National Institute of BUILDING SCIENCES™

2025 Moving Forward Report

Prepared by the NIBS Consultative Council

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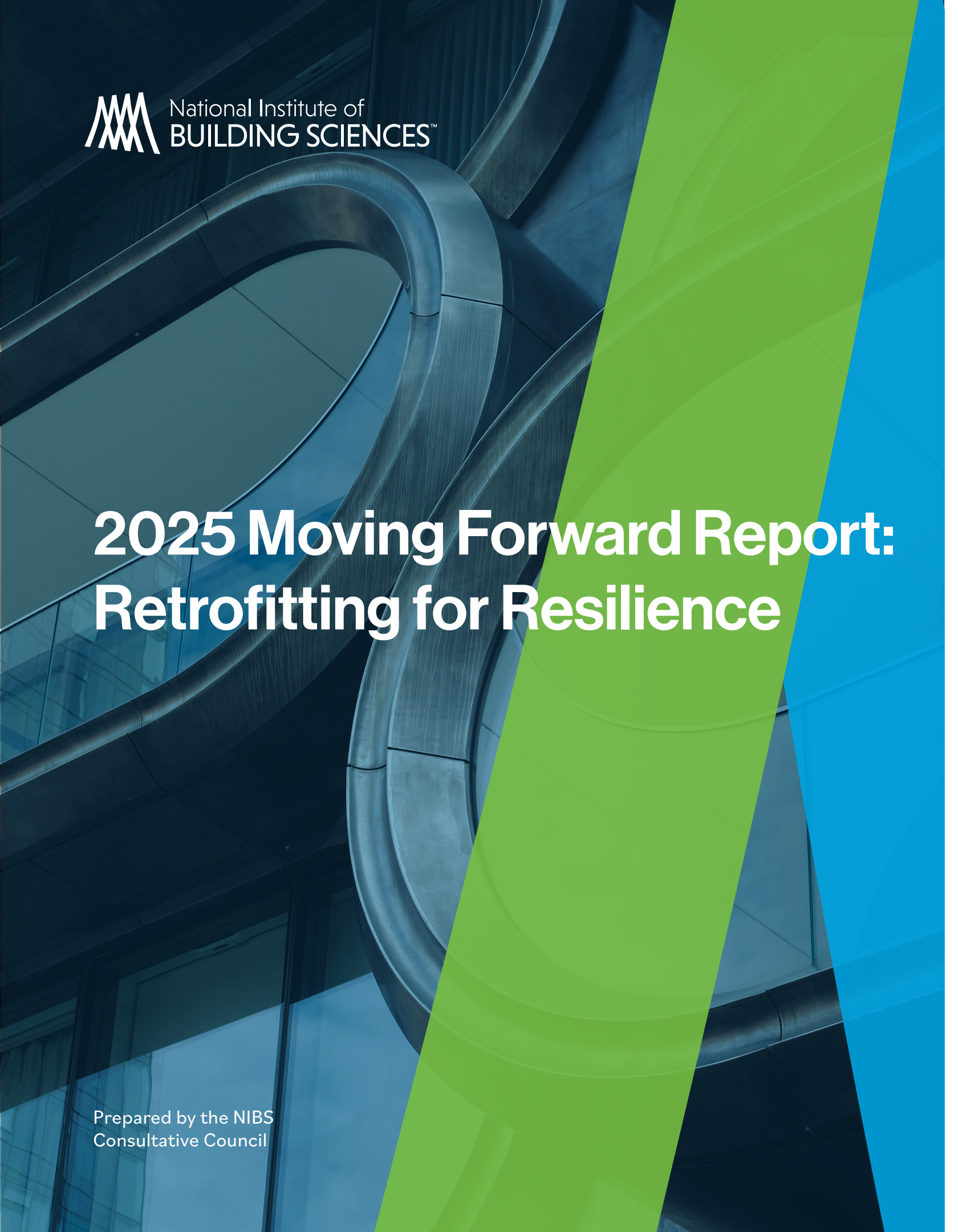


