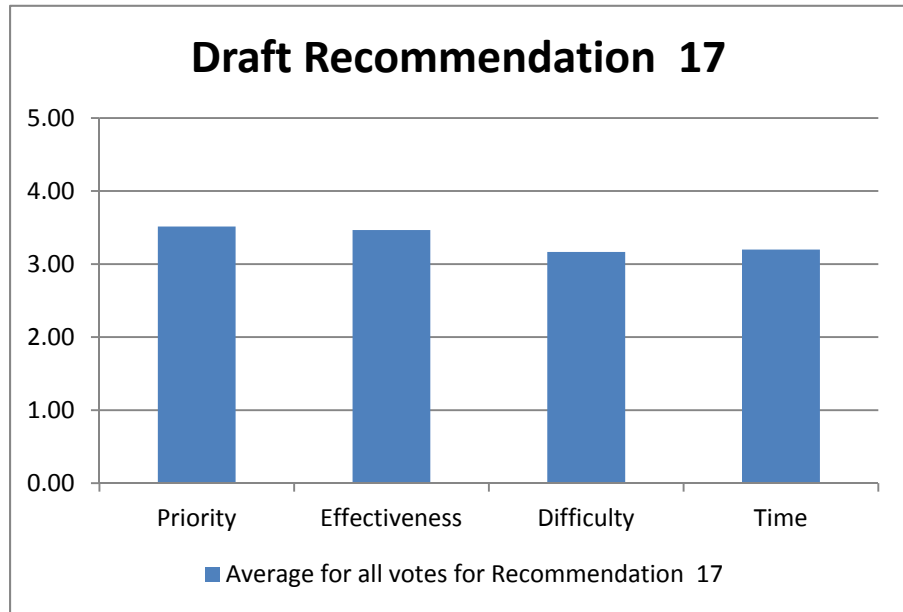
**D.5.16 Draft Recommendation 16**

Develop code-compliant, engineered solutions to fill knowledge gaps in jurisdictions where building codes have not yet been adopted or where code enforcement is weak.



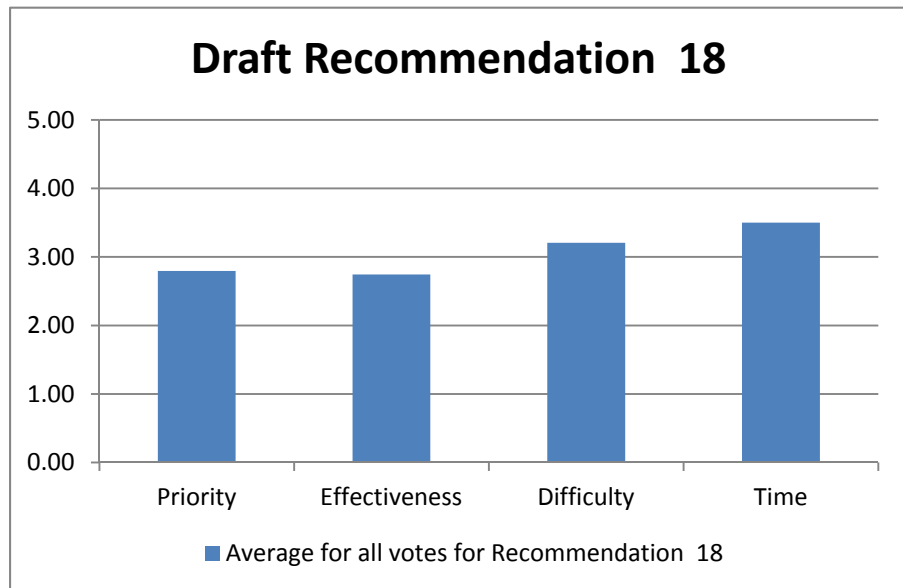
**D.5.17 Draft Recommendation 17**

Study decision-making behaviors by individuals and communities regarding understanding risk, hazard resistance and building code adoption.



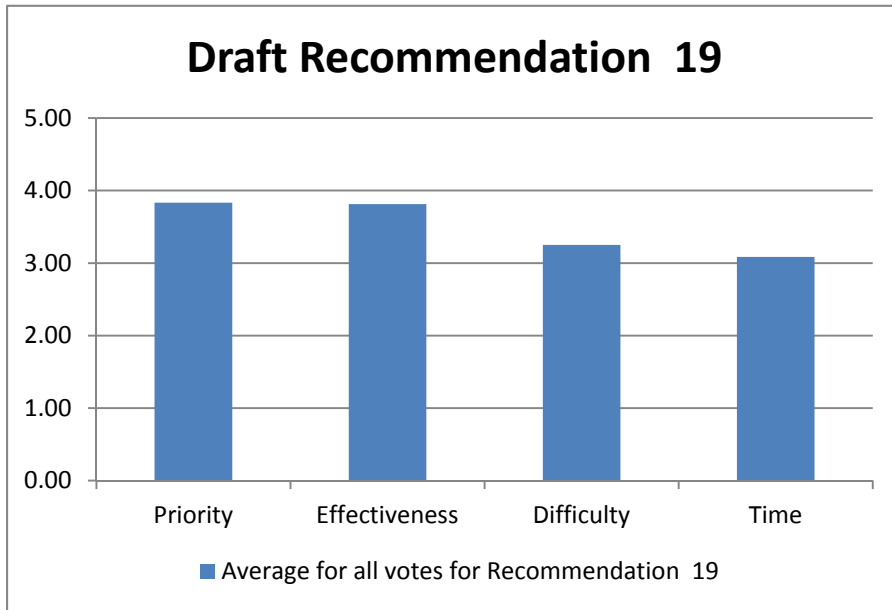
**D.5.18 Draft Recommendation 18**

Increase Federal agency participation in the building code development process.



