



Why Americans Aren't Concerned About Building Codes (*even though they should be*)

Understanding the research-inspired “No Code. No Confidence.” outreach campaign to increase public awareness and decrease the policy gap between vulnerable and resilient communities

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The Challenge

If building codes are the foundation of disaster resilience, and they are, then why don't consumers demand them when they buy or build homes? Why isn't building code status a top feature on real estate sites like Trulia or Zillow? Why do some, but not all, local and state leaders adopt and enforce codes to ensure the safety, welfare, and resiliency of the communities they serve?

These are the perennial questions posed by the disaster safety and resilience movement because we know that one cannot reliably protect families and homes without the use of current codes and standards. It is impossible.

In the U.S., jurisdictions that adopt residential building codes often adopt a version of the International Residential Code (IRC) either amended or in full. The IRC incorporates the latest advances in building design, construction practices, post-disaster findings, product innovation, research, and safety. Communities that adopt current and largely unamended versions of the IRC enjoy the benefits of a comprehensive code developed through an open, multi-year process with a broad cross-section of participants and experts.

If you map building code statuses across the U.S., you will see a tremendous inconsistency. Analysis completed during the second quarter of 2019 tells us that of 23,143 U.S. cities and towns facing floods, high wind, hurricane, seismic, or tornado hazards, only 7,265 have adopted building codes with disaster-resistant provisions incorporated for both commercial and residential codes. This means that 69% of evaluated U.S. communities facing one or more of the above-described hazards are doing so without the benefit of current, relevant structural building codes (See Appendix A).

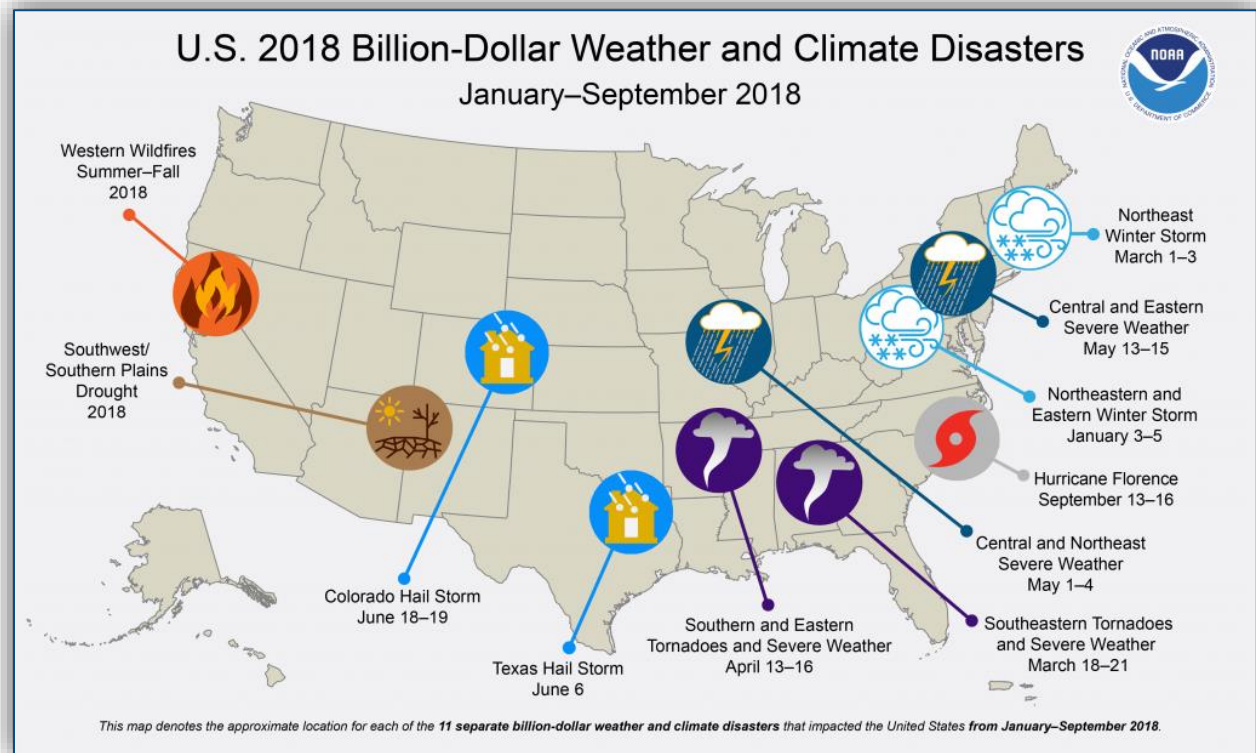
How does this happen? Some states adopt current codes statewide while in other states codes are adopted at the local level. They enforce them and keep them updated. However, too many do not. Those states leave the decision to the local city, county, and town leaders, and that is often where the breakdown occurs.



State and local leaders, somewhat understandably, prioritize short-term interests and needs that overcome the case for long-term investment in building codes and effective enforcement. But those decisions leave homeowners, private insurers, and taxpayers to pay the price when buildings are constructed without minimum safety standards.

Unknowing consumers are impacted most of all as they pay the price through the unfair burden of higher taxes and insurance premiums. This is especially unfortunate as these codes are not “super codes” or even “code-plus” recommendations. The often-overlooked codes represent the *minimum* consensus provisions that the engaged experts have decided are necessary for the construction of a compliant building. And yet, with alarming frequency, the codes are weakened or made less stringent by authorities having jurisdiction at the state or local level. In nearly all cases, the homebuyer is wholly unaware of these policy decisions that negatively affect future safety and resilience in a disaster. The human and economic consequences for these policy decisions are visible when flooding, hurricanes, tornadoes, wildfires, or geologic events like earthquakes destroy homes. Tragically, the public awareness of the connection between codes and building performance nearly always comes after the fact.

NOAA National Centers for Environmental Information analysis of billion-dollar disasters finds, “The 1980–2018 annual average is 6.2 events (CPI-adjusted); the annual average for the five years from 2014 to 2018 is 12.6 events (CPI-adjusted).” This finding means that the rate of billion-dollar events in the past five-plus years has nearly doubled that of the past forty years.



More costly disasters are occurring, and building performance/failure evidence is abundant, yet the cycle of “Build-Destroy-Rebuild” persists. Too many communities continue to build with inferior methods, experience a natural disaster causing catastrophic building failure, and then rebuild using the same inferior practices. One wonders why isn’t there an outcry by consumers? After all, they bear the ultimate and disproportionate burden of this policy leadership shortfall.

At the nonprofit Federal Alliance for Safe Homes, we believe it's simple. There is no outcry from consumers because *they do not know*. We have worked with consumers before and after disasters for more than 20 years, and our experience teaches us that consumers are not worried about codes because they assume, incorrectly, that leaders would not allow anyone to build them a home without using a playbook of minimum safety standards. They trust that, as with automobiles, the government would never abandon consumer protections when family safety and financial security is on the line.

That is why we designed and conducted the *Building Code Consumer Awareness Research and Outreach Project*. We wanted to understand and validate consumer attitudes and beliefs regarding building codes and use the insights to bring transparency to the issue once and for all.

The first goal for our project was to test our anecdotal assumptions and gauge whether consumers understand or value building codes and standards. The next step was to measure the breadth of the problem by analyzing the presence/absence of relevant structural codes across disaster-exposed U.S. communities. That analysis revealed the above-described statistic that indicates only one-third of our communities examined have the minimum building codes they need to confront disasters responsibly.

Next, we secured and enhanced a national dataset on building code adoption and created a digital tool to provide code adoption transparency in a way that consumers can understand. From there, we designed a public outreach and education effort to raise awareness, establish consumer understanding, and drive attitude and behavior change.

The project phases included:

- Conducting a behavior-focused study to discover and validate consumer attitudes
- Analyzing the presence/absence of relevant structural building codes
- Designing and testing study-informed consumer messaging and slogans
- Creating a “big data” tool to increase building code transparency and information access
- Conducting a public outreach and education campaign
- Creating a sustained consumer and leadership conversation to increase the overall social value of building codes and drive understanding, demand, and support

The project began at a pivotal time before the start of two epic, deadly, and costly disaster years in 2017 and 2018. Since then, three critical developments have taken shape. First, hurricane, flood, and wildfire events have increased national awareness of the deadly and costly impact of billion-dollar disasters. Second, the body of evidence of building code value both in terms of losses avoided and benefit-cost analysis is growing and compelling (See Appendix B). Third, new federal policies like the Disaster Recovery Reform Act and the Bipartisan Budget Act recognize the value of codes and provide state and local leaders enhanced federal dollars before and after disasters for code administration.