National Institute of BUILDING SCIENCES™

2025 Moving Forward Report: Retrofitting for Resilience

Prepared by the NIBS Consultative Council

Introduction

The National Institute of Building Sciences (NIBS) serves as an unbiased forum for addressing common challenges and identifying opportunities within the building community. The NIBS Consultative Council is comprised of high-level building community leaders who make collective recommendations directly to policymakers on how to improve our nation's buildings and infrastructure. Members of the council include organizations representing consumers, architects, engineers, standards-setting bodies, government officials, contractors, researchers, and housing officials.

The goals of the council are three-fold:

- **Convening Thought Leaders**: Bringing together industry leaders and experts across the built environment to improve our nation's infrastructure and buildings.
- **Identifying Challenges**: We maximize the collective knowledge of our experts to identify current and emerging key issues they believe the industry will face in the year ahead.
- **Finding Solutions**: Developing and publishing a yearly report that offers solutions to key challenges the built environment faces.

Each year, the Consultative Council publishes the Moving Forward Report to investigate critical challenges facing the building industry and make recommendations to both industry and policymakers to help overcome those challenges. These reports provide a reference point on the state of the industry at a specific time.

Retrofitting for Resilience: Recommendations Summary

The imperative to proactively prepare for extreme weather is clear in the wake of destructive hurricanes, wildfires, earthquakes, tornadoes, droughts, hailstorms, and floods. While the cost to retrofit buildings and infrastructure to mitigate the financial, physical, and emotional toll of these disasters varies widely, the benefits are clear. The 2019 NIBS Mitigation Saves Study found that every $1 invested in resilience measures can save up to $13, with a national average ranging from $4 to $11 in avoided future losses. For every building type, commercial business owners, homeowners, communities, and government agencies--can take steps to increase resilience. These actions will result in less economic disruption and ultimately save lives and money.

Placing the full financial burden of retrofitting buildings and infrastructure solely on property owners and individual communities is not financially feasible. That burden is also disproportionate, because there are numerous beneficiaries of money spent on measures to improve resilience. Beyond property owners, many stakeholders benefit from retrofitting for resilience, including insurance companies, the mortgage industry that may lower post-disaster mortgage delinquency spikes, affordable housing providers, small business and large corporations that do not lose access to commercial structures or workers searching for new housing, and the federal, state, and local government agencies that often bear the brunt of post-disaster reconstruction spending. State and local governments also face the potential loss of revenue from property and income taxes, while the federal government faces a potential loss of income tax revenue from communities devastated by disaster.

In this report, we offer several recommendations from the NIBS Consultative Council, discussed in greater detail beginning on page 17, including:

- Tax incentives, either on property, income taxes, or sales taxes, should be offered at the federal, state, or local level to offset the cost to property owners of retrofitting for resilience.
- Federal, state, or local governments should provide targeted grants supporting resilience upgrades to

communities and households at extreme risk of damage from natural hazards, saving money for those agencies in the long run.

- Trade associations, nonprofit organizations, and government agencies should offer education and certification programs for additional training in specific retrofits to encourage proactive preparation to mitigate the damage from natural hazards.
- Federal agencies such as the Department of Energy Building Technologies Office, and the National Institute of Standards and Technology, should be funded through their R&D programs to support the development of new building technologies, such as off-site construction or stronger building materials that address some of the critical needs of building resilience. These agencies should be encouraged to work in public-private partnerships with NIST to push new innovations into the market, to speed up the adoption of new technologies in private sector construction, and renovation.
- State and local governments should implement tax-advantaged catastrophe savings accounts for property owners to self-fund retrofits or post-disaster repairs.
- Private sector beneficiaries of resilient retrofits, including the property insurance industry, mortgage industry, lenders, local business owners, real estate agents, and others, should identify ways to incentivize such investments by property owners. To date, only the insurance industry contributes to such incentives, via consideration of insurability and, where appropriate, pricing.