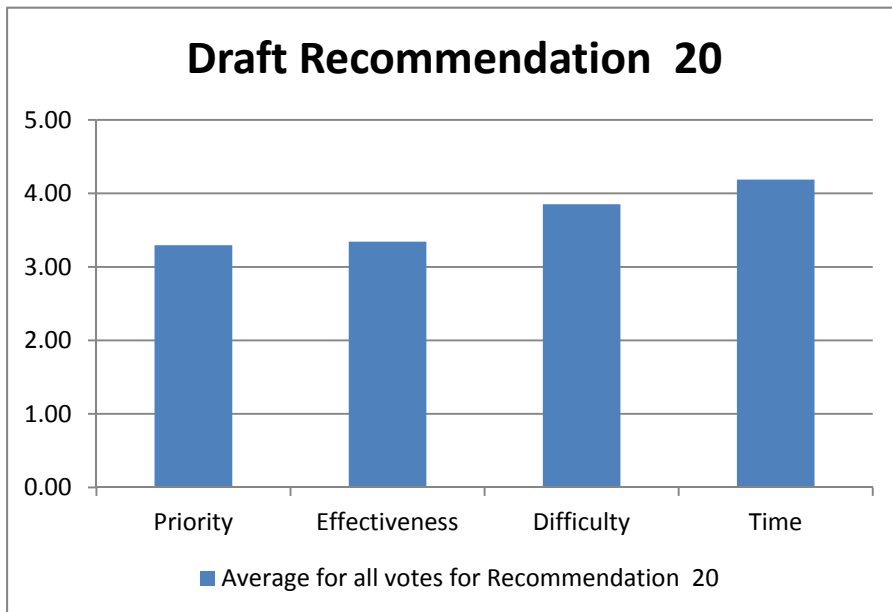
**D.5.19 Draft Recommendation 19**

Support development of pre-standards and standards that can be adopted by reference in building codes.



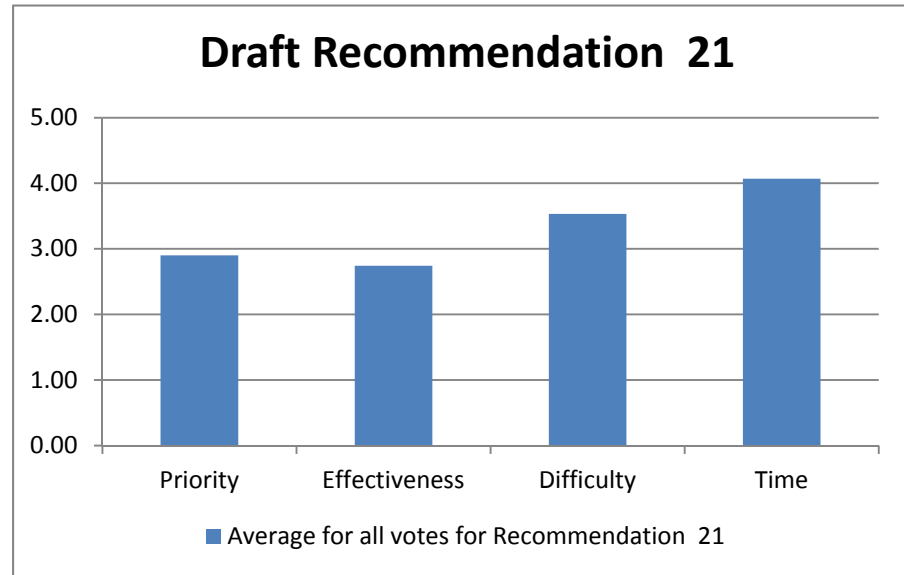
**D.5.20 Draft Recommendation 20**

Support continuation of three-year code cycles to keep codes up-to-date on best practices.