There is only one missing piece now. We hope that the addition of consumer and constituent awareness through the national *Building Code Consumer Awareness Research and Outreach Project* now “No Code. No Confidence.” will provide the fourth and final ingredient for a recipe to drive lasting social value for building codes. When it does, all communities can enjoy the fundamental protections they deserve.

Connecting with Consumers Through Research

Research Methodology

We worked with our long-time research partners and used a four-pronged approach to discover and gauge consumer attitudes on codes.

First, we convened a two-day synthesis, or ideation, session in August 2017 with key stakeholders to help to frame building code issues from a consumer's perspective. The following professionals participated: architects, builders, code officials, engineers, emergency managers, firefighters, floodplain managers, research scientists, and risk communicators.

The synthesis session goals included:

- Tapping the knowledge and experience of the experts to understand the issue
- Building understanding of, and empathy for, the consumer perspective
- Establishing the consumer-centered project goal

The second phase of the research included qualitative research (focus groups) with three homeowner audiences: recent homebuyers, recent new builders/renovators, and influential members of the represented communities.

This phase took place in September 2017 when our research partners conducted a total of nine 90-minute focus groups (three-to-five per group for a total sample size of N=40) spread across three markets chosen for their proximity to natural disasters and extreme weather. The markets included Orlando, Florida (hurricanes), Memphis, Tennessee (earthquakes), and San Antonio, Texas (flooding, hurricanes). The qualitative research had several goals, including:

- Understanding consumer problems for homebuyers, renovators, and community influencers
- Testing messaging platforms through card sorting/ranking exercises
- Exploring existing impressions and understanding of residential building codes

The third phase of the research included a national online survey of homeowners (N=1,002), balanced to U.S. Census proportions of homeowners, plus an oversample in the Houston Metropolitan Statistical Area (N=411). The online survey was conducted in March 2018 and included several goals:

- Identifying audience segments for potential engagement and support or opposition
- Testing consumer message points through a statistical exercise
- Establishing baseline measures for a future education campaign
- Gathering proof points of support to use in marketing outreach



The fourth and final testing effort included design and testing possible campaign messages and slogans derived from the qualitative and quantitative findings. The draft slogans included verbatim feedback from the qualitative survey phase as well as phrases suggested by the project team. The options tested provided a statement followed by a call to action.

Findings

The four key consumer perception findings and overall conclusions validated from the qualitative and quantitative phases of this research are:

1) *Understanding safety is important, but it's not enough.*

- “Safety” is easily the first, and often only, impression that homeowners have of building codes. But safety is an assumption, and they think it is already “baked in” and an existing home attribute.
- Similarly, many homeowners assume that the code where they live provides a greater level of protection than it does (sometimes because they don’t have a code at all).

Conclusion: Consumers understand the linkage between codes and safety, but they think it happens automatically or by default. Providing transparent and accurate building code status information that reveals the inexact nature of code adoption can inform to, and improve disaster-safety decision-making (e.g., evacuation and home retrofitting), thereby increasing life safety and decreasing building damage.

2) *Codes (and the safety they afford) are important to homeowners generally, but not necessarily personally. Also, they are often misunderstood.*

- The findings validate that the prospect of not having a code that governs safety in their home or where they live is *terrifying* to most homeowners.
- They place value on feeling protected by not just codes, but builders and public officials who value codes and the importance of safety standards. Some specifically described builders who do not support building codes as “shoddy.”
- “Safety” is a generality they highly value, although, they had difficulty connecting how codes translate into specific safety benefits. Things as obvious as protecting owners from shocks and electrocution in the home were largely misunderstood, unknown, or underappreciated.

Conclusion: Providing information about the specific, individual, and practical benefits of building codes, during normal and disaster times alike, can increase consumer value and support for codes.

3) Negative impressions of codes often come from specific, personal experiences.

- Unlike the positives of codes, which are often broad and generic, the negatives are typically very specific and often reflect a similar set of sentiments, born from experience:
 - ❖ That codes can change a simple home repair or fix into an unexpected and expensive issue.
 - ❖ That they are more concerned with environmental protection than safety.
 - ❖ That they restrict freedom for owners to manage their property how they wish.
 - ❖ That they are a one-size-fits-all approach that can't (or won't) take nuance into account.
 - ❖ That they are constantly changing and confusing to keep up with.
 - ❖ They often confused building codes (which govern how we construct buildings) with zoning or historic preservation rules.

Conclusion: Providing consumers with case studies that demonstrate the affordability of building codes, the economic benefits of losses avoided, and the proven record of home survival during disasters can help overcome misconceptions.

4) Consumers have no idea how to get involved with code adoption, nor do they have a particular drive to do so.

- While most homeowners support having the latest building codes where they live, very few are interested in getting involved under current conditions.
- They also do not know anything about the process of code development or adoption and are reluctant to learn, opting to rely on others they trust (they specified local leaders and their builders) to decide.
- In addition to lacking the time, some are also reluctant to get involved because they are afraid of being known as the “neighborhood crank” or finding themselves in an adversarial position they'd rather avoid.

Conclusion: Given that consumers assume the “right” codes are already in place, it is not surprising that they are not interested in getting involved; however, the provision of transparent building code status information may change that position. It may provide consumers with the option to voice their concerns in public meetings where building codes are debated and decided.

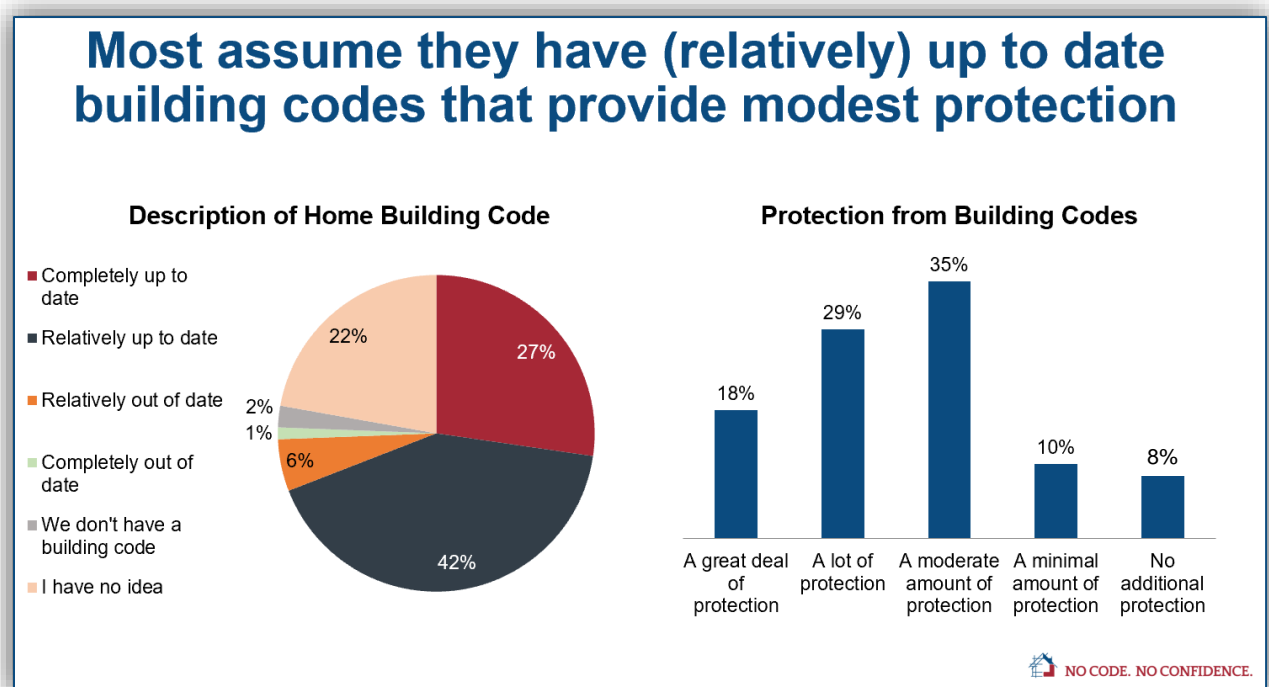
Applying Scenarios to Better Understand the Findings

The following is a discussion of the research findings through the lens of *realistic* scenarios using *fictional* characters.

Understanding safety is important, but it's not enough.

Scenario One – *The Smith Family of Tampa, Florida*

The Smith family lives in Tampa, Florida, in a one-story wood-frame home valued at approximately \$200,000. They grew up in the state and have always heard that homes in Florida are built to withstand hurricanes. They know that there is a statewide building code in Florida, but they don't know that it only is in effect for homes built in 2002 or later. Moreover, they don't know that the state allowed exceptions to windborne debris protection requirements (mainly window shutters) for counties other than Miami-Dade and Broward until 2007. Their home was built in 1990, but they always felt safe.