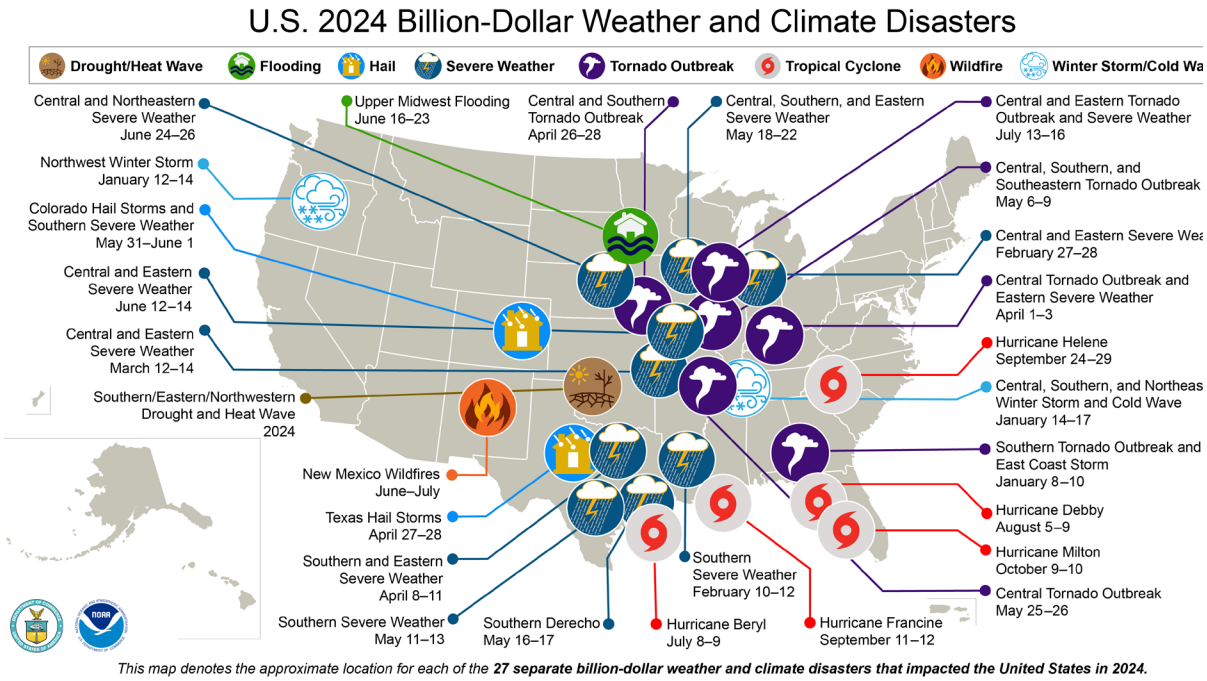
The Challenge: Costs of Disasters

Back-to-back hurricanes in Florida, Georgia and North Carolina in the fall of 2024, followed by destructive wildfires in Los Angeles in January 2025, as well as severe convective storm occurrences in 2023 and 2024 that each exceed the 20-year average for damages are the most recent examples of disasters that plague our very large and economically- and climate-diverse nation. The toll on human life, homes, commercial buildings, infrastructure, and essential community lifelines, including access to health care, food, water, shelter, and transportation from disasters, has increased in recent years with more frequent and severe occurrences. The heartbreaking sight of lost homes, businesses, and lives has touched everyone in the U.S. and renewed a commitment to find solutions to make buildings, infrastructure, and people more resilient to disasters.

Preliminary estimates of the cost of loss and damages to people, property, healthcare, businesses, and local economies from the Los Angeles and Ventura counties wildfires in January 2025 range from $250 billion to $275 billion.[1] Property data analytics firm Cotality (formerly CoreLogic) estimates that insurance companies will need to pay $35 billion to $45 billion in claims to their customers due to the two most devastating fires in Los Angeles – the Palisades fire and the Eaton fire – in January 2025.[2]

The cumulative financial cost from weather-related disasters reached nearly $3 trillion between 1980 and January 2025, according to the National Oceanic and Atmospheric Administration's (NOAA) National Centers for Environmental Information (NCEI) 2025 U.S. Billion-Dollar Weather and Climate Disasters Report.[3] That number only includes the 403 disasters in those years that generated costs of $1 billion or more per disaster when adjusted to 2024 dollars.

