

RATING **THE STATES** 2024

 **HURRICANE COAST**

*An Assessment of Residential Building Code and Enforcement Systems
for Life Safety and Property Protection in Hurricane-Prone Regions*

**ATLANTIC AND GULF COAST STATES
APRIL 2024**

May 2024: *The total score and contractor licensing and education score for Rhode Island have been updated to reflect the state now requires continuing education for all contractor trades.*

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Rating the States: 2024 Edition

The 2024 Edition is the fifth Insurance Institute for Business & Home Safety (IBHS) *Rating the States* report evaluating building code enforcement and administration and contractor licensing in the 18 Atlantic and Gulf coast states most vulnerable to catastrophic hurricanes. Each state is scored using a 0-100-point scale to assess the state's building code adoption, implementation, and enforcement system toward mitigating damage from windstorms.

Introduction

IBHS is a nonprofit organization supported by property insurers and reinsurers that conducts scientific research to identify and promote effective actions to strengthen homes, businesses, and communities against disasters and other causes of loss. As part of this mission, IBHS provides technical guidance to inform and improve model building codes, advocates for timely adoption of national model building codes and standards and encourages uniform enforcement of these codes.

The IBHS Rating the States report is intended to help provide a roadmap for states to improve their system of residential-related building regulations by following best practices to mitigate against damage from windstorms. It is not intended for use in insurance underwriting or rating, or for regulatory purposes. The metrics used in Rating the States are focused on the system of windstorm protections offered by the building code regime at the state level of government. The IBHS metrics used in Rating the States differ from those used by the Federal Emergency Management Agency (FEMA) and the ISO Building Code Effectiveness Grading Schedule (BCEGS®) program.

Since the fourth edition of IBHS *Rating the States* in 2021, the United States experienced six landfalling hurricanes, three of which made landfall in Florida, and one (Fiona 2022) in Puerto Rico (Figure 1). The strongest of these was Hurricane Ian (2022) which made landfall near Port Charlotte, Florida in September of 2022. Hurricane Ian (2022) was a Category 4 hurricane on the Saffir-Simpson Hurricane Wind Scale and brought extreme winds and catastrophic storm surge to the southwest coast of Florida. Total losses from Hurricane Ian (2022) exceeded \$110 billion with insured losses eclipsing \$65 billion.^{1 2} Despite the stout losses produced by Hurricane Ian (2022), it also demonstrated the value of the modern *Florida Building Code* and its system of adoption and uniform enforcement. Florida has been ranked either number 1 or number 2 in every edition of *Rating the States*. If it was not for Hurricane Ian (2022), Hurricane Ida (2021) would have taken center stage as the most impactful event since the last edition. Hurricane Ida (2021) made landfall near Grand Isle, Louisiana and produced over \$75 billion in damage. At the time, Hurricane Ida (2021) was the fifth costliest hurricane to strike the United States³.

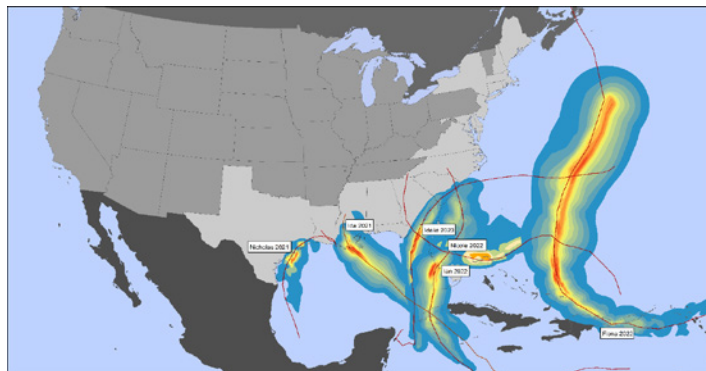


Figure 1. Hurricane tracks and peak wind gust swaths for the six hurricanes (Nicholas, Fiona, Ida, Ian, Nicole, and Idalia) that made landfall in the United States during this IBHS *Rating the States* cycle (2021-2023). The strongest of these five storms was Hurricane Ian (2022) which made landfall near Port Charlotte, Florida on September 28, 2022. The wind gust swaths shown here are from the Moody's RMS HWIND post-storm wind footprint.

Resilience of the built environment is the key to reducing the damage, displacement, disruption, and financial costs associated with these destructive natural hazards. Ensuring that standards required by the building code are incorporated into construction of residential dwellings has a direct relationship to building resilience. A 2023 study by IBHS and CoreLogic found that homes constructed under modern building code regimes reduced the jump in mortgage delinquencies commonly observed following major hurricanes (Category 3 or stronger) by nearly 50%. The result points not only to the direct impact of strong building codes reducing damage but also to strong codes helping homeowners maintain their financial stability in the wake of a disaster⁴. Because of the relationship between codes and resilience, the goal of *Rating the States* is to focus attention on the need for effective statewide building codes, uniform enforcement of those codes, and proper training and education for building officials and contractors. Each of these elements—administered at the state level of government to achieve consistency—completes the system of protection that an effective building code system can offer.

¹ National Centers for Environmental Information, 2023: Annual 2022 National Climate Report. National Oceanographic and Atmospheric Administration. <https://www.ncei.noaa.gov/access/monitoring/monthly-report/national/202213>.

² AON, 2023: Weather, Climate and Catastrophe Insight, Technical Report, 115 pp.

³ Beven, J.L., A. Hagen, and R. Berg, 2022: National Hurricane Center Tropical Cyclone Report: Hurricane Ida, National Hurricane Center, Miami FL, 163 pp.

⁴ Havlicek, T.D., I.M. Giammanco, W.H. Pogorzelski, and M. Shabaniyan, 2023: Do Modern Building Codes Mitigate Mortgage Delinquency Following Landfalling Hurricanes: The Influence of Building Codes on Mortgages, IBHS – CoreLogic Joint Technical Report, 20 pp.

Building Codes as a Tool for Mitigation

Facing the weather of today and the impacts a changing climate may bring presents a challenge as the cycle of damage, disruption, and displacement continues to payout far too frequently following severe weather. Standing in the face of severe weather, strong building codes and beyond-code resilience standards—such as IBHS’s FORTIFIED Home™ and Wildfire Prepared Home™ standards—are essential climate resilience tools. For this reason, IBHS strongly supports the adoption of statewide building codes and standards, strong local enforcement of the codes, and training and licensing of building officials, builders, and contractors. Modern building codes help safeguard people and property from hazards such as fires, electrical or plumbing malfunctions, and severe weather and natural hazards.

Many communities across the country remain vulnerable to severe weather because state or local jurisdictions have failed to adopt modern codes. Through the IBHS *Rating the States* program, the value and limitations of state-level building code decisions can be evaluated over time through tracking the level of adoption and enforcement of the building codes, the training and education of building code officials, and the licensing and training of construction trades with a particular focus on residential codes as a tool for windstorm damage mitigation.

What are Building Codes?

Building codes specify basic standards for the design and construction of buildings to protect life safety. Model building codes are developed by the International Code Council (ICC) by consensus through a public review process. This process allows for input and participation from a wide range of stakeholders, including state and local officials, designers, builders, contractors, insurers, and product manufacturers. Building codes like the International Residential Code® (IRC) provide prescriptive specifications and construction requirements for the design and construction of homes. In the United States, building codes are adopted and enforced at the state, county, and/or municipal levels. Most jurisdictions base their codes on ICC model codes with modifications, as needed. The IRC is updated on a three-year schedule, and the version most widely adopted at this time is the 2021 edition.

From Applied Science to Building Codes

Regular code adoption is one of the critical variables assessed in the *Rating the States* framework. Adopting the latest model code every three years integrates the latest science, engineering, and practical experience into construction practices. This regular adoption cycle ensures that building codes—the safety standards for our built-environment—represent the most current state of knowledge.

How does new science make its way into building codes?

The creation of the ICC in 1994 helped standardize building codes and the process of moving new science and engineering knowledge into the code itself. Proposals for a building code change or a new provision are typically based on research in fields such as structural engineering, materials science, fire safety, and environmental science. When research findings provide data and insights into the behavior of buildings, materials, and systems that illuminate a vulnerability, a potential hazard, or risk associated with a material, construction practice, component, or building system, proposals are developed to address the issue in the model building codes. The process can take two different forms:

- 1) a proposal for the development of a new testing standard for product or material performance that can be referenced by the building code once the standard is approved, or
- 2) a proposal adopted directly into the building code itself. These proposals typically focus on improving best practices, adding clarity to a provision, or addressing building system performance.

Testing and Standards: Standardized test methods are developed and used to evaluate the performance and safety of building materials, components, and systems. Standards organizations such as ASTM International, American Society of Civil Engineers (ASCE), American National Standards Institute (ANSI), the International Code Council (ICC), and the National Fire Protection Association (NFPA) develop standards based on scientific research and testing. These standards often form the basis for building code requirements and are used by the code to govern performance criteria.

In both pathways, the consensus process is used to determine whether or not the proposal moves ahead to change or develop a new testing standard and/or is integrated in the next codification cycle. Often, proposals are revised based on commentary from stakeholders during the voting process. It is not uncommon for a specific topic to be proposed in multiple cycles to reach a state where it receives consensus approval.

The timeline of a proposal moving into the building code can span a decade or more. In its shortest form, approved proposals are integrated on the three-year update cycle of the ICC’s model codes. This timeline also highlights why adopting model codes in their intended three-year cycle is critical to ensure the vulnerabilities are not allowed to grow in the built environment when known solutions are available, putting both lives and properties at risk.

As shown across the history of *Rating the States*, states span the spectrum of adoption cycles from rigidly following the three-year cycle, to adopting model codes every two cycles (6 years), to gaps in adoption created by events such as the COVID-19 pandemic, or to complete pauses in code adoption all together. The standardization of building codes and their update process allows the scientific process to play a fundamental role in the construction of homes and businesses by providing the empirical evidence, analytical tools, and expertise needed to establish requirements that promote safety, durability, and sustainability in the built environment.