Their home is within the so-called windborne debris region, so if it had been constructed to the newest building code (without exception), it would have been required to have window protection, like shutters. The code requires glazed (glass) openings in buildings located in windborne debris regions to be protected, but their windows have no protection.

Late one summer, a hurricane forms, and they are within the forecasted impact area. But again, they believe that their home is built to code and should protect their family. They decide to stay home and ride out the storm.

During the storm, debris from fallen trees, roof shingles, landscaping, and pieces of pool screens become flying missiles and strike the side of their home, breaking several windows and pushing in part of the garage door. The openings in the windows become larger and larger, and the wind enters, putting pressure on the rest of the home, including the ceiling. The roof eventually breaks open at the weakest point over the garage, allowing rain and debris to come into the home. The family is terrified, but they survive the 12-hour ordeal by taking shelter in a bathroom under a mattress.

After the storm, as they clean up the water damage and mold that quickly formed in the Florida heat, they vow to upgrade their windows or buy shutters before the next hurricane season begins. They question what else is weak about their home. Are the connections from the roof to the wall strong enough? Will the walls stay connected to the foundation? What type of garage door would be better, more impact-resistant? What else don't they know, and how can they find peace of mind living in hurricane-prone Florida?

All these questions unfold as they face the task of paying their \$4,000 hurricane deductible and searching for reputable help with rebuilding and recovery.

Facts

This fictional scenario plays out in real hurricanes and other disasters when consumers assume, inaccurately, that the latest residential building codes protect them.

Unfortunately, Florida has experienced many tests of its building code. In 2005, Hurricane Charley severely impacted individuals and families along the west coast and in Central Florida, including in areas not on the coast.ⁱ The eye of Charley passed over downtown Orlando, bringing nearly 100-mph winds. Older homes, not built to the new Florida Building Code, didn't perform as well as those that were built to the Florida Building Code.ⁱⁱ

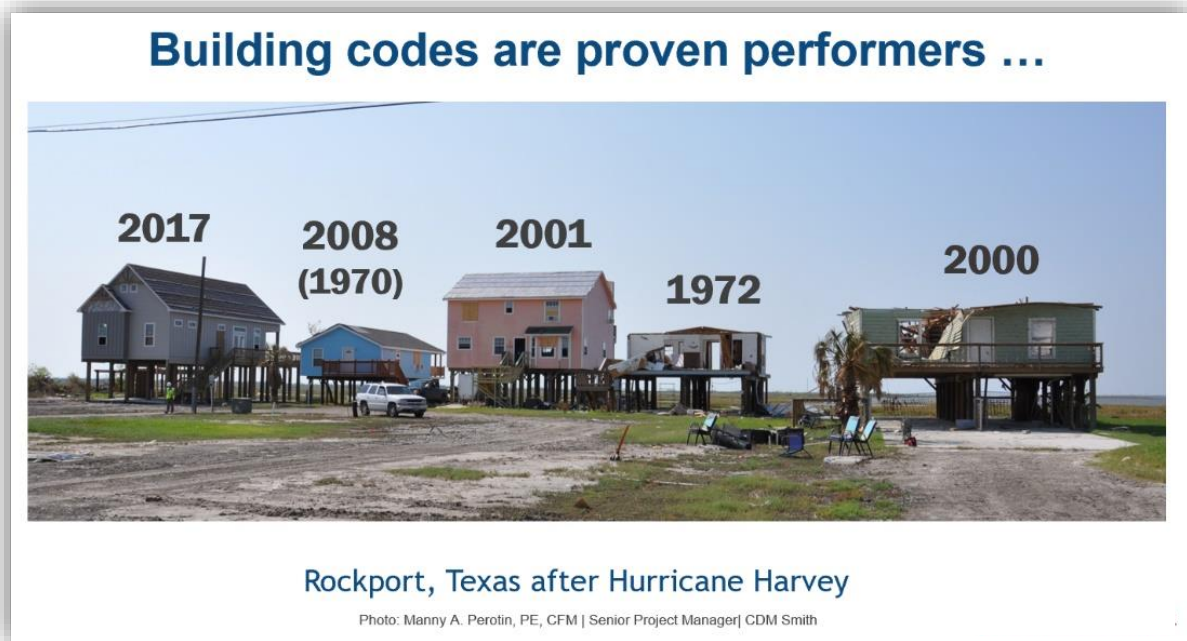
More recently, Hurricane Michael devastated homes on the coast as well as inland and north well into Georgia. Preliminary analysis confirms that, yet again, homes built to the Florida Building Code performed better than homes built before the 2008 implementation of the Florida Building Code without exceptions.

Other states also have evidence of homes built to building codes performing better than homes not built to codes. And codes protect against many types of perils, not just hurricanes. One study in Missouri found that effective and well-enforced codes reduced hail damage from 12% to 28% on average.ⁱⁱⁱ Many other states have examples of the specific improved performance of homes built to codes versus pre-code homes.

The photo array below depicts the different levels of building performance and failure during extreme winds from Hurricane Harvey based on the vintage of building. It is important to note that the 1970 home performed more effectively as it was updated to the 2008 codes.

The Texas case reflects how important it is to stay current with the latest versions of modern building codes as each new code version is updated to incorporate specific, highly-relevant benefits that are critical to building performance in different geophysical or extreme weather events.

Building codes provide safety for many families; however, many assume their homes are already built to code. In the Smith family's fictional case, they didn't have the protections of a modern building code during a hurricane, so they were unnecessarily susceptible to damage from the storm. Moreover, they may be without other non-disaster benefits that current codes provide, e.g., improved air quality, energy savings, enhanced electrical fire prevention, improved fall prevention, and avoidance of costly water losses.



Codes (and the safety they afford) are important to homeowners generally, but not necessarily personally. Also, they are often misunderstood.

Scenario Two – *The Jones Family of Louisiana*

The Jones family lives in Boudreaux Parish, Louisiana, and they just bought a new house. It was important to them to have a home built by a reputable builder to a modern building code because they relocated to Boudreaux after losing their home through Hurricane Katrina in 2005. Despite their desire for a safe home, they couldn't necessarily identify the specific, added safety benefits from building codes, but they trusted their local officials and builder to handle the details.

Following prolonged summer rains, a severe flood occurred in their neighborhood. Thankfully, their home did not experience flooding because of the one foot of elevation required in the building code used by their parish government. This is noteworthy given that the Louisiana State Uniform Construction Code Council (LSUCCC) omitted the elevation requirement during the process of adopting the 2015 IRC statewide. Thankfully, the local parish decided to require the elevation anyway.

After the flood, they learned that not only did the code protect their home, but they realized that they were receiving flood insurance premium discounts because of building code elevation requirements as well. Not all of their neighbors had flood insurance, but the Jones learned the importance of having flood insurance during Katrina.

Facts

Our research findings revealed that the prospect of having a home not built to code is terrifying to most homeowners. Furthermore, they value the protection afforded by using codes. However, the value they place is more general as

opposed to specific. Once we attempt to translate and define the perception into levels of understanding of the safety benefits, we learn that those benefits are largely unknown, misunderstood, or underappreciated.

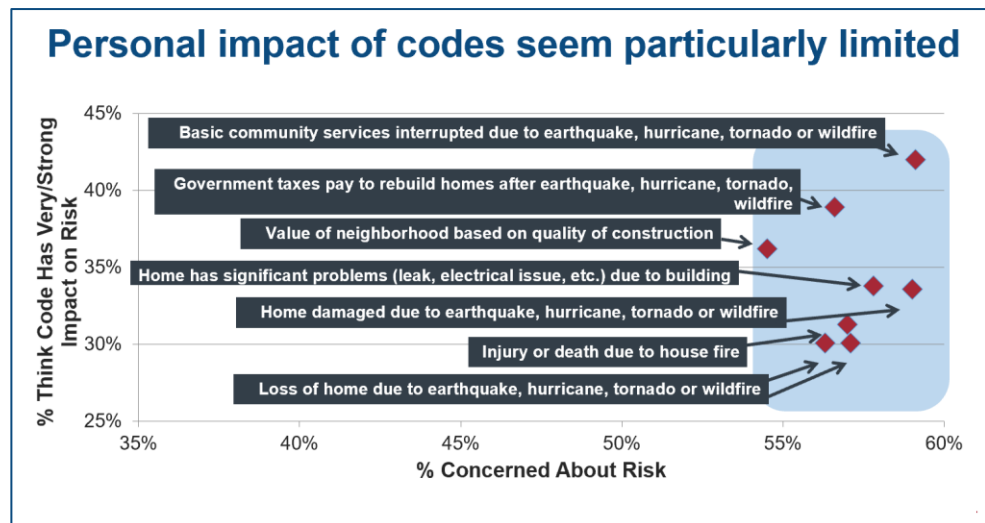
Despite the lack of detailed understanding by consumers, modern building codes and stronger floodplain regulations have repeatedly delivered benefits during disasters. This is especially true in flooding events: the most common, costly, and deadly disaster. Codes save lives and property during flooding through a variety of measures, most notably the use of freeboard.

