

# Building Resilience: FEMA's Building Codes Policies and Considerations for Congress

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## Building Resilience: FEMA's Building Codes Policies and Considerations for Congress

The built environment plays a critical role in determining the severity of a natural hazard's impact on a community. How many lives are lost, how long a recovery takes, and how many dollars would be needed if rebuilding often depends upon the structural integrity of the buildings struck by the tornado, hurricane, fire, earthquake, flood, or other natural disaster. For this reason, experts and agencies promoting hazard resiliency often focus on the development, adoption, and enforcement of hazard-resilient building codes and design standards.

In recent years, Congress has increasingly acknowledged how buildings and building codes may determine the expense and severity of a disaster. Yet the federal government exercises little direct control over building codes. In general, subfederal governments exercise authority over how building codes are developed, adopted, and enforced.

Congress has authorized the Federal Emergency Management Agency (FEMA) to utilize a range of policy tools that may promote a resilient built environment and enforcement of hazard-resistant building codes despite the limitations on federal authorities. Under both longstanding and recently enacted statutory authorities, FEMA may provide funding to states and localities to adopt and enforce hazard-resilient building codes, require that federally-funded reconstruction efforts adhere to recent hazard-resistant building codes, and restrict federal funding to rebuild in certain hazard-prone areas. FEMA has, in turn, recently taken a range of actions to promote the adoption and enforcement of hazard-resistant building codes across the country, and monitored the weakening or absence of building codes at the subfederal level.

FEMA's authorities with respect to building codes have generated a number of policy discussions. Issues facing the 118<sup>th</sup> Congress include determining the proper role of the federal government in building code and land use policy, how to develop hazard-resistant building codes in an age of climate change, and how to ensure that code requirements align with FEMA's goals to promote equitable disaster recovery and ensure the fair treatment of survivors.

Congress has seen significant legislation introduced in recent years to address the causes and consequences of climate change—including appropriations and new authorities that enhance FEMA's building code policies and related activities. Several recent hearings dedicated to FEMA oversight have centered on the agency's response to the hazards that climate change may intensify or make more frequent. In addition, FEMA itself has made climate adaptation a top priority in its *FY2022-26 Strategic Plan*. Congress's potential enhancement of these authorities and oversight of existing authorities could strengthen FEMA's role in promoting hazard-resistant building code compliance or, conversely, modify or limit FEMA's work in this policy area. This report summarizes this background, discusses FEMA's role in building code adoption and compliance, and offers relevant considerations for Congress.

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## Introduction

In 1990, a representative of the Federal Emergency Management Agency (FEMA) testified before Congress that “earthquakes do not kill people, the built environment does.”<sup>1</sup> This saying, as well as similar sentiments, has been included in testimony since at least 1973, well before FEMA existed.<sup>2</sup> According to seismologists and other experts, it is not seismic shaking but “the collapse or failure of ... structures ... that ... kill most of the people in an earthquake.”<sup>3</sup> Emergency managers and engineers have long echoed the point that the nature of the built environment often determines the severity of a disaster no matter whether the inciting event is an earthquake, hurricane, flood, or fire. How buildings withstand seismic shaking, high winds, floodwaters, or falling embers may determine the number of casualties, how long the power is out, and how many millions of dollars would be needed if rebuilding. The potential for hazards to become dangerous, disruptive, or costly often depends on where and how people build.<sup>4</sup>

Nearly one-third of the U.S. housing stock is considered to be at high risk of a natural disaster.<sup>5</sup> Given that Americans are estimated to spend approximately 90% of their time indoors,<sup>6</sup> individuals are most likely to experience a hazard inside of a building. The impacts of natural hazards are expected to increase during the useful lifetime of much existing and new U.S. property and infrastructure,<sup>7</sup> placing an increasing burden on federal, state, and local governments, as well as individuals and businesses.

For these reasons, FEMA and other federal agencies have long stressed the importance of hazard-resistant building codes and land use policy as a means to mitigate disaster losses. The federal government, however, exercises limited control over such codes and policies. The authority to adopt, administer, and enforce building codes and facilitate land use largely resides with state, tribal, territory, and local governments (SLTTs), which do not consistently exercise these authorities. FEMA has found most jurisdictions lack hazard-resistant codes, and 35 states received FEMA's lowest ranking for adopting hazard-resistant building codes.<sup>8</sup>

To encourage resilience, Congress has authorized FEMA and other federal officials to incentivize SLTT adoption and enforcement of hazard-resistant building codes and land use policies, and to

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<sup>1</sup> Statement of Grant C. Peterson, Federal Emergency Management Agency (FEMA), U.S. Congress, House Committee on Banking, Finance and Urban Affairs, Subcommittee on Policy Research and Insurance, *Earthquakes and Earthquake Insurance*, hearing, 101<sup>st</sup> Cong., 2<sup>nd</sup> sess., February 7, 1990, p. 82.

<sup>2</sup> See, for example, Statement of State of California State Geologist Wesley Bruer, U.S. Congress, Senate Committee on Commerce, Subcommittee on Oceans and Atmosphere, *Earthquakes*, hearings, 93<sup>rd</sup> Cong., 1<sup>st</sup> sess., April 26-27, 1973, p. 101 (hereinafter Senate Oceans and Atmosphere, *Earthquakes*); U.S. Congress, House Committee on Appropriations, *Department of the Interior and Related Agencies Appropriations for 1990*, hearings, 101<sup>st</sup> Cong., 1<sup>st</sup> sess., March 2, 1989, p. 570.

<sup>3</sup> Senate Oceans and Atmosphere, *Earthquakes*, p. 99.

<sup>4</sup> See, for an exemplary discussion of this point, Ian Kelman, *Disaster by Choice: How Our Actions Turn Natural Hazards Into Catastrophes* (New York: Oxford University Press, 2022).

<sup>5</sup> CoreLogic, “Risk Redefined: CoreLogic Climate Change Catastrophe Report Emphasizes Need to Address Increasing Frequency of Hazard Events,” January 27, 2021, <https://www.corelogic.com/press-releases/risk-redefined-corelogic-climate-change-catastrophe-report-emphasizes-need-to-address-increasing-frequency-of-hazard-events/>.

<sup>6</sup> U.S. Environmental Protection Agency (EPA), “The Inside Story: A Guide to Indoor Air Quality,” <https://www.epa.gov/indoor-air-quality-iaq/inside-story-guide-indoor-air-quality>.

<sup>7</sup> Multihazard Mitigation Council, National Institute of Building Sciences, *Natural Hazard Mitigation Saves*, 2017 Interim Report, Washington, DC, December 2017, p. 17, [https://www.fema.gov/sites/default/files/2020-07/fema\\_ms2\\_interim\\_report\\_2017.pdf](https://www.fema.gov/sites/default/files/2020-07/fema_ms2_interim_report_2017.pdf).

<sup>8</sup> FEMA, “2023 Building Code Adoption Tracking Overview,” March 2023, [https://www.fema.gov/sites/default/files/documents/fema\\_bcat-report-about\\_fy2023.pdf](https://www.fema.gov/sites/default/files/documents/fema_bcat-report-about_fy2023.pdf).

require code compliance in federally funded projects. For its part, FEMA has expanded agency efforts to promote the use of hazard-resistant codes, design, and land use to reduce the risk of human casualty and structural damage. May has been observed as National Building Safety Month for several years,<sup>9</sup> advocating the importance of building codes.

The 118<sup>th</sup> Congress faces fundamental questions regarding the built environment in the face of more numerous, costly, and disruptive disasters. Where is it wise to build? How should buildings in hazardous locations be constructed? The 118<sup>th</sup> Congress may decide how the federal government engages with these questions, promotes a hazard-resilient built environment, and reduces future disaster-related losses.

### Terms

**Building Codes**—Building codes are officially adopted comprehensive specifications regulating building construction, materials, and performance to protect the public health, safety, and welfare.<sup>10</sup> Building codes may reference more than one design standard.

**Design Standard**—A design standard is a specified criteria or standard that dictates that a provision, practice, requirement, or limit be met;<sup>11</sup> for example, the use of the 1% annual chance flood or the degree of protection of a structural project.

**Code Development, Adoption, Administration, Enforcement**—Building code **development** refers to the process of authoring, revising, and approving building codes. **Adoption** refers to a government's codification of a given set of building codes as legally required minimum standards within a given jurisdiction. **Administration and enforcement** refers to permitting, certification of compliance and occupancy, fee collection, training and employing relevant staff, inspection, monitoring of unpermitted activities, identification of corrective action, and similar activities.

**Natural hazards**—FEMA defines natural hazards as environmental phenomena that have the potential to impact societies and the human environment. Hazardous weather and climate events include severe storms, tropical cyclones, drought, wildfires, and extreme heat or cold. Other natural hazards include avalanche, earthquake, landslide, tsunami, and volcanic activity. FEMA distinguishes between natural hazards and natural disasters, which the agency defines as the negative impact following an actual occurrence of a natural hazard in the event that it significantly harms a community.<sup>12</sup>

## Value of Building Codes

The federal government has allocated increasing resources to disaster relief and recovery,<sup>13</sup> and the Government Accountability Office (GAO) has found that the rising number of natural disasters and increasing reliance on the federal government for response and recovery assistance is a key source of federal fiscal exposure.<sup>14</sup> In the United States, as in many countries, these increasing costs can be attributed to a combination of factors, including increased development in

<sup>9</sup> See, for example, International Code Council, *2023 Building Safety Month: It Starts with You!* <https://www.iccsafe.org/advocacy/building-safety-month/building-safety-month/>.

<sup>10</sup> Federal Emergency Management Agency, *Glossary*, Building Codes Toolkit, February 7, 2013, p. 1, [https://www.fema.gov/media-library-data/20130726-1903-25045-7477/building\\_codes\\_toolkit\\_glossary.pdf](https://www.fema.gov/media-library-data/20130726-1903-25045-7477/building_codes_toolkit_glossary.pdf).

<sup>11</sup> James M. Wright, *Regulatory and Design Standards for Reducing Losses*, Federal Emergency Management Agency, Floodplain Management: Principles and Current Practices, 2021, p. 13-1, <https://training.fema.gov/hiedu/aemrc/courses/coursetreat/fm.aspx>.

<sup>12</sup> FEMA, *National Risk Index, Natural Hazards*, <https://hazards.fema.gov/nri/natural-hazards>.

<sup>13</sup> See, for example, U.S. Government Accountability Office, *Federal Disaster Assistance: Federal Departments and Agencies Obligated at Least \$277.6 Billion During Fiscal Years 2005 Through 2014*, GAO-16-797, September 22, 2016, <https://www.gao.gov/assets/gao-16-797.pdf>; and CRS Report R45484, *The Disaster Relief Fund: Overview and Issues*, by William L. Painter.

<sup>14</sup> GAO, *Climate Change: A Climate Migration Pilot Program Could Enhance the Nation's Resilience and Reduce Federal Fiscal Exposure*, GAO-20-488, July 6, 2020, pp. 1-2, <https://www.gao.gov/assets/gao-20-488.pdf>.

areas that are susceptible to natural hazards, rising property values in hazardous areas, and climatological and environmental changes. The role of inadequate building codes is less frequently considered a contributor to natural disaster losses, despite long-standing information that may support this connection. For example, although South Florida had one of the strongest building codes in the nation in 1992, a quarter of the \$16 billion in insured losses from Hurricane Andrew were attributed to Dade County's failure to enforce its building code.<sup>15</sup> Subsequent research revealed that the construction practices in place at the time were not only insufficient to withstand the powerful winds, but had also magnified the damage.<sup>16</sup> Thirty years later, studies of damage from Hurricane Ian in southwest Florida found that residential buildings constructed to the 2002 Florida Building Code or later suffered minimal observable structural damage from either wind or storm surge, even during a historic storm surge of the magnitude induced by Hurricane Ian.<sup>17</sup>

Experts have also pointed out how hazard-resistant building codes reduce earthquake damage. In 2010, both Chile and Haiti were hit by major earthquakes. The magnitude 7 earthquake<sup>18</sup> in Haiti killed an estimated 220,000 people, injured 300,000, and left 1.5 million homeless. The much stronger magnitude 8.8 earthquake<sup>19</sup> in Chile killed less than 800 people, most due to the resulting tsunami, and caused relatively little structural damage.<sup>20</sup> Some of the difference in outcomes might be attributable to variations in seismic and site characteristics, while much of the difference in casualties and structural damage has been attributed to the adoption and enforcement of strong building codes in Chile, in contrast to the virtually non-existent and poorly enforced building codes in Haiti.<sup>21</sup>

The National Institute of Building Sciences also emphasized the importance of building codes in a widely cited study which found that adopting the most recent building code could save \$11 for

<sup>15</sup> Multi-Hazard Mitigation Council, National Institute of Building Sciences, *Natural Hazard Mitigation Saves*, 2017 Report, Washington, DC, p. 80, [https://www.fema.gov/sites/default/files/2020-07/fema\\_ms2\\_interim\\_report\\_2017.pdf](https://www.fema.gov/sites/default/files/2020-07/fema_ms2_interim_report_2017.pdf).

<sup>16</sup> Paul Fronstin and Alphonse G. Holtmann, "The Determinants of Residential Property Damage Caused by Hurricane Andrew," *Southern Economic Journal*, vol. 61, no. 2 (October 1994), pp. 387-397; and Edward L. Keith and John D. Rose, "Hurricane Andrew - Structural Performance of Buildings in South Florida," *Journal of Performance of Constructed Facilities*, vol. 8, no. 3 (August 1994), pp. 178-191.

<sup>17</sup> David O. Prevatt, David B. Roueche, and Kurtis R. Gurley, *Survey and Investigation of Buildings Damaged by Category III, IV, and V Hurricanes in FY 2022-2023—Hurricane Ian*, Engineering School of Sustainable Infrastructure and Environment, Department of Civil and Coastal Engineering, University of Florida, Report No. 02-23 for Florida Department of Business and Professional Regulation, Gainesville, FL, June 13, 2023, pp. 20, 34, [https://www.floridabuilding.org/fbc/commission/FBC\\_0623/Prevatt-Hurricane\\_Ian\\_Building\\_Damage\\_Observation\\_in\\_FY\\_2022-2023\\_Final](https://www.floridabuilding.org/fbc/commission/FBC_0623/Prevatt-Hurricane_Ian_Building_Damage_Observation_in_FY_2022-2023_Final). See also Jeff Zbar, *How Newer-Construction Homes Fared in Florida's Hurricane Season*, Urban Land, March 17, 2023, <https://urbanland.uli.org/public/building-for-resilience-how-newer-construction-homes-fared-in-floridas-hurricane-season/>; and Scott Neuman, *One Florida Community Build to Weather Hurricanes Endured Ian with Barely a Scratch*, NPR, October 6, 2022, <https://www.npr.org/2022/10/05/1126900340/florida-community-designed-weather-hurricane-ian-babcock-ranch-solar>.

<sup>18</sup> The Moment Magnitude,  $M_W$ , is an indicator of the amount of energy released during an earthquake. The  $M_W$  scale is logarithmic, with an increase of one step corresponding to a tenfold increase in the measured amplitude of the ground motion of the earthquake, and 32 times more energy release. In other words, an  $M_W$  8.0 earthquake releases 32 times more energy than an  $M_W$  7.0 earthquake. For more information on how earthquakes are measured, see CRS Report RL33861, *Earthquakes: Risk, Detection, Warning, and Research*, by Peter Folger.

<sup>19</sup> A magnitude 8.8 earthquake releases 500 times as much energy as a magnitude 7 earthquake. See United States Geological Survey, "How Much Bigger?" *Calculator*, <https://earthquake.usgs.gov/education/calculator.php>.

<sup>20</sup> International Tsunami Information Center, February 27, 2021,  $M_W$  8.8, Off Central Chile, [http://itic.ioc-unesco.org/index.php?option=com\\_content&view=article&id=1667:27-february-2010-mw-88-off-central-chile](http://itic.ioc-unesco.org/index.php?option=com_content&view=article&id=1667:27-february-2010-mw-88-off-central-chile).

<sup>21</sup> See, for example, Richard A. Lovett, "Why Chile Fared Better Than Haiti," *Nature*, March 1, 2010, <https://www.nature.com/articles/news.2010.100>; and Michael K. Lindell, "Built-in Resilience," *Nature Geoscience*, vol. 3 (October 24, 2021), pp. 739-740, <https://www.nature.com/articles/ngeo998>.



every dollar invested in hazard-resistant codes and standards, and above-code design could save \$4 for each dollar invested. The study also found that adopting the 2015 International Code Council building codes added about 1% in costs relative to 1990 standards.<sup>22</sup>

## Building Codes and FEMA: Background

### State, Local, Federal, and Nonfederal Roles

#### Role of the International Code Council and Code-Development Organizations

In 1994, the three groups publishing model codes merged to form the International Code Council (ICC),<sup>23</sup> which published the first *International Building Code* in 1995.<sup>24</sup> The ICC continues to develop and publish model codes and guides to building practices that are now adopted, adapted, and enforced at the state, territorial and local level.<sup>25</sup> The ICC's "family" of I-Codes includes codes for different types of dwellings (e.g., residential, new, existing structures), and was most recently updated in 2021.<sup>26</sup>

#### Federal Role

In the last decades of the twentieth century, the federal government—including FEMA—helped to develop and promote hazard-resistant building codes promulgated by the ICC and other code-developing organizations like the American Society of Civil Engineers (ASCE).<sup>27</sup>

The federal government continues to collaborate with the ICC and similar organizations to help develop, revise, and promote hazard-resistant model building codes.<sup>28</sup> The ICC updates I-Codes on a three-year cycle and includes hearings and opportunities for public comment.