The Value of Building Codes

With the effect of climate change on severe weather and the continued development of the built environment into at-risk areas, the cost of natural hazards intersecting our built environment is ever growing. According to NOAA, the United States experienced twenty-eight weather or climate events in 2023 alone that cost over \$1 billion; the total cost of these billion-dollar events over the past decade exceeds \$2 trillion⁵. 2023 was the ninth consecutive year in which ten-or-more billion-dollar weather-related disasters have occurred in the United States.

The adoption and enforcement of modern building codes and resilience standards have been proven to reduce the damage and disruption caused by disasters. Most recently, this was illustrated in a study by IBHS and CoreLogic that explored how building codes influence mortgage delinquencies following landfalling

hurricanes⁴. The housing markets in code jurisdictions following Hurricanes Irma, Harvey, Michael, and Laura were analyzed to explore how mortgage delinquencies, that typically jump following a disaster, were influenced by the different building code regimes that homes were constructed under. When accounting for economic factors, it was found that homeowners with a home constructed under a modern building code regime were 50 percent less likely to default on their mortgage compared to homes built prior to a modern building code regime. If a default was observed on a modern code-built home, homeowners were more likely to become current on their mortgage within 90 days and less likely to have to sell their home to become current on their mortgage.

Since the modern structure of building codes emerged in 2002, statewide adopted and uniformly enforced codes have been highly effective at reducing damage from windstorms. IBHS assessed the performance of over 5,000 structures following Hurricane Ian (2022)⁶. Of the 455 single-family homes and the 57 multifamily structures built under the post-2002 modern *Florida Building Code* (FBC), none had structural damage (Figure 2). When considering total damage, both structural damage and damage to components and cladding elements, modern code-built homes had nearly 2 times less total damage. It was estimated that the system of protection offered by the modern FBC likely saved \$1 - \$3 billion dollars in damage to just single-family homes in the areas impacted by Hurricane Ian (2022)⁶.

5 NOAA National Centers for Environmental Information (NCEI) U.S. Billion-Dollar Weather and Climate Disasters (2024). <https://www.ncei.noaa.gov/access/billions/>, DOI: [10.25921/stkw-7w73](https://doi.org/10.25921/stkw-7w73)

6 Giammanco, I.M., E. Newby, W.H. Pogorzelski, and M. Shabanian, 2024: Observations of building performance in southwest Florida during Hurricane Ian (2022) Part II: Performance of the *Florida Building Code. Insurance Institute for Business & Home Safety*, Technical Report, 21 pp.

Hurricane Ian (2022): Structural Performance

Maximum gust winds 110-160 mph

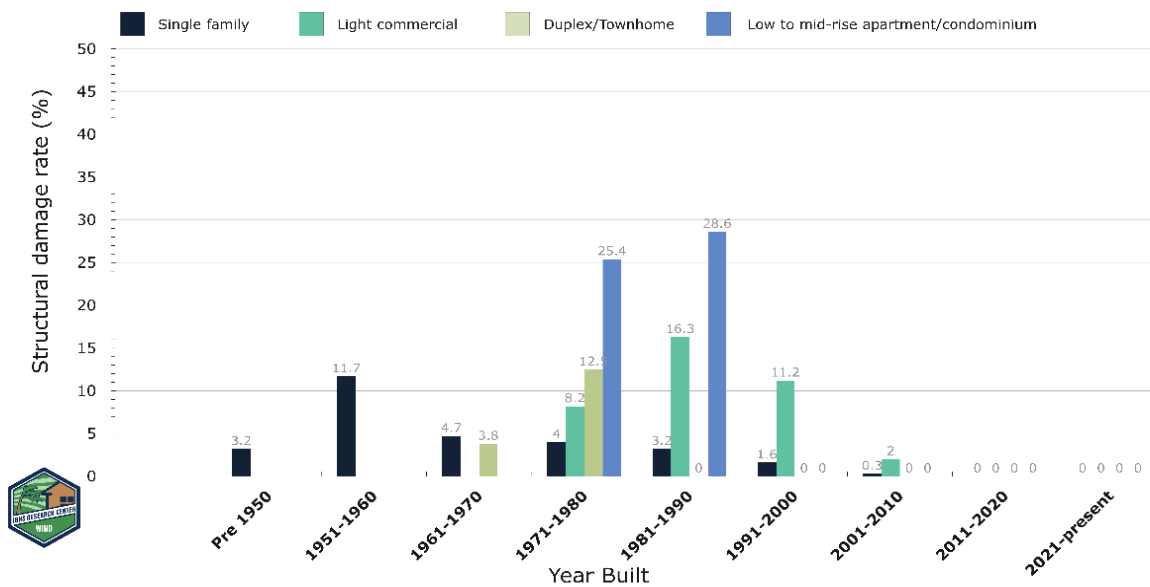


Figure 2. Structural damage rates observed in Hurricane Ian (2022) for buildings assessed in Giammanco et al. (2023) grouped by year built for single-family, light commercial, and multifamily construction (e.g., duplex/townhomes and low- to-mid-rise apartment/condominiums)⁷. Note the reduction in structural damage for structures built under the post-2002 modern Florida Building Code.

7 Giammanco, I.M., E. Newby, H. Pogorzelski, M. Shabanian, 2023: Observations of building performance in Southwest Florida during Hurricane Ian (2022): Part II, Performance of the modern *Florida Building Code*, *Insurance Institute for Business & Home Safety*, Technical Report, 21 pp.

When applying the work conducted by Simmons et al. (2017)⁸ on the cost of the modern FBC relative to less stringent code provisions to the performance during Hurricane Ian (2022), it was estimated that for every added \$1 in construction cost, the modern FBC saved \$8 in structural damage alone. The result was very similar to that found by the FEMA 2020 Building Codes Save study. That research found that existing codes will result in a \$132 billion reduction in losses between 2000 and 2040. If all new buildings in the United States complied with modern editions of model building codes, more than \$600 billion⁹ in losses could be avoided.

⁸ Simmons, K.M., J. Czajkowski, and J. Done, 2017: Economic effectiveness of implementing a statewide building code: The case of Florida, SSRN, <https://dx.doi.org/10.2139/ssrn.2963244>.

⁹ Federal Emergency Management Agency, 2020: Building Codes Save: A Nationwide Study, Losses Avoided as a Result of Adopting Hazard-Resistant Building Codes, United States Department of Homeland Security, 189 pp.

The National Institute of Building Sciences (NIBS) found similar savings in a 2019 report, identifying an average return on investment of \$11 for every dollar spent on adopting modern codes, and an additional \$4 for every dollar spent on adopting beyond-code resilience standards like FORTIFIED¹⁰.

Voluntary resilience standards go beyond building codes to offer enhanced protection. These standards are designed not just for life safety, like conventional building codes, but are also designed to protect structures from specific hazards, thus minimizing damage and disruption to daily life. For example, the IBHS FORTIFIED standard is designed to strengthen homes and commercial buildings against specific types of severe weather such as high winds, hail, hurricanes, and tornadoes.

¹⁰ National Institute of Building Sciences, 2019: Natural Hazard Mitigation Saves, Multi-Hazard Mitigation Council, National Institute of Building Sciences, Washington D.C., 658 pp.

Rating the States Methodology

The *Rating the States* scoring system evaluates 47 components of building code adoption, enforcement, licensing, and education to assess the effectiveness of a state's code program. The assessment covers factors such as:

- The current statewide residential building code and whether one exists at all.
- The processes in place to ensure uniform code application without amendments that weaken it.
- State and local enforcement programs.
- Licensing and education of building officials, contractors, and subcontractors.

After identifying data points in each category, activities and/or processes associated with each element are weighted as follows:

- 50% of the total score is based on statewide adoption and enforcement of building codes.
- 25% of the total score is based on state-adopted requirements for building official certification, training, and continuing education. It is noted that these factors are not included in the FEMA Building Code Adoption Tracking Toolkit or any associated metrics.
- 25% of the total score is based on state regulations for on-site implementation and proficiency, as demonstrated by contractor and subcontractor registration, licensing, and continuing education. It is noted that these factors are not included in the FEMA Building Code Adoption Tracking Toolkit or any associated metrics.

The statistical weighting allows for recognition that the building code is the focal point of an effective state regulatory life safety and property protection system. Within each of the three components, subcategories include:

- Whether statewide building codes can be amended at the local level,
- Certification requirements for building officials, and
- Specific construction trades covered by licensing requirements.

Points are scored in these subcategories based on their relative importance to building safety and integrity, with an emphasis on the wind hazard protection requirements. States received points based on IBHS research relating to a set of questions seeking to gauge the statutory and regulatory environment in three categories and associated subcategories identified. Points were allotted when the answer to a given question was consistent with promotion of safer residential construction. No points were allotted if the answer to a given question was inconsistent with the promotion of safer construction. In limited instances, a subjective interpretation was required by IBHS building code experts. No negative points are allotted. As a result, possible scores range from 0 to 100, with 0 as the weakest and 100 as the strongest score. In 2024, actual *Rating the States* total scores ranged from 23 to 96. The full assessment survey and point scoring system can be found in Appendix A.

Overview of 2024 Results

In the 2024 edition of *Rating the States*, Virginia finished with a 96 representing the best building code system along the United States hurricane coast. Florida finished a close second with a score of 95. These two states have been the top two for every edition of *Rating the States*. It is noted that neither state has received a perfect score, but Virginia's 96 is the highest score in the history of the program. Virginia's momentous achievement did not come without suspense. In January of 2024, the Virginia Board of Housing and Community Development put forth a motion to roll back the adoption of the 2021 I-Codes. It was defeated by a vote of 10-3 against reopening the codes cycle.

The full results of the 2024 edition of *Rating the States* are provided in Table 1 along with total scores for the previous four editions. Figure 2 provides the geographic representation of the 2024 scores. In this fifth edition, five states achieved scores higher than 90 points, which is considered a top performing building codes system. In addition to Florida and Virginia, New Jersey, South Carolina, and Louisiana scored above 90 points. Connecticut scored 90.