In 2024, 27 confirmed disasters in the U.S. caused economic losses of more than $1 billion each. Those events directly caused 568 deaths and significantly impacted local economies. While Hurricanes Helene and Milton were particularly devastating, the events included 3 other tropical cyclone (hurricane) events, a wildfire, a drought, a flood, 17 severe storms, and 2 winter storms.[3]



Source: National Centers for Environmental Information, April U.S. Release 2025

Between 2020 and 2024, an average of 23 events generating $1 billion or more (inflation-adjusted) in losses were recorded yearly by NOAA. That compares to the annual average of nine events per year between 1980 and 2024, demonstrating the increased occurrences and severity of the financial losses.[3] It can take from months to years for a community to recover from a disaster, which takes an additional toll on businesses and tax revenue beyond the initial cost.

Among 2024 incidents, some of the costliest disasters include:

- **Hurricane Helene**: $79.6 billion. This severe hurricane impacted Florida, Georgia, and North Carolina in September, damaging and destroying homes, businesses, hospitals, roads, bridges, agricultural fields, equipment, and critical electrical, cellular, and water supply infrastructure. The damage came from a mix of storm surge, flooding, extreme rainfall, landslides, wind, and storm debris.[3]

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[1]Danielle, Monica. "AccuWeather estimates more than $250 billion in damages and economic loss from LA wildfires," January 16, 2025 https://www.accuweather.com/en/weather-news/accuweather-estimates-more-than-250-billion-in-damages-and-economic-loss-from-la-wildfires/1733821

[2] "CoreLogic Estimates the Eaton and Palisades Fires are Causing Devastating Initial Property Losses Estimated to be Between $35 Billion to $45 Billion" January 16, 2025. https://www.corelogic.com/press-releases/corelogic-estimates-the-eaton-and-palisades-fires-are-causing-devastating-initial-property-losses-estimated-to-be-between-35-billion-to-45-billion/

[3]NOAA National Centers for Environmental Information (NCEI) U.S. Billion-Dollar Weather and Climate Disasters (2025) https://www.ncei.noaa.gov/access/billions/

- **Hurricane Milton**. $34.3 billion. This severe hurricane, also in September, damaged a swath of Florida's coastline with its extreme winds and storm surge. The hurricane spawned tornadoes across densely populated South Florida, causing damage to homes, businesses, vehicles, and infrastructure.[3]
- **Hurricane Beryl**. $7.2 billion. In June and July, this Texas hurricane generated more than 50 tornadoes across nearby states, with damage caused by high winds and multiple days of power outages.[3]
- **Three Days of Tornadoes**. $6.6 billion. More than 165 tornadoes tore across multiple states including Oklahoma, Kansas, Nebraska, Michigan, Indiana, Ohio, Kentucky, Tennessee, Alabama, North Carolina, South Carolina, Georgia and Florida over a three-day period in May, damaging and destroying homes, businesses, vehicles, agricultural fields and equipment, and infrastructure.[3]

The Challenge: Hazards that Impact Buildings, Infrastructure, and Community Lifelines

The Federal Emergency Management Administration (FEMA) lists 18 natural hazards that can impact people, buildings, infrastructure, and community lifelines.[4] While some are common in only specific parts of the U.S., others may occur anywhere in the country. FEMA researchers developed and introduced a National Risk Index in 2020 to better help communities assess the likelihood of exposure to a natural hazard and take steps to prepare for one.