**State and Local Roles** Most states and local jurisdictions adopt model codes that are created on a national or international level by standards-developing organizations like the ICC, and amend them where needed prior to adoption into state laws and local ordinances. Building codes are administered at a community level; the federal government cannot mandate the level of code enforcement in states or communities. Some states have adopted statewide building codes that apply to virtually every type of structure while others employ lesser degrees of regulation and code applicability. Statewide codes sometimes allow certain individual jurisdictions (e.g., cities or

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<sup>22</sup> National Institute of Building Sciences, *Natural Hazard Mitigation Saves: 2019 Report*, Washington, DC, 2019, pp. 37-39, [https://www.nibs.org/files/pdfs/NIBS\\_MMC\\_MitigationSaves\\_2019.pdf](https://www.nibs.org/files/pdfs/NIBS_MMC_MitigationSaves_2019.pdf).

<sup>23</sup> These were Building Officials and Code Administrators International, Inc., International Conference of Building Officials, Inc., and Southern Building Code Congress, Inc. (Steve Thomas, *Building Code Essentials: Based on the 2016 International Building Code*, International Code Council, 2015 edition, pp. 3-4).

<sup>24</sup> Ibid; International Code Council, "About," <https://global.iccsafe.org/about/>.

<sup>25</sup> For detailed discussion of building codes and hazard-resistant design, see CRS Report R47215, *Hazard-Resilient Buildings: Sustaining Occupancy and Function After a Natural Disaster*, by Linda R. Rowan.

<sup>26</sup> Federal Emergency Management Agency, *Building Codes Fact Sheet*, Building Codes Toolkit, February 5, 2013, p. 1, [https://www.fema.gov/media-library-data/20130726-1903-25045-6866/building\\_codes\\_toolkit\\_fact\\_sheet.pdf](https://www.fema.gov/media-library-data/20130726-1903-25045-6866/building_codes_toolkit_fact_sheet.pdf).

<sup>27</sup> FEMA, *Building Code Strategy*, March 2022, p. 41 (hereinafter FEMA, *Building Codes Strategy*), available at [https://www.fema.gov/sites/default/files/documents/fema\\_building-codes-strategy.pdf](https://www.fema.gov/sites/default/files/documents/fema_building-codes-strategy.pdf).

<sup>28</sup> FEMA, *Building Code Strategy*, p. 41.



a particular class of counties) to deviate from the standard, weakening the model minimum code in response to objections based on the cost of compliance.<sup>29</sup>

## **Building Codes Adoption and Enforcement Shortfalls**

Nearly two-thirds of Americans live in communities that have not adopted the latest model building codes,<sup>30</sup> and many jurisdictions do not consistently adopt and enforce building codes—leading to significant threats to public health and individual safety—particularly in the face of a hazard.<sup>31</sup> According to FEMA, 35% of localities across the country have adopted “modern building codes without weakening the natural hazard-resistant provisions.”<sup>32</sup> Most inhabitants are unaware that they may live in substandard, vulnerable structures, which increases the risk of damage and casualty.<sup>33</sup> Further, FEMA has found that a majority of areas with natural hazard risk in the United States have not adopted current versions of hazard-resistant building codes.<sup>34</sup> In many regions, low-income or otherwise socially vulnerable households are more likely to live in areas of higher risk to natural hazards.<sup>35</sup> In addition, the U.S. Surgeon General has found that socially vulnerable populations, including individuals with low-incomes, identifying as racial or ethnic minorities, and those with disabilities, are more likely to live in substandard housing.<sup>36</sup> Often citing these risks, FEMA advocates for the adoption, strengthening, and enforcement of SLTT building codes.<sup>37</sup>

Many jurisdictions particularly struggle to adopt and adequately enforce codes in the wake of a disaster. Local officials may face a large number of damaged structures and a high volume of permit applications, and there may be pressure on local officials to waive requirements that are perceived to hamper rapid reconstruction or “getting back to normal.”<sup>38</sup> The sudden, widespread increase in building activity, loss or displacement of workers, and other factors may lead to personnel shortfalls. For this reason, some jurisdictions have established mutual aid agreements to

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<sup>29</sup> Insurance Institute for Business and Home Safety (IBHS), *The Benefit of Statewide Building Codes*, [https://ibhs.org/wp-content/uploads/2019/01/The-Benefits-of-Statewide-Building-Codes\\_IBHS.pdf](https://ibhs.org/wp-content/uploads/2019/01/The-Benefits-of-Statewide-Building-Codes_IBHS.pdf).

<sup>30</sup> The White House, “A Proclamation on National Building Safety Month, 2023,” press release, April 28, 2023, <https://www.whitehouse.gov/briefing-room/presidential-actions/2023/04/28/a-proclamation-on-national-building-safety-month-2023/>.

<sup>31</sup> See James Chauvin et al., “Building Codes: An Often Overlooked Determinant of Health,” *Journal of Public Health Policy*, vol. 37, no. 2 (May 2016), pp. 136-148.

<sup>32</sup> FEMA, *Building Codes Strategy*, p. 6.

<sup>33</sup> *Ibid.*

<sup>34</sup> FEMA, *Building Codes Adoption Playbook*, p. 3.

<sup>35</sup> Rachel M. Gregg and Kathryn N. Braddock, *Climate Change and Displacement in U.S. Communities*, EcoAdapt, April 2020, pp. 17-18, <http://www.sparcchub.org/wp-content/uploads/2020/04/Climate-Change-and-Displacement-in-U.S.-Communities.pdf>.

<sup>36</sup> U.S. Surgeon General, *Call to Action to Promote Healthy Homes*, 2009, [https://www.ncbi.nlm.nih.gov/books/NBK44192/pdf/Bookshelf\\_NBK44192.pdf](https://www.ncbi.nlm.nih.gov/books/NBK44192/pdf/Bookshelf_NBK44192.pdf).

<sup>37</sup> The third of three primary goals driving FEMA’s *Building Codes Strategy*, released March 2022, is to drive public action on building codes.

<sup>38</sup> See, for example, Peter Belfiore, “Over Five Years After Sandy, Town of Hempstead Homeowners Are Told They Must Elevate,” *LIHerald*, June 18, 2018, <https://www.liherald.com/stories/over-five-years-after-hurricane-sandy-town-of-hempstead-homeowners-are-told-they-must-elevate,104307>; and Derek Gilliam, “FEMA Rule Could Mean Many Can’t Afford to Rebuild After Hurricane Ian,” *Sarasota Herald-Tribune*, November 22, 2022, <https://www.heraldtribune.com/story/weather/hurricane/2022/11/22/fema-rule-impacting-thousands-across-southwest-florida/10711118002/>.

allow building departments to augment staff in times of need. FEMA encourages and tracks such agreements.<sup>39</sup>

## **Developing Hazard-Resistant Codes in an Age of Climate Change**

### **Reliance on Historic Hazard Data**

In general, existing building codes and standards in the United States are designed to respond to risks of hazards based on current and historic climate conditions. For example, the ICC codes, or I-Codes, that FEMA often considers the “consensus-based codes” to which many FEMA-funded projects must be rebuilt are currently updated every three years. The use of consensus-based codes, specifications, and standards may not necessarily incorporate the latest hazard-resistant design,<sup>40</sup> and that design may not provide sufficient protection against extreme events or future conditions.

Standard-developing organizations generally have not used forward-looking climate information, relying instead on historical observations rather than incorporating long-term planning for climate hazards or employ climate projections. Further, standards-developing organizations vary in whether they update the climate information in design standards, building codes, and voluntary certifications on a regular basis.<sup>41</sup> Recent increases in the frequency and intensity of extreme weather events attributed to climate change,<sup>42</sup> coupled with the use of historical data, means that the codes may more accurately reflect historical dangers than current or future risk.<sup>43</sup>

For example, the International Building Code allows for some degree of protection against sea level rise in its elevation requirements, but the ICC recognizes that the code may need to evolve to respond to changing risk.<sup>44</sup> Since 2015, the I-Codes have required at least one foot of freeboard

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<sup>39</sup> FEMA, “Mutual Aid for Building Departments,” [https://www.fema.gov/sites/default/files/documents/fema\\_mabd\\_overview\\_2022.pdf](https://www.fema.gov/sites/default/files/documents/fema_mabd_overview_2022.pdf).

<sup>40</sup> FEMA, “Consensus-Based Codes, Specifications and Standards for Public Assistance,” FEMA Recovery Interim Policy FP-104-009-11, Version 2, December 2019, p. 10, [https://www.fema.gov/sites/default/files/2020-05/DRRA1235b\\_Consensus\\_BasedCodes\\_Specifications\\_and\\_Standards\\_for\\_Public\\_Assistance122019.pdf](https://www.fema.gov/sites/default/files/2020-05/DRRA1235b_Consensus_BasedCodes_Specifications_and_Standards_for_Public_Assistance122019.pdf). For example, FEMA defines a hazard-resistant building code as a “building code with provisions that provide a minimum level of building protection against natural hazards,” and considers a community to be hazard resistant if it adopts either of the two most recent editions of the International Code Council’s ICC codes without weakening provisions related to flood, hurricane wind, and seismic hazards. FEMA, *Building Codes Saves: A Nationwide Study*, November 2020, p. xi and p. 3-4, [https://www.fema.gov/sites/default/files/2020-11/fema\\_building-codes-save\\_study.pdf](https://www.fema.gov/sites/default/files/2020-11/fema_building-codes-save_study.pdf).

<sup>41</sup> GAO, *Climate Change: Improved Federal Coordination Could Facilitate Forward-Looking Climate Information in Design Standards, Building Codes, and Certifications*, GAO-17-3, November 2016, p. 14, <https://www.gao.gov/products/GAO-17-3>.

<sup>42</sup> See for example, K. Hayhoe et al., “Our Changing Climate,” in *Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment*, vol. 2., U.S. Global Change Research Program, 2018, 10.7930/NCA4.2018.CH2.

<sup>43</sup> Global Resiliency Dialogue, *Delivering Climate Responsive Resilient Building Codes and Standards*, Findings from the Global Resiliency Dialogue Survey of Building Code Stakeholders in Canada, Australia, New Zealand, and the United States, November 2021, p. 18, [https://www.iccsafe.org/wp-content/uploads/Global\\_Resiliency\\_Dialogue\\_Second\\_Survey\\_Report-USA-Oct\\_2021.pdf](https://www.iccsafe.org/wp-content/uploads/Global_Resiliency_Dialogue_Second_Survey_Report-USA-Oct_2021.pdf).

<sup>44</sup> International Code Council, *Resilience Contributions of the International Building Code*, White Paper, October 24, 2019, p. 9, [https://www.iccsafe.org/wp-content/uploads/19-17804\\_IBC\\_Resilience\\_WhitePaper\\_FINAL\\_HIRES.pdf](https://www.iccsafe.org/wp-content/uploads/19-17804_IBC_Resilience_WhitePaper_FINAL_HIRES.pdf). The ICC participates in the Global Resiliency Dialogue (GRD), a joint initiative with research organizations from Australia, Canada, New Zealand, and the United States. The GRD is working to inform the development of building codes that draw on both building science and climate science to improve the resilience of buildings and communities to intensifying risks from weather-related natural hazards. ICC, *Global Resiliency Dialogue*, <https://www.globalresiliency.org/>.

be incorporated into elevation requirements,<sup>45</sup> designed with reference to the elevation of current assessments of the 1%-annual-chance flood (a flood event with a 1% chance of being equaled or exceeded in a given year).<sup>46</sup> This risk calculation does not account for changes in water level and hazard probability associated with climate change and extreme events. For example, one study found that as sea level rises, by the late 21<sup>st</sup> century the historical 100-year flood would occur annually in New England and Mid-Atlantic regions and every 1-30 years in the southeast Atlantic and Gulf of Mexico regions.<sup>47</sup>

## **Incorporating Climate Risk into Building Standards**

The I-Codes used throughout the United States are developed through a consensus-based process; because changes to the I-Codes cannot be unilaterally mandated, the ICC is considering potential strategies that align with the current format of the codes. These include an overlay document (standard or guideline) that communities seeking to address future climate risk can adopt alongside their code, or the development of a stand-alone standard that addresses the process that jurisdictions can use to factor climate change into their codes. Some local jurisdictions, including New York City and Southeast Florida, have developed design guidance that addresses climate risk. In New York this guidance currently applies to municipal buildings but may be extended to all buildings in the future. Local governments in Southeast Florida have developed common sea level rise projections that can be incorporated into zoning or building code requirement.<sup>48</sup>

An example of enhanced hazard-resistant standards are the FORTIFIED Home performance-based engineering and building standards developed by the Insurance Institute for Business and Home Safety (IBHS), a regular partner of FEMA on building-code related efforts.<sup>49</sup> These standards are designed to help strengthen new and existing homes through the installation of specific building upgrades that reduce damage from hurricanes, hailstorms, low-level tornadoes, and severe thunderstorms.<sup>50</sup> Each of the FORTIFIED standards provides three optional levels to exceed I-Code design requirements.

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<sup>45</sup> FEMA defines freeboard as an additional amount of height above the Base Flood Elevation used as a factor of safety in determining the level at which a structure's lowest floor must be elevated or floodproofed to be in accordance with the state or community floodplain management standards. See FEMA, "Freeboard," <https://www.fema.gov/glossary/freeboard>. The Base Flood Elevation (BFE) is defined as the water surface elevation of the base flood, which is the 1%-annual-chance flood, commonly called the 100-year flood. The probability is 1% that rising water will reach BFE heights in any given year.

<sup>46</sup> The area that will be inundated by the 1%-annual-chance flood is known as the Special Flood Hazard Area (SFHA).

<sup>47</sup> Reza Marsooli, Ning Lin, Kerry Emanuel, et al., "Climate Change Exacerbates Hurricane Flood Hazards Along US Atlantic and Gulf Coasts in Spatially Varying Patterns," *Nature Communications*, vol. 10 (August 1, 2019), <https://www.nature.com/articles/s41467-019-11755-z>.

<sup>48</sup> Global Resiliency Dialogue, *The Use of Climate Data and Assessment of Extreme Weather Event Risks in Building Codes Around the World: Survey Findings from the Global Resiliency Dialogue*, January 2021, pp. 6-7, [https://www.iccsafe.org/wp-content/uploads/21-19612\\_CORP\\_CANZUS\\_Survey\\_Whitepaper\\_RPT\\_FINAL\\_HIRES.pdf](https://www.iccsafe.org/wp-content/uploads/21-19612_CORP_CANZUS_Survey_Whitepaper_RPT_FINAL_HIRES.pdf).

<sup>49</sup> The Insurance Institute for Business and Home Safety (IBHS) is a non-profit organization supported by property insurers and reinsurers that conducts research to identify and promote the most effective ways to strengthen buildings and communities against natural disasters and other causes of loss. See <https://disastersafety.org/> for further information. FEMA signed an MOU with the organization in November 2022 (FEMA, "FEMA Building Science," newsletter, Jan. 24, 2023). The two entities have collaborated on previous efforts, like funding previous iterations of *Natural Hazard Mitigation Saves* reports.

<sup>50</sup> The IBHS has not developed FORTIFIED standards for floods.

## Federal Authorities and Limitations

Several statutes authorize the federal government to undertake actions to develop and strengthen model building codes and promote subfederal adoption of updated codes. **Table 1** lists key authorities relevant to hazard-resistant building design, post-disaster rebuilding, and FEMA.