Freeboard is the term for elevation required in the IRC for buildings in a special flood hazard area. The term was handed down from nautical engineering where it describes the distance between the deck of a ship and the waterline. The higher the freeboard, the more protected the vessel is from taking on water. The same applies to buildings and homes. Freeboard provides a critical measure of safety and financial protection through extra height to keep floodwaters shy of the doorstep and out of a home.

In storm after storm, keeping even just a few inches of water away is beneficial and can prevent thousands of dollars of damage to floor finishes, electrical wiring, contents, and more. According to FEMA, two inches of water causes an average of \$21,000 in damage, four inches will cost an average of \$39,000, and so forth.

The East Baton Rouge, Louisiana flooding of August 2016 provides clear evidence of the economic benefits of freeboard. According to HUD data, approximately 24,000 of the substantially-damaged homes in that event experienced flooding from water at levels less than one foot. What this means is that if the LSUCCC had put a one-foot freeboard requirement (like the one required in the IRC) in place before the construction of the affected homes, 24,000 families and homes might not have experienced flooding in East Baton Rouge. They would have avoided catastrophic financial impact, life disruption, and long-term recovery woes as well.

Beyond the building performance benefit of freeboard, another financial benefit is that elevated structures receive annual flood insurance premium discounts, with or without flooding activity.



These savings add up over time and don't only offset the initial, additional cost of construction to raise the home at the most cost-effective time to elevate, but one foot of freeboard reduces the monthly expense of a home by about five percent according to the Association of State Floodplain Managers (ASFPM).^{iv}

This makes a clear case for upfront elevation in special flood hazard areas, something that current, model codes require.

Negative impressions of codes often come from specific, personal experiences.

Scenario Three – *The Carter Family of Tulsa, Oklahoma*

The Carter family lives in Tulsa, Oklahoma in a wood-frame home built in the 1970s. They have lived in their home for decades, and they need to add a mother-in-law suite to accommodate an elderly family member. They also want to add a tornado safe room or storm shelter, but they have learned that they must apply for a building permit and build their safe room to meet specific standards.

The process of applying for a permit and learning the requirements sounds daunting, and they feel like they should be able to do what they want to their home without having to ask for permission. They aren't sure they understand the newest requirements for the home addition or the storm shelter. Worse yet, one of their neighbors told them they had a paperwork hassle when applying for a building permit. Now they wish they could avoid it altogether.

Despite their concerns, they moved forward, followed the rules, submitted the building plans, and secured the permit. The process was not as expensive, complex, or time-consuming as they had feared. Moreover, they felt confident as they and their builder enjoyed the building inspector's expertise throughout the project.

Two years later, when a deadly EF-4 tornado hit their home, the Carters (including their elderly relative) took refuge in their tornado safe room. The safe room met the required safety standards and withstood the powerful winds. The Carter family was safe inside.

Facts

Deadly tornadoes struck Moore, Oklahoma on May 20, 2013, the last day of an outbreak that, according to the National Weather Service, "produced the most deadly and devastating tornado of the year for Oklahoma and the United States." The catastrophic event caused deaths and destruction throughout the community and served as a policy catalyst for the community to improve the performance of its building codes.

Unfortunately, despite the history of deadly tornadoes in Oklahoma, the statewide storm shelter requirements for certain types of commercial structures, e.g., schools, are not uniformly required or enforced across cities and counties, and residential codes, in general, are not uniformly required or enforced. Of course, we want everyone in tornado-prone areas to invest in a safe room for family protection, but not everyone can afford to do so. The key is to follow the building code *if you do decide* to build or install a safe room.

Our project research findings indicate that, like with the fictional Carter family, negative perceptions of building codes tend to reflect personal experiences. Regardless, homes (and safe

rooms) built to strong, modern building codes perform better than those built without codes, even in events like tornadoes.

In the fictional scenario, the Carters built their safe room to the standards required in the building code, and that is why it performed well. Many real-world examples of compliant safe rooms that save lives exist, and they provide teaching moments regarding both the benefits of safe rooms as well as the case for following the codes and standards they incorporate. Sadly, noncompliant safe rooms are often the cause in fatal scenarios. That is why it is critical to ensure that safe rooms use tested doors, door assemblies, and even specific hardware to guarantee performance. And in more than 18 years of post-tornado damage investigations, Texas Tech engineers have never documented the failure of a *compliant* tornado shelter.

Consumers have no idea how to get involved with code adoption, nor do they have a particular drive to do so.

Scenario Four – *The Warner Family of Flagstaff, Arizona*

The Warner family lives in Flagstaff, Arizona, and they are very concerned about wildfires. They know they live in the “Wildland-Urban Interface” (WUI) where the threat is greater, but they are not sure what they can do about it.

A family member in California told them that wildfire control methods by the government like prescribed burns are the only thing that can be done to stop wildfires, but they heard from a friend that even landscaping measures could make a difference. After doing some internet research, they learned that landscaping using plants with high water content and creating a defensible space around buildings is effective, but even more so if the whole neighborhood participates.

Mr. Warner just became president of his homeowners’ association (HOA), but he is not aware of any current programs or requirements to govern landscaping techniques for wildfire protection. He wants to raise the issue with the HOA as a potential action for the neighborhood, but he is worried that his neighbors will think he’s the neighborhood crank.

Mr. Warner researches wildfire codes and mitigation, and despite some hesitation, decides to bring his findings to the city council and urge action. Recent fires in Colorado and California have him concerned, and his concerns overcome his fear of a misunderstanding with his neighbors. To his pleasant surprise, the city council not only accepts his recommendations for converting common-area landscaping to noncombustible plants, but they adopt the WUI code by a wide margin to address construction materials and methods. The code restricts ignitable materials, introduces fire mitigation practices like screening around vents, and requires other proven wildfire mitigation and prevention practices, including the incorporation of defensible space around the home. Further, the city council votes to identify high-risk areas by mapping the WUI and communicating the boundaries to residents.

The city council commends Mr. Warner and his family for making the neighborhood and surrounding areas safer, and his efforts increase community engagement overall. Neighbors form safety teams and identify elderly neighbors that might need communication or transportation assistance in the case of a wildfire evacuation order.

Facts

Recent wildfires demonstrate how deadly and devastating they can be to entire communities and large areas of land. Wildfires have destroyed more than 35,000 structures within the past decade,^v and there has been a steady occurrence of wildfires on the West Coast in recent years as well. At least 88 people died in the Camp Fire during 2018 with many trapped inside homes with flammable roofs and open vents.^{vi} The October 2017 fires in Northern California and wine country, the Thomas Fire in December 2017, and the Carr Fire in 2018 are just a few that confirm wildfires as a priority issue that leaders must address. Wildfires are not only a threat on the west coast as they frequently happen across the U.S. The Gatlinburg, Tennessee wildfire in 2016 is one example.



The Wildland-Urban Interface (WUI) is defined by the US Forest Service as areas where built structures bump up against or intermingle with undeveloped natural areas.^{vii} The WUI is an area of particular wildfire risk, and one-third of all U.S. homes are now located there.^{viii} One study found that the WUI has increased from 1990 to 2010, now affecting 43.4 million homes (a 41% increase), and covering 770,000 km² (a 33% increase), making it the fastest growing land use type in the conterminous U.S.^{ix}

There are specific building codes to mitigate against wildfire in the WUI,^x and one such code, the 2018 International Wildland-Urban Interface Code (IWUIC), was recently adopted in the State of Washington (in part) for statewide applicability and authorizes cities and counties to adopt the entire IWUIC.^{xi}

Our research found that some homeowners lack the willingness to advocate for code adoption or updates in part because they fear becoming an unpopular neighbor or finding themselves in an adversarial position. However, when wildfire mitigation is implemented neighborhood- or community-wide, the probability of successfully interrupting or stopping a major fire will increase. This makes a strong case for community participation. Additionally, many wildfire protections are considered more affordable as they focus on landscaping and use of nonignitable building materials vs. specialty products, so the odds of becoming viewed as a disruptive neighbor may be much lower when advocating helpful, affordable protection.

A recent study by the Insurance Institute for Business and Home Safety found that a new home built to wildfire codes costs roughly the same as a typical home.^{xii} Also, the National Institute for Building Sciences study found that use of the IWUIC generates a \$4 benefit for each dollar of cost invested.^{xiii} Studies like these address concerns regarding the cost of using modern codes.