Many disasters lead to additional hazards for the surrounding community. For example, hurricanes generate high winds and flooding, and they are sometimes followed by landslides in the aftermath of intense rain and floods. Power outages can cause significant community and economic disruption, including massive blackouts and frozen pipes, and are frequently a corollary impact accompanying a disaster.

FEMA's list of natural hazards[4] includes:

Avalanches: can bury people, buildings, and infrastructure under snow and ice and disrupt community lifelines.

Coastal flooding: can damage or destroy buildings and infrastructure and create hazardous conditions for people, first responders, and community lifelines.

Cold waves: can cause pipes and water mains to freeze and burst, damaging buildings, infrastructure, and community lifelines.

Drought: can lead to decreased water quantity and quality, increased incidence of illness or disease, increased mortality rates, and can cause settling in the ground, leading to structural issues such as foundation cracks in buildings and sinkholes.[5]

Earthquakes: can destroy or damage infrastructure and buildings to make them uninhabitable and create hazardous conditions for community lifelines. They can also weaken infrastructure and buildings in ways that are not always seen initially, making them more susceptible to failure in the future.

Hail: can damage buildings, vehicles, and infrastructure.

Heat waves: can put pressure on the electrical grid and cause power shortages and outages, and may also damage the materials in some buildings, such as plastic.[6]

Hurricanes: can damage or destroy buildings and infrastructure, create hazardous conditions for people, first responders, and community lifelines.

Ice storms: can cause power outages, hazardous driving conditions, and damage to buildings and infrastructure.

Landslides: can damage or destroy buildings, vehicles, and infrastructure.

Lightning: can damage buildings, agricultural areas, infrastructure, and cause fires.

Riverine flooding: can damage or destroy buildings and infrastructure and create hazardous conditions for people, first responders, and community lifelines.

Strong wind: can damage or destroy buildings and infrastructure, creating hazardous conditions for people, first responders, and community lifelines.

Tornadoes: can flip cars, destroy buildings, and damage infrastructure, including knocking down electrical wires to cause power outages.

Tsunamis: cause sudden flooding of coastal areas that can destroy buildings and infrastructure.

Volcanic activity: can potentially damage or destroy buildings and infrastructure, and cause fires.

Wildfires: can damage or destroy buildings, infrastructure, natural resources, and community lifelines.

Winter weather: can cause power outages, hazardous driving conditions, freeze pipes and water mains, and damage buildings and infrastructure.

FEMA's National Risk Index, which was created to provide a comprehensive, national view of natural hazard risk and vulnerability, can be used by communities to anticipate potentially dangerous conditions and financial consequences in different areas.[4] Two examples provided below illustrate how an understanding of the nature of risks and the financial implications is key to developing a plan to mitigate and prepare for those future challenges on a community-by-community specific basis.

In Hillsborough County, Florida, home to Tampa, FEMA's expected annual losses due to natural hazards attributed to buildings are nearly $428 million, and agricultural losses of nearly $6 million. The county is susceptible to 14 of the 18 identified natural hazards, with a very high risk of impacts from hurricanes, lightning, and tornadoes.[4]

In St. Louis County, Missouri, residents, infrastructure, community lifelines, and buildings are also exposed to 14 of the 18 natural hazards, with the highest risk of losses due to hail, heat waves, ice storms, lightning, and winter weather. FEMA estimates annual losses to buildings of more than $118 million, and agricultural losses of nearly $426,000.[4]

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[4]FEMA National Risk Index https://hazards.fema.gov/nri/natural-hazards

[5]National Integrated Drought Information System (NIDIS), part of NOAA, https://www.drought.gov/sectors/public-health

[6]"How heat waves impact infrastructures and ecosystems," Earthscan by Mitiga Solutions, June 17, 2024 https://www.earth-scan.com/blog/heatwaves-impact

Solution: Retrofitting to Reduce Risk

The astronomical financial costs of these increasingly severe disasters require a multifaceted approach with numerous stakeholders who can share responsibilities and expenses. While homeowners and commercial building owners benefit from measures taken to increase their properties' resilience to damage, local economies also suffer less when measures are taken to increase resilience. One of the most important benefits of proactively improving the resilience of properties is that doing so lessens the level of disruption faced in a community when disasters occur. The minimization of severe disruption is an immediate benefit to an entire community.