**Table 1. Key FEMA Authorities Related to Building Codes and Standards**

1968, enactment of the National Flood Insurance Act of 1968 (P.L. 90-488.)	Directed the Secretary of Housing and Urban Development (HUD, which administered the National Flood Insurance Program prior to FEMA's creation) to make federal flood insurance available in areas where "permanent land use and control measures ... have been adopted." <sup>51</sup> Furthermore, rates established for the program incorporate "risks due to land use measures, flood-proofing,... and similar measures," <sup>52</sup> and insurance is not available for property in violation of state or local laws, regulations, or ordinances restricting development in flood-prone areas. The act further authorized the Secretary of HUD (now the FEMA Administrator) to analyze state and local land use, flood control, zoning, and mitigation measures in flood-prone areas, and on the basis of these studies, develop criteria to restrict development and mitigate risk in floodprone areas. <sup>53</sup>
1974, enactment of The Disaster Relief Act of 1974 (P.L. 93-288).	The Disaster Relief Act of 1974 authorized assistance to repair and restore disaster-damaged facilities, or alternative projects, "in conformity with current applicable codes, specifications, and standards." <sup>54</sup> President Jimmy Carter created FEMA in 1979 and delegated many of these authorities to the agency. <sup>55</sup>
1977, enactment of Earthquake Hazards Reduction Act of 1977 (P.L. 95-124).	The Earthquake Hazards Reduction Act of 1977 established the National Earthquake Hazards Reduction program, which aims to develop, publish, and promote the use of model building codes to redress seismic risk. <sup>56</sup> The 1990 reauthorization directed FEMA to promote implementation of seismic building codes by nonfederal governments and in building code development organizations. <sup>57</sup>
1982, OMB publishes Circular A-119	Office of Management and Budget (OMB) Circular A-119 required federal agency to comply with building codes and standards and encouraged federal agency participation in their development. Subsequently, Congress codified these authorities in the National Technology Transfer and Advancement Act of 1995 (P.L. 104-113). OMB updated the circular in 2016.
1988, enactment of Robert T. Stafford Disaster Relief and Emergency Assistance Act	The Robert T. Stafford Disaster Relief and Emergency Assistance Act superseded the Disaster Relief Act of 1974, authorizing assistance to repair and restore disaster-damaged facilities, or alternative projects, "in conformity with current applicable codes, specifications, and standards." <sup>58</sup> FEMA administers this assistance as the "Public Assistance" program.
2000, enactment of the Disaster Mitigation Act of 2000.	The Disaster Mitigation Act of 2000 (DMA) revised the Stafford Act to require funded projects to be executed "in accordance with applicable standards of safety, decency, and sanitation and in conformity with applicable codes, specifications, and standards." <sup>59</sup> Additionally, DMA requires entities receiving assistance to demonstrate compliance.
2004, enactment of the National	The National Windstorm Impact Reduction Act established the National Windstorm Impact Reduction Program and directed FEMA to work with national building code

<sup>51</sup> Sec. 1305(c)(2) of P.L. 90-488.

<sup>52</sup> Sec. 1308(b)(1) of P.L. 90-488.

<sup>53</sup> Sec. 1361(a)-(c) of P.L. 90-488.

<sup>54</sup> Sec. 402(e)-(f) of P.L. 93-288.

<sup>55</sup> Executive Order 12148, *Federal Emergency Management* (1979), 44 *Federal Register* 43239, July 20, 1979.

<sup>56</sup> P.L. 95-124; FEMA, *Building Codes Strategy*, p. 41.

<sup>57</sup> Sec. 5(b) of P.L. 101-614.

<sup>58</sup> Sec. 402(e)-(f) of P.L. 93-288.

<sup>59</sup> Sec. 104(a) of P.L. 106-390, as it amended Sec. 323 of the Stafford Act, 42 U.S.C. §5165a.

Windstorm Reduction Act of 2004	organizations to develop relevant codes. <sup>60</sup> In 2015, Congress reauthorized the National Windstorm Impact Reduction Act and required FEMA to coordinate with the National Institute of Standards and Technology (NIST) and building code organizations to promote implementation of results and report related spending. <sup>61</sup>
2018, enactment of the Bipartisan Budget Act of 2018	The Bipartisan Budget Act of 2018 authorized the President to increase the federal cost share for funds provided to rebuild or replace eligible nonprofit and public buildings in order to incentivize resilience, including by recognizing an affected state or tribe's adoption and enforcement of the latest published editions of consensus-based codes and standards. <sup>62</sup>
2018, enactment of the Disaster Recovery Reform Act, Division D of P.L. 115-254	The Disaster Recovery Reform Act of 2018 (DRRA; Division D of P.L. 115-254) amended the Stafford Act and authorized significant new investments in predisaster mitigation, enhancing FEMA's authorities to require compliance with more rigorous building codes and standards in federally funded projects, and authorizing FEMA to provide assistance for subfederal building code adoption and enforcement. <sup>63</sup>

**Source:** Compiled by CRS, using Congress.gov and FEMA, *Building Codes Strategy*.

## Land Use Planning and Hazard Zones

Building codes define what can be built, and how, but generally do not address the question of where to build—this must be done through land use planning or zoning. The federal government does not have direct authority over local zoning and land use decisions. The regulation of land use falls under the states' police powers, which the Constitution reserves to the states, and the states delegate this power down to their respective political subdivisions.<sup>64</sup> Typically, states delegate much of their authority for zoning and land use regulation to units of local government.<sup>65</sup> Based on this delegated authority, local governments employ zoning ordinances and related regulations to restrict the location, type, and characteristics of future development and use of land under their jurisdiction.<sup>66</sup> Zoning ordinances are the main instrument to restrict and steer the development of land within the jurisdiction of a local government. Typically, they contain text-based and map-based parts that indicate permitted and conditional uses for lots.<sup>67</sup>

Planning policies can reduce risk through their control of land use and spatial configurations in cities. Zoning plans, which govern the location, type, and intensity of new development, may designate areas for specific purposes or to identify areas of high exposure. For example, by strategically directing funding for road and utility infrastructure, governments can greatly

<sup>60</sup> Sec. P.L. 108-360.

<sup>61</sup> Sec. 3 of P.L. 114-52; FEMA, *Building Codes Strategy*, pp. 40-41.

<sup>62</sup> Sec. 20606 of P.L. 115-123, as it amended Sec. 406 of the Stafford Act, 42 U.S.C. §5172.

<sup>63</sup> For detailed discussion of DRRA, see CRS Report R45819, *The Disaster Recovery Reform Act of 2018 (DRRA): A Summary of Selected Statutory Provisions*, coordinated by Elizabeth M. Webster and Bruce R. Lindsay; and CRS Report R46776, *The Disaster Recovery Reform Act of 2018 (DRRA): Implementation Updates for Select Provisions*, coordinated by Elizabeth M. Webster and Bruce R. Lindsay.

<sup>64</sup> FEMA, "National Flood Insurance Program Nationwide Programmatic Environmental Impact Statement," 82(66) *Federal Register* 17023, April 7, 2017.

<sup>65</sup> Harvard Law Review, "Addressing Challenges to Affordable Housing in Land Use Law: Recognizing Affordable Housing as a Right," *Housing Law and Policy Note*, February 10, 2022, p. 1107.

<sup>66</sup> Dudley S. Hinds, Neil G. Carn, and O. Nicholas Ordway, "What Zoning Is," in *Winning at Zoning*, ed. W. Hodson Mogan and Joseph Williams (New York: McGraw-Hill, 1979), pp. 7-8.

<sup>67</sup> Organisation for Economic Co-operation and Development (OECD), *The Governance of Land Use: Country Fact Sheet United States*, Series: OECD Regional Development Studies, May 2, 2017, p. 3, <https://www.oecd.org/regional/regional-policy/land-use-United-States.pdf>.



influence how and where communities develop.<sup>68</sup> Governments may also acquire properties in hazard-prone locations with public funds and convert them to less hazardous uses; for example, buying out homes in the floodplain and using the land for a park. This can include acquisition (of undeveloped land, development rights, or damaged buildings), transfer of development rights to safer locations, building relocation, and/or demolition of individual or multiple structures.<sup>69</sup>

## **FEMA's Authorities and Land Use Planning**

Despite its lack of direct powers to regulate land use planning on nonfederal lands, the federal government can exercise considerable influence through federal law; for example, the Endangered Species Act (P.L. 93-205), the Energy Policy Act (P.L. 102-486), the Clean Water Act (P.L. 95-217), and the National Environmental Policy Act (P.L. 91-190). Much of FEMA's authority over land use planning stems from its role in administering the National Flood Insurance Program (NFIP), which is described below.

## **Mitigation Plans**

The Stafford Act (P.L. 93-288, as amended; 42 U.S.C. §§5151 et seq.) and FEMA regulations require SLTT governments to have a FEMA-approved mitigation plan as a condition of receiving certain non-emergency Stafford Act assistance and FEMA mitigation grants, including assistance through the following programs:

- Public Assistance (PA) categories C-G;<sup>70</sup>
- Fire Management Assistance Grants (FMAG);
- Building Resilient Infrastructure and Communities (BRIC);
- Hazard Mitigation Grant Program (HMGP);
- Hazard Mitigation Grant Program Post Fire (HMGP Post Fire);
- Flood Mitigation Assistance (FMA);
- Rehabilitation of High Hazard Potential Dams (HHPD);
- Safeguarding Tomorrow Revolving Loan Fund Program (STRLF).

The mitigation plan demonstrates the SLTT government's commitment to reduce risks from natural hazards and serves as a guide for decisionmakers as they commit resources to reducing the effects of natural hazards.<sup>71</sup> States and tribes can submit enhanced hazard mitigation plans in order to receive increased funds under HMGP. An enhanced hazard mitigation plan should document that, to the extent allowed by SLTT law, the STT requires or encourages local governments to use a current version of a nationally applicable model building code or standard that addresses natural hazards as a basis for design and construction of STT-sponsored mitigation

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<sup>68</sup> Jessica Grannis, *Adaptation Tool Kit: Sea Level Rise and Coastal Land Use. How Governments Can Use Land-Use Practices to Adapt to Sea-Level rise*, Georgetown Climate Center, October 2011, <https://www.georgetownclimate.org/reports/adaptation-tool-kit-sea-level-rise-and-coastal-land-use.html>.

<sup>69</sup> Raymond J. Burby, Robert E. Doyle, David R. Godschalk, et al., "Creating hazard resilient communities through land-use planning," *Natural Hazards Review*, vol. 1, no. 2, (2000), pp. 99-106.

<sup>70</sup> Categories C to G represent Public Assistance permanent work. Category C is roads and bridges, Category D is water control, Category E is buildings and equipment, Category F is utilities, and Category G is parks, recreational, and other. See CRS In Focus IF11529, *A Brief Overview of FEMA's Public Assistance Program*, by Erica A. Lee.

<sup>71</sup> FEMA, State Mitigation Planning Policy Guide, FP 302-094-2, April 19, 2022, p. 8, [https://www.fema.gov/sites/default/files/documents/fema\\_state-mitigation-planning-policy-guide\\_042022.pdf](https://www.fema.gov/sites/default/files/documents/fema_state-mitigation-planning-policy-guide_042022.pdf) (hereinafter *SMPPG*).

projects.<sup>72</sup> For states with a mandatory statewide building code, the enhanced plan must provide evidence that the state, among other things, does not allow local governments to weaken the hazard-resistant provisions of the state building code.<sup>73</sup> Enhanced plans must also demonstrate commitment to a comprehensive mitigation program through a combination of activities that may include use of a model floodplain ordinance that includes and goes beyond the NFIP minimum requirements and is coordinated with the state building codes.<sup>74</sup>

## **Community Disaster Resilience Zones**

The Community Disaster Resilience Zones Act of 2022 (P.L. 117-255, CDRZA), signed into law in December 2022, amended the Stafford Act to establish a statutory structure to identify and designate communities most at risk from natural hazards. It also authorized the President to increase the federal cost share under Section 203 of the Stafford Act—Predisaster Hazard Mitigation<sup>75</sup>—to 90% for CDRZA-designated communities and to use funding set aside under Section 203(i).<sup>76</sup>

The CDRZA required FEMA to identify and designate Community Disaster Resilience Zones (CDRZs). At a minimum, CDRZs must include the 50 census tracts assigned the highest individual hazard risk ratings nationwide. The CDRZA also directed FEMA to ensure geographic balance by considering designations in coastal, inland, urban, suburban, rural areas and tribal lands, with not less than 1% of census tracts in each state assigned high individual risk ratings designated as CDRZs. CDRZs hold their designation for a period not less than five years and should be reviewed and updated every five years.

The CDRZA requires FEMA to maintain and update a natural hazard assessment program and products for the public's use that show the risk of natural hazards through use of risk ratings at the census tract level. FEMA intends to use the National Risk Index (NRI)<sup>77</sup> to satisfy this requirement of the CDRZA, and to use the NRI to identify the communities which are most in need of assistance for resilience-related projects and thus to be designated as CDRZs. FEMA issued a notice and request for information on implementation of the CDRZA,<sup>78</sup> and expects to designate CDRZs later in 2023.<sup>79</sup>

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<sup>72</sup> 44 C.F.R. §201.5.

<sup>73</sup> *SMPPG*, p. 46.

<sup>74</sup> *Ibid.*, p. 45.

<sup>75</sup> 42 U.S.C. §5133.

<sup>76</sup> 42 U.S.C. §5133(i). For further information on the set-aside for pre-disaster mitigation, see CRS Report R46989, *FEMA Hazard Mitigation: A First Step Toward Climate Adaptation*, by Diane P. Horn.

<sup>77</sup> The National Risk Index (NRI) is an online mapping application that identifies communities most at risk from 18 natural hazards and maps a community's expected annual loss, social vulnerability, and community resilience. The NRI provides a baseline relative risk measurement for each county and census tract in the United States. Currently the NRI does not account for future conditions or anticipated impacts due to climate change. See FEMA, *National Risk Index for Natural Hazards*, March 23, 2023, <https://www.fema.gov/flood-maps/products-tools/national-risk-index>; and FEMA, "Community Disaster Resilience Zones and the National Risk Index," 88(102) *Federal Register* 34171-34179, May 26, 2023.

<sup>78</sup> FEMA, "Community Disaster Resilience Zones and the National Risk Index," 88(102) *Federal Register* 34171-34179, May 26, 2023.

<sup>79</sup> FEMA, *Community Disaster Resilience Zones*, March 23, 2023, <https://www.fema.gov/flood-maps/products-tools/national-risk-index/community-disaster-resilience-zones>.



## The Federal Flood Risk Management Standard

FEMA, along with other federal agencies, is required to comply with Executive Order (E.O.) 11988—Floodplain Management<sup>80</sup> and E.O. 11990—Protection of Wetlands.<sup>81</sup> These Executive Orders require federal actions<sup>82</sup> to avoid, to the extent possible, the long- and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative. FEMA implemented E.O. 11988 and E.O. 11990 in regulations in 44 C.F.R. Part 9, which requires FEMA to use a systematic decisionmaking process to evaluate the potential effects of projects located in, or affecting, floodplains (the eight-step process).<sup>83</sup>

In January 2015, President Obama signed Executive Order 13690<sup>84</sup> which, among other things, established a Federal Flood Risk Management Standard (FFRMS) for federally funded projects that required a higher level of flood resilience than E.O. 11988.<sup>85</sup> Federally funded projects are defined as actions where federal funds are used for new construction, substantial improvement, or to address substantial damage to structures and facilities.<sup>86</sup>

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<sup>80</sup> Executive Order 11988, *Floodplain Management*, May 24, 1977, <https://www.archives.gov/federal-register/codification/executive-order/11988.html>.

<sup>81</sup> Executive Order 11990, *Protection of Wetlands*, May 24, 1977, <https://www.archives.gov/federal-register/codification/executive-order/11990.html>.

<sup>82</sup> Federal actions are defined as any action or activity including (a) acquiring, managing, and disposing of federal lands and facilities; (b) providing federally undertaken, financed or assisted construction, and improvements; and (c) conducting federal activities and programs affecting land use, including, but not limited to, water and land related resources, planning, regulating, and licensing activities. See 44 C.F.R. §9.4.

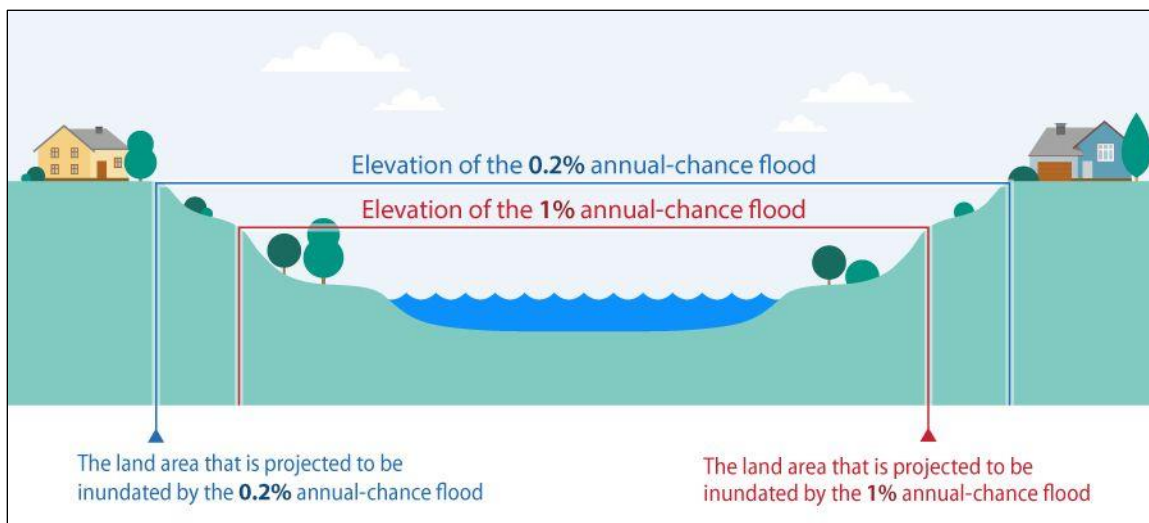
<sup>83</sup> 44 C.F.R. §9.6.