Finally, and most importantly, a McClatchy analysis following the California Camp Fire in October of 2018 found that 51% of the houses built after 2008 escaped damage compared to 18% of the 12,100 houses built prior to 2008 and the landmark building code enacted in that year requiring fire-resistant roofs, siding, and other safeguards.

All this evidence makes a profound case for wildfire code adoption to save lives, homes, and communities from wildfires.

Leveraging the Learning

Through our research project, we learned that Americans are unaware of the role building codes can play in making a community more resilient in the face of extreme weather and other perils. While they highly value resilience, American homeowners know little about how codes are adopted, how they work, or their impact on community resilience. Almost half the surveyed homeowners were unsure if codes had even a “moderate impact” on how well a home—or the people inside a home—survive a natural disaster.^{xiv}



Additionally, they knew little about their own community's building codes. Eight of ten people living in areas with out-of-date codes described their code as up-to-date. Most importantly, the findings revealed a disparity between consumer assumptions regarding the presence of codes as well as the actuality that codes may or may not be adopted in their area.

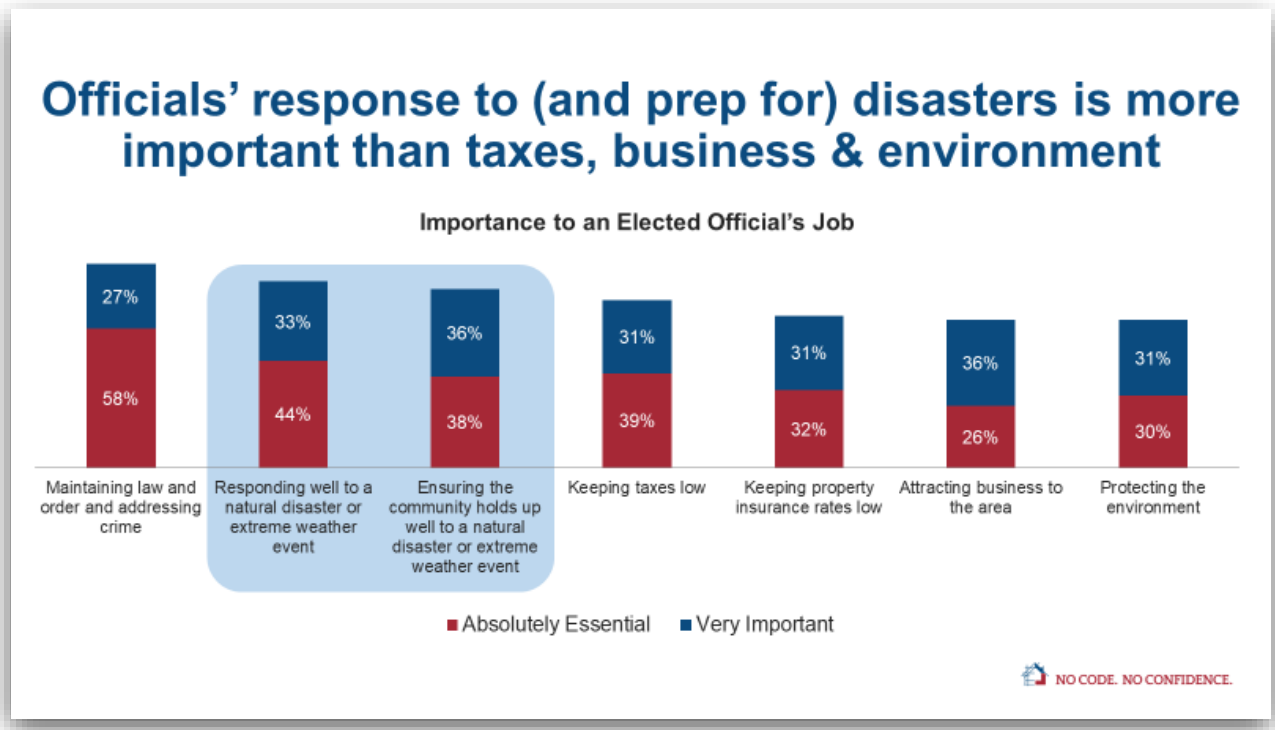
Consider the 7.1 magnitude Alaska earthquake in November 2018 that caused extensive structure and infrastructure damage, but thankfully no fatalities. Experts cite the Anchorage building code as a factor in saving lives during the earthquake, but the costly building damage and disruption there has Alaskan leaders taking note. Accordingly, new awareness on this issue has led state leaders to propose statewide adoption of the IRC.^{xv} The deliberations include discussion of the historic 1964 9.2 magnitude Alaska earthquake and tsunami as well.

Alaska is now taking critical steps for the safety of its communities, and we hope that they are finished before the next earthquake strikes. But were Alaskans aware of the building code gap there before the earthquake occurred? Our findings tell us that they likely were not.

Our opportunity with this new national building code awareness campaign is to help the public see the value of building codes that are adopted, enforced, and maintained *before* an earthquake or other disaster makes the case. We believe that a solution to this challenge is a research-informed outreach campaign to connect consumers to the issue of building codes and to make it relevant on a par with other issues facing families throughout the U.S.

We plan to show consumers how residential codes impact resilience through public outreach using communication assets and a consumer-facing digital tool for building code adoption status information. Our movement of disaster safety stakeholders will serve as a key distribution channel.

The new public education and outreach campaign is the culmination of nearly two years of effort, including the above-discussed qualitative and quantitative research that showed how highly homeowners value resilience: ranking it as more or just as important to an elected official's job as keeping taxes low, protecting the environment, or attracting business.



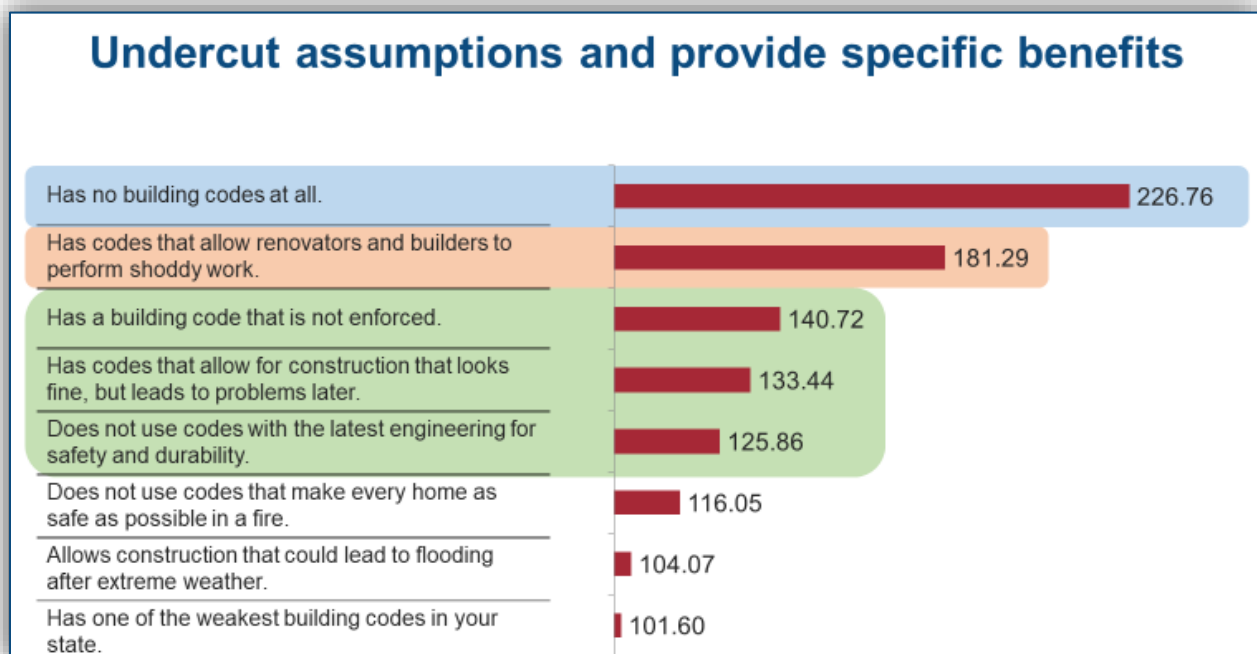
Even so, up until now, there has not been an effort to explain the lack of uniform residential building codes to consumers and homeowners. Homebuilders and realtors have told us for many years that they prioritize what their customers prioritize. Today, the homebuyer priority is largely about the cost. As such, it is understandable that they may undervalue continuously updated codes as they can introduce additional costs for training and implementation for professionals. However, once their customers understand that the modern code may not already be part of the building plan, and they communicate that priority, a shift to higher market and social value for codes can begin.