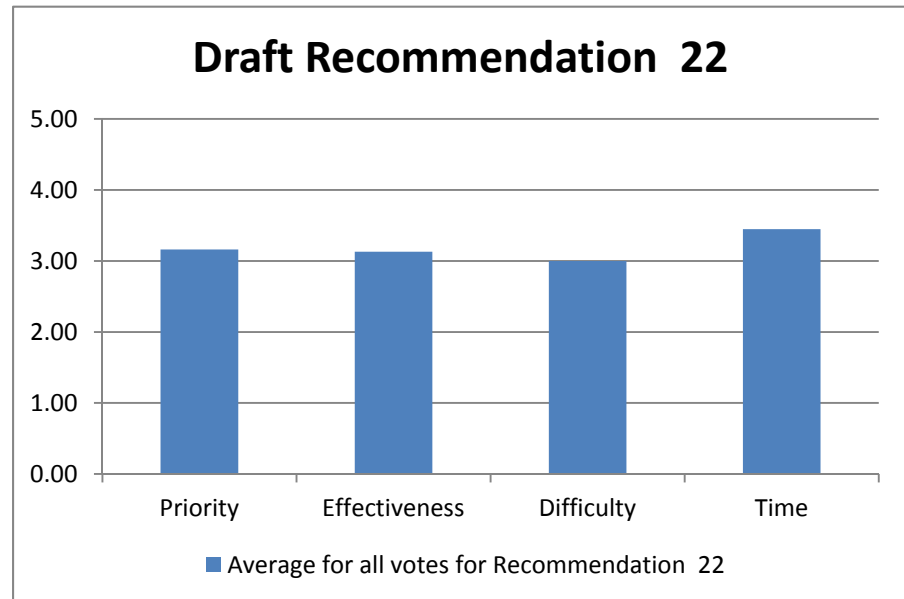
**D.5.21 Draft Recommendation 21**

Create a visual comparison of Federal grant program timelines and requirements regarding building code adoption and use, to assist grant applicants in their efforts to understand and select appropriate grants for code adoption and use.



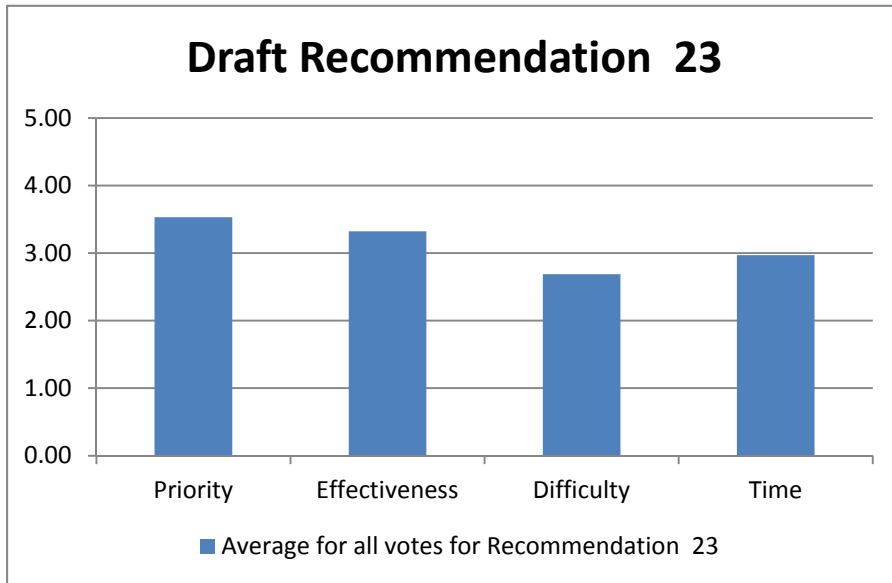
**D.5.22 Draft Recommendation 22**

Review differences between agency terminology, the treatment of building codes and funding for projects triggering code use, and harmonize to enhance program coordination and effectiveness.



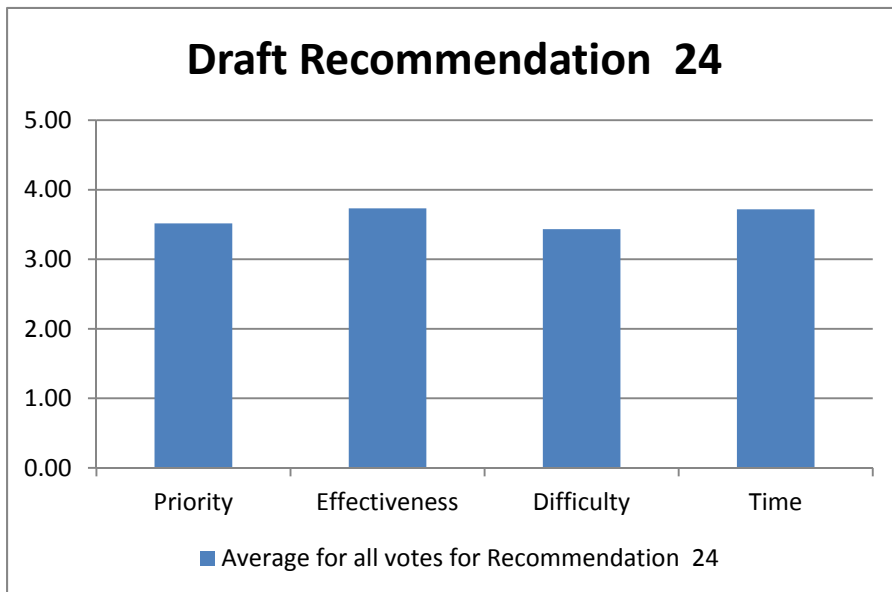
**D.5.23 Draft Recommendation 23**

Standardize policy and operational aspects of pre- and post-disaster (code-dependent) expenditures within and between Federal agencies.