<sup>84</sup> Executive Order 13690, “Establishing a Federal Flood Risk Management Standard and a Process for Further Soliciting and Considering Stakeholder Input,” 80(23) *Federal Register* 6425-6428, January 30, 2015.

<sup>85</sup> In August 2017, President Trump signed Executive Order 13807 in an effort to streamline federal infrastructure approval. Among other actions, E.O. 13807 revoked E.O. 13690. In January 2021, President Biden revoked E.O. 13807 as part of Executive Order 13990, which had the effect of reinstating E.O. 13690, including the FFRMS. In May 2021, President Biden’s Executive Order 14030 confirmed that guidelines for implementing E.O. 13690 were never revoked and thus remain in effect. Executive Order 13807, “Establishing Discipline and Accountability in the Environmental Review and Permitting Process for Infrastructure Projects,” 82(163) *Federal Register* 40436-40469, August 24, 2017; Executive Order 13990, “Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis,” 86(14) *Federal Register* 7037-7042, January 25, 2021; Executive Order 14030, “Climate-Related Financial Risk,” 86(99) *Federal Register* 27967-27971, May 25, 2021.

<sup>86</sup> FEMA, Guidelines for Implementing Executive Order 11988, Floodplain Management, and Executive Order 13690, Establishing a Federal Flood Risk Management Standard and a Process for Further Soliciting and Considering Stakeholder Input, October 8, 2018, p. 16, [https://www.fema.gov/sites/default/files/documents/fema\\_implementing-guidelines-EO11988-13690\\_10082015.pdf](https://www.fema.gov/sites/default/files/documents/fema_implementing-guidelines-EO11988-13690_10082015.pdf) (hereinafter Guidelines for Establishing a FFRMS). Note that the FEMA guidelines do not require the use of the NFIP definitions of substantial damage and substantial improvement (footnote 144).

**Figure I. Vertical Elevation and Horizontal Extent of the Federal Flood Risk Management Standard Floodplain**



**Source:** CRS, adapted from Pew Charitable Trusts, North Carolina City Adopts Stringent Standard for Building in a Flood Plain, Issue Brief, November 19, 2019, <https://www.pewtrusts.org/en/research-and-analysis/issue-briefs/2019/11/north-carolina-city-adopts-stringent-standard-for-building-in-a-flood-plain>.

**Notes:** The FFRMS floodplain is the 500-year floodplain, or the area inundated by the 0.2% annual-chance flood. The current floodplain (the SFHA) is the area inundated by the 1% annual-chance flood.

E.O. 13690 modified the requirements of E.O. 11988, largely by redefining the floodplain at the foundation of federal floodplain management policy. Rather than relying on the Base Flood Elevation (BFE) floodplain,<sup>87</sup> E.O. 13690 provided that the floodplain be determined by one of three methods:

1. the freeboard value approach;<sup>88</sup>
2. the 0.2% annual-chance (500-year) flood approach;<sup>89</sup> or
3. the climate-informed science approach.<sup>90</sup>

FEMA has produced policy guidance for partial implementation of the FFRMS for certain programs by requiring the use of the FFRMS freeboard approach for certain non-critical actions

<sup>87</sup> The Base Flood Elevation (BFE) is defined as the water surface elevation of the base flood, which is the 1%-annual-chance flood.

<sup>88</sup> The floodplain obtained through the freeboard value approach in the FFRMS is defined as the elevation and flood hazard area that result from adding an additional two feet to BFE for non-critical actions and adding an additional three feet to BFE for critical actions, which are defined as any activity for which even a slight chance of flooding would be too great. FEMA's *Guidelines for Establishing a FFRMS* provides additional guidance to assist agencies in determining whether an action is critical.

<sup>89</sup> The 500-year floodplain is defined as the area subject to flooding by the 0.2%-annual-chance flood.

<sup>90</sup> Defined as the elevation and flood hazard area that result from using a climate-informed science approach that uses the best-available, actionable hydrologic and hydraulic data and methods that integrate current and future changes in flooding based on climate science. For additional information on the methods of calculating the FFRMS floodplain, see National Climate Task Force, *Federal Flood Risk Management Standard Climate-Informed Science Approach (CISA) State of the Science Report*, Report by the FFRMS Science Subgroup of the Flood Resilience Interagency Working Group, Washington, DC, March 22, 2023, <https://www.whitehouse.gov/wp-content/uploads/2023/03/Federal-Flood-Risk-Management-Standard-Climate-Informed-Science-Approach-CISA-State-of-the-Science-Report.pdf>.

involving structures in the Special Flood Hazard Area (SFHA).<sup>91</sup> The interim policy applies to structures in the SFHA that receive funding from any FEMA program (Individual Assistance, Public Assistance, and Hazard Mitigation Assistance) but does not address the expansion of the horizontal floodplain or the application of the FFRMS to critical actions. FEMA intends to fully implement the FFRMS by rulemaking; full implementation of the FFRMS will require an update to 44 C.F.R. Part 9.<sup>92</sup>

## **National Flood Insurance Program Requirements Related to Planning and Building Codes**

The National Flood Insurance Act of 1968 (NFIA)<sup>93</sup> requires participating communities to adopt the minimum NFIP requirements through zoning, floodplain ordinances, and/or building codes. However, FEMA's view is that the agency has no direct involvement in the administration of local floodplain management ordinances or in the permitting process for development in the floodplain.<sup>94</sup> Instead, FEMA sets minimum standards that communities must adopt in order to participate in the NFIP. The NFIA authorizes FEMA to develop criteria designed to encourage, where necessary, the adoption of adequate state and local measures which, to the maximum extent feasible, will

1. constrict the development of land which is exposed to flood damage where appropriate;
2. guide the development of proposed construction away from locations which are threatened by flood hazards;
3. assist in restricting damage caused by floods; and
4. otherwise improve the long-range land management and use of flood-prone areas.<sup>95</sup>

In order to accomplish these goals, FEMA has set forth minimum floodplain management standards in federal regulations.<sup>96</sup> These standards only have the force of law because they are adopted and enforced by an SLTT government. Communities are required to adopt these minimum floodplain management standards in order to participate in the NFIP.<sup>97</sup> FEMA's land use criteria, once adopted by the community, take precedence over any less restrictive or conflicting local laws, ordinances, or codes for floodplain management.<sup>98</sup> However, NFIP-participating communities are permitted and encouraged to adopt higher standards than the minimum set forth in regulation. FEMA has determined that the flood provisions in the 2021 I-Codes meet or exceed the minimum NFIP standards.<sup>99</sup> NFIP minimum standards apply to all

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<sup>91</sup> The Special Flood Hazard Area (SFHA) is defined by FEMA as an area with a 1% or greater risk of flooding every year.

<sup>92</sup> FEMA, *Partial Implementation of the Federal Flood Risk Management Standard for Hazard Mitigation Assistance Programs*, FEMA Policy 206-21-003-0001, Washington, DC, December 9, 2022, p. 1, [https://www.fema.gov/sites/default/files/documents/fema\\_policy-fp-206-21-003-0001-implementation-ffrms-hma-program\\_122022.pdf](https://www.fema.gov/sites/default/files/documents/fema_policy-fp-206-21-003-0001-implementation-ffrms-hma-program_122022.pdf).

<sup>93</sup> Title XIII of P.L. 90-448, as amended, 42 U.S.C. §4001 et seq.

<sup>94</sup> FEMA, "National Flood Insurance Program Nationwide Programmatic Environmental Impact Statement," 82(66) *Federal Register* 17024, April 7, 2017.

<sup>95</sup> 42 U.S.C. §4102(c).

<sup>96</sup> See 44 C.F.R. Part 60, particularly 44 C.F.R. §60.3.

<sup>97</sup> 42 U.S.C. §4022(a)(1).

<sup>98</sup> 44 C.F.R. §60.1(b).

<sup>99</sup> FEMA, *Comparing National Flood Insurance Program Requirements to 2021 International Codes/ American Society* (continued...)

new construction in the SFHA, and requirements for structures in SFHAs cannot be suspended or waived.

In addition to providing flood insurance and requiring communities to reduce flood damage through floodplain management, the NFIP identifies and maps the nation's floodplains. Maps depicting flood hazard information, known as Flood Insurance Rate Maps (FIRMs), are used to promote awareness of flood hazards and determine the appropriate minimum floodplain management criteria for flood hazard areas.<sup>100</sup> While FEMA is generally responsible for the development of flood maps, the community itself must pass the map into its local or state law for the map to be effective (i.e., in force). FIRMs are used for both building code and floodplain management requirements in SFHAs.<sup>101</sup>

## **FEMA: Code Requirements for Funded Projects**

### **Code Requirements: Authorities, Developments, and Variations Across Programs**

The Stafford Act, the National Flood Insurance Act, federal regulations, and FEMA policy generally require recipients of federal assistance to comply with applicable building codes when conducting federally funded construction projects. Each FEMA grant program includes different code compliance requirements. For example, a city may rebuild some structures under the PA program and in line with the required International Building Code (IBC), while repairs to other projects may be completed under the Hazard Mitigation Grant Program (HMGP), which only requires compliance with local codes.

These variations have generated criticism. ASCE has urged FEMA to be consistent in the minimum standards it applies across all of its programs.<sup>102</sup> Congress examined this issue at a House hearing where several participants advocated the adoption and enforcement of statewide building codes and standardizing requirements across all programs that fund mitigation measures.<sup>103</sup> FEMA's 2022 *Building Codes Strategy* announced that the agency's first goal was to align building code policies across FEMA programs.<sup>104</sup>

Some of FEMA's authorities relevant to building codes are currently in flux, pending implementation of provisions enacted in recent legislation, including the Disaster Recovery Reform Act (DRRA, P.L. 115-254). Many of DRRA's changes enhanced FEMA's authorities to

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of Civil Engineers Standard ASCE 24-14, May 27, 2022, [https://www.fema.gov/sites/default/files/documents/fema\\_checklist-nfip-2021-i-codes-asce-24-14.pdf](https://www.fema.gov/sites/default/files/documents/fema_checklist-nfip-2021-i-codes-asce-24-14.pdf).

<sup>100</sup> With the introduction of the NFIP's new pricing system, Risk Rating 2.0, flood maps are no longer used to set flood insurance premiums. For further information, see CRS Report R45999, *National Flood Insurance Program: The Current Rating Structure and Risk Rating 2.0*, by Diane P. Horn.

<sup>101</sup> See, for example, FEMA, *Comparison of Select NFIP and 2018 I-Code Requirements for Special Flood Hazard Areas*, [https://www.fema.gov/sites/default/files/2020-07/fema\\_quick-ref-guide-nfip-2018-icodes-reqs-flood-areas.pdf](https://www.fema.gov/sites/default/files/2020-07/fema_quick-ref-guide-nfip-2018-icodes-reqs-flood-areas.pdf). Note that although the I-Codes have been updated to the 2021 version, NFIP requirements have not been updated.

<sup>102</sup> American Society of Civil Engineers, Re: Joint Comments in Response to FEMA's Proposed Policy to Implement Hazard Mitigation Assistance: Building Resilient Infrastructure and Communities, Letter to FEMA Office of Response and Recovery, May 11, 2020, p. 5, <https://www.infrastructurereportcard.org/wp-content/uploads/2020/05/ASCE-Statement-to-FEMA-on-BRIC-Guidance-5-11-20-FINAL.pdf>.

<sup>103</sup> U.S. Congress, House Committee on Transportation and Infrastructure, Subcommittee on Economic Development, Public Buildings, and Emergency Management, *Disaster Preparedness: DRRA Implementation and FEMA Readiness*, hearing, 116<sup>th</sup> Cong., 1<sup>st</sup> sess., May 22, 2019, H.Rept. 116-18 (Washington: GPO, 2019).

<sup>104</sup> FEMA, *Building Codes Strategy*, pp. 14-20.

require compliance with consensus-based standards that may exceed locally adopted codes. **Table 2** summarizes requirements by FEMA program.

## **Building Code Development, Adoption, Enforcement: FEMA Assistance and Incentives**

Several FEMA programs provide financial and technical assistance to nonfederal governments for building code adoption, enforcement, and development—not just assistance to rebuild individual structures (as summarized in **Table 3**). Such assistance may be particularly valuable in post-disaster contexts, when many facilities are undergoing rebuilding simultaneously and governments may be overwhelmed with permitting, inspections, and their own rebuilding projects. Governments may be able to receive support for enforcing codes and standards in a wide range of facilities, including those ineligible for other FEMA assistance (e.g., for-profit entities). In August 2022, FEMA released a playbook for jurisdictions adopting and enforcing building codes that included an overview of relevant FEMA assistance.<sup>105</sup> Significant updates to these requirements are forthcoming, such as the adoption of the ASCE 7-22 Flood Supplement 2, which includes new provisions that protect against 500-year flood events and introduces a new requirement for relative sea level change as it relates to an individual structure.<sup>106</sup>

### **Public Assistance**

DRRA amended the Stafford Act to authorize assistance for SLTT governments to administer and enforce building codes.<sup>107</sup> In 2019, FEMA released guidance that partially implemented these new authorities, primarily through the Public Assistance program. Under that policy, which remains active, FEMA may provide assistance to fund building code enforcement on disaster-damaged facilities within 180 days of the related Stafford Act declaration.<sup>108</sup>

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<sup>105</sup> For example, FEMA may provide assistance to cover the costs of hiring, training, and supervising building code staff, reviewing and processing applications for building permits, and inspecting structures under construction for compliance (apart from the costs incurred while executing the actual reconstruction).

<sup>106</sup> American Society of Civil Engineers, *New Addition to the ASCE/SEI 7-22 Standard Protects Buildings from a 500-Year Flood Event*, May 25, 2023, <https://www.asce.org/publications-and-news/civil-engineering-source/society-news/article/2023/05/25/asce-7-flood-loads-supplement>.

<sup>107</sup> DRRA Sections 1206(a)-(b), as they amend Stafford Act Sections 402 and 406; FEMA, “Building Code and Floodplain Management Administration and Enforcement,” FEMA Policy FP 204-079-01, p. 6, [https://www.fema.gov/sites/default/files/documents/fema\\_building-code-floodplain-management-drra-1206\\_policy\\_10-15-2020\\_0.pdf](https://www.fema.gov/sites/default/files/documents/fema_building-code-floodplain-management-drra-1206_policy_10-15-2020_0.pdf).

<sup>108</sup> FEMA, “Building Code and Floodplain Management Administration and Enforcement,” FEMA Policy FP 204-079-01 p. 2, [https://www.fema.gov/sites/default/files/documents/fema\\_building-code-floodplain-management-drra-1206\\_policy\\_10-15-2020\\_0.pdf](https://www.fema.gov/sites/default/files/documents/fema_building-code-floodplain-management-drra-1206_policy_10-15-2020_0.pdf).