"Resilience" refers to measures taken to mitigate risk for people and property before, during, and after a storm, wildfire, flood, high winds, extreme temperatures, and other hazards. Communities can work together to increase their resilience to hazards and power outages, and individual homes and commercial buildings can be retrofitted to reduce property damage, save lives, increase safety, and shorten the time it takes to resume normal activities such as school and work. Improved resilience also helps local economies recover faster, protecting small businesses from closing and protecting businesses and homeowners from losing their property.

One challenge to retrofitting buildings is that there is not one solution that fits every structure and peril. In many locations and instances, multiple potentially damaging issues must be mitigated at once, such as the risk from high winds, storm surges, power outages, and flooding due to a hurricane.

The first step for property owners, community leaders in government, and the private sector is to identify the most common risks faced in their area. For example, if the risk of flooding from a river, lake, or snowmelt is likely, buildings can be protected by sealing gaps and foundation cracks, mechanical systems and other items can be moved to a higher level or raised on shelves or platforms above a potential flood line, and flood barriers or vents can be built.

Beyond structural changes to buildings to mitigate the direct risk of a hazard such as a flood, property owners can take measures to conserve water and make their homes and businesses more energy efficient or energy independent, which reduces demand on the grid during a power outage. When demand is lower, community members can rely for longer periods on backup power. Investing in microgrids, backup generators, renewable energy, and battery storage for extended power outages is another way to increase community resilience. Governments at all levels should be supporting programs that encourage these investments.

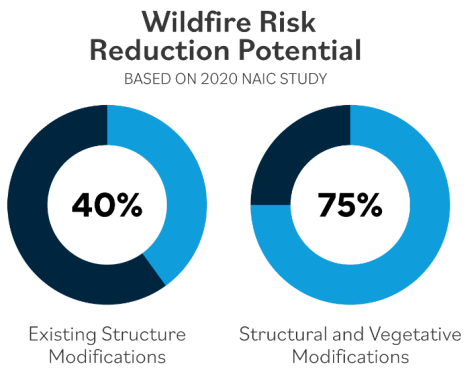
Determining which retrofits make the most sense depends on numerous factors, such as the type of hazard that may impact a particular location, the style and type of structure to be retrofitted, and the construction materials used for the structure. Local and state governments should ensure that offices and staff who work with the community in the aftermath of a disaster understand the best practices or recommended strategies for retrofits and resilient rebuilding that are most impactful.

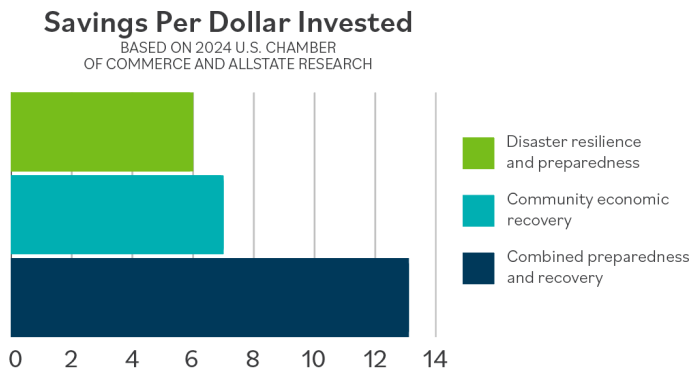
While some of these steps to improve resilience are relatively inexpensive, others are cost-prohibitive for private residential and commercial building owners. Building owners and homeowners with significant resources may be able to afford these improvements, yet most will need financial support in the form of grants from the private sector, nonprofit agencies, or their local, state, or federal government. Additional incentives may also be available from building or homeowner insurers, along with other stakeholders such as lenders, investors, and the business community. Sharing the cost of retrofits makes sense when every stakeholder benefits from the investments.