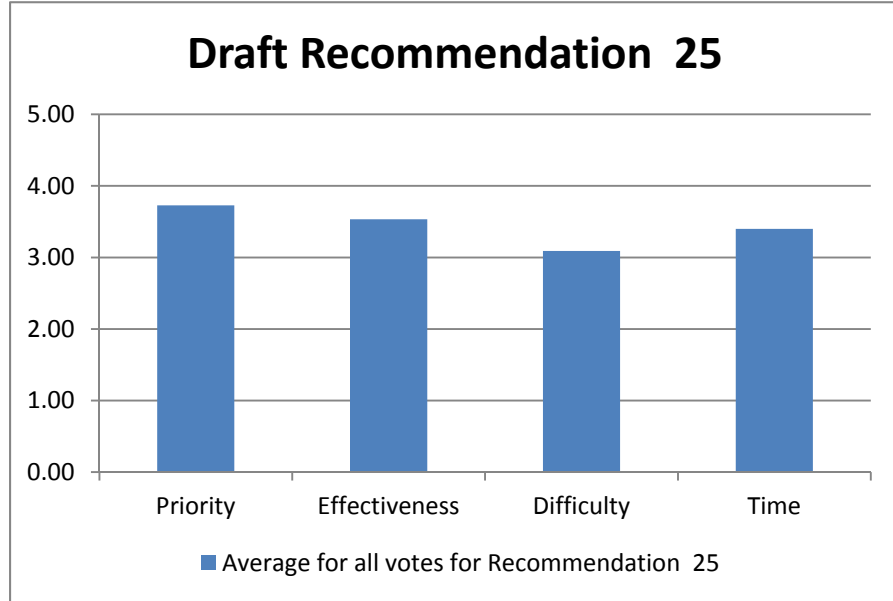
**D.5.24 Draft Recommendation 24**

Review how post-disaster mutual aid and assistance resources can be coordinated and communicated to facilitate State and local building code adoption and enforcement.



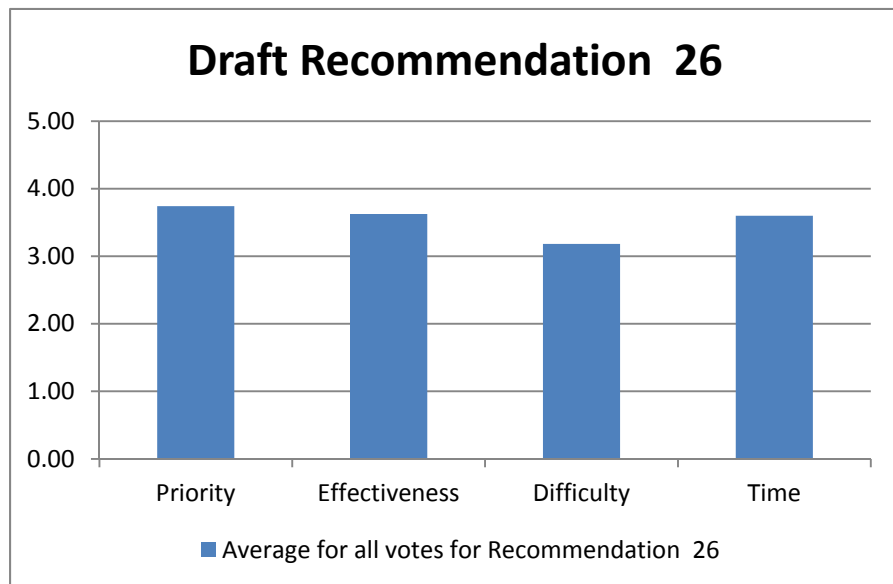
**D.5.25 Draft Recommendation 25**

Use Federal funding, other Federal resources and existing Federal programs to facilitate coordination and code adoption (as opposed to creating new programs).



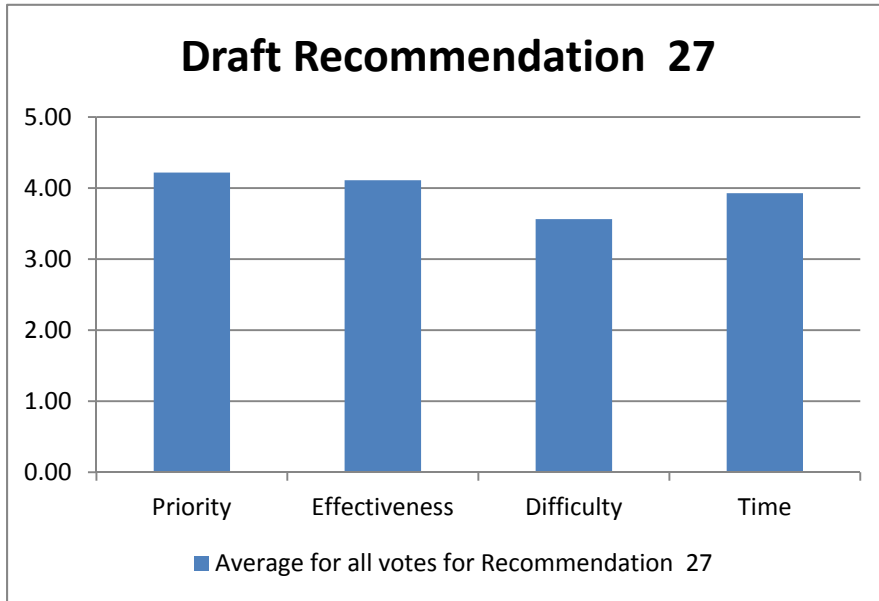
**D.5.26 Draft Recommendation 26**

Use the National Disaster Recovery Framework to leverage State and local building code adoption.