**Table 2. FEMA Building Code Requirements by Program**

For eligible funded projects

Program Name	Key Authorities <sup>a</sup>	Building Code Requirements
Individual Assistance (IA) – Individuals and Households Program (IHP)	<ul style="list-style-type: none"> <li>• 44 C.F.R. Part 9</li> <li>• 44 C.F.R. §206-117(b)(1)(ii)(c)</li> <li>• 44 C.F.R. §§206-117(b)(1)-(4)</li> <li>• FEMA Policy FP-206-21-0003</li> </ul>	<p>Regulations require, at minimum:</p> <ul style="list-style-type: none"> <li>• FEMA-provided direct housing assistance to comply with applicable local and/or state codes and ordinances and federal floodplain management regulations.</li> <li>• FEMA-funded permanent or semi-permanent housing construction to conform to applicable local and/or state building code or industry standards and federal environmental laws and regulations.</li> </ul> <p>FEMA guidance:</p> <ul style="list-style-type: none"> <li>• Allows FEMA to provide home repair assistance to cover eligible costs of code compliance.<sup>a</sup></li> <li>• Requires compliance with interim FFRMS for structures in Special Hazard Flood Zones (SHFZs).</li> </ul>
Public Assistance (PA) for Repair, Restoration, and Replacement	<ul style="list-style-type: none"> <li>• Stafford Act, Sections 323 and 406(e), 42 U.S.C. §5165a and §5172(e)</li> <li>• 44 C.F.R. §§206.226(d) and 206.400-402</li> <li>• 44 C.F.R. §§9.4, 9.6 &amp; 9.11(d)</li> <li>• Americans with Disabilities Act, 42 U.S.C. §12101 et seq. and related regulations at 28 C.F.R. §35.151</li> </ul>	<p>Statute requires, at minimum:</p> <ul style="list-style-type: none"> <li>• FEMA to estimate awards so that repair and replacement projects comply with “the latest published editions of relevant consensus-based codes, specifications, and standards that incorporate the latest hazard-resistant designs” for disasters after August 1, 2017.<sup>b</sup></li> <li>• FEMA to estimate awards so that repair and replacement projects “meet the definition of resilient.” FEMA has not yet issued the definition.</li> <li>• Funded projects comply with the Americans with Disabilities Act.</li> </ul> <p>Regulations additionally require:</p> <ul style="list-style-type: none"> <li>• Funded projects to comply with codes that include minimum requirements of the National Flood Insurance Program (NFIP) and National Earthquake Hazards Reduction Program (NEHRP).</li> <li>• Funded projects to comply with Executive Order 11988, Floodplain Management, Executive Order 12699, Seismic Safety of Federal and Federally Assisted or Regulated New Building Construction, and any other applicable executive orders.</li> </ul> <p>FEMA implements these authorities with guidance and policies that include additional requirements and specifications, including that structures in SFHAs comply with interim FFRMS guidance and future final rulemaking.</p>
Hazard Mitigation Grant Program (HMGP)	<ul style="list-style-type: none"> <li>• Stafford Act Sections 323 and 404, 42 U.S.C. §5165a &amp; §5170c</li> <li>• 44 C.F.R. §206,</li> </ul>	<p>FEMA guidance requires, to establish minimum design and construction requirements for structure elevation, dry floodproofing, and mitigation reconstruction:</p> <ul style="list-style-type: none"> <li>• The use of American Society of Civil Engineers <i>Flood Resistant Design and Construction</i> (ASCE) 24-14, or the latest edition.</li> <li>• The use of the FFRMS freeboard value approach (see footnote 89) to establish the minimum flood protection elevation for (1) any major disaster declaration on or after August 27, 2021; (2) HMGP assistance approved under the COVID-19 disaster declarations; and (3) Fire Management Assistance Grants issued or published on or after August 27, 2021.</li> </ul>



Program Name	Key Authorities <sup>a</sup>	Building Code Requirements
	<ul style="list-style-type: none"> <li>FEMA Policy FP-206-21-0003</li> </ul>	<ul style="list-style-type: none"> <li>All structure elevation, mitigation reconstruction, and dry floodproofing, and all projects where HMA is used for new construction, substantial improvement, or to address substantial damage to structures must meet the minimum standards of FEMA's partial implementation of the FFRMS.<sup>c</sup></li> </ul>
Flood Mitigation Assistance (FMA)	National Flood Insurance Act, 42 U.S.C. §4104(c), and FEMA Policy FP-206-21-0003	<p>FEMA guidance requires, to establish minimum design and construction requirements for structure elevation, dry floodproofing, and mitigation reconstruction:</p> <ul style="list-style-type: none"> <li>The use of ASCE 24-14, or the latest edition.</li> <li>The minimum standards of FEMA's partial implementation of the FFRMS.</li> </ul>
Building Resilient Communities and Infrastructure (BRIC)	Stafford Act Sections 323 and 203, 42 U.S.C. §5165a and §5133, and FEMA Policy FP-206-21-0003	<p>FEMA guidance requires, to establish minimum design and construction requirements for structure elevation, dry floodproofing, and mitigation reconstruction:</p> <ul style="list-style-type: none"> <li>The use of ASCE 24-14, or the latest edition.</li> <li>The minimum standards of FEMA's partial implementation of the FFRMS.</li> </ul>
Safeguarding Tomorrow Revolving Loan Fund Program (STRLF)	Stafford Act Sections 323 and 205, 42 U.S.C. §5165a and §5135, FEMA Policy FP-206-21-0003	The FY2023 Notice of Funding Opportunity <sup>d</sup> requires that recipients of loans for new construction or substantial improvement must comply with FEMA Policy FP-206-21-0003.
National Flood Insurance Program (NFIP)	42 U.S.C. §4102(c) and 44 C.F.R. §60.3	<p>Regulations require, at minimum, that communities:</p> <ul style="list-style-type: none"> <li>Require permits for development in SFHAs.</li> <li>Require elevation of the lowest floor of all new residential buildings in the SFHA to be at or above BFE.</li> <li>Restrict development in the regulatory floodway to prevent increasing the risk of flooding.</li> <li>Require certain construction materials and methods that minimize future flood damage.</li> <li>Enforce NFIP minimum standards on buildings that are substantially improved or substantially damaged, as defined in regulations, regardless of the cause of the damage.<sup>e</sup></li> <li>Review all applications for development in SFHAs and enforce flood management regulations and building codes.</li> </ul>

**Sources:** Compiled by CRS using FEMA guidance and regulations as well as authorizing statutes as cited. Authorities listed here include key statutory provisions, regulations, and policies. Due to the volume of policies that apply to various FEMA grant programs, CRS could not list all applicable policies.

**Notes:**

a. FEMA, *Individual Assistance Program and Policy Guide*, FP-104-009-03, May 2021, p. 90.

b. Stafford Act 406(e), as amended by Disaster Recovery Reform Act (DRRA) Section 1235(b), 42 U.S.C. §5172(e).



- c. FEMA, *Hazard Mitigation Assistance Program and Policy Guide*, March 23, 2023, p. 88, [https://www.fema.gov/sites/default/files/documents/fema\\_hma-program-policy-guide\\_032023.pdf](https://www.fema.gov/sites/default/files/documents/fema_hma-program-policy-guide_032023.pdf) (hereinafter FEMA, *HMAPP*G).
- d. FEMA, *Safeguarding Tomorrow Revolving Loan Program, Notice of Funding Opportunity Fiscal Year 2023*, <https://www.fema.gov/grants/mitigation/storm-rlf>.
- e. 44 C.F.R. §59.1 defines substantial improvement as any reconstruction, rehabilitation, addition, or other improvement of a structure, the cost of which equals or exceeds 50% of the market value of the structure before the “start of construction” of the improvement. This term includes structures which have incurred “substantial damage,” regardless of the actual repair work performed. Floodplain management requirements for new construction apply to substantial improvements. 44 C.F.R. §59.1 defines substantial damage as damage of any origin sustained by a structure whereby the cost of restoring the structure to its before-damaged condition would equal or exceed 50% of the market value of the structure before the damage occurred. Note that these requirements are not restricted to damage caused by flooding; a property in an SFHA damaged by fire would still trigger the substantial damage requirement.

## Hazard Mitigation Assistance

Requirements related to building codes for Hazard Mitigation Assistance (HMA) programs (i.e., the Hazard Mitigation Grant Program, the Flood Mitigation Grant Program, the Safeguarding Tomorrow Revolving Loan Fund Program, and Building Resilient Infrastructure and Communities) are only mentioned in HMA guidance. All mitigation reconstruction activities<sup>109</sup> must be completed in accordance with the latest published editions of the International Codes and FFRMS requirements. FEMA is to use the latest published edition of ASCE-24 or its equivalent as the minimum design criteria for all HMA-assisted mitigation reconstruction projects in flood hazard areas.

Close-out<sup>110</sup> requirements for all HMA grants include comments and documentation to support that the project was completed in compliance with all required permits and building codes and standards (if applicable).<sup>111</sup> However, there is no explicit requirement for proof of compliance with building code requirements, in contrast to PA, where non-compliance can result in potential denial or de-obligation of PA funding for a facility.<sup>112</sup>

## Hazard Mitigation Grant Program

The Hazard Mitigation Grant Program (HMGP) is authorized by Stafford Act Section 404—Hazard Mitigation,<sup>113</sup> with the objective of ensuring that the opportunity to take critical mitigation measures is not lost during the reconstruction process following a disaster. There is no mention of building code requirements for HMGP in Stafford Act Section 404, nor in HMGP regulations.<sup>114</sup>

## Safeguarding Tomorrow Revolving Loan Fund Program

Hazard mitigation loans are available through the Safeguarding Tomorrow Revolving Loan Fund Program (STRLF).<sup>115</sup> The STRLF program was created by the STORM Act (Safeguarding Tomorrow through Ongoing Risk Mitigation Act, P.L. 116-284), which amended the Stafford Act by authorizing FEMA to enter into agreements with eligible entities to establish hazard mitigation revolving loan funds.<sup>116</sup> Funds made available through the STORM Act may be used to assist homeowners, businesses, certain nonprofit organizations, and communities to reduce risk in order to decrease the loss of life and property, the cost of flood insurance, and federal disaster

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<sup>109</sup> Mitigation reconstruction is the construction of an improved, elevated structure that conforms to the latest building codes on the same site where an existing structure and/or foundation has been partially or completely demolished or destroyed. See FEMA, *HMAPP*, p. 75.

<sup>110</sup> Close-out is the end of the grant process, when the award recipient must submit the final financial and programmatic reports. See Grants.Gov, *Grants 101, Post Award Phase*, <https://www.grants.gov/learn-grants/grants-101/post-award-phase.html>.

<sup>111</sup> FEMA, *HMAPP*, p. 193.

<sup>112</sup> FEMA, “Consensus-Based Codes, Specifications and Standards for Public Assistance,” FEMA Recovery Interim Policy FP-104-009-11, Version 2, December 2019, p. 6, [https://www.fema.gov/sites/default/files/2020-05/DRRA1235b\\_Consensus\\_BasedCodes\\_Specifications\\_and\\_Standards\\_for\\_Public\\_Assistance122019.pdf](https://www.fema.gov/sites/default/files/2020-05/DRRA1235b_Consensus_BasedCodes_Specifications_and_Standards_for_Public_Assistance122019.pdf).

<sup>113</sup> 42 U.S.C. §5170c.

<sup>114</sup> 44 C.F.R. §206 Subpart N – Hazard Mitigation Grant Program.

<sup>115</sup> 42 U.S.C. §5135.

<sup>116</sup> A revolving loan fund (RLF) is a self-replenishing financial mechanism that starts with a base level of capital, often consisting of grants from the federal government or a state, or private investment. RLFs can make loans targeted to specific types of borrowers or for specific types of activities, and are designed to use loan repayments to recapitalize the fund and therefore make additional loans. This may create an ongoing source of funding and potentially reduce the need for annual appropriations.

payments. The legislation is intended to provide states with funding that will help them carry out their own hazard mitigation projects.<sup>117</sup> Eligible entities include states and territories, and the tribal governments that received a major disaster declaration pursuant to Section 401 of the Stafford Act.<sup>118</sup> As a new program with its first funding round in FY2023, the STRLF is not mentioned in FEMA guidance or regulations.

## **Flood Mitigation Assistance Grant Program**

The Flood Mitigation Assistance (FMA) grant program is another pre-disaster mitigation funding program operated by FEMA. The FMA program is funded entirely through revenue collected by the NFIP,<sup>119</sup> and FMA grants are only available to communities that participate in the NFIP,<sup>120</sup> to assist in efforts to reduce or eliminate flood damage to buildings and structures insurable under the NFIP, particularly repetitive loss<sup>121</sup> and severe repetitive loss<sup>122</sup> properties. There is no mention of building code requirements for FMA in the National Flood Insurance Act or in FMA regulations.<sup>123</sup>

## **Building Resilient Infrastructure and Communities**

DRRA Section 1234 amended Section 203 of the Stafford Act—Predisaster Hazard Mitigation<sup>124</sup> to allow use of predisaster mitigation funding to establish and carry out enforcement activities and implement the latest version of consensus-based codes.<sup>125</sup> Section 1234 also expanded the criteria to be considered in awarding pre-disaster mitigation funds, including the extent to which the applicants have adopted hazard-resistant building codes and design standards.<sup>126</sup> FEMA introduced a new program, Building Resilient Infrastructure and Communities (BRIC),<sup>127</sup> in FY2020 to replace the Predisaster Mitigation Grant Program (PDM).<sup>128</sup> In each of the first three years of BRIC, one of FEMA's main priorities has been to increase funding to applicants that facilitate the adoption and enforcement of the latest published editions of building codes. As of June 2023, the majority of states and territories did not qualify for the BRIC building code point allotment (see **Figure 2**).

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<sup>117</sup> Senate Committee on Homeland Security and Governmental Affairs, S.Rept. 116-249, August 10, 2020, p. 3, <https://www.congress.gov/congressional-report/116th-congress/senate-report/249>.

<sup>118</sup> 42 U.S.C. §5170.

<sup>119</sup> The Infrastructure Investment and Jobs Act (P.L. 117-58) appropriated \$3.5 billion for the FMA program, with \$700 million for each of FY2022 to FY2026. This represents the first time that funding has been appropriated for FMA.

<sup>120</sup> 42 U.S.C. §4104c.

<sup>121</sup> 42 U.S.C. §4121(a)(7) defines repetitive loss structure as a structure covered by a contract for flood insurance that (a) has incurred flood-related damage on two occasions, in which the cost of repair, on the average, equaled or exceeded 25% of the value of the structure at the time of each such flood event; and (b) at the time of the second incidence of flood-related damage, the contract for flood insurance contains increased cost of compliance coverage.

<sup>122</sup> Severe repetitive loss properties are those that have incurred four or more claim payments exceeding \$5,000 each, with a cumulative amount of such payments over \$20,000; or at least two claims with a cumulative total exceeding the value of the property. See 42 U.S.C. §4014(h) and 44 C.F.R. §79.2(h).

<sup>123</sup> 44 C.F.R. Part 77—Flood Mitigation Grants.

<sup>124</sup> 42 U.S.C. §5133.

<sup>125</sup> 42 U.S.C. §5133(e)(1)(B)(iv).

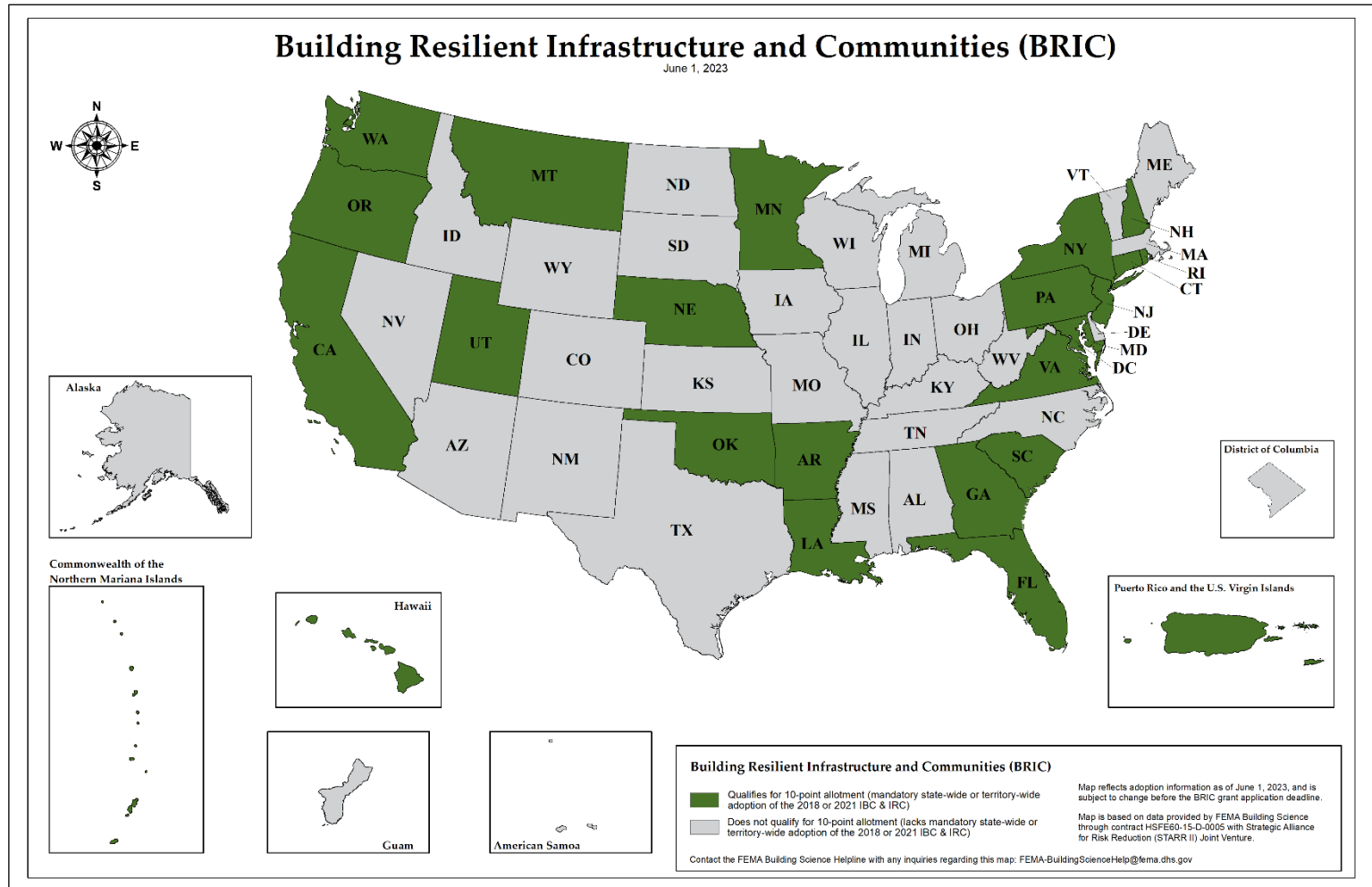
<sup>126</sup> 42 U.S.C. §5133(g)(4).