We believe that improving the social value for codes can increase understanding and acceptance not only for consumers but across all relevant stakeholder audiences, especially builders, leaders, and realtors. This is essential as they are crucial to the effective use and implementation of the building practices and standards provided by modern codes and beyond-code innovations that provide the path to improved codes in the future.

Creating the “No Code. No Confidence.” Campaign

Step One – Fulfilling the right informational needs

Digging deeper into the findings indicated that the best performing messages were those that undercut broad existing assumptions about safety and quality while helping consumers understand the specific benefits of codes. We learned that consumers lacked any deep understanding of code benefits beyond a general “safety” value. This pointed up the opportunity to improve understanding by making a connection between basic code attributes and how they contribute to building performance. There are many specific examples of code requirements that increase disaster resilience. For example, roofs with more closely-spaced metal connectors resist wind uplift and perform better in high winds, hurricanes, and tornadoes (See Appendix B).



Other benefits may be more general, but they have a personal impact. For example, according to FEMA, structures built to higher standards are 77% less likely to be damaged in a disaster. Various studies reflect additional objective benefits such as another FEMA analysis from 2014 that estimated an approximately \$500 million in annualized losses avoided in eight Southeastern states due to do the adoption of modern building codes.^{xvi}

Another study found that Florida’s statewide building code reduced actual windstorm losses by as much as 72 percent, producing \$6 in reduced loss to \$1 of cost.^{xvii} All of these studies are helping in advancing the policy dialogue, but when we are speaking to consumers, we need to show the personal benefits of how codes make *their* homes better.

It is also important to point out that the benefits of building codes are *continuous*. This is true for insurance discounts that recognize the use of modern building codes. In that instance,

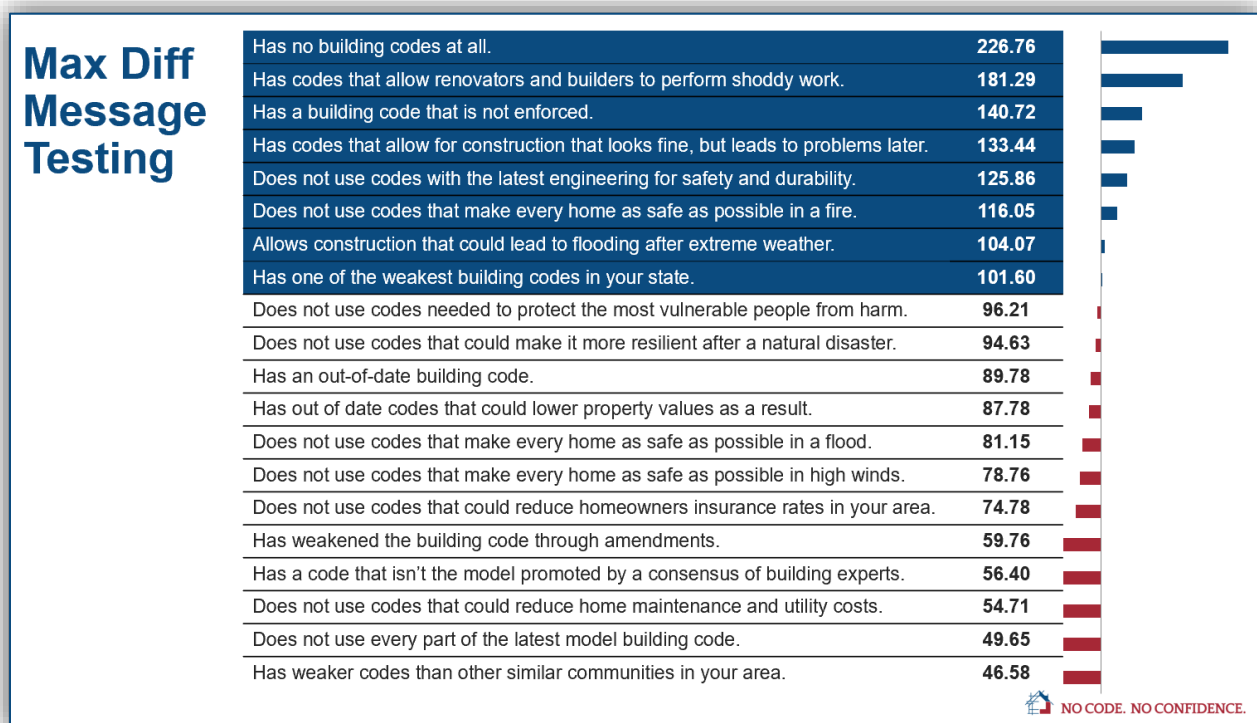
homeowners realize the benefits every year that they own their home. One NAHB article found that the typical single-family home buyer can be expected to live in the home for approximately 13 years.^{xviii} Another statistic finds the typical homeowner to live in a home for 14 years,^{xix} and another finds a median of 15 years.^{xx} This long-term homeownership trend provides a substantial pay-back period to defray any upfront costs of code compliance during construction.

Lastly, a recent update to the wide-ranging National Institute of Building Sciences “Mitigation Saves” study referenced in the wildfire discussion under scenario four captures the value of disaster mitigation as well by establishing the benefit-cost ratio of various types of disaster-specific building codes (See Appendix C). This research provides validated insights and support for leaders as to how building codes benefit individuals, communities, and stakeholders.

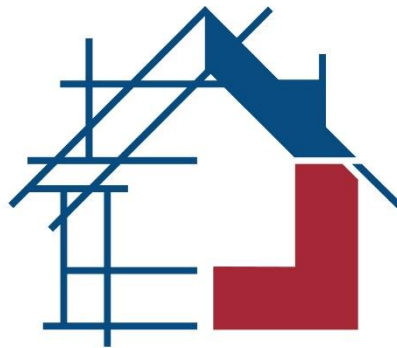
Step Two – Crafting the message

Our next step was to identify a slogan or key message followed by a call to action using insights regarding consumer concerns. And while only a handful of statements resonated as concerns, they did so powerfully. The chart below indicates the statements with the most potential as indicated by statements that scored above 100 in the Maximum Differential (MaxDiff) testing. MaxDiff is a mathematical method for measuring relevance and impact of tested statements. The higher the number above 100, the stronger the statement resonated with the audience. The lower the number, the weaker the relevance of the statement.

As you can see, “has no building codes at all” tested at the highest and most significant level, making it the priority to address through our public outreach campaign.



We developed the campaign slogan and call to action, “No Code. No Confidence. Inspect to Protect” to address a fundamental problem. When we construct buildings without codes, we create a *lack of confidence*. The presence, or lack thereof, of a building code isn’t necessarily a verdict on a building. We can’t say definitively that “no code” equals an inferior building. What we can say is that without the use of codes verified through third-party inspections, we cannot be *confident* that the home is built consistent with the best codes and standards. The lack of confidence becomes an even bigger issue when it comes to disasters. Nobody should have to wonder if they are going to be safe and if their home will survive when disasters strike. This is especially true as a home is typically a families’ most significant, lifetime investment.