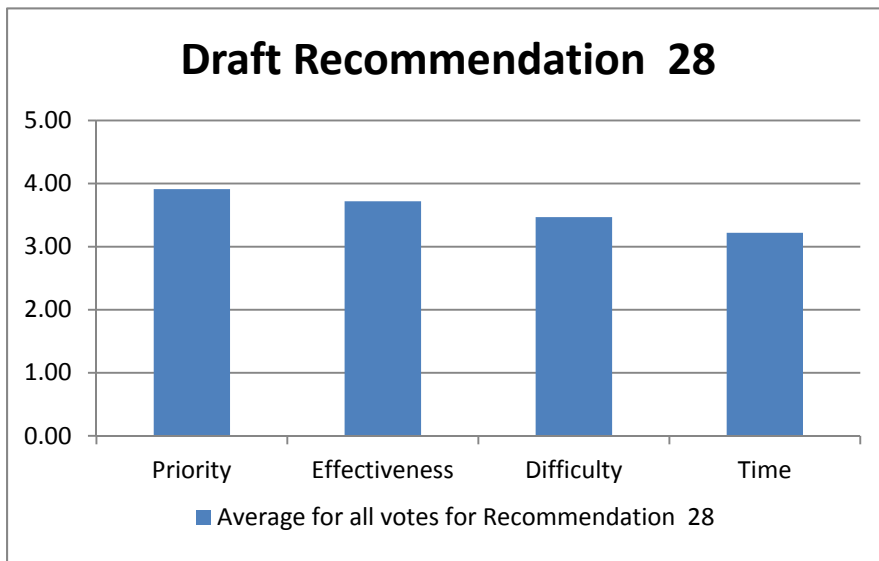
**D.5.27 Draft Recommendation 27**

Review agency discretionary funding under the Hazard Mitigation Grant Program (HMGP) and identify ways to promote building code adoption (i.e. raise the 5-percent cap on mitigation funds to be spent on building code adoption-related projects deemed important but which do not pass benefit/cost analyses, and broaden mitigation funding to cover all hazards).



**D.5.28 Draft Recommendation 28**

Use model codes for Federal facilities.

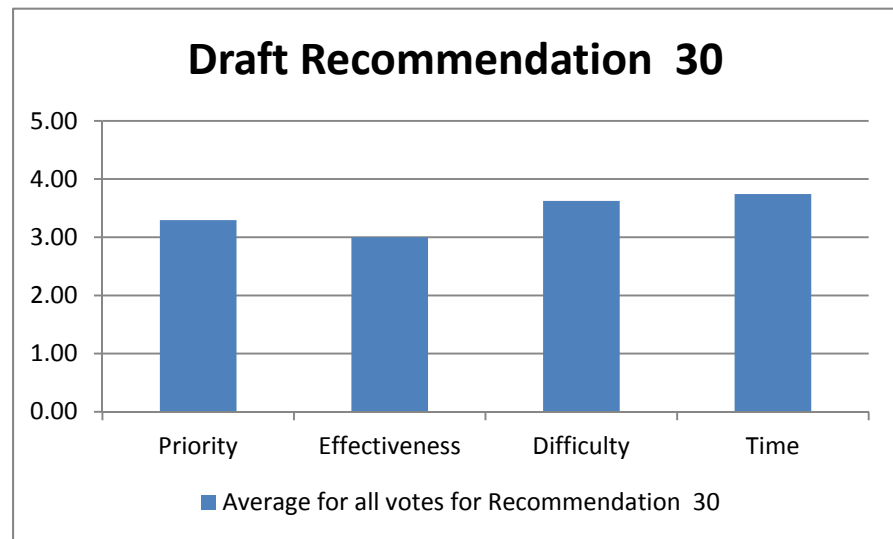


**D.5.29 Draft Recommendation 29**

Harmonize HUD and Department of Energy (DOE) energy codes. During the presentation at the workshop the attendees decided to delete this recommendation and instead make harmonization an over-arching goal of Federal agencies. Therefore voting on Recommendation 29 was not conducted.

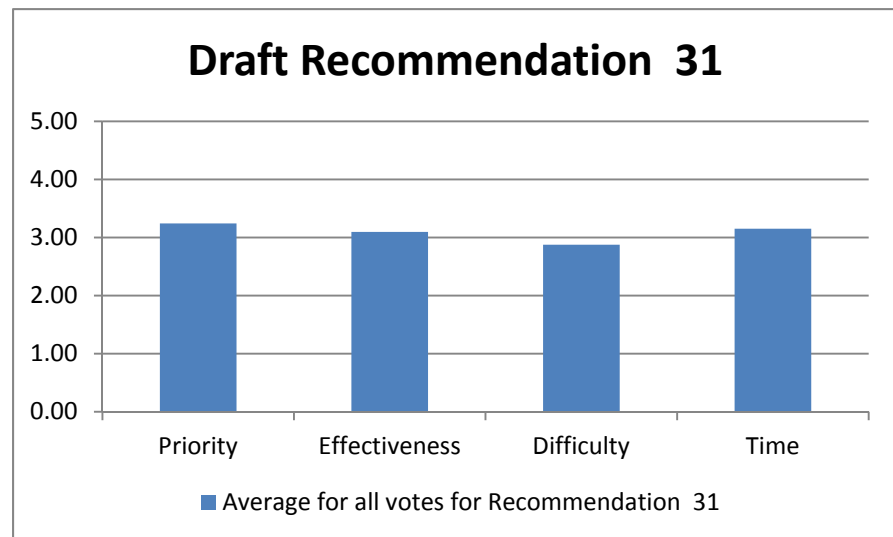
**D.5.30 Draft Recommendation 30**

Push for more support of building code adoption by Federal agency senior leadership.