<sup>127</sup> FEMA, *Building Resilient Infrastructure and Communities (BRIC)*, <https://www.fema.gov/grants/mitigation/building-resilient-infrastructure-communities>.

<sup>128</sup> 42 U.S.C. §5133.

**Figure 2. State and Territory Building Code Status for BRIC Awards**

As of June 1, 2023



**Source:** Figure provided by FEMA Congressional Affairs Staff, June 26, 2023.

FEMA intends to increase its emphasis on building code criteria in future BRIC grant cycles.<sup>129</sup> In FY2022, building code-related activities accounted for up to 40 points of the total 100 point BRIC technical evaluation criteria score.<sup>130</sup> Concerns have been expressed that communities in states without building codes may be at a disadvantage for competitive awards.<sup>131</sup> For example, a community that has adopted the latest codes could be considered noncompliant if it is in a state that does not meet the BRIC technical evaluation criteria<sup>132</sup> for building codes.<sup>133</sup> In addition, concerns have been expressed that BRIC technical criteria take a narrow approach to recognizing resilience efforts and give preference to communities with certain mitigation practices, particularly those within states, territories, and tribes that have adopted recent versions of the ICC codes, while ignoring other categories like state floodplain management practices that go above NFIP minimum standards.<sup>134</sup>

### ***BRIC Direct Technical Assistance***

FEMA introduced a new form of assistance for the BRIC program, known as non-financial Direct Technical Assistance (DTA),<sup>135</sup> which is intended to help communities build capacity and develop applications to support underserved populations.<sup>136</sup> The establishment, adoption, and enforcement of building codes are eligible capability- and capacity-building activities for DTA.<sup>137</sup> FEMA selected eight communities to receive DTA in FY2020 and 20 communities in FY2021. FEMA

<sup>129</sup> Ibid., p. 3.

<sup>130</sup> Ibid., pp. 3-6.

<sup>131</sup> See, for example, Anna Weber, *Building Resilience, BRIC by BRIC: Fall 2022 Update*, September 23, 2022, <https://www.nrdc.org/experts/anna-weber/building-resilience-bric-bric-fall-2022-update>; and Kevin Manuele and Mark Haggerty, *How FEMA Can Build Rural Resilience Through Disaster Preparedness*, Center for American Progress, October 6, 2022, <https://www.americanprogress.org/article/how-fema-can-build-rural-resilience-through-disaster-preparedness/>.

<sup>132</sup> FEMA, *BRIC Technical Evaluation Criteria*, August 2022, [https://www.fema.gov/sites/default/files/documents/fema\\_fy22-bric-technical-evaluation-criteria-psm.pdf](https://www.fema.gov/sites/default/files/documents/fema_fy22-bric-technical-evaluation-criteria-psm.pdf).

<sup>133</sup> Noreen Clancy, Melissa L. Finucane, Jordan R. Fischbach, et al., *The Building Resilient Infrastructure and Communities Mitigation Grant Program: Incorporating Hazard Risk and Social Equity into Decisionmaking Processes*, RAND Corporation, RR-A1258-1, 2022, p. 28, [https://www.rand.org/pubs/research\\_reports/RR-A1258-1.html](https://www.rand.org/pubs/research_reports/RR-A1258-1.html).

<sup>134</sup> See, for example, Senator Tammy Baldwin, "Senators Baldwin, Hoeven Call on FEMA to Distribute Funds to Inland States for Climate-Resilient Infrastructure," press release, September 15, 2022, <https://www.baldwin.senate.gov/news/press-releases/senators-baldwin-hoeven-call-on-fema-to-distribute-funds-to-inland-states-for-climate-resilient-infrastructure>; and Headwater Economics, *Capacity-Limited States Still Struggle to Access FEMA BRIC Grants*, August 4, 2022, <https://headwaterseconomics.org/equity/capacity-limited-fema-bric-grants/>.

<sup>135</sup> FEMA, *BRIC Direct Technical Assistance*, September 2022, [https://www.fema.gov/sites/default/files/documents/fema\\_fy22-bric-technical-assistance-psm.pdf](https://www.fema.gov/sites/default/files/documents/fema_fy22-bric-technical-assistance-psm.pdf).

<sup>136</sup> In FY2022 BRIC applications, applications for Direct Technical Assistance were (1) are noted in E.O. 14008; (2) have demonstrated that the community, or areas within the community, have a Centers for Disease Control Social Vulnerability Index (SVI) score equal to or greater than 0.6; (3) qualify as an economically disadvantaged rural community; (4) have shown a compelling need; or (5) have not received a grant award under PDM, BRIC, HMGP, or FMA within the last five years. The SVI uses United States Census Data to determine the social vulnerability of every census tract, ranked on 15 social factors. SVI scores range from 0 to 1, with 1 representing the highest level of social vulnerability. For example, a SVI ranking of 0.6 means that 60% of census tracts in the nation are less vulnerable than the tract of interest. Category (4) includes communities with disadvantaged populations as referenced in E.O. 14008 that (1) have had multiple major disaster declarations within the past five years; (2) have limited funds; or (3) have strong community engagement but need technical assistance.

<sup>137</sup> FEMA, *Mitigation Assistance: Building Resilient Infrastructure and Communities*, FEMA Policy FP-104-008-05, December 1, 2022, [https://www.fema.gov/sites/default/files/documents/fema\\_bric-policy-fp-008-05\\_program\\_policy.pdf](https://www.fema.gov/sites/default/files/documents/fema_bric-policy-fp-008-05_program_policy.pdf).

intends to select 40 communities for DTA in FY2022.<sup>138</sup> Applications for DTA in FY2022 were oversubscribed, with 109 communities applying.<sup>139</sup> In May 2023, FEMA announced that 46 communities and tribal nations had been selected for DTA for FY2022.<sup>140</sup>

## National Flood Insurance Program

DRRA Section 1206(a) amended Stafford Act Section 402—General Federal Assistance<sup>141</sup> to allow state and local governments to use general federal assistance funds for the administration and enforcement of building codes and floodplain management ordinances, including inspections for substantial damage compliance.<sup>142</sup> If a building in an SFHA is determined to be substantially damaged, it must be brought into compliance with local floodplain management standards. Local communities can require the building to be rebuilt to current floodplain management requirements even if the property previously did not need to do so. FEMA does not make a determination of substantial damage; this is the responsibility of the local government, generally by a building department official or floodplain manager. Particularly following a major flood, communities may be required to assess a large number of properties at the same time, and, as a result, additional resources may be needed. This provision affords an additional source of funding to support communities in carrying out such activities.

The NFIP Community Rating System (CRS) is a voluntary incentive-based program that rewards communities for adopting floodplain management practices to a higher standard than the NFIP minimum standards by providing reduced-cost flood insurance premiums to policyholders in the community.<sup>143</sup> The CRS program, as authorized by law, is intended to incentivize the reduction of flood and erosion risk, for example through community adoption of hazard-resistant building codes to exceed the minimum NFIP requirements, as well as the adoption of more effective measures to protect natural and beneficial floodplain functions.<sup>144</sup> FEMA awards points that increase a community's "class" rating in the CRS on a scale of one to ten, with one being the highest ranking. As CRS ratings increase, residents of the community receive increasing discounts on their NFIP premiums. FEMA implemented new guidance for the CRS on January 1, 2021, which for the first time includes prerequisites related to building codes. To qualify for class 8 (for which residents receive a 10% discount on their premiums), the community must adopt and enforce throughout its SFHA at least a one-foot freeboard requirement for all residential buildings constructed, substantially improved, and/or reconstructed due to substantial damage. The freeboard standard must be applied to all residential buildings, whether single-family, multi-

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<sup>138</sup> Department of Homeland Security, *Notice of Funding Opportunity (NOFO) Fiscal Year 2022, Building Resilient Infrastructure and Communities*, Washington, DC, October 25, 2022, [https://www.fema.gov/sites/default/files/documents/fema\\_fy22-bric-nofo\\_082022.pdf](https://www.fema.gov/sites/default/files/documents/fema_fy22-bric-nofo_082022.pdf).

<sup>139</sup> Email from FEMA Congressional Affairs Staff, February 10, 2023.

<sup>140</sup> FEMA, *Fiscal Year 2022 Building Resilience Infrastructure and Communities Direct Technical Assistance Selections*, May 19, 2023, <https://www.fema.gov/fact-sheet/fiscal-year-2022-building-resilient-infrastructure-and-communities-direct-technical>.

<sup>141</sup> 42 U.S.C. §5170a.

<sup>142</sup> 44 C.F.R. §59.1 defines substantial damage as damage of any origin sustained by a structure whereby the cost of restoring the structure to its before-damaged condition would equal or exceed 50% of the market value of the structure before the damage occurred. 44 C.F.R. §59.1 defines substantial improvement as any reconstruction, rehabilitation, addition, or other improvement of a structure, the cost of which equals or exceeds 50% of the market value of the structure before the start of construction of the improvement. This term includes structures which have incurred "substantial damage," regardless of the actual repair work performed. Floodplain management requirements for new construction apply to substantial improvements.

<sup>143</sup> 42 U.S.C. §4022(b)(1).

<sup>144</sup> 42 U.S.C. §4022(b)(1).

family, or manufactured. This prerequisite can be met through the enforcement of local ordinances or building codes, and/or state building codes.<sup>145</sup>

**Table 3. FEMA Incentives and Assistance for SLTT Building Code Work**

Program	Authorities	Eligible Code Activities			Notes
		Adoption	Enforcement	Development	
Public Assistance	Stafford Act §§402(5) and 406(a)(2)(D) <sup>a</sup>		X		FEMA policy limits assistance to work pertaining to disaster-damaged structures within 180 days of relevant declaration.
HMGP	Stafford Act §404	X	X	X	Codes and standards activities eligible for assistance include but are not limited to: (1) evaluation of the adoption and/or implementation of codes to reduce risk; (2) enhancement of existing adopted codes to incorporate more current requirements or higher standards; (3) development of professional workforce capabilities through technical assistance and training; (4) evaluation of the adoption and/or implementation of land use and zoning ordinances; and (5) post-disaster code enforcement (which is a recovery activity).
BRIC	Stafford Act §203	X	X	X	Activities (1) to (4) listed under HMGP.
FMA	National Flood Insurance Act §4104c				SLTTs are encouraged, but not required to align with planning mechanisms such as economic development, housing, comprehensive plans, transportation plans, building codes, and floodplain ordinances.
STRLF	Stafford Act §205	X	X	X	Specified in FY2023 Notice of Funding Opportunity; the STRLF is not yet included in FEMA guidance or regulations.
NFIP/ CRS	National Flood Insurance Act §4022(b)(2)	X	X		Communities that adopt hazard-resistant codes are eligible for reduced flood insurance premiums.

**Sources:** Compiled by CRS from statutes, *HMAPPG*, and *Addendum to the 2017 Community Rating System Coordinators' Manual*.

a. 42 U.S.C. §§5170a and 5172(a)(2)(D).

<sup>145</sup> FEMA, *Addendum to the 2017 CRS Coordinators' Manual*, Washington, DC, January 2021, pp. A-11, [https://www.fema.gov/sites/default/files/documents/fema\\_community-rating-system\\_coordinator-manual\\_addendum-2021.pdf](https://www.fema.gov/sites/default/files/documents/fema_community-rating-system_coordinator-manual_addendum-2021.pdf).



## **Additional FEMA Technical Assistance**

FEMA also provides technical expertise to jurisdictions through Mitigation Assessment Teams (MATs). These teams deploy to areas affected by disasters, analyze structural damage, and develop recommendations for local construction methods and building code improvements.<sup>146</sup> FEMA has recently taken action to broaden its own capacity to promote the adoption, administration and enforcement of modern building codes, hiring Regional Specialists in Building Codes in all 10 FEMA Regions.

## **FEMA: Building Codes Advocacy and Leadership**

Since its founding, FEMA has assumed an active role in the development and promotion of hazard-resistant building codes, including the activities summarized in the sections below.

### **Research and Development**

Several statutes direct FEMA to collaborate with other federal agencies such as the National Institute of Standards and Technology (NIST) and private code development organizations like the ICC to develop hazard-resistant building codes and standards.<sup>147</sup> Additionally, FEMA has assumed a leading role in researching the benefits of building codes, and raising awareness about code adoption and enforcement. In 2011, the agency initiated a four-party study on the value of avoided disaster-related physical damages attributed to the use of modern building codes.<sup>148</sup> The most recent part of this study was published in November 2020, *Building Codes Save*.<sup>149</sup> The report concluded that about half of the buildings struck by a disaster after 2000 avoided losses as a result of accordance with I-Codes for an estimated aggregate saving of \$1.6 billion annually.<sup>150</sup> The study projected that I-Code savings would increase to \$3.2 annually by 2040, for cumulative savings of \$132 billion.<sup>151</sup>

FEMA has also helped research, promote, and identify financial and technical support for the use of “nature-based solutions.” Nature-based solutions refer to building methods that integrate environmental features and processes into the build environment rather than rely on entirely artificial, “gray” infrastructure (e.g., “green roofs” fitted with planting medium and vegetation that reduce rain runoff and energy costs).<sup>152</sup>

### **Multiagency Coordination**

FEMA leads several multiagency efforts to promote the use of hazard-resistant codes across federal programs and facilities, including the Mitigation Framework Leadership Group

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<sup>146</sup> FEMA, *Building Codes Save*, ES-2.

<sup>147</sup> Section 3 of P.L. 114-52; FEMA; Section 5(b)(2)(A)(iii) of the Earthquake Hazards Reduction Act of 1977, as amended; 42 U.S.C. §7704(b)(2)(A)(iii).

<sup>148</sup> Related losses (e.g., avoided displacement of workers) were not included in the study.

<sup>149</sup> FEMA, *Building Codes Save: A Nationwide Study*, November 2020, [https://www.fema.gov/sites/default/files/2020-11/fema\\_building-codes-save\\_study.pdf](https://www.fema.gov/sites/default/files/2020-11/fema_building-codes-save_study.pdf).

<sup>150</sup> *Ibid.*, ES-6.

<sup>151</sup> *Ibid.*

<sup>152</sup> FEMA, *Building Community Resilience with Nature-Based Solutions: A Guide for Local Communities*, June 2021, [https://www.fema.gov/sites/default/files/documents/fema\\_riskmap-nature-based-solutions-guide\\_2021.pdf](https://www.fema.gov/sites/default/files/documents/fema_riskmap-nature-based-solutions-guide_2021.pdf). For background, see CRS Report R46328, *Flood Risk Reduction from Natural and Nature-Based Features: Army Corps of Engineers Authorities*, by Nicole T. Carter and Eva Lipiec.

(MitFLG).<sup>153</sup> MitFLG was established through Presidential Policy Directive 8, as directed by the Post-Katrina Emergency Management Reform Act of 2006 (PKEMRA, P.L. 109-295), and includes representatives from more than 15 federal agencies as well as SLTT government representatives that collaborate to increase resiliency to hazards in communities across the country.<sup>154</sup> MitFLG's efforts include the development of a range of guidance, plans, and executive orders relevant to hazard mitigation, including the 2019 publication of the National Mitigation Investment Strategy (NIMS).<sup>155</sup> NIMS identifies and tries to coordinate state, local, private, and federal support for mitigation measures and guide implementation. MitFLG reviewed over 100 agency programs that fund construction or repair of facilities to ensure each program requires adherence to consensus-based codes.<sup>156</sup>

FEMA is also working to increase federal personnel with expertise in developing and implementing codes and standards. For example, FEMA's Building Codes Strategy called for the creation of building codes specialists in each FEMA region, and FEMA has reported that each region will have the position filled by the end of FY2023.<sup>157</sup>

## Public Awareness

FEMA has also supported efforts to raise awareness regarding the importance of building codes. One recent example is the No Codes, No Confidence campaign developed by the nonprofit consumer advocate Federal Alliance for Safe Homes (FLASH). With financial support from the Department of Homeland Security, and in partnership with FEMA and ICC, among others, No Codes, No Confidence developed events, videos, and other materials to inform individuals about building codes in their own community, and whether their residences are built to modern, hazard-resistant designs.<sup>158</sup>

## Monitoring Building Code Adoption

FEMA tracks building code adoption status for SLTTs (an effort called Building Code Adoption Tracking, or BCAT). FEMA tracks state or territory requirements for building code adoption, the status of code adoption, and known amendments weakening adopted building codes.<sup>159</sup> The BCAT portal provides users an interactive map that tracks hazards and relevant building code adoption information (see **Figure 3**).<sup>160</sup> Additionally, FEMA publishes fact sheets analyzing

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<sup>153</sup> FEMA, Mitigation Framework Leadership Group, website, <https://www.fema.gov/emergency-managers/national-preparedness/frameworks/mitigation/mitflg>.