Louisiana's improvements in enforcement and training requirements helped the state gain 9 points in the 2024 edition compared to its score in the 2021 edition of *Rating the States*. Louisiana also launched a grant program to help spur homeowners towards an IBHS designated FORTIFIED Roof™. The state is considered one of the most improved, along with Mississippi. While Mississippi has fallen in the bottom third of the rankings over the history of the program, in the 2024 edition of *Rating the States*, the state gained 15 points through provisions now requiring state licensure of trades (electrical, plumbing, etc.) and their training. Mississippi now scores 20 out of a possible 25 points in the contractor licensing and training category. It is the largest point gain for any state between individual editions since Mississippi gained 24 points between the 2012 and 2015 editions of *Rating the States*. However, Mississippi still lacks severely in code adoption, enforcement, and building official training. Its total score for 2024 was 44, which remains in the bottom third, but ahead of Texas, Alabama, and Delaware.

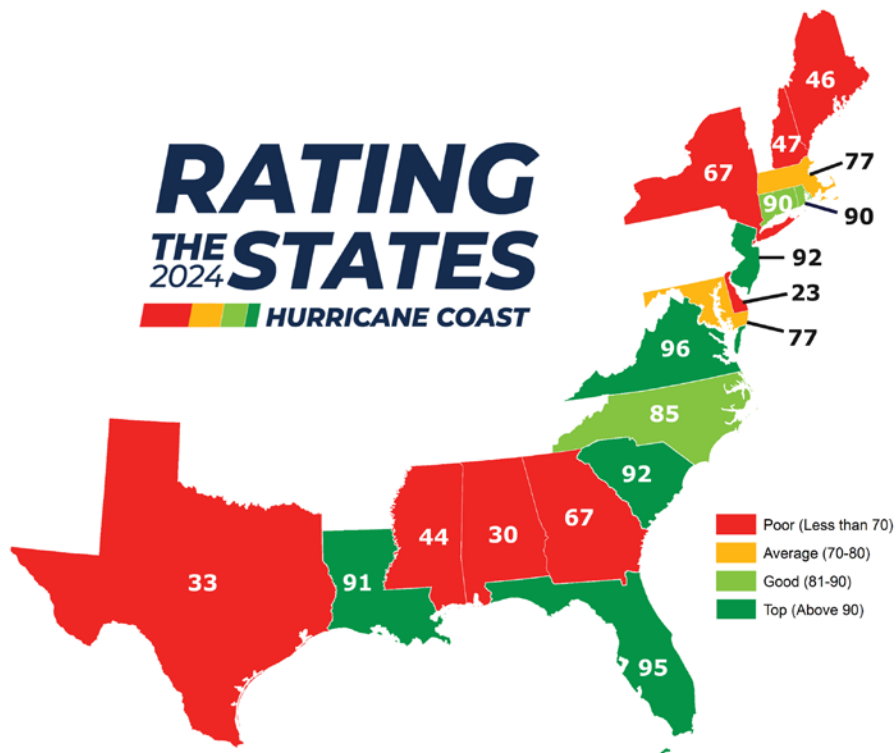


Figure 3. Map of the 18 states and their total scores for the 2024 IBHS Rating the States report.

STATE	2012	2015	2018	2021	2024
Virginia	95	95	94	94	96
Florida	95	94	95	95	95
South Carolina	84	92	92	92	92
New Jersey	94	89	90	90	92
Louisiana	74	82	83	82	91
Connecticut	81	88	89	89	90
Rhode Island	79	87	87	89	90
North Carolina	82	84	83	88	85
Massachusetts	87	79	81	78	77
Maryland	74	78	78	78	77
Georgia	67	69	68	69	67
New York	60	56	64	60	67
New Hampshire	49	48	46	48	47
Maine	64	55	54	55	46
Mississippi	4	28	28	29	44
Texas	18	36	34	34	33
Alabama	18	26	27	30	30
Delaware	17	17	17	17	23

Table 1. 2012 through 2024 total score by state.

The most concerning negative action taken by any state during this cycle of *Rating the States* occurred in North Carolina in 2023. The state was considered one of the most improved in the 2021 fourth edition of *Rating the States*. Yet in 2023, legislation passed through an overridden veto placed a moratorium on new building code adoption through 2031. The result, in this edition, was a loss of one point, but the state’s score will continue to fall for at least the next two editions. North Carolina also lost two more points because of altering opening protection provisions. The code adoption moratorium will cause North Carolina to drop to a score of 82 by the seventh edition of *Rating the States* in 2030 if no changes are made to the current code and no other weakening actions occur. The regular adoption of the latest model building codes is a critical way to ensure new science and engineering knowledge is incorporated into building safety standards (i.e., building codes) especially in an environment where new materials and new construction practices are emerging quickly. This ensures that past vulnerabilities are dealt with systematically and new ones are not created.

Massachusetts is another state with a downward trend in its *Rating the States* scores since the program began in 2012. The state has lost a total of 10 points since 2012,

through various actions that have weakened the state’s building code.

The “State-by-State Building Code Assessment” section of this report identifies in detail changes in each state’s scores (total and components) as well as additional meaningful steps that could be implemented to improve their statewide building code system. Figure 3 provides the state-by-state total scores for each of the five *Rating the States* editions and Figure 4 shows the scores for each of the three components that comprise the total rating.

IBHS Rating the States

Total scores by state 2012-2024
Each state receives a score from 0 - 100

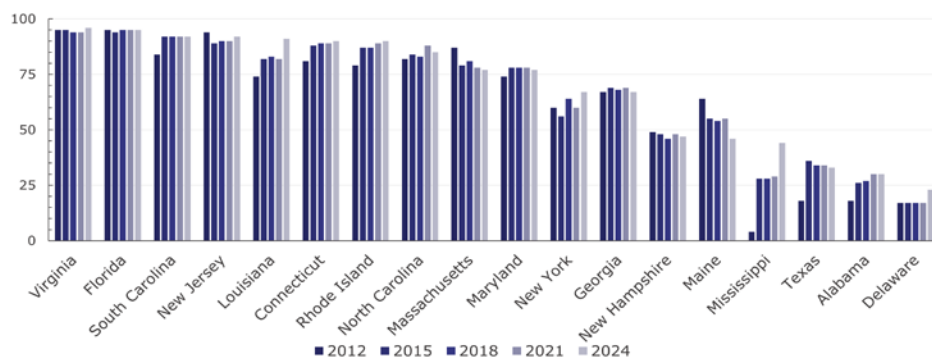
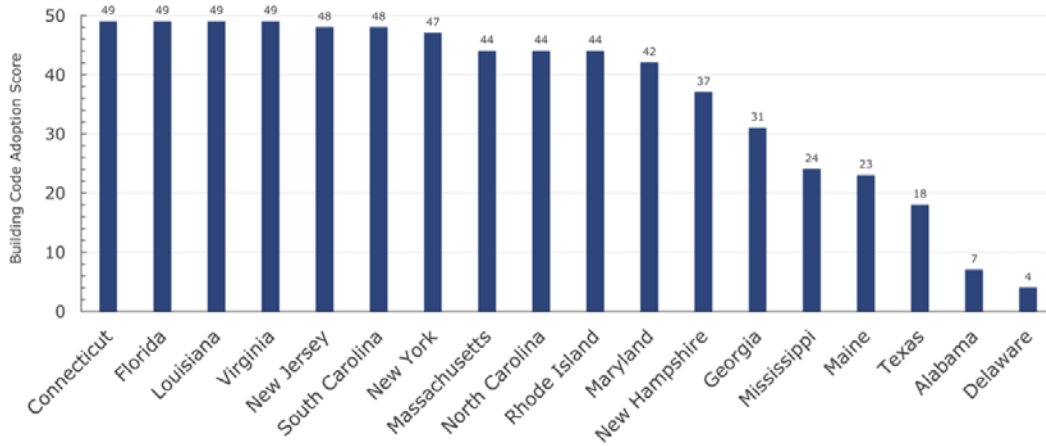


Figure 4. IBHS Rating the States total scores by state for each edition from 2012-2024.