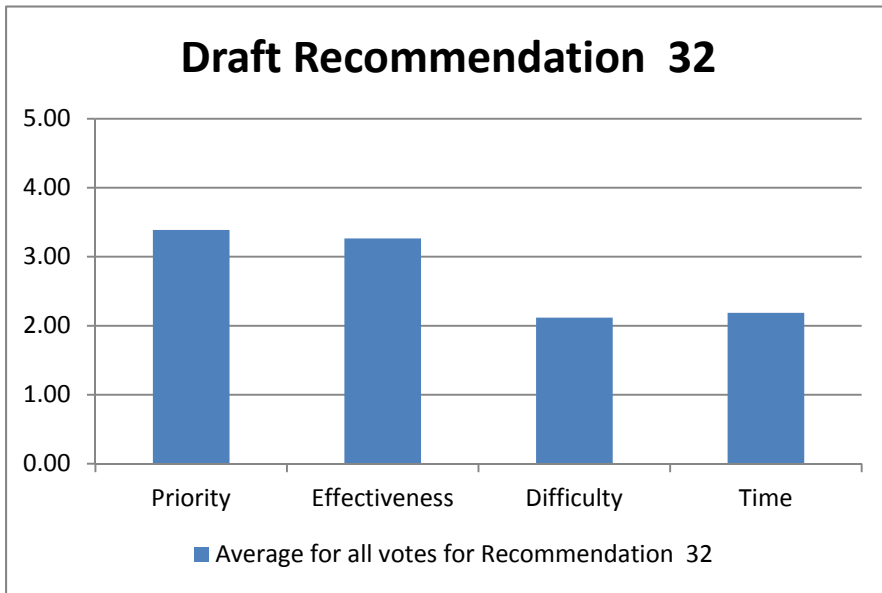
**D.5.31 Draft Recommendation 31**

Utilize Federal agency regional offices to promote building code adoption.



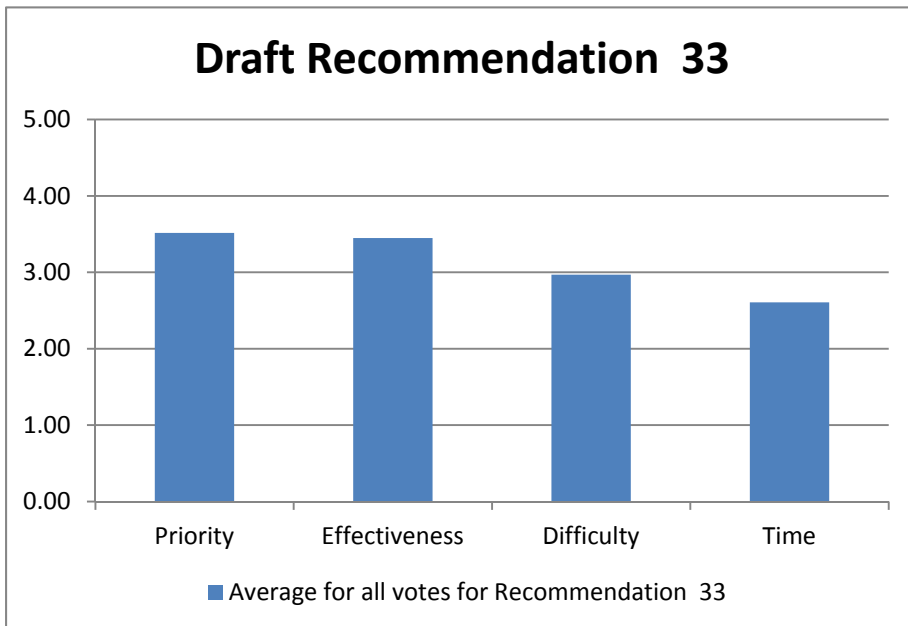
**D.5.32 Draft Recommendation 32**

Promote development of a grading system for existing buildings.