<sup>154</sup> Ibid.

<sup>155</sup> MitFLG, Department of Homeland Security, *National Investment Mitigation Strategy*, August 2019, [https://www.fema.gov/sites/default/files/2020-10/fema\\_national-mitigation-investment-strategy.pdf](https://www.fema.gov/sites/default/files/2020-10/fema_national-mitigation-investment-strategy.pdf).

<sup>156</sup> FEMA, "Creating a 'Codealition': Bold Plans for Using Building Codes to Strengthen Resilience," presentation with *Natural Hazards Center*, September 13, 2022, <https://hazards.colorado.edu/training/webinars/creating-a-codealition-bold-plans-for-using-building-codes-to-strengthen-resilience>.

<sup>157</sup> FEMA, "Building Science: May Update," May 2023. Email from Building Science Listserv.

<sup>158</sup> FLASH, *No Code. No Confidence*, <https://inspecttoprotect.org/>.

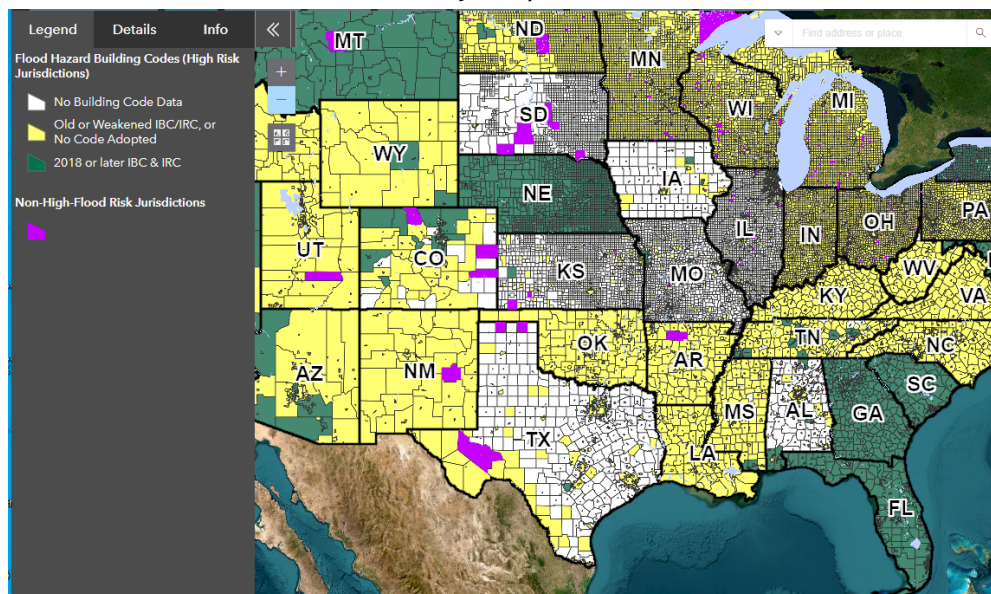
<sup>159</sup> FEMA, *Nationwide Building Code Adoption Tracking*, <https://www.fema.gov/emergency-managers/risk-management/building-science/bcat>.

<sup>160</sup> FEMA, *Building Code Adoption Portal*, <https://stantec.maps.arcgis.com/apps/MapSeries/index.html?appid=a053ac48343c4217ab4184bc8759c350>.

building code adoption trends (e.g., the percentage of jurisdictions with hazard-resistant building codes within a state or territory).<sup>161</sup>

**Figure 3. Building Code Adoption Portal**

Detail, January 9, 2023



**Source:** FEMA, Building Code Adoption Portal, <https://stantec.maps.arcgis.com/apps/MapSeries/index.html?appid=a053ac48343c4217ab4184bc8759c350>.

## Considerations for Congress

### Building Codes and Equity

Socially vulnerable individuals and communities experience particular hazard risks due to substandard building codes.<sup>162</sup> They are more likely to live in poor-quality housing, which is more vulnerable to disaster-related damages. Furthermore, socially vulnerable populations are more likely to experience financial hardship related to a disaster, yet are less likely to be able to cover

<sup>161</sup> FEMA, “Annual Fact Sheets: BCAT & Mutual Aid for Building Departments,” <https://www.fema.gov/emergency-managers/risk-management/building-science/bcat/fact-sheets>.

<sup>162</sup> See, for example, Wesley Highfield, Walter Gillis Peacock, and Shannon Van Zandt, “Mitigation Planning: Why Hazard Exposure, Structural Vulnerability, and Social Vulnerability Matter,” *Journal of the American Planning Association*, vol. 34, no. 3 (2014), pp. 287-300, 2014; and Yang Zhang and Walter Gillis Peacock, “Planning for Housing Recovery? Lessons Learned from Hurricane Andrew,” *Journal of the American Planning Association*, vol. 76, no. 1 (2010), pp. 5-24. This report adopts FEMA’s definition of social vulnerability in the context of emergency management, meaning “the susceptibility of social groups to the adverse impacts of natural hazards, including disproportionate death, injury, loss, or disruption of livelihood.” (FEMA, National Risk Index: Primer, November 2020, [https://www.fema.gov/sites/default/files/2020-11/fema\\_national-risk-index\\_primer.pdf](https://www.fema.gov/sites/default/files/2020-11/fema_national-risk-index_primer.pdf).) Per the U.S. Centers for Disease Control and Prevention (CDC), higher levels of social vulnerability (including poverty, limited English proficiency, disability, and minority status) within a disaster-affected community may correspond to fewer resources available to reduce and mitigate suffering and loss, and for this reason, warrant federal or other assistance. (U.S. Centers for Disease Control and Prevention (CDC), “CDC SVI Documentation 2018,” CDC SVI 2018 Documentation—1/31/2020, January 31, 2020, [https://www.atsdr.cdc.gov/placeandhealth/svi/documentation/SVI\\_documentation\\_2018.html](https://www.atsdr.cdc.gov/placeandhealth/svi/documentation/SVI_documentation_2018.html).)

emergency costs. Communities with fewer resources may also suffer disproportionate effects of climate change.<sup>163</sup>

Despite this, SLTTs representing low-income and socially vulnerable populations may have fewer resources to develop, update, and enforce strong, hazard-resistant building codes. Local governments with smaller budgets may not be able to maintain sufficient staff with applicable expertise to enforce building codes. The ICC and partner organizations have recognized the burdens that certain communities face in developing, administering, and enforcing codes so as to ensure safe and hazard-resistant buildings.

In addition, building codes only regulate new construction. Except in certain circumstances, for example if a building suffers substantial damage, the code requirements for existing buildings are those which were in effect when the structure was designed and constructed.<sup>164</sup> Residents of older buildings which do not meet current building codes may not have their building upgraded to modern building codes without suffering disaster damage.

Congress may consider options to increase support for individuals and communities struggling to implement hazard-resistant building codes, for example, by providing additional financial or direct assistance (e.g., deployed or embedded federal personnel). Congress could consider directing FEMA to fully implement authorities from the Disaster Recovery Reform Act (DRRA) that authorized assistance for building code enforcement for non-disaster damaged buildings, without time restrictions.<sup>165</sup> Congress could consider increasing the proportion of funding for DTA in BRIC. As of February 10, 2023, FEMA had obligated \$3,158,832 for DTA in FY2020 and FY2021,<sup>166</sup> out of a total of \$1.5 billion available for BRIC in those two years. Congress could also consider making DTA available for other FEMA-funded programs, or monitor the implementation of other federal programs supporting building code adoption.<sup>167</sup> Alternatively, Congress could consider means of supporting or monitoring a recent proposal by FEMA whereby communities pool and share trained nonfederal building code professionals following disasters as a form of mutual aid.<sup>168</sup> Such options could mitigate the potential burdens that new, strict codes may impose on low-income and other vulnerable individuals and communities that may not have the financial resources to fund compliance measures, or may lose access to noncompliant housing and other facilities.

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<sup>163</sup> See, for example, Jay, A., D.R. Reidmiller, C.W. Avery, D. Barrie, B.J. DeAngelo, A. Dave, M. Dzaugis, M. Kolian, K.L.M. Lewis, K. Reeves, and D. Winner, 2018, "Overview," in *Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II*, Reidmiller, D.R. et al., (eds.), U.S. Global Change Research Program, Washington, DC, USA, pp. 33-71, doi: 10.7930/NCA4.2018.CH1.

<sup>164</sup> FEMA, *Frequently Asked Questions*, Building Codes Toolkit, January 29, 2014, p. 2, [https://www.fema.gov/media-library-data/1391095848112-ea8765dee99538f4bb2cc7179cf5c175/Building\\_Codes\\_Toolkit\\_FAQ\\_508.pdf](https://www.fema.gov/media-library-data/1391095848112-ea8765dee99538f4bb2cc7179cf5c175/Building_Codes_Toolkit_FAQ_508.pdf).

<sup>165</sup> Some industry advocates raised concern that FEMA interpreted its authorities under the relevant provision (Section 1206(a)) too narrowly, for example, by restricting implementation to 180 days to work related to disaster-damaged facilities, or by not providing PA for the design and adoption of new building codes. American Society of Civil Engineers (ASCE) et al., Joint Comments in Response to FEMA's Draft Policy to Implement DRRA Sec. 1206, p. 5, <https://www.ashrae.org/file%20library/about/government%20affairs/public%20policy%20resources/joint-comments-on-drra-sec-1206-implementation-.pdf>.

<sup>166</sup> Email from FEMA Congressional Affairs Staff, February 10, 2023.

<sup>167</sup> See, for example, Assistance for Latest and Zero Building Energy Code Adoption, Sec. 50131 of the Inflation Reduction Act, as discussed in U.S. Department of Energy, "New Federal Funding and Technical Assistance Opportunities for Building Energy Codes," presentation, National Energy Codes Conference, May 2-4, 2023, [https://www.energycodes.gov/sites/default/files/2023-05/2023\\_NECC\\_New\\_Federal\\_Funding.pdf](https://www.energycodes.gov/sites/default/files/2023-05/2023_NECC_New_Federal_Funding.pdf).

<sup>168</sup> General Services Administration, "10x Announces New Projects Chosen for FY22 Phase 1 Funding," May 11, 2022, <https://10x.gsa.gov/posts/2022-selected-projects/>.

## Streamlining and Standardizing Post-Disaster Federal Building Codes Requirements

Under current statute, regulations, and policy, different Stafford Act programs require compliance with different building codes and standards, as summarized above. Such inconsistency creates confusion or haphazard standards within the same community. Recently, FEMA has worked with other agencies to remedy such inconsistencies. The first goal of FEMA's 2022 *Building Codes Strategy* is to integrate building codes and standards across FEMA programs, including by using a consistent set of codes.

Should Congress seek to codify such policies, it could consider modifying FEMA's statutory authorities to require compliance with a clearly identified set of consensus-based codes and standards across all FEMA-funded programs. Congress could additionally consider explicitly requiring federally funded projects to meet or exceed applicable higher local standards. Alternatively, Congress may consider codifying certain building code requirements that currently exist only in regulations or policy. For example, Congress could consider expanding and codifying the application of the Federal Flood Risk Mitigation Standard (FFMRS) that currently depends on an Executive Order.<sup>169</sup> Bills to do so were introduced in the 116<sup>th</sup> and 117<sup>th</sup> Congresses.<sup>170</sup> Doing so may eliminate the risk of termination and policy changes across administrations.<sup>171</sup> Congress could also consider applying the FFRMS for all federally funded projects in the SFHA, or for all facilities which have received disaster assistance for flooding, or for all federal housing lending.

## FEMA Assistance in Hazard Zones

Some scholars and oversight entities, including the Congressional Budget Office (CBO), have raised concerns that the federal government may incentivize building or rebuilding in hazard zones by providing assistance to facilities in hazard-prone areas.<sup>172</sup> Statutory limitations on such

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<sup>169</sup> Executive Order 13690, "Establishing a Federal Flood Risk Management Standard and a Process for Further Soliciting and Considering Stakeholder Input," 80 *Federal Register* 6425-6428, January 30, 2015.

<sup>170</sup> For example, S. 1688, Federal Flood Risk Management Act of 2021, in the 117<sup>th</sup> Congress; and S. 5022, Federal Flood Risk Management Act of 2020, in the 116<sup>th</sup> Congress.

<sup>171</sup> In August 2017, President Trump signed Executive Order 13807 in an effort to streamline federal infrastructure approval. Among other actions, E.O. 13807 revoked the Obama Administration E.O. 13690. In January 2021, President Biden revoked the Trump Administration E.O. 13807 as part of Executive Order 13990, which had the effect of reinstating the Obama Administration E.O. 13690, including the FFRMS. In May 2021, President Biden's Executive Order 14030 confirmed that guidelines for implementing E.O. 13690 were never revoked and thus remain in effect. See Executive Order 13690, "Establishing a Federal Flood Risk Management Standard and a Process for Further Soliciting and Considering Stakeholder Input," 80 *Federal Register* 6425-6428, January 30, 2015; Executive Order 13807, "Establishing Discipline and Accountability in the Environmental Review and Permitting Process for Infrastructure Projects," 82 *Federal Register* 40463, August 24, 2017; Executive Order 13990, "Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis," 86 *Federal Register* 7037, January 25, 2021; and Executive Order 14030, "Climate-Related Financial Risk," 86 *Federal Register* 27967-27971, May 20, 2021.

<sup>172</sup> See, for example, Congressional Budget Office (CBO), *Expected Costs of Damage from Hurricane Winds and Storm-Related Flooding*, April 2019, pp. 27-28, <https://www.cbo.gov/system/files/2019-04/55019-ExpectedCostsFromWindStorm.pdf>; and Sadie Frank et al., "Inviting Danger: How Federal Disaster, Insurance and Infrastructure Policies are Magnifying the Harm of Climate Change," *Brookings Institution Report*, March 24, 2021, <https://www.brookings.edu/research/inviting-danger-how-federal-disaster-insurance-and-infrastructure-policies-are-magnifying-the-harm-of-climate-change/>.



assistance could reduce the risk of increasing hazard-prone development that may contribute to disaster casualties and losses.<sup>173</sup>

Congress may wish to consider proposals to restrict or eliminate federal assistance for rebuilding in high-risk hazard zones beyond existing limitations on assistance<sup>174</sup> for rebuilding in Special Flood Hazard Areas (SFHAs) by specifying that such projects do not meet a defined resilience standard.<sup>175</sup> The Stafford Act already authorizes a reduction in the federal cost share for PA-funded projects that have experienced repetitive losses over the past 10 years, or where the owner has “failed to implement appropriate mitigation measures to address the hazard that caused the damage to the facility.”<sup>176</sup> Similar reductions could be put in place to discourage rebuilding in high-risk areas.

However, such proposals are not without risk. Restricting assistance could significantly burden communities that are predominantly or entirely located in hazard-prone areas, or could potentially exacerbate affordable housing shortages by discouraging development.<sup>177</sup> Some entire counties, for example, are in SFHAs, so reducing assistance in these areas could impede community recovery following an incident, or prove infeasible. Additionally, FEMA’s implementation of such authorities could jeopardize insurance eligibility or affordability of certain properties or communities, with potential negative consequences.

## FEMA, Clean Energy, and Building Codes

Historically, FEMA has not covered the cost of certain energy-related improvements, such as smart grid technology or the marginal cost of low-carbon materials, to facilities eligible for Stafford Act assistance, citing limitations on statutory authority to fund improvements (vs. repair) of disaster-damaged structures.<sup>178</sup> P.L. 117-169, often referred to as the Inflation Reduction Act of 2022, enhanced FEMA’s relevant authorities. Section 70006 authorized FEMA to provide financial assistance through BRIC, HMGP, and PA until September 30, 2026, to cover “costs

<sup>173</sup> Carolyn Kousky, “Managing Shoreline Retreat: A US Perspective,” *Climatic Change*, vol. 124, pp. 9-20 (2014), <https://link.springer.com/article/10.1007/s10584-014-1106-3>; Alice Hill, “Reducing Disaster Costs by Building Better,” *Council on Foreign Relations*, April 2, 2020, <https://www.cfr.org/report/reducing-disaster-costs-building-better>.

<sup>174</sup> See Stafford Act Section 406(c)(1)(C), 42 U.S.C. §5172(c)(1)(C).