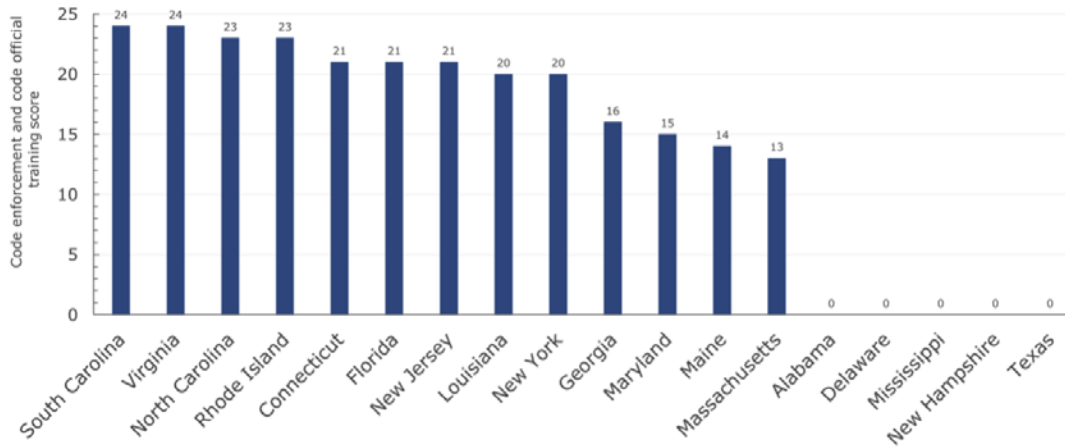
2024 Building code adoption scores

For this category, each state receives a score from 0-50



2024 Building code enforcement and code official training scores

For this category, each state receives a score from 0-25



2024 Contractor licensing and training scores

For this category, each state receives a score from 0-25

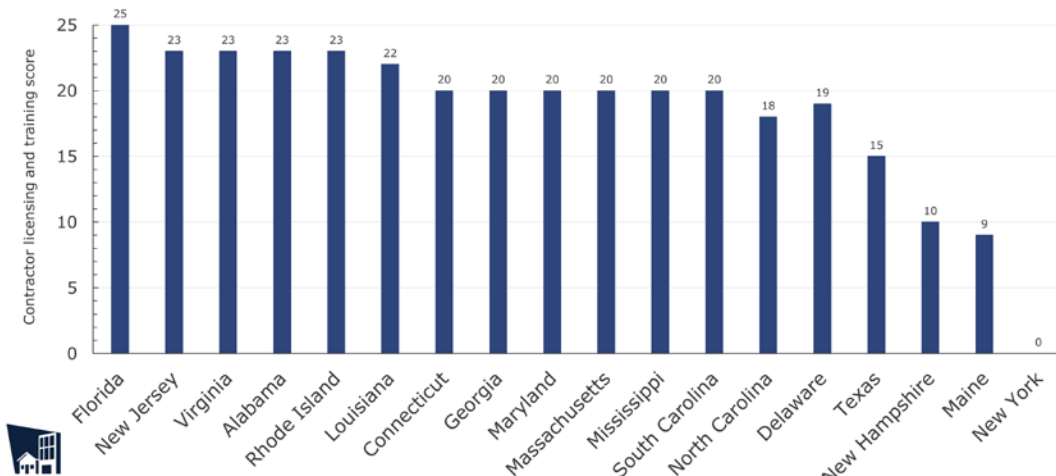


Figure 5. Rating the States 2024 component scores for each state: (top) code adoption, (middle) building code official training, and (bottom) contractor licensing and training.

State-by-State Building Code System Assessments

This section provides the state-by-state component scores and outlines positive and negative actions since the last edition of *Rating the States*. The states are listed by their rank in this section. Ties in total scores are broken first by comparing the state's code adoption score; if states are still tied, then the next tie breaker is comparing the training of code officials component scores followed by the contractor licensing and training scores. However, it is noted that the total score is the best reflection of a state's overall building code system. The complete scoring system is provided in Appendix A.

#1. Virginia

Virginia returns to the top spot in this edition of *Rating the States*.

BUILDING CODE ADOPTION

Virginia is currently enforcing the 2021 edition of the IRC and continues to maintain one of the strongest code enforcement programs across all the states included in *Rating the States*. Its 2024 total score of 96 is the highest achieved by any state over the five editions of *Rating the States*. In 2023, the state adopted the latest editions of the model I-Codes into the *Virginia Uniform Statewide Building Code*. This action closed a code adoption cycle gap as new code adoption was halted by the state during the COVID-19 pandemic. The state also added additional provisions that go beyond the IRC. Virginia scored 49 out of 50 possible points in the building code adoption component. It is noted in this category that the FEMA Building Code Adoption Tracking Toolkit identifies differences where alternate provisions associated with the design and construction of a building's load path can be applied. While Virginia did alter wall bracing requirements, IBHS code experts consider the alternate provisions to be a simplification and not a weakening provision. Therefore, the state has received full credit for this data field in *Rating the States*.

CERTIFICATIONS AND EDUCATION OF BUILDING OFFICIALS

In this category, Virginia scored 24 out of 25 possible points. The state has one of the best systems in place for the certification and continuing education of building code officials. Virginia requires certification and training for its building officials. On-the-job training prior to sitting for the certification exam is permitted. While in training, inspectors work under the supervision of a licensed inspector. Upon completion of on-the-job training and the examination, inspectors receive the official construction trade recognition. A mechanism for consumers to file complaints related to building code enforcement is available in Virginia. The rules permit the authority to apply disciplinary actions, which also can be applied at the local level.

LICENSING OF CONTRACTORS

Virginia issues licenses for general, plumbing, mechanical, electrical, and roofing contractors. However, general and roofing contractors are not required to complete continuing education to renew licenses.

CHANGES OR KEY AREAS FOR IMPROVEMENT

Virginia has an exemplary code adoption and enforcement program and has remained at or near the top over the history of *Rating the States*. The addition of continuing education requirements for general and roofing contractors can further enhance the Commonwealth's model statewide code adoption and enforcement program to help it gain the two remaining points in this category.

#2. Florida

BUILDING CODE ADOPTION

Florida, like Virginia, continues to be a leader in building code safety. In the 2024 edition of *Rating the States*, the state scored a total of 95 points. The 8th Edition of the *Florida Building Code* went into effect in January of 2023. Notable updates within the *Florida Building Code* include new provisions on soffit and fascia attachments, as well as requiring a sealed roof deck across the entire state. Florida scored 49 out of a possible 50 points in the building code adoption category. Florida also adopted the ASCE 7-22 wind design standard in advance of it being adopted into the I-Codes; states using the 2021 I-Codes reference the previous ASCE 7-16 wind design requirements.

CERTIFICATIONS AND EDUCATION OF BUILDING OFFICIALS

Florida has a mandated program for training and certifying building officials. The program requires individuals take code-specific courses prior to taking a certification or licensing exam. However, a combination of experience and education can qualify candidates as well. The state has a one- and two-family dwelling inspector certification category that is limited to residential

inspections and is valid for 24 months. In this category the state received 21 points out of 25, leaving room for improvement through better continuing education requirements for building code officials.

LICENSING OF CONTRACTORS

In the licensing of contractors, Florida received a perfect 25 out of 25 score. The state requires licensing of general, plumbing, mechanical, electrical, and roofing contractors. To be licensed, a contractor must pass an examination and participate in continuing education. The state can also discipline a contractor for violations or noncompliance with the code. The state's system of contractor licensing is the most robust of all the states included in *Rating the States*.

CHANGES OR KEY AREAS FOR IMPROVEMENT

The lack of continuing education requirements (specific to the residential code) for building officials to maintain their certification and/or license is one area that could be improved. Because the state places greater emphasis on the *Florida Building Code*, it will be necessary to monitor the new code development process carefully to ensure important improvements to the IRC are not bypassed.

HURRICANE IAN

Hurricane Ian made landfall near Port Charlotte, Florida on September 28, 2022, as a Category 4 hurricane on the Saffir-Simpson Hurricane Wind Scale. Ian's final landfall location was nearly in the same spot as Hurricane Charley's in 2004. Hurricane Charley was the first test of the modern uniformly enforced *Florida Building Code*; Hurricane Ian (2022) was the latest test. IBHS conducted a remote-sensing-based survey of over 3,600 single-family homes, 455 of which were built to the modern *Florida Building Code*. None of those 455 homes had any evidence of structural damage. Homes built under the modern *Florida Building Code* also experienced 80% less damage than those built prior when considering damage to components and cladding elements, in addition to the elimination of structural damage by the modern FBC. It was estimated by IBHS that the modern *Florida Building Code* and its system of enforcement, training, and licensing saved between \$1 billion and \$3 billion in structural damage to single-family homes alone.

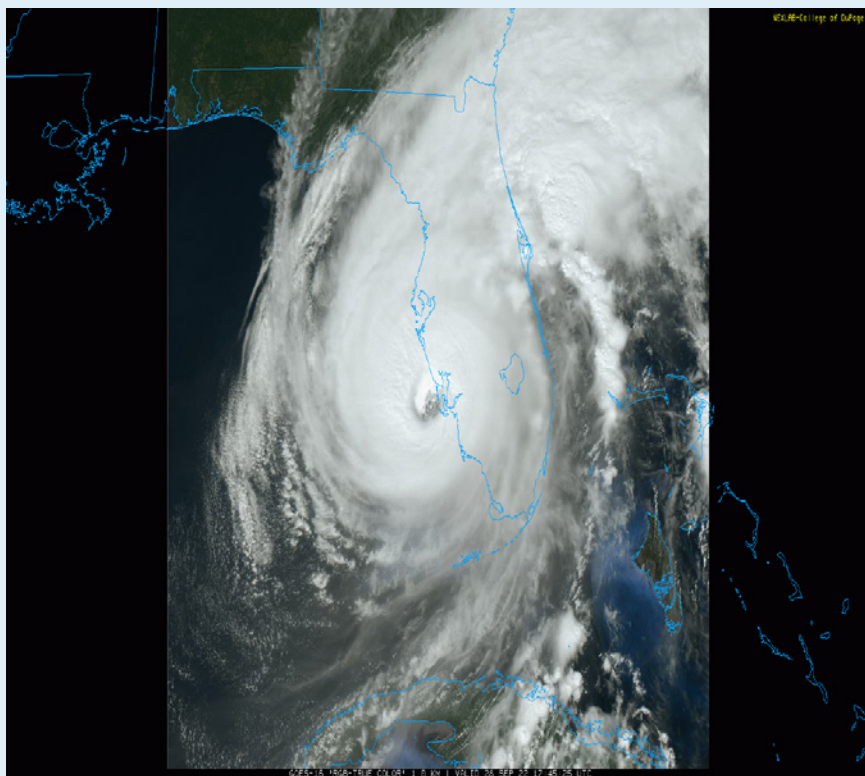


Figure 6. Visible satellite image of Hurricane Ian shortly before landfall on September 28, 2022. Image courtesy of NOAA.

#3. South Carolina

BUILDING CODE ADOPTION

South Carolina scored a total of 92 points in this edition of *Rating the States*, matching its score in the 2021, 2018, and 2015 editions of the report. The state maintains a strong code adoption structure and is currently enforcing uniformly the 2021 I-Codes. While in 2015 and 2021 the state made small changes to the ASCE design wind speed contours to match geographic features (e.g., lakes, rivers) and physical boundaries (e.g., streets, highways), the changes were considered minor and not significant enough to qualify as weakening the state's code. This differs from FEMA's Building Code Adoption Tracking Toolkit, which considers any deviation from the model codes as a weakening element.