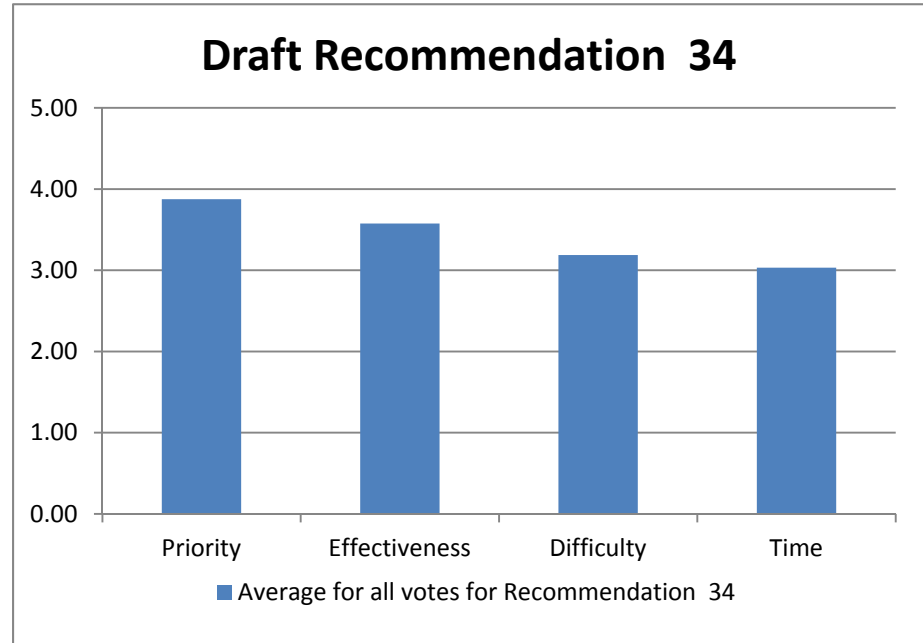
**D.5.33 Draft Recommendation 33**

Demonstrate an understanding of building codes as a requirement for registration or licensing (added by Workshop attendees).



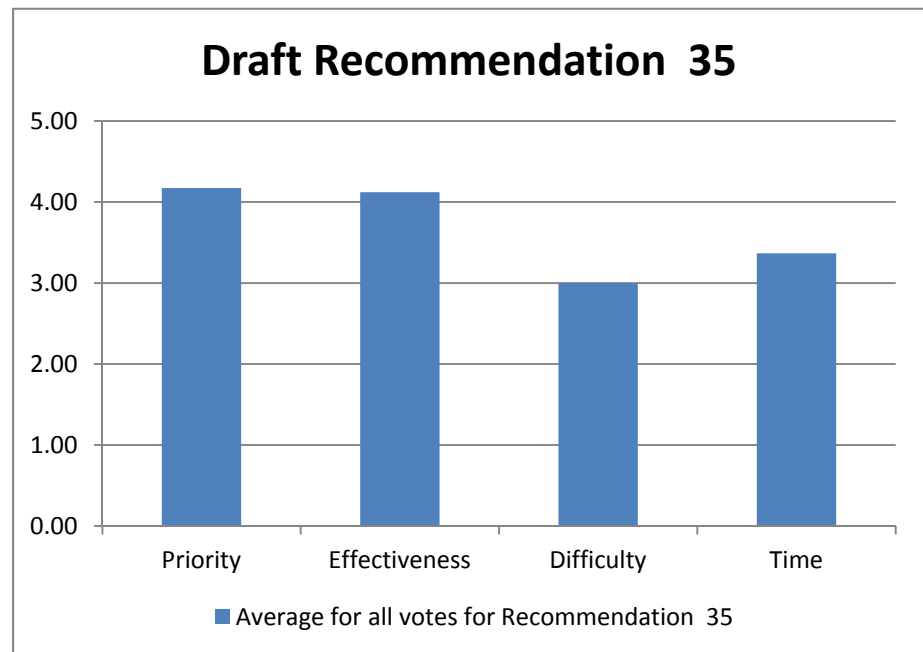
**D.5.34 Draft Recommendation 34**

Use existing Federal technical assistance mechanisms for resilience and disaster recovery to address gaps in local planning capacity that will enable adoption and enforcement of building codes (added by Workshop attendees).



**D.5.35 Draft Recommendation 35**

Identify strategies to strengthen building code administration and enforcement in jurisdictions (added by Workshop attendees).



## Appendix E

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# Conversion of Preliminary Draft Recommendations to Final Recommendations

Immediately following the Second Project Workshop, the Project Technical Committee held its second project meeting at the ATC Office in Arlington, Virginia. The PTC reviewed the draft recommendations, results of the voting process, and comments made during the workshop as well as comments submitted in writing. The PTC agreed to restate some of the recommendations as over-arching considerations, to combine some recommendations, and (in a few instances) to eliminate recommendations with low voting results. Fifteen final recommendations emerged from the Committee's work. They were organized into the following three topical areas:

- Building Code Education, Training and Outreach,
- Technical and Economic Studies by (or Sponsored by) Federal Agencies, and
- Agency Leadership, Cooperation and Coordination.

### **E.1 Overarching Considerations**

The Project Technical Committee also identified five overarching considerations for Federal agencies to be mindful of in undertaking the recommended strategies and approaches, as follows:

1. The Federal government has an obligation to “lead by example” in adopting and utilizing the most current model building codes.
2. Existing Federal programs should be used first (ahead of creating new programs).
3. Federal agencies must proactively engage personnel and program resources whenever and wherever possible, including those from the headquarters and regional offices closest to State and local governments.
4. Sustained interagency collaboration and coordination is necessary to harmonize Federal policy and program requirements related to building

code adoption and implementation, within and between Federal agencies, both pre- and post-disaster.

5. Although outside the scope of this project, the Federal government should use its substantial leverage in promoting good land-use planning, building code enforcement, and compliance practices, at both the State and local levels, especially post-disaster.

*[These overarching considerations were drawn from the former preliminary draft Recommendations #20, part of #23, #25, #28, and #35.]<sup>2</sup>*

## **E.2 Recommendations for Building Code Education, Training and Outreach**

These recommendations address the need to enhance outreach, training and education to targeted groups about the importance of building code adoption and implementation. Former recommendation #5 was dropped for consideration.