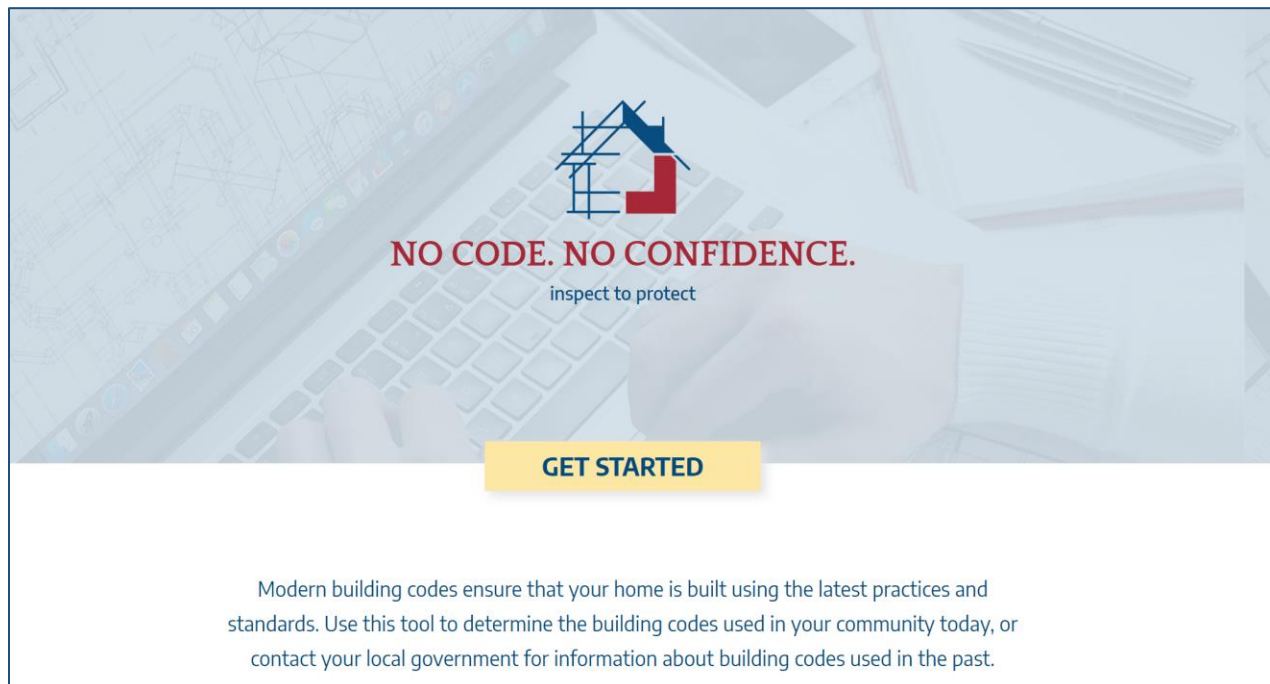
**NO CODE.
NO CONFIDENCE.**

inspecttoprotect.org

Step Three – Building a digital tool to provide specific, individualized information

The outreach effort includes the creation of a digital tool based on a national building code adoption database that provides a simple way to understand code status. Once individuals learn about the building code issue through the campaign, they can access the website www.InspectToProtect.org and check the status of residential building codes currently used in their area. Visitors to the site will be able to search by address and see a color-coded map showing the status of the residential building code for their community. Red depicts “no code,” yellow for an “out-of-date” code, green for an “up-to-date” code, or black for “no data available.”

The website allows users to use a feedback loop to ask questions or offer additional building code information to help enrich the database behind the website as well. The site will not provide records about past residential building codes or certain states that do not report code statuses, so a user with a home built in 1998 will have to ask their local building department for that information. This is a common aspect to the challenge of building codes as the lack of available, transparent data and historical information keeps them out of sight, out of mind. Over time, we plan to grow and refine the dataset to provide many additional types of records to allow users easy access to information about their homes and the presence (or absence) of codes. Meanwhile, our consumer-facing building code website is the first-of-its-kind and a good starting point for our effort to demystify this complex issue.

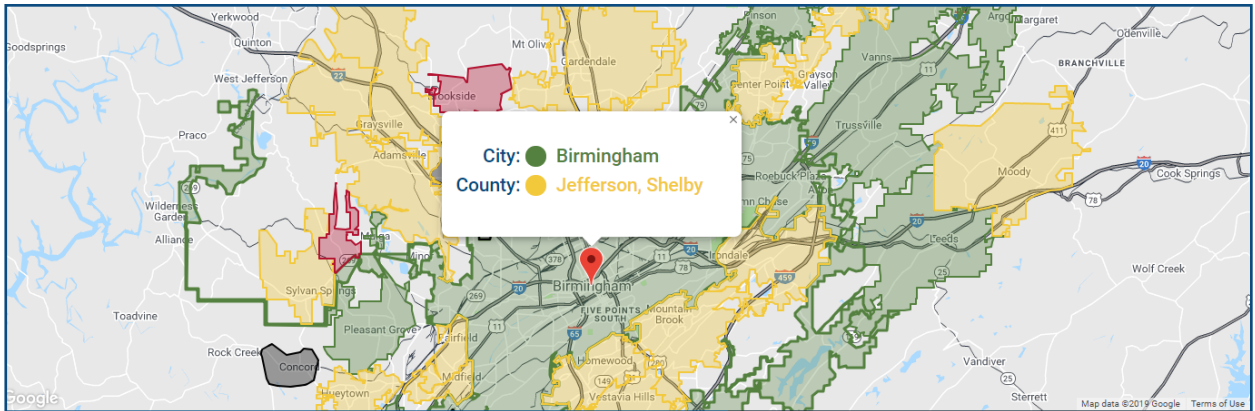


NO CODE. NO CONFIDENCE.
inspect to protect

GET STARTED

Modern building codes ensure that your home is built using the latest practices and standards. Use this tool to determine the building codes used in your community today, or contact your local government for information about building codes used in the past.

InspectToProtect Report Screenshot



Birmingham, Alabama
35203

CHANGE LOCATION | VIEW COUNTY | HOW IT WORKS

- Code Not Adopted (Red circle)
- Current Code Adopted (Green circle)
- Code Out-of-Date (Yellow circle)
- Unavailable (Black circle)

The color-coded analysis is based on the best available data and reflects the status of **International Residential Code adoption only** and does not reflect the status of building code enforcement.

Read the full disclosure.

City of Birmingham

Building Code ● 2015 International Building Code

County of Jefferson

Building Code ● 2015 International Building Code

County of Shelby

Building Code ● 2009 International Building Code

IMPORTANT

City and county codes do not match.

Need more detailed info? Contact your local city and county government offices for more detailed info.

Nearby cities

- Mountain Brook
- Homewood
- Tarrant
- Cahaba Heights
- Forestdale
- Fultondale
- Hoover
- Vestavia Hills
- Fairfield
- Midfield
- Irondale
- Shannon
- Pleasant Grove
- Adamsville

Step Four – Using creativity to design communication tools, including Public Service Announcements

Building codes are complex, and their value is often not apparent until disaster strikes. Moreover, they are not inherently interesting as a general topic, so most people are not seeking information about codes. Our research indicated that definitively.

The *No Code. No Confidence.* outreach campaign introduces the not so dramatic subject matter of building codes by using dramatic metaphors, e.g., not having a building code is compared to not inspecting your parachute or not having traffic codes. This is intended to grab the interest of a general audience and avoid losing their attention.

The [first Public Service Announcement](#) draws people in with the drama of a parachute jump, then uses the metaphor of inspected or non-inspected parachutes to frame the "confidence" message. This creates viewers who are primed to listen to the messaging later in the spot. The closing call to action is to visit "InspectToProtect.org," where they can learn the status of code adoption current in their community.

The second Public Service Announcement as you can [see here](#) depicts a four-way traffic stop with a sign that says "Stop ... If you have time." A driver comes upon the sign and is confused by what she sees only to learn that this community doesn't have traffic codes. A car speeds through the four-way intersection, and you may guess the rest. Off camera, we hear the sound of a high-speed crash.

The rest of the communication and outreach tools, [including this dramatic movie trailer](#) animation, follow a similar theme and drive home the point, "No Code. No Confidence." and that one must "Inspect to Protect."



Shareable 15", 30", and 45" Videos

The video PSAs are optimized for sharing on both broadcast television and social media platforms

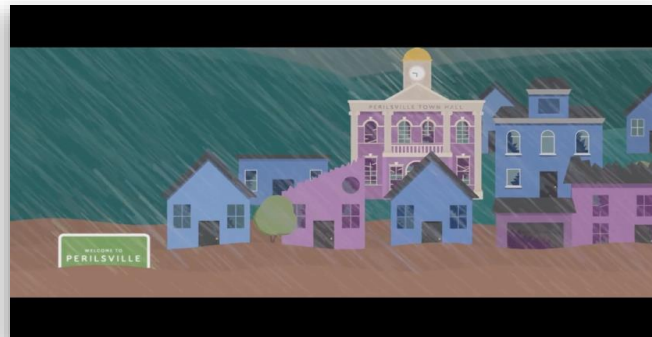
Title: Parachute



Title: Four-Way Stop



Title: Movie Trailer Animation



Shareable Graphic

Conclusion

Moving Forward to a Code-Protected Country

The goal at the outset of the *Building Code Consumer Awareness Research and Outreach Project* was to understand and validate consumer attitudes and beliefs regarding building codes and to use the insights to bring transparency to the issue. The research validated what we always suspected. Consumer knowledge and desire to engage in building codes as an issue is low; however, consumers are uninterested because they have misplaced confidence that the system automatically provides building codes needed for their safety.

Our research findings revealed an opportunity to improve consumer awareness and understanding through information transparency that disrupts inaccurate consumer perceptions regarding building codes while providing specific and relatable information about code benefits. With the conclusive findings in hand, we have developed a strategy and created outreach and education tools for disaster safety and resilience leaders, stakeholders, and voices who understand that building codes are the foundation of resilience.