CERTIFICATION AND EDUCATION OF BUILDING OFFICIALS

South Carolina accumulated 24 out of a possible 25 points in the building code official certification and education category. South Carolina requires registration, certification, and licensing for all building officials. A nonrenewable one-year provisional license is issued to code enforcement officials who are undergoing state-required training for certification. The state requires that a chief code enforcement officer/building official must at least be certified in one trade category before

hire. However, they are granted one year to obtain the remaining code certification categories. South Carolina has continuing education requirements for building officials.

LICENSING OF CONTRACTORS

South Carolina requires licensing of general, plumbing, mechanical, electrical, and roofing contractors, but does not mandate continuing education for renewal of licenses in any category. The state has five available points to gain in this category, and should the state require continuing education requirements for contractors, it would boost South Carolina near the top of the *Rating the States* scores.

CHANGES OR KEY AREAS FOR IMPROVEMENT

South Carolina's regular three-year code adoption process helped position the state among the top three coastal states with the best building code systems. Implementing a set schedule for code adoption and revisions is a methodology that all states should follow. The area where the state lacks the most is requiring continuing education for contractors. By requiring continuing education for contractors, the state would find itself atop the *Rating the States* scores with Virginia and Florida.

#4. New Jersey

BUILDING CODE ADOPTION

New Jersey scored 92 points in the 2024 edition of *Rating the States*. The state uniformly enforces the 2021 IRC as the *New Jersey One- and Two-Family Dwelling Subcode*. The building code system is administered by the New Jersey Division of Codes and Standards. The division is also responsible for licensing of building code officials.

CERTIFICATION AND EDUCATION OF BUILDING OFFICIALS

New Jersey has a state program for building official certification and training with continuing education requirements that is modeled after the program currently administered by the ICC.

LICENSING OF CONTRACTORS

New Jersey gained two points in the contractor licensing category in this edition of *Rating the States* over its score in 2021. During this cycle, the state added a competency test to general contractor and roofing contractor licensing

requirements. This pushed the state's contractor licensing component score to 23 of 25 possible points and its total score to 92. The state is closing in on its score of 94 in the first edition of *Rating the States* in 2012, which is the highest it has achieved in the history of the report. However, the state still does not require continuing education for general or roofing contractors. New Jersey does maintain a continuing education program for electrical, mechanical, and plumbing contractors.

CHANGES OR KEY AREAS FOR IMPROVEMENT

The state would benefit from continuing education for building officials specifically dealing with the residential code, as well as continuing education for general and roofing contractors.

#5. Louisiana – Most Improved

Louisiana is one of the two **most improved** states in the 2024 edition of *Rating the States*. The state gained 9 points in this edition compared to the last, raising its total score from an 82 to a 91. In recent years the state has faced an onslaught of landfalling hurricanes beginning with Hurricane Laura in August 2020. Between 2020 and 2021, five hurricanes made landfall in the state. The latest was Hurricane Ida in August 2021. The damage caused by these storms put considerable strain on the state and its private insurance market. In 2023, Louisiana launched a grant program to help fund FORTIFIED Roof installations for homeowners (see inset).

BUILDING CODE ADOPTION

Louisiana has updated its code to the 2021 IRC after operating on the 2015 IRC for the last two editions of *Rating the States*. The state uniformly enforces the code. In 2008, it became the latest state to adopt and put in place a uniform system of enforcement of a statewide building code.

CERTIFICATION AND EDUCATION OF BUILDING OFFICIALS

The state has moved to require code-specific training for its building code officials. This change allowed the state to gain six additional points in this category. The state previously only required certification, but no mandatory training for code officials.

#6. Connecticut

BUILDING CODE ADOPTION

Connecticut updated its building code from the 2015 IRC to the latest 2021 IRC following its six-year code update cycle. The state originally intended to adopt the 2018 version of the IRC in 2021 but decided to move to the most current code edition. Connecticut state building codes, referred to as the *State Building and Fire Safety Codes*, are based on the 2021 editions of the I-Codes.

The Connecticut Division of Construction Services continues to develop initiatives to improve resilience of the residential dwellings in the state. Although the state is no longer in the high-wind design required category, the initiatives focus on homes located in coastal areas at risk for high wind, flooding, and storm surge.

CERTIFICATION AND EDUCATION OF BUILDING OFFICIALS

Connecticut has a program for certifying building officials. The program requires education classes prior to becoming certified as a residential code inspector.

LICENSING OF CONTRACTORS

Louisiana requires licensing of general, plumbing, mechanical, electrical, and roofing contractors. This includes requiring general and plumbing contractors to participate in continuing education to renew their licenses. Electrical, mechanical, and roofing contractors are not required to take continuing education classes.

CHANGES OR KEY AREAS FOR IMPROVEMENT

Louisiana should consider requiring continuing education classes for electrical, mechanical, and roofing contractors as a part of their licensing requirements. Having closed other gaps, the addition of these requirements would help push the state closer to the top of *Rating the States*.

The Louisiana Fortify Homes grant program launched in November 2023 and is administered by the Louisiana Department of Insurance. It provides grants of up to \$10,000 to help homeowners upgrade their roof to the FORTIFIED Roof standard. Most homeowners receiving the grant will replace their roof to meet FORTIFIED requirements. However, the grant program also allows homeowners who recently completed roof replacements due to storm damage to use funds to meet FORTIFIED by installing compliant closed cell foam to seal and strengthen the roof deck attachment. The initial launch of Louisiana Fortify Homes committed \$30 million to 3,000 homeowners. A consistent source of annual funding is being pursued to allow the grant program to continue to strengthen homes across the state for years to come.

LICENSING OF CONTRACTORS

Connecticut requires licensing for all construction trades. However, only electrical and plumbing contractors are required to take continuing education to maintain their licenses. The state has a system for consumers to file complaints against licensed contractors and may institute disciplinary action as appropriate.

CHANGES OR KEY AREAS FOR IMPROVEMENT

Connecticut should consider requiring continuing education for all contractors. In addition, the state could gain additional points by requiring specific residential code training for code officials and shorten the certification cycle for building officials from every three years to every two.

#7. Rhode Island

BUILDING CODE ADOPTION

Rhode Island is currently enforcing the 2018 edition of the IRC with Rhode Island state amendments. The state remains one code cycle behind. The Rhode Island code still contains a deficiency that was highlighted in prior editions of *Rating the States*. Specifically, Section R301.2.1.2 of the *Rhode Island State Building Code* (RISBC-2) allows buildings to be designed as partially enclosed in wind-borne debris regions in lieu of protecting glazed openings. Although this design methodology results in a building designed for generally higher wind loads, it increases the possibility that wind-driven rain could enter a home if windows and glazed areas are broken during a storm. The partially enclosed building design was allowed in the 2003 edition of the IRC but has been eliminated as an option in subsequent updates. Also, the state has published a prescriptive method for high-wind design (Appendix AA of *Rhode Island State Building Code*, SBC-2).

CERTIFICATION AND EDUCATION OF BUILDING OFFICIALS

Rhode Island has a program for building official certification and licensing and includes code-specified training courses prior to certification. The state also has requirements for continuing education of its building officials.

LICENSING OF CONTRACTORS

Rhode Island issues licenses for plumbing, mechanical, and electrical contractors which requires passing a test of minimum competency while general and roofing contractors must be registered with no test of minimum competency. Continuing education is required to renew registration/licenses for all trades. The registration of Roofing contractors is governed by the State of Rhode Island Contractors' Registration and Licensing Board

CHANGES OR KEY AREAS FOR IMPROVEMENT

Rhode Island should consider closing the gap in its residential statewide code based on the latest edition of the IRC. The state remains a full code cycle behind. Another meaningful step would be to eliminate the state amendment that allows the partially enclosed building design in the wind-borne debris region as described above.

#8. North Carolina

BUILDING CODE ADOPTION

In 2023, the State of North Carolina undertook one of the most detrimental steps of any state reducing its building code system of protections. The state legislature passed, through a veto override, legislation that placed a moratorium on building code adoption through 2031. The state is currently enforcing the 2015 IRC, which is now six years behind the latest model code (2021 IRC). North Carolina lost three points in this edition of *Rating the States* resulting from their lagging code adoption coupled with weakening of open protection provisions, but it remains in 8th place with a total score of 85. However, if the code adoption moratorium is not lifted, the state will continue to lose points in the next edition of *Rating the States*. A minor code weakening change passed while the code moratorium is still in effect would cause North Carolina to fall out of the "Good" category.

Since 1980, 120 tropical cyclones have impacted the state. North Carolina also experiences a high frequency of severe thunderstorms each year. The actions taken by the state legislature are unfortunate and will create unnecessary vulnerabilities to buildings that face nearly all types of severe weather. North Carolina was considered one of the most improved states in the previous edition of *Rating the States* after gaining 5 points for improved code adoption and enforcement. As building codes are the safety standards for homes and businesses, it is imperative to maintain a regular code update cycle to ensure the latest science and engineering knowledge is incorporated into our building codes. This prevents

unnecessary damage to homes and businesses and helps keep pace with rapidly evolving building technologies and materials.

CERTIFICATION AND EDUCATION OF BUILDING OFFICIALS

North Carolina has a program for building official certification and licensing that includes code-specific training courses prior to certification with continuing education requirements.