<sup>175</sup> Stafford Act Sec. 406(c)(1)(C), 42 U.S.C. §5172(c)(1)(C). See proposal in Council on Foreign Relations, *Reducing Disaster Costs by Building Better*, April 2, 2020, <https://www.cfr.org/report/reducing-disaster-costs-building-better>.

<sup>176</sup> Stafford Act Sec. 406(b)(2)(B), 42 U.S.C. §5172(b)(2)(B).

<sup>177</sup> Elizabeth Maly, Tamiyo Kondo, and Michiko Banba, “Post-Disaster Land Use Management after Hurricane Katrina and Superstorm Sandy in the United States,” chapter 6 in Michiko Banba and Rajib Shaw, eds., *Land Use Management in Disaster Risk Reduction: Practice and Cases from a Global Perspective* (Kobe, Japan: Springer, 2017). On restricting development in hazard zones, see, for example, Eric Biber and Moira O’Neill, “Building to Burn? Permitting Exurban Housing Development in High Fire Hazard Zones,” *Ecology Law Quarterly*, vol. 48, no. 4 (2021), pp. 943-980.

<sup>178</sup> For example, GAO reported that in Puerto Rico, enhanced grid resilience measures including “smart grid technology ... are not eligible for PA funding.” GAO, *Puerto Rico Electricity: FEMA and HUD Have Not Approved Long-Term Projects and Need to Implement Recommendations to Address Uncertainties and Enhance Resilience*, GAO-21-54, November 2020, pp. 12 and 19-20, <https://www.gao.gov/assets/gao-21-54.pdf>; Comité Diálogo Ambiental, Inc. et al., “Opposition to PREPA’s Motion Seeking PREB Approval of 10-Year Infrastructure Plan,” Case No. NEPR-MI-2021-0002, <https://energia.pr.gov/wp-content/uploads/sites/7/2021/03/Opposition-to-PREPAS-Motion-Seeking-Preb-Approval-of-10-Year-Infrastructure-Plan-with-Attachments-NEPR-MI-2021-0002-1.pdf>; and FEMA, “Finding of No Significant Impact, Programmatic Environmental Assessment,” [https://www.fema.gov/sites/default/files/documents/fema\\_oehp-fonsi-utilities-repair\\_06-17-21.pdf](https://www.fema.gov/sites/default/files/documents/fema_oehp-fonsi-utilities-repair_06-17-21.pdf).

associated with low-carbon materials” and “incentives that encourage low-carbon and net-zero energy projects.”<sup>179</sup>

This broadly written authority affords significant discretion to the FEMA Administrator. While it does not require FEMA to take any specific action, it allows the Administrator to provide financial assistance for a potentially broad range of costs in federally funded mitigation and reconstruction projects. In March 2023, FEMA released a memorandum implementing the authorities, including by defining low-carbon materials.<sup>180</sup>

Congress may monitor how many applicants pursue such assistance, how many projects are approved, what energy standards may be identified as eligible for assistance,<sup>181</sup> and how the FEMA Administrator chooses to incentivize net-zero energy projects.

Separately, some of FEMA's recent code-related proposals have generated criticism from building industry representatives.<sup>182</sup> In fall 2022, FEMA proposed increasing the risk categories of certain energy generation facilities, thus requiring more hazard-resistant design, given that the loss of function of such facilities could result in power outages and represent a substantial hazard to communities.<sup>183</sup> Several hundred industry organizations campaigned against the proposal on the basis that it would discourage clean energy development by increasing the cost of clean energy projects “without achieving its intended benefit of grid resiliency and reliability.”<sup>184</sup> According to industry reports, the ICC ultimately approved a “compromise” proposal that treats certain projects, such as solar, differently than other energy generation projects.<sup>185</sup> Congress may monitor such code compliance requirements for emerging and specialized building projects, including those undertaken to increase renewable energy generation.

## **FEMA and Rebuilding for Future Conditions**

As described earlier in this report, building codes often utilize historical data to determine what forces or hazards a building should withstand (e.g., building to withstand a flood with a 1% or greater risk of occurring in any given year). Yet the utility of such historical data for understanding future risks may be diminishing. Climate change and changing development

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<sup>179</sup> Section 70006 of P.L. 117-130.

<sup>180</sup> Assistant Administrator of Recovery Melissa Forbes to FEMA Regional Administrators, “Implementation of Inflation Reduction Act Section 70006(1) for FEMA Public Assistance and Hazard Mitigation Assistance Programs, March 21, 2023, [https://www.fema.gov/sites/default/files/documents/fema\\_inflation-reduction-act-implementation-memo\\_032023.pdf](https://www.fema.gov/sites/default/files/documents/fema_inflation-reduction-act-implementation-memo_032023.pdf).

<sup>181</sup> See CRS Report R46719, *Green Building Overview and Issues*, by Corrie E. Clark, for details on green building standards that could be utilized.

<sup>182</sup> For further background, see David Iaconangelo, “FEMA Plan Sparks Fears of Renewables Slowdown,” October 12, 2022, <https://www.eenews.net/articles/fema-plan-sparks-fears-of-renewables-slowdown/>; and Ryan Kennedy, “Proposed FEMA Building Code May Hamper Solar Deployment,” October 7, 2022, <https://pv-magazine-usa.com/2022/10/07/proposed-fema-building-code-may-hamper-solar-deployment/>.

<sup>183</sup> David Bonowitz, representing FEMA-ATC Seismic Code Support Committee, et al., “Proposed Change as Submitted,” S76-22, available at <https://subscriber.politicopro.com/eenews/f/eenews/?id=00000183-c839-d231-abc3-dcfb7dfc0000>.

<sup>184</sup> American Clean Power, Solar Energy Industries Association (SEIA), Distribution Wind Energy Association, et al., “Letter to ICC Governmental Member Voting Representatives,” October 17, 2022, available at [https://www.seia.org/sites/default/files/2022-10/Clean%20Energy%20Industry%20ICC%20S76-22%20Opposition%20Letter%20October%202022\\_0.pdf](https://www.seia.org/sites/default/files/2022-10/Clean%20Energy%20Industry%20ICC%20S76-22%20Opposition%20Letter%20October%202022_0.pdf). See also SEIA, “Oppose FEMA Code Change Proposal S76-22,” September 2022, <https://www.seia.org/sites/default/files/2022-10/FEMA%20Proposal%20Factsheet%20Sept.%202022%20copy.pdf>.

<sup>185</sup> SEIA, “Compromise Code Proposal Prevails in Victory for Clean Energy,” November 11, 2022, <https://www.seia.org/news/compromise-code-proposal-prevails-victory-clean-energy>.



patterns may significantly change the risk of certain hazards, rendering codes insufficient or obsolete more quickly than in earlier decades. For this reason, Congress may consider the limitations of existing building codes to require future construction to withstand the risks of the hazards projected to occur in 10, 20, or more years.

Congress may consider requiring federally funded projects to rebuild to standards resilient to “future conditions,” whenever possible.<sup>186</sup> Congress could direct FEMA to incorporate estimations of future conditions into the agency’s definition of resilience that is currently in draft rulemaking, so that recipients of FEMA funding may build to codes and standards reflecting anticipated conditions on a certain future date. (For example, FEMA’s 2020 National Advisory Committee report uses 2045 as a reference date, and the *Resilience Roadmap: The Urgent Need for Climate Resilience Action* recommends using 2050.)<sup>187</sup> Congress could also incentivize, rather than require, such mitigation measures by authorizing higher federal cost shares,<sup>188</sup> discounts on insurance premiums, tax credits, or access to additional grants or loans.<sup>189</sup> In a recent federal interagency workshop to identify ways to ensure future standards incorporate climate projections, participants recommended convening appropriate stakeholders across disciplines and identifying the most reliable data to inform future codes and standards.<sup>190</sup> Congress may consider how, if at all, to support such efforts through funding or agency direction.

Congress may also direct FEMA to address climate change by requiring communities receiving mitigation funding to implement higher standards to prepare for climate change-related impacts. Congress could, for example, consider introducing standards comparable to the FFRMS for other natural hazards, or requiring building codes and standards that allow for future conditions in all federally funded projects. Alternatively, Congress could consider directing the Multi-Hazard Mitigation Council to report on how the ICC’s codes (I-Codes) could be adopted and updated as climate change effects accrue.

<sup>186</sup> See, for example, Emily A. Feenstra, American Society of Civil Engineers, submitted statement to U.S. Congress, House Select Committee on the Climate Crisis, June 10, 2021, p. 3, [https://www.asce.org/uploadedFiles/Issues\\_and\\_Advocacy/Advocacy/Content\\_Pieces/2021-0610-asce-letter-select-climate.pdf](https://www.asce.org/uploadedFiles/Issues_and_Advocacy/Advocacy/Content_Pieces/2021-0610-asce-letter-select-climate.pdf); and Yoca Ardit-Rocha et al., Council of Foreign Relations, *Resilience Roadmap*, April 2021, p. 5 (hereinafter CFR, *Resilience Roadmap*), <https://cdn.cfr.org/sites/default/files/pdf/resilience-roadmap-urgent-need-climate-resilience-action.pdf>. For FEMA’s discussion of future conditions, see FEMA, *Future Conditions Job Aid*, September 2020, [https://www.fema.gov/sites/default/files/2020-09/fema\\_planning-future-condition.pdf](https://www.fema.gov/sites/default/files/2020-09/fema_planning-future-condition.pdf). Note that codes reflecting future conditions are not always available. See discussion in the GAO report, *Climate Change: Improved Federal Coordination Could Facilitate Use of Forward-Looking Climate Information in Design Standards, Building Codes, and Certifications*, GAO-17-03, November 2016, <https://www.gao.gov/assets/gao-17-3.pdf>.

<sup>187</sup> See the reference to “future events” (defined as conditions in 2045) in *National Advisory Council Report to the FEMA Administrator*, November 2020, [https://www.fema.gov/sites/default/files/documents/fema\\_nac-report\\_11-2020.pdf#page8](https://www.fema.gov/sites/default/files/documents/fema_nac-report_11-2020.pdf#page8); CFR, *Resilience Roadmap*, p. 5.

<sup>188</sup> See for example, Section 20606 of the Bipartisan Budget Act of 2018 (P.L. 115-123) as it amends Stafford Act Section 406(b) to authorize an increased federal share for PA to provide incentives to governments to “invest in measures that increase readiness for, and resilience from, a major disaster,” which may include “encouraging the adoption and enforcement of the latest published editions of relevant consensus-based codes, specifications, and standards.”

<sup>189</sup> Department of Homeland Security, Mitigation Framework Leadership Group, *National Mitigation Investment Strategy*, Washington, DC, August 2019, p. 16, [https://www.fema.gov/sites/default/files/2020-10/fema\\_national-mitigation-investment-strategy.pdf](https://www.fema.gov/sites/default/files/2020-10/fema_national-mitigation-investment-strategy.pdf).

<sup>190</sup> *Ibid.*, p. 38.

## Concluding Comments

Currently, FEMA is actively exercising a wide range of authorities and policy tools to promote a hazard-resistant built environment. Some argue the agency's existing authorities—or capacity—may be insufficient to help communities adopt codes in line with their anticipated disaster risk. Those who may want the federal government to more aggressively promote structural resilience may consider a range of policy mechanisms to fund, expand, or build upon FEMA's existing efforts, whether by codifying stricter code compliance requirements across federal programs or bolstering funding for subfederal code development and enforcement. Congress may also take note that some efforts to promote resiliency and stricter code requirements may burden hazard-prone communities and increase building costs for certain industry groups. The 118<sup>th</sup> Congress faces critical questions about how, where, and at what cost the country should build in the face of persistent—and growing—risk of disaster.

## Appendix. Chronology of Recent FEMA Actions

### Key Recent FEMA Actions Related to Building Codes

September 2016	FEMA releases guidance requiring adherence to I-Codes for certain rebuilding projects funded by FEMA Public Assistance, regardless of local code requirements. <sup>191</sup>
November 2020	FEMA releases <i>Building Codes Save: A Nationwide Study</i> quantifying the fiscal value of losses avoided by building code adoption and enforcement. <sup>192</sup>
May 2021	FEMA releases the <i>Building Codes Adoption Tracking Portal</i> to the public.
June 2021	FEMA releases <i>Building Community Resilience with Nature-Based Solutions: A Guide for Local Communities</i> . <sup>193</sup>
August 2021	FEMA releases the <i>National Risk Index</i> , an online application visualizing disaster risk across counties (and equivalent jurisdictions) in the United States. The index aims, in part, to support enhancement of codes and standards. <sup>194</sup>
March, 2022	FEMA publishes the agency's <i>Building Codes Strategy</i> to promote the adoption and enforcement of hazard-resistant codes throughout the country. <sup>195</sup>
June 1, 2022	President Biden announces the "National Initiative to Advance Building Codes," alongside FEMA Administrator Deanne Criswell. <sup>196</sup> As part of this initiative, the FEMA-led interagency Mitigation Framework Leadership Group (MitFLG) will review programs across the government to identify opportunities to increase use of modern building codes. <sup>197</sup> The initiative also is to incentivize adoption of current building codes through strategies including those outlined in FEMA's <i>Building Codes Strategy</i> .
August 2022	FEMA releases a <i>Building Codes Adoption Playbook</i> for subfederal governments. <sup>198</sup>
November 22, 2022	FEMA signs a Memorandum of Understanding with the Institute for Building and Home Safety, which FEMA explains will help "support[t] the development, maintenance, adoption, outreach, training and enforcement of natural hazard-resistant building and construction codes." <sup>199</sup>

<sup>191</sup> FEMA, "Public Assistance Required Minimum Standards," FEMA Recovery Policy FP\_104-009-4, September 30, 2016, [https://www.fema.gov/sites/default/files/2020-05/FEMA\\_Public\\_Assistance\\_Minimum\\_Standards\\_Policy\\_signed\\_9-30-16.pdf](https://www.fema.gov/sites/default/files/2020-05/FEMA_Public_Assistance_Minimum_Standards_Policy_signed_9-30-16.pdf).

<sup>192</sup> FEMA, *Building Codes Save: A Nationwide Study*, November 2020, [https://www.fema.gov/sites/default/files/2020-11/fema\\_building-codes-save\\_study.pdf](https://www.fema.gov/sites/default/files/2020-11/fema_building-codes-save_study.pdf).

<sup>193</sup> FEMA, *Building Community Resilience with Nature-Based Solutions: A Guide for Local Communities*, June 2021, [https://www.fema.gov/sites/default/files/documents/fema\\_riskmap-nature-based-solutions-guide\\_2021.pdf](https://www.fema.gov/sites/default/files/documents/fema_riskmap-nature-based-solutions-guide_2021.pdf).

<sup>194</sup> FEMA, *National Risk Index: Technical Documentation*, March 2023, p. 1-1, [https://www.fema.gov/sites/default/files/documents/fema\\_national-risk-index\\_technical-documentation.pdf](https://www.fema.gov/sites/default/files/documents/fema_national-risk-index_technical-documentation.pdf).

<sup>195</sup> FEMA, *Building Codes Strategy*, [https://www.fema.gov/sites/default/files/documents/fema\\_building-codes-strategy.pdf](https://www.fema.gov/sites/default/files/documents/fema_building-codes-strategy.pdf).

<sup>196</sup> White House, "Biden-Harris Administration Launches Initiative to Modernize Building Codes, Improve Climate Resilience, and Reduce Energy Costs," fact sheet, June 1, 2022, <https://www.whitehouse.gov/briefing-room/statements-releases/2022/06/01/fact-sheet-biden-harris-administration-launches-initiative-to-modernize-building-codes-improve-climate-resilience-and-reduce-energy-costs/>.

<sup>197</sup> Ibid.

<sup>198</sup> FEMA, *Building Codes Adoption Playbook: For Authorities Having Jurisdiction*, FEMA P-2196, August 2022, [https://www.fema.gov/sites/default/files/documents/fema\\_building-codes-adoption-playbook-for-authorities-having-jurisdiction.pdf](https://www.fema.gov/sites/default/files/documents/fema_building-codes-adoption-playbook-for-authorities-having-jurisdiction.pdf).

<sup>199</sup> FEMA, Building Science Bulletin, January 24, 2023.

March 2023      FEMA releases implementing guidance for Section 70006 of the Inflation Reduction Act, which directs FEMA to provide assistance for certain FEMA-funded projects with low-carbon materials (among other criteria).<sup>200</sup>

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<sup>200</sup> Assistant Administrator of Recovery Melissa Forbes to FEMA Regional Administrators, "Implementation of Inflation Reduction Act Section 70006(1) for FEMA Public Assistance and Hazard Mitigation Assistance Programs," March 21, 2023, [https://www.fema.gov/sites/default/files/documents/fema\\_inflation-reduction-act-implementation-memo\\_032023.pdf](https://www.fema.gov/sites/default/files/documents/fema_inflation-reduction-act-implementation-memo_032023.pdf).