We believe the campaign is a unique opportunity to give Americans the understanding that they may, or may not, have residential building codes in their community and to provide specifics on how codes benefit them. As a result, we hope that they will support local officials who invest in codes as well as builders, design professionals, and realtors who embrace the use of modern codes and beyond-code innovation. This is essential as these professionals and leaders are critical to the effective use and implementation of the continuously updated building practices and standards.

Based on our decades of experience, we are confident that this strategy can increase the social value for codes and advance our goal to break the “Build-Destroy-Rebuild” cycle. Once achieved, we will increase community resilience by creating a generation of homes and buildings that not only withstand natural disasters more effectively, but that retain their value over time through enhanced durability, energy efficiency, fire resistance, sustainability, and more.



Appendix A

Building code adoption analysis by hazard/jurisdiction

Hazard	Percentage of 23,143 jurisdictions that have adopted current disaster-resistant codes
Earthquake	56%
Flood	34%
High Wind	46%
Hurricane	56%
Tornado	50%

Appendix B

Examples of code requirements that contribute to disaster resilience

Hazard	Home Strengthening Measures
Earthquakes	<ul style="list-style-type: none"> ▪ Provide building designs to avoid collapse from shaking forces. One of the best examples is precluding so-called “soft story” construction where the first story is an open parking lot or atrium with floors built overhead ▪ Require residential building that ensures that the basement foundation “cripple” walls are properly braced to withstand shaking and collapse ▪ Address simple, yet, important things like securing water heaters to prevent tanks or attached hoses from shaking and separating, causing fires from gas leaks or severed electrical connections
Flooding	<ul style="list-style-type: none"> ▪ Prescribe elevation requirements in high-risk areas as well as overall structural strength to withstand hydrostatic forces of water and wave action ▪ Specify use of methods to dry floodproof (keep all water out) or wet floodproof (allow water to flow underneath) <p><i>Note: Flood-related provisions in the building code cover coastal areas that are usually assumed to be at risk of flooding as well as inland areas where flooding might not be expected but frequently occurs.</i></p>

Hurricanes	<ul style="list-style-type: none"> ▪ Require enhanced nailing patterns (more nails and closer spacing) to ensure roof decks (under shingles) are adequately attached to roof trusses ▪ Strengthen connections from the roof to walls to the foundation to keep roofs from blowing off, walls from collapsing, or houses from sliding off their foundations ▪ Require coverings like shutters for windows, doors, and other openings like garage doors, so that windborne debris and other projectiles cannot break glass or push in the doors, etc., when under pressure from high wind forces ▪ Address the wind resistance of the roof coverings (shingles, tile, etc.) and the installation methods (ring-shank nails or screws)
Wildfire	<ul style="list-style-type: none"> ▪ Prescribe use of non-combustible building materials (roofing, siding, soffits, decks, etc.) to prevent ignition from flying embers and fires ▪ Prescribe setbacks or how far the house can be from the road or woodland areas in wildfire regions ▪ Address the depth and the finish of walls that serve as fire breaks in either housefire or wildfire scenarios ▪ Require mesh around chimney tops to keep embers from flying out and landing on the roof and causing ignition ▪ Require mesh on vents and other openings to keep the wildfire embers from entering the vent opening and the home as well.

Appendix C

National Institute for Building Sciences “Mitigations Saves 2.0”

Building Code/Mitigation Category	Cost	Benefit	Benefit/Cost Ratio
Riverine Flood	\$0.09	\$0.55	6:1
Hurricane Wind	\$0.53	\$5.55	10:1
Earthquake	\$0.58	\$6.90	12:1
Wildfire	\$0.80	\$3.03	4:1
Total BCR for adopting the 2018 I-Codes	\$1.20	\$13.00	11:1

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- ⁱ Mark Skoneki. June 14, 2018. "Hurricane Charley memories, lessons come roaring back in one image." *Orlando Sentinel*. <http://www.orlandosentinel.com/business/os-hurricane-charley-photograph-20180613-story.html>.
- ⁱⁱ Building Code Triage Teams After Action Report Hurricane Charley
- ⁱⁱⁱ Jeffrey Czajkowski and Kevin Simmons. 2014. "Convective Storm Vulnerability: Quantifying the Role of Effective and Well-Enforced Building Codes in Minimizing Missouri Hail Property Damage." *Land Economics*.
- ^{iv} New construction of 2,00 sq. Ft. Primary Residence, A-Zone, Monthly Payment. One foot of freeboard results in \$983 principle + interest plus \$74 in flood insurance = \$1,061 for a 5% decrease. *Assumes \$206,000 in initial construction costs with \$190,000 of those costs financed plus all freeboard costs financed at 4.5%, 30-year fixed rate. Freeboard assumed at 1.9% per foot of construction cost. Flood insurance amounts of \$200K/\$80K Bldg/Contents based on April 2017 rates.
- ^v Stephen L. Quarles and Kelly Pohl. Nov. 2018. "Building a Wildfire-Resistant Home: Codes and Costs." <https://headwaterseconomics.org/wildfire/homes-risk/building-costs-codes/>. Derived from National Incident Coordination Center Annual Reports. <https://www.predictiveservices.nifc.gov/intelligence/intelligence.htm>
- ^{vi} Sarah Kaplan and Frances Stead Sellers. Nov. 30, 2018. "How they survived: Owners of the few homes left standing around Paradise, Calif., took critical steps to ward off wildfires." *The Washington Post*. https://www.washingtonpost.com/national/how-they-survived-owners-of-the-few-homes-left-standing-around-paradise-calif-took-critical-steps-to-ward-off-wildfires/2018/11/30/db323782-f34b-11e8-80d0-f7e1948d55f4_story.html?noredirect=on&utm_term=.5e3abd1b1879
- ^{vii} United States Department of Agriculture. "Wildfire Management in Wildland-Urban Interface Areas." <https://www.nrs.fs.fed.us/disturbance/fire/wui/>
- ^{viii} Radeloff, V.C., D. P. Helmers, H. A. Kramer, M. H. Mockrin, P.M. Alexandre, A. Bar-Massada, V. Butsic, T.J. Hawbaker, s. Martinuzi, A. D. Syphard, and S. I. Stewart. 2018. Rapid growth of the US wildland-urban interface raises wildfire risk. PNAS. <http://www.pnas.org/content/early/2018/03/06/1718850115.short>
- ^{ix} <https://www.nrs.fs.fed.us/data/WUI/>
- ^x Stephen L. Quarles and Kelly Pohl. Nov. 2018. "Building a Wildfire-Resistant Home: Codes and Costs." <https://headwaterseconomics.org/wildfire/homes-risk/building-costs-codes/>. Cites the IWUIC, the National Fire Protection Association's Standard for Reducing Structure Ignition Hazards from Wildland Fire (Standard 1144), and the California Building Code Chapter 7A—Materials and Construction Methods for Exterior Wildfire Exposure.
- ^{xi} <https://www.iccsafe.org/building-safety-journal/bsj-hits/washington-signs-significant-iwuic-legislation/>
- ^{xii} Stephen L. Quarles and Kelly Pohl. Nov. 2018. "Building a Wildfire-Resistant Home: Codes and Costs." <https://headwaterseconomics.org/wildfire/homes-risk/building-costs-codes/>
- ^{xiii} National Institute of Building Sciences. *Mitigation Saves: At the Wildland Urban Interface, Complying with the 2015 IWUIC Provides \$4 Benefit for Each \$1 Invested*. https://cdn.ymaws.com/www.nibs.org/resource/resmgr/docs/MS_Code-IWUIC.pdf.
- ^{xiv} FLASH/Marketing for Change Survey of Homeowners, March 2018 (n=1,002).
- ^{xv} FEMA, *Phase 3 National Methodology and Phase 2 Regional Study Losses Avoided as a Result of Adopting and Enforcing Hazard-Resistant Building Codes* (2014). FEMA, *Phase 3 National Methodology and Phase 2 Regional Study Losses Avoided as a Result of Adopting and Enforcing Hazard-Resistant Building Codes* (2014).
- ^{xvii} Kevin Simmons, Jeffrey Czajkowski, and James M. Done. 2018. *Economic Effectiveness of Implementing a Statewide Building Code: The Case of Florida*. Land Economics.
- ^{xviii} Paul Emrath. Jan. 3, 2013. "Latest Study Shows Average Buyer Expected to Stay in a Home 13 Years." <http://eyeonhousing.org/2013/01/latest-study-shows-average-buyer-expected-to-stay-in-a-home-13-years/>.
- ^{xix} National Association of Realtors. "Quick Real Estate Statistics." May 11, 2018. <https://www.nar.realtor/research-and-statistics/quick-real-estate-statistics>.
- ^{xx} "The Typical American Homeowner." <https://www.zillow.com/report/2017/homeowners/typical-american-homeowner/>.