LICENSING OF CONTRACTORS

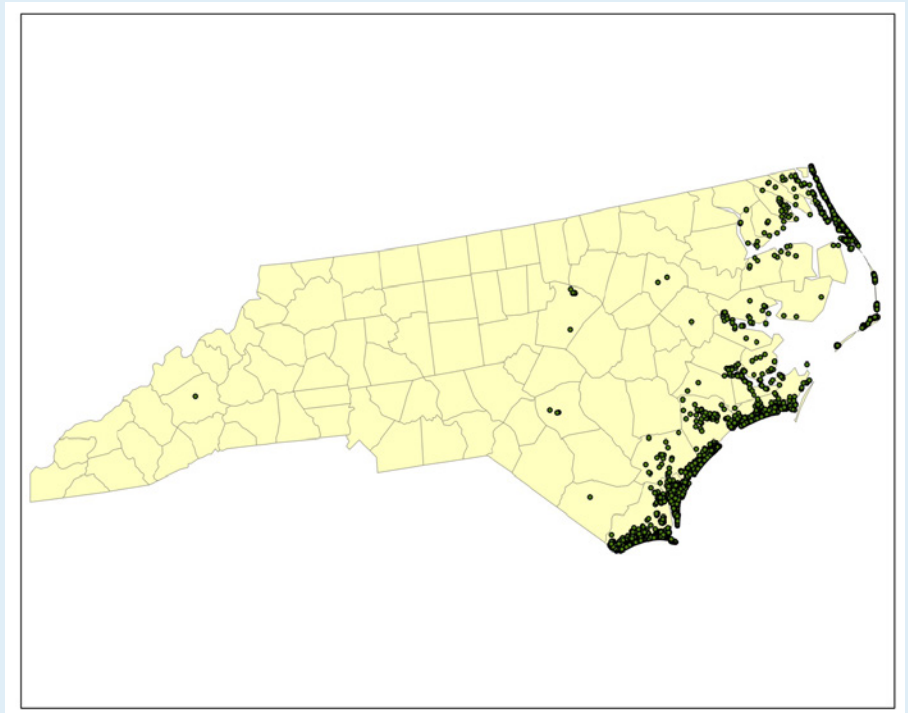
North Carolina requires licenses for general, plumbing, mechanical, and electrical contractors. However, plumbing, and mechanical contractors are not required to complete continuing education classes to renew licenses. Currently, there are no licensing requirements for roofing contractors.

CHANGES OR KEY AREAS FOR IMPROVEMENT

It is imperative that the moratorium on building code adoption be lifted by legislative action. This action will cause unnecessary vulnerabilities to homes and businesses and can lead to enhanced damage and financial loss. Other meaningful changes the state should take include requiring continuing education for plumbing and mechanical contractors and enacting licensing requirements for roofing contractors.

While the State of North Carolina has weakened the system of protections offered by an updated modern building code, the North Carolina Insurance Underwriting Association (NCIUA) is a leader in promoting resilient construction through its NCIUA Strengthen Your Roof grant program. Thanks to the action and awareness of this program, more than 9,800 homes in the state's coastal counties now have a FORTIFIED Roof designation, with over 300 more with Gold or Silver FORTIFIED Home designations at the time of this report

Figure 7. Map of homes with active FORTIFIED designations in North Carolina.



#9. Massachusetts

BUILDING CODE ADOPTION

The Commonwealth of Massachusetts tied Maryland with 77 total points, but Massachusetts comes in at number 9 with a code adoption score of 44 compared to Maryland's 42. While Massachusetts uniformly enforces its building code, the state remains on the 2015 IRC making the current code now six years behind the latest I-Codes. The state also had the largest decline in scores from the 2018 to the 2021 edition of *Rating the States* resulting from the elimination of the wind-borne debris region, weakening windstorm protection in parts of Cape Cod.

CERTIFICATION AND EDUCATION OF BUILDING OFFICIALS

Although there is a program for building official certification, it does not require individuals to complete training classes prior to the certification exam. Massachusetts does not require a continuing education program specifically related to the residential dwelling code.

#10. Maryland

BUILDING CODE ADOPTION

At number 10, Maryland is the first state in these rankings that does not uniformly enforce its statewide building code. The state currently requires the 2021 edition of the IRC as a part of *Maryland Building Performance Standards*, which is the designated building code law throughout the state. However, local jurisdictions may modify provisions of the *Maryland Building Performance Standards* – except for wind design requirements and the requirements for automatic fire sprinkler systems. Also, through amendments, local jurisdictions can address conditions specific to its needs. Local jurisdictions are allowed a twelve-month period to amend the state required code, after which time they are required to enforce the state's provisions. Currently, all but one county has adopted the most recent IRC. Howard County, in the Baltimore-metropolitan area, remains on the 2018 IRC.

CERTIFICATION AND EDUCATION OF BUILDING OFFICIALS

Maryland does not license inspectors separately for residential construction or require completion of code training classes prior to certification. The state does not have a mechanism for the public to file complaints against inspectors.

LICENSING OF CONTRACTORS

Massachusetts requires licensing of general, plumbing, electrical, and roofing contractors along with continuing education requirements. However, no licensing is required to perform heating, ventilation, and air conditioning work for HVAC units that are rated 10 ton or less. Most one- and two-family dwellings subject to IRC requirements use units rated below that threshold.

CHANGES OR KEY AREAS FOR IMPROVEMENT

The state should move to adopt the latest IRC given that its statewide adopted code is still based on the I-Codes from two cycles ago. In addition, Massachusetts' weakening of the wind-borne debris requirement of the IRC—originally based on ASCE 7-16, now ASCE 7-22 design wind requirements—is not endorsed. The state should consider reinstating the code requirements for wind-borne debris regions.

LICENSING OF CONTRACTORS

The state requires licensing of general, plumbing, mechanical, electrical, and roofing contractors. Continuing education is only required for electrical contractors.

CHANGES OR KEY AREAS FOR IMPROVEMENT

Given the near uniform county level adoption of the latest I-Codes, the state could move towards a fully adopted and uniformly enforced statewide building code. It is recommended that the state remove provisions that allow local jurisdictions to weaken the building code. The Maryland Office of Code Administration provides a voluntary training program for building officials throughout the state. Mandating certification and licensing for residential inspectors would further reinforce Maryland's commitment to an even stronger building and safety code program. Such a program would improve the capabilities of code enforcement personnel, improve uniformity of enforcement, and help elevate their recognition as professionals throughout the state.

#11. New York

New York gained 7 points in this edition of *Rating the States*, which was the third largest point gain of any state. New York tied Georgia with 67 total points, however the state has a code adoption component score of 47 compared to Georgia's 31. New York allows local jurisdictions to strengthen their code beyond what is required by the state. Given that there are no allowances for weakening of the code below what is required by the state, IBHS considers this as an effective statewide code. However, it is noted that the FEMA Building Code Adoption Tracking Toolkit does identify this as a mechanism that allows for local jurisdictions to alter the building code. This predominantly impacts New York City, which has elected to go beyond the state-required code provisions in some areas.

BUILDING CODE ADOPTION

New York is currently enforcing the 2018 IRC but has updated its code to meet the opening protection requirements specified through ASCE 7-22. The code also now directly references wind mitigation standards for areas with a design wind speed above 110 mph. These improvements helped the state gain 7 points in this edition of *Rating the States* over its score in the last edition.

#12. Georgia

BUILDING CODE ADOPTION

Georgia remains on the 2018 IRC as its statewide code, which is now one code cycle behind. The state has provisions that allow county and local jurisdictions to opt out of the statewide code requirements. However, currently all county-level jurisdictions are enforcing the state-adopted building code. It is beyond the scope of *Rating the States* to investigate local jurisdiction code adoption. For the purposes of the *Rating the States* program, because the provisions allow local jurisdiction to opt out of the code, the state is not considered to have a statewide, uniformly enforced building code. This differs from how the state is assessed by the FEMA Building Code Adoption Tracking portal.

CERTIFICATION AND EDUCATION OF BUILDING OFFICIALS

Georgia law defines a qualified inspector as one certified by the ICC as residential inspector and requires any construction work to be inspected by a qualified inspector. The state requires the governing authority of a municipality or county that has adopted provisions for enforcement of the state minimum standard codes to post a notice stating whether the local inspectors

The New York City building regulatory system remains exempt from the state requirements. The *New York City Construction Codes* (currently enforced) are based on the 2015 edition of the I-Codes with city-specific requirements for residential construction.

CERTIFICATION AND EDUCATION OF BUILDING OFFICIALS

New York has a mandated program for certification of building officials, including code classes prior to certification. However, this program does not require that continuing education focus specifically on the residential code.

LICENSING OF CONTRACTORS

The state does not require licensing of general, plumbing, mechanical, electrical, or roofing contractors and leaves the decision of whether to require regulations for licensing of construction trade contractors to local jurisdictions.

CHANGES OR KEY AREAS FOR IMPROVEMENT

New York should consider adopting a state-mandated certification and licensing program for construction trade contractors.

possess certain qualifications. It also provides for persons possessing qualifications to conduct inspections to determine code compliance if the municipal or county inspectors do not possess such qualifications. There is no mechanism for the state to take disciplinary action against an inspector.

LICENSING OF CONTRACTORS

General, plumbing, mechanical, and electrical contractors are required to be licensed in Georgia. Exams and continuing education are a part of the licensing programs. There are no licensing requirements for roofing contractors.

CHANGES OR KEY AREAS FOR IMPROVEMENT

To strengthen its building code system, Georgia should move toward uniform enforcement of the statewide code and eliminate provisions for local jurisdictions to opt out. The state would also benefit from code-specific education requirements prior to code officials being certified. Positive changes in these two areas could move Georgia into the top 10.

#13. New Hampshire

New Hampshire leads off the lower third of states in *Rating the States 2024*. Scores here drop at least twenty points from Georgia's score.

BUILDING CODE ADOPTION

New Hampshire updated its state building code to reflect the 2018 I-Codes cycle. While the code is applied statewide, mandatory enforcement at the state level is lacking. In the *Rating the States* scoring system, the state is considered to have a statewide code but not uniform enforcement. Currently, all counties in the state are enforcing the statewide code with no amendments. However, there are four local jurisdictions that have amended the statewide code: Amherst, Durham, Manchester, and Portsmouth. This interpretation differs from the FEMA Building Code Adoption Tracking Toolkit, which considers the state to have a statewide mandatory code.

#14. Maine

BUILDING CODE ADOPTION

Maine remains on the 2015 I-Codes—now two code cycles behind. The Office of Maine State Fire Marshal manages the code adoption and enforcement process. A continuing major weakness in state regulations allows municipalities with fewer than 4,000 people to choose not to have or enforce a building code at all.