**Recommendation 1:** Support and assist the process of educating State lawmakers and local elected officials about the importance of building codes, their adoption and proper implementation.

*[Former #1 and peer-to-peer concept of #11]*

**Recommendation 2:** Support the training of building designers, building department staff, and contractors on the proper use and implementation of building codes and, as appropriate, integrate training with licensing and registration where they are required.

*[Former #2 and #33]*

**Recommendation 3:** Support the development and delivery of building code educational content (i.e., hazard science, code purpose, code development process, code use, and code enforcement) at secondary and collegiate educational levels consistent with levels attained by various disciplines and groups (i.e., construction trades, engineering, architecture and building science, construction management, public administration, finance, and real estate).

*[Former #3]*

**Recommendation 4:** Develop and conduct tailored briefings and education for Congressional leaders and staff, Federal agency legislative affairs offices, and Federal agency leaders and key staff, on the importance of building codes and Federal support for State and local building

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<sup>2</sup> *Items shown in italics are included to help clarify the changes that were made following the second workshop*

code adoption and implementation.

*[Former #6, #7, and #30]*

**Recommendation 5:** Work with the real estate, property appraisal, insurance and mortgage banking industries, and other key stakeholders (including building owners and managers) to achieve building valuations that reflect the value of hazard resistance and code-compliance.

*[Former #4, #9, and #17]*

**Recommendation 6:** Target education and outreach opportunities during the “windows of opportunity” that arise following disasters and which also coincide with disaster anniversaries and other calendar dates such as the start of hurricane season.

*[Former #10 and #12, and peer-to-peer concepts of #11]*

### **E.3 Recommendations for Technical and Economic Studies by (or Sponsored by) Federal Agencies**

The Federal government may be uniquely situated to collect and/or analyze information, assemble nationwide experts, and undertake studies that are beyond the capabilities of most States and localities. These recommendations pertain to such situations.

**Recommendation 7:** Identify and support the conduct (or update) of technical and socio-economic studies crucial to building code adoption and implementation but which may not be achievable by States and localities.

*[Former #13, #15, and #17]*

**Recommendation 8:** Develop code-compliant, engineered and performance-based solutions to fill knowledge gaps in gaps in the construction trades, building design industry and building code implementation.

*[Former #16]*

**Recommendation 9:** Assess the status of prior building code recommendations by Federal agencies, whether the recommendations were incorporated into codes and standards, and what lessons can be gleaned to improve the adoption of future agency recommendations.

*[Former #14]*

#### **E.4 Recommendations for Agency Leadership, Cooperation and Coordination**

Federal agencies have different missions and authorities, and some have different requirements for similar activities. Federal agencies may interact with each other and outside groups in different ways, both pre- and post-disaster. These recommendations address how Federal agencies can enhance leadership and interagency coordination and collaboration to assist in the building code development process, improve the hazard resistance of structures built to those codes, and promote building code adoption and implementation. Former recommendation #29 was dropped for consideration.

**Recommendation 10:** Support the development of pre-standards and standards that can be adopted by reference in model building codes.  
*[Former #18 and #19]*

**Recommendation 11:** Develop a Federal “one-stop location” for States and localities to access information on grant programs and funding available for building code adoption and implementation.  
*[Former #8, #21, #22, and part of #23]*

**Recommendation 12:** Review and revise, as appropriate, Federal agency policies, programs, practices and terminology, to facilitate State and local building code adoption and implementation, both pre-disaster and post-disaster.  
*[Former #11, #24, #26 and part of #23]*

**Recommendation 13:** Consider modifications to the regulations governing the application of Federal Disaster Assistance Programs, including Public Assistance (PA), Individual Assistance (IA) and the Hazard Mitigation Grant Program (HMGP), to promote State and local building code adoption and implementation. This should include both pre- and post-disaster actions and for both new and existing facilities  
*[Former #27]*

**Recommendation 14:** Promote the development of a market-based, private sector-led grading system for the hazard-related performance of buildings.  
*[Former #32]*

**Recommendation 15:** Use existing Federal programs and technical assistance to improve State and local planning capacity for disaster recovery and resilience, including consideration for building code

adoption and implementation.

*[Former #34]*

## **E.5 Prioritization of Recommendations**

Utilizing the voting results from the second workshop, the PTC sorted and ranked the final fifteen recommendations. While some of the final fifteen recommendations were not voted on at the Second Project Workshop, the voting tallies for their constituent parts were used to infer opinions regarding priority and effectiveness of the final recommendations. Distinctions were made between the prioritization of recommendations that can only be implemented by and between Federal agencies and those recommendations that will involve non-Federal stakeholders and may or may not involve Federal agencies.



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FEMA, 1991, *NEHRP Recommended Provisions for the Development of Seismic Regulations for New Buildings, 1991 Edition*, FEMA 222 Report, prepared for the Federal Emergency Management Agency by the Building Seismic Safety Council, Washington, DC.

ICC, 2003, *International Building Code*, International Code Council, Washington, DC.

SBCCI, 1999, *Standard Building Code*, Southern Building Code Congress International, Birmingham, Alabama.



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