CERTIFICATION AND EDUCATION OF BUILDING OFFICIALS

Maine has a program for certifying building officials but does not require code-specific education courses prior to certification. The state requires continuing education, but it is a minimal requirement of nine hours every six years. The state has a certification category for residential construction inspectors, but there is no process for filing complaints or disciplinary action against inspectors.

CERTIFICATION AND EDUCATION OF BUILDING OFFICIALS

New Hampshire has no statewide program to license building officials and receives a score of zero for this component.

LICENSING OF CONTRACTORS

Contractor licensing is required for plumbing and electrical contractors, but not for other trades. Plumbing and electrical contractors are required to take an exam prior to licensing, are subject to disciplinary action, and are required to take continuing education classes.

CHANGES OR KEY AREAS FOR IMPROVEMENT

New Hampshire should consider uniform enforcement of the statewide residential code and establish a building official certification and licensing program throughout the state. Improvements in these areas would move the state out of the bottom third of the *Rating the States* rankings.

LICENSING OF CONTRACTORS

The state requires licensing for plumbing and electrical contractors, but not for other trades. Plumbing and electrical contractors are required to take an exam prior to licensing, and they are subject to disciplinary action. Electrical contractors are required to obtain continuing education for license renewal.

CHANGES OR KEY AREAS FOR IMPROVEMENT

The state's delay in code adoption is an area of concern. The state should consider regular adoption and enforcement of the IRC and require all municipalities throughout the state to adopt and enforce the *Maine Uniform Building Code*.

#15. Mississippi – Most Improved

Mississippi now requires statewide licensing of contractors. The positive change helped the state gain 15 points in this edition of *Rating the States*. This is the largest improvement of any state in this edition. The state, however, remains in the lower third due to substantial deficiencies in other areas. Over the history of the *Rating the States* program, Mississippi has progressed from a total score of 4 in the first edition—the lowest ever recorded—to a total of 44 in this, the fifth edition.

BUILDING CODE ADOPTION

Mississippi took an important step forward in 2014 by adopting a building code law that governs construction of most residential buildings in the state. The law allows municipalities to adopt one of the last three effective IRC editions (currently represents the 2015, 2018, and 2021 I-Codes). However, municipalities could opt out of the requirements for adoption and enforcement within 120 days of the effective date (i.e., November 30, 2014). The opt-out provision of the law has complicated the code adoption coverage throughout the state. There are several county and local jurisdictions that have opted out of any code coverage. The lack of modern code adoption and its impact on both life-safety and property damage has unfortunately been exposed in recent tornado outbreaks, which have affected the state and would be exploited in a hurricane impact.

#16. Texas

BUILDING CODE ADOPTION

In 2001, the Texas legislature adopted the 2000 IRC as the standard for residential construction. However, as a “home rule” state, it does not require mandatory adoption and uniform enforcement of its residential building code. Generally, all incorporated cities in Texas have adopted a building code and a large percentage of these jurisdictions adopted more recent editions (2012) of the IRC than mandated by the outdated state law. However, the building code gap is evident in unincorporated areas of the state with some counties having no adopted code at all. While Texas geographically covers a large area across different climate zones, all corners of the state are at risk as the state experiences all types of windstorms (i.e., hurricanes, severe thunderstorms, derechos, synoptic windstorms, and tornadoes). The deficiencies in its building code regime leave many areas highly vulnerable.

A 2017 state law requires builders in unincorporated areas of certain counties to provide an inspection report to the county that shows their construction complies with the building code. Failure to provide inspection documentation to the county could result in prosecution of the builder. However, because the inspection is conducted by a party hired by the builder, the requirement creates a conflict-of-interest scenario. The current requirement does not assure the same level of protection and safety that an active code enforcement program would provide.

CERTIFICATION AND EDUCATION OF BUILDING OFFICIALS

Mississippi has no statewide program to license building officials. However, the state has allocated funding for training of building officials and inspectors through local governments.

LICENSING OF CONTRACTORS

Mississippi now requires licensing of mechanical, electrical, plumbing, and general contractors along with competency requirements and continuing education. Roofing contractors are not required to be registered or licensed.

CHANGES OR KEY AREAS FOR IMPROVEMENT

With the substantial windstorm risk faced by the state (i.e., hurricanes, severe thunderstorms, and tornadoes), Mississippi needs to improve its state-level code adoption and enforcement program. In addition, the state should continue the progress made in licensure by extending requirements to general and roofing contractors. The state should be commended for the progress it has made over the past twelve years, but substantial deficiencies remain.

Some of the deficiencies in unincorporated areas of coastal counties are mitigated by the Texas Windstorm Insurance Association (TWIA) code and inspection requirements for property owners that obtain windstorm and hail insurance through the state’s wind catastrophe pool. TWIA is a nonprofit insurance organization administered by the Texas Department of Insurance.

CERTIFICATION AND EDUCATION OF BUILDING OFFICIALS

Texas has no statewide program to license building officials.

LICENSING OF CONTRACTORS

The state requires licensing for plumbing, mechanical, and electrical contractors, and these contractors are required to take continuing education classes for license renewal.

CHANGES OR KEY AREAS FOR IMPROVEMENT

Specifically, unincorporated areas within several counties in Texas have no enforced standards for windstorm protection through high-wind design standards and building codes. Adoption of a mandatory statewide code system throughout the state and adequate uniform code enforcement gives communities a high degree of building safety through application of modern building codes.

#17. Alabama

BUILDING CODE ADOPTION

In 2023, a bill was introduced into the Alabama state legislature to create and adopt a statewide building code. However, this piece of legislation did not make it to the floor of the legislature to be voted upon. As a result, Alabama continues to not have a statewide building code system.

Alabama remains on the 2015 IRC within the voluntary *Alabama Energy and Residential Codes* (AERC) for residential construction. The AERC adoption is left to local jurisdictions that can amend the code substantially if they choose. Although the energy portion of the code is mandatory at the local level, local jurisdictions can continue enforcing previously adopted editions of the residential code. However, if a jurisdiction has not previously adopted a residential building code and decides to adopt one, the law requires adoption of the current AERC.

Unfortunately, the enforcement aspects of the Alabama code are not clearly defined in the rule and could be considered nonexistent. Despite the deficiencies at the state level, communities along the coast are commended for adopting and enforcing strong building codes. In fact, 17 of the 24 permitting jurisdictions within Mobile and Baldwin counties also enforce the Coastal Construction Code Supplement¹¹, which was created after Hurricanes Ivan (2004) and Katrina (2005) by building code officials and community leaders, with the support of local builders and developers. The code supplement is based on the IBHS FORTIFIED Home standard.

¹¹ <https://www.smarthomeamerica.org/resources/code-supplement>

CERTIFICATION AND EDUCATION OF BUILDING OFFICIALS

Alabama has no statewide program to license building officials.

LICENSING OF CONTRACTORS

The state requires licensing for general, plumbing, mechanical, electrical, and roofing contractors. General, mechanical, electrical, and roofing contractors must take part in continuing education for license renewal. The state differentiates between general contractors, who are licensed for commercial work, and licensed home builders, who are licensed for residential construction. Home builders and roofing contractors are also required to obtain six continuing education credits annually before license renewal.

CHANGES OR KEY AREAS FOR IMPROVEMENT

The entire state is no stranger to all windstorms, whether from hurricanes or severe storms (i.e., tornadoes, severe thunderstorms). Adoption of a modern mandatory statewide residential code would establish uniformity in application and enforcement of the important code provisions. There is some momentum building; however, as of this report, the state still lacks a statewide building code.

FORTIFIED: A MODEL FOR SUCCESS

Alabama is home to the most successful voluntary windstorm mitigation program in the United States. Within the State of Alabama reside over 48,000 homes with a FORTIFIED Home designation (Roof, Silver, or Gold). The program—which began as a voluntary effort in the two coastal counties of Mobile and Baldwin—has been codified in most coastal jurisdictions. Voluntary adoption is growing in central Alabama, too, as a result of the highly successful Strengthen Alabama Homes grant program. The success of these collective efforts was proven when Hurricane Sally (2020) affected nearly 17,000 FORTIFIED homes and approximately 95% incurred little to no damage. The windstorm resilience model developed first in the coastal counties and supported by all levels of government has become a model for other states to implement a windstorm mitigation program. The Alabama windstorm resilience model is currently being replicated in Louisiana with other states likely to follow and adapt the model to other perils such as hail and wildfire.



Figure 8. A FORTIFIED Home during construction in Fairhope, Alabama.

#18. Delaware

Delaware has the unfortunate distinction of finishing last in *Rating the States*. This edition marks the fourth consecutive *Rating the States* where Delaware has occupied the bottom of the 18 coastal states included in this program.

BUILDING CODE ADOPTION

Delaware does not have a statewide residential building code, except for plumbing. Code adoption is handled by local jurisdictions. Many code jurisdictions have adopted the latest 2021 I-Codes; however, there are some that have not. Of these jurisdictions that have not, some have no code at all while others are using codes that are more than 10 years out of date.

CERTIFICATION AND EDUCATION OF BUILDING OFFICIALS

Delaware has no statewide program to license building officials.

LICENSING OF CONTRACTORS

Delaware requires licensing for plumbing, mechanical, and electrical contractors. Electrical contractors are required to obtain continuing education for license renewal. General and roofing contractors are not licensed but are required to be registered with the state. The registration requirement did gain the state 4 points and the added complaint mechanisms earned the state 2 points in this component score.

Modern building codes, when adopted and enforced, work by saving lives, reducing property damage, reducing the disruption in residents' lives, and strengthening the resilience of communities.

No state has adopted a new residential code and simultaneously enacted uniform statewide enforcement of that code since 2008. A few states have adopted a state code, but actual implementation and enforcement is variable. In the absence of statewide codes, local jurisdictions must try to fill the gap but often lack the resources to succeed.

The result: less than 35 percent of Americans live in communities with modern updated codes in place.

Consumer Resources

The Federal Alliance for Safe Homes (FLASH) created the *No Code. No Confidence.* [Inspect2Protect.org](https://inspect2protect.org) initiative (I2P) to close the gap between public understanding of lifesaving codes and the actuality of code status in every community. I2P features public service announcements, public outreach, and the [Inspect2Protect.org](https://inspect2protect.org) digital lookup tool to raise awareness, expand understanding, and increase consumer transparency. Homeowners can visit the website to learn about personal disaster risk, look up the specific codes used in their communities, and identify retrofits and upgrade options to increase home strength in the face of disasters. The case for current model building codes is growing along with public understanding and leadership support for code administration investments. This progress comes at a critical time as communities face an accelerating number of billion-dollar disasters each year.

Appendix A: *Rating the States* Framework

This appendix provides the data fields used in the fifth edition, *Rating the States*. For this edition, slight changes were made to Questions/Data Fields 5 and 6. Over the next two years, IBHS will conduct a thorough review of the *Rating the States* framework to ensure the data fields shown here remain effective, are keeping pace with current code activities, and reflect the latest trends in building code policy. *Rating the States* is designed for a different purpose than other metrics currently available (FEMA Building Code Tracking Tool, ISO BCEGS, etc.), and there will be differences because of the scope of each metric and interpretation of data fields.

Assessment Framework

PART 1 - STATE CODE ADOPTION AND ENFORCEMENT

Maximum possible points: 50

Statewide Code Adoption

1. Statewide Code Regime:

Each state must fall into one and only one of the categories 1a - 1c; 'yes' to 1a represents the maximum points for this set of questions:

- Do the statutes of the state require adoption of a mandatory statewide residential code? (10 points if yes)
- Do the statutes adopt a residential code, but adoption by local jurisdictions is not mandatory, or code doesn't apply throughout the state? (4 points if yes)
- Is there no statewide code? Meaning local government can use any code they choose. (0 points if yes)

2. Enforcement: Do the state statutes require mandatory enforcement? (10 points if yes).

3. Updated Codes: What edition of the *International Residential Code* (IRC) does the state use? (5 points for the 2021 IRC; 4 points for the 2018 IRC; 3 points for the 2015 IRC, and 0 points if an older (i.e., older than 2015) or no code is adopted.)

4. Wind Provisions:

- Do the provisions of the code meet the requirements of the IRC/ASCE 7 for opening protection (IRC Ref. R301.2.1.2)? (2 points if yes)
- Do the provisions of the code require roof coverings to meet the provisions of ASTM D3161 and/or ASTM D7158? (2 points if both standards are adopted; 0 points if only 1 is adopted).
- Do the provisions of the code require windows, doors (dwelling and garage) to meet pressure ratings as provided in the IRC? (1 point if yes). Note: if the state has adopted Table R301.2(2) and Section R301.2.1 of the IRC without any changes they would qualify for the points.
- Do the provisions of the code require that exterior wall covers (siding) are to be wind rated? (1 point if yes). IRC references are Section

R703.1.2 and R703.4 of 2012 through 2021 editions. Note: all states with codes based on the 2012 IRC and later editions should qualify for the points.

- Part I: In areas where ultimate design wind speeds equal or exceed 130 mph per IRC (wind design required - Figure R301.2(5)B - in 2012 through 2021)/ASCE 7 maps, does the code direct users to the requirements of one of the following standards (IRC reference R301.2.1.1) (1 Point if Part I or II are met):

American Forest and Paper Association (AF&PA) Wood Frame Construction Manual for One- and Two-Family Dwellings (WFCM);

International Code Council (ICC) Standard for Residential Construction in High Wind Regions (ICC-600);

Minimum Design Loads for Buildings and Other Structures (ASCE 7);

American Iron and Steel Institute (AISI) Standard for Cold-formed Steel Framing - Prescriptive Method for One- and Two-Family Dwellings (AISI S230);

Concrete construction (i.e., insulated concrete forms or ICFs) shall be designed in accordance with the provisions of this code (IRC Section R611.2 limits ICFs to 130 mph in Exposure B, 110 mph in Exposure C and 100 mph in Exposure D). Comment: limitations of Section R611.2 must be considered when these products are to be used in high wind areas using the IRC prescriptive methods.

Structural insulated panel (SIP) walls shall be designed in accordance with the provisions of this code (IRC Section R613.2 limits SIPs to 120 mph in Exposure A and B and 110 mph in Exposure C). Comment: limitations of Section R613.2 must be considered when these products are to be used in high wind areas using the IRC prescriptive methods.

Part II: For states that have adopted the **2012 through 2021 IRC** check the following:

Roof rafters are attached in accordance with Table R602.3(1).

Compliance with Table R802.11 for roof tie-downs (i.e., adoption and enforcement of the table without amendment).

- The code does not allow alternate state provisions (amendments) that are less than those from the referenced standards (WFCM, ICC-600, etc.) for strapping/load path and bracing or, simply stated,

are the requirements for strapping/load path and bracing in the state code consistent with any of the standards referenced in the IRC?

The following areas are to be checked:

- a) Strapping/load path
- b) Sheathing attachment (roofs)
- c) Wall bracing

(1 point if a, b, and c are in conformance)

5. Strengthening Amendments: Has the state adopted strengthening amendments to the residential code? (1 point if yes)

6. Other Weakening Amendments: Other than wind provisions, has the state adopted other weakening amendments to the residential code? (1 point if no).

7. Local Amendments:

- a) Are weakening amendments allowed by local jurisdictions? (5 points if no)
- b) Are local technical amendments required to be approved by a state administrative body? (2 points if yes; treated as "yes" if local weakening amendments are not permitted)

8. Plumbing Codes: Has the state adopted a plumbing code? (4 points if yes)

9. Electrical Codes: Has the state adopted an electrical code? (4 points if yes)

PART 2 - CERTIFICATION AND EDUCATION OF BUILDING OFFICIALS (RESIDENTIAL CONSTRUCTION)

Maximum possible points: 25

10. Does the state have a mandated program for building officials for certification/licensing? (7 points if yes)

11. Does the building certification/licensing program require individuals to complete code-specific educational classes before they can take the exam? (6 points if yes)

12. Code official training and certification program:

- a) Does the state require that, before employment, inspectors receive certification in the field in which they will work?
- b) If no, is the certification required within a fixed time?
- c) What is the time period?

(For 12a to 12c, a range of points are possible based on the time frame in which code enforcement personnel receive certification: 4 points if certification is required upon employment (12a is yes); 3 points if certification is required within 2 years of employment (12a is no, 12b is yes, and 12c is equal to or less than 24 months); 2

points if the deadline for certification is more than 2 years after employment (12a is no, 12b is yes, and 12c is greater than 24 months), and 0 points if there is no certification requirement)

13. Residential-specific code training program:

- a) Does the certification/licensing program require continuing education on the residential code? (3 points if yes)
- b) If the certification/licensing program requires continuing education, what is the interval for recertification? (1 point if less than or equal to 2 years)
- c) If continuing education is required to maintain certification/licensing, how many hours are required? (1 point if the average required number of continuing education hours (the hours in c divided by the certification interval in b) is equal to or greater than 5. (using the ICC Continuing Education model of 15 hours every 3 years).

14. Does the state license inspectors separately for residential construction? (1 point if yes)

15. Does the state have a mechanism for consumers to file complaints and does a board have the authority to discipline inspectors? (2 points if yes)

PART 3 - LICENSING OF CONTRACTORS AND SUBCONTRACTORS

Maximum possible points: 25

16. Residential/General Contractors:

- a) Do the statutes mandate licensing/registration of residential/general contractors? (2 points if yes)
- b) Do applicants take a minimum competency exam? (1 point if yes)
- c) Do consumers have a mechanism to file complaints and does the licensing board have authority to discipline licensees? (1 point if yes)
- d) Does licensing require continuing education? (1 point if yes)

17. Plumbing Contractors:

- a) Do the statutes mandate licensing/registration of plumbing contractors? (2 points if yes)
- b) Do applicants take a minimum competency exam? (1 point if yes)
- c) Do consumers have a mechanism to file complaints and does the licensing board have authority to discipline licensees? (1 point if yes)
- d) Does licensing require continuing education? (1 point if yes)

18. Mechanical Contractors:

- a) Do the statutes mandate licensing/registration of mechanical contractors. (2 points if yes)
- b) Do applicants take a minimum competency exam? (1 point if yes)
- c) Do consumers have a mechanism to file complaints and does the licensing board have authority to discipline licensees? (1 point if yes)
- d) Does licensing require continuing education? (1 point if yes)

19. Electrical Contractors

- a) Do the statutes mandate licensing/registration of electrical contractors? (2 points if yes)
- b) Do applicants take a minimum competency exam? (1 point if yes)

- c) Do consumers have a mechanism to file complaints and does the licensing board have authority to discipline licensees? (1 point if yes)
- d) Does licensing require continuing education? (1 point if yes)

20. Roofing Contractors

- a) Do the statutes mandate licensing/registration of roofing contractors? (2 points if yes)
- b) Do applicants take a minimum competency exam? (1 point if yes)
- c) Do consumers have a mechanism to file complaints and does the licensing board have authority to discipline licensees? (1 point if yes)
- d) Does licensing require continuing education? (1 point if yes)



The IBHS Rating the States report is intended to help provide a roadmap for states to follow and improve their system of residential-related building regulations by following best practices to mitigate against damage from windstorms. It is not intended for use in insurance underwriting or rating, or for regulatory purposes. The metrics used in Rating the States are focused on the system of windstorm protections offered by the building code regime at the state level of government. While the framework is designed to provide an objective metric, there are times in which IBHS building codes experts apply engineering judgement based on information gathered or provided by states for a given data field. The IBHS metrics used in Rating the States differ from those used by the Federal Emergency Management Agency (FEMA) and the ISO Building Code Effectiveness Grading Schedule (BCEGS) program. Rating the States scores are not intended for direct comparisons with other building code or resilience metrics.