Solution: Business Case for Retrofitting

In the wake of an epic and expensive disaster such as 2025's Los Angeles wildfires or 2024's Hurricanes Helene and Milton, it may be tempting to give up on rebuilding or retrofitting homes, especially in areas prone to floods, fires, and storms. A recent state evaluation of Louisiana's FORTIFIED grant program found that grantees saved $1,250 on their insurance bill and that a FORTIFIED Roof pays for itself in under five years.

The cost to build or retrofit a resilient home is often less than anticipated, depending on the action taken. For example, a 2022 study by the Insurance Institute for Business & Home Safety (IBHS) and Headwaters Economics found that wildfire mitigation added less than $3,000 to the cost of building a new home in California.[9] In addition to meeting the baseline California building code, this study included the cost to enclose underdeck spaces and landscape the property to establish a noncombustible zone in a five-foot perimeter around it.





A 2020 study by the National Association for Insurance Commissioners (NAIC), Risk Management Solutions, and IBHS found that structural modifications on existing properties can reduce wildfire risk by up to 40%, and structural and vegetation modifications combined can reduce wildfire risk by up to 75%.[10]

Research by the U.S. Chamber of Commerce and Allstate in 2024 found that every $1 investment in resilience and preparedness for a disaster saves $6 in damage and clean-up costs. In addition, each $1 of investment reduces a community's economic costs after an event by $7, which is the median ratio for the 25 disasters modeled during the study, for a total of $13 in savings for every $1 invested.[11]

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[9]"New Headwaters Economics, IBHS study analyzes costs of wildfire-resistant construction in California," July 28, 2022, IBHS https://ibhs.org/ibhs-news-releases/new-headwaters-economics-ibhs-study-analyzes-costs-of-wildfire-resistant-construction-in-california/

[10]"Application of Wildfire Mitigation to Insured Property Exposure', Center for Insurance Policy Research, the National Association for Insurance Commissioners (NAIC), Risk Management Solutions, and IBHS, November 15, 2020, https://content.naic.org/sites/default/files/cipr_report_wildfire_mitigation.pdf

[11]The Preparedness Payoff: The Economic Benefits of Investing in Climate Resilience, 2024 U.S. Chamber of Commerce, Allstate, and the U.S. Chamber of Commerce Foundation https://www.uschamber.com/assets/documents/USChamber_AllState-2024-Climate-Resiliency-Report.pdf

For commercial buildings, researchers at the Department of Energy's Better Buildings initiative, established in 2019, found that for every $1 spent to protect structures from hurricane, wind, and flood damage, owner's exposure to property loss and business disruption decreased by an average of $105.[12] In addition, commercial buildings that have been built or retrofitted for resilience are more marketable to tenants and investors, which has the financial benefit of faster lease-ups and tenant retention. In many cases, improvements to add resilience increased operational efficiencies and addressed maintenance backlogs.[12]

An IBHS study reviewed the opportunities to improve the resilience of Section 8 multifamily and single-family housing in the Atlantic and Gulf Coast regions, estimating that retrofitting these properties with a FORTIFIED roof could reduce losses by 30% to 50%.[13]

Depending on the specific perils faced by a particular property, owners can take various steps to retrofit for resilience. They can start with low investment options, upgrade to medium investments, or, if funds are available, take every possible precaution to protect their property. In addition, co-beneficiaries of resilience mitigation, such as lenders, property investors, local and state governments, real estate agents, and insurance companies can work with homeowners to suggest retrofits or provide financial incentives.

Solution: Private Sector Incentives

Property owners' natural inclination, particularly after recent disasters, is to evaluate the costs and benefits of retrofitting their homes and businesses to increase resilience. But when they look at the Return on Investment (ROI), they may hesitate to make significant investments in a property they don't intend to own forever. It is very often the case that if the expense vs. ROI does not work "on paper," many building owners will walk away from the effort. Retrofitting a building offers peace of mind and added safety to current owners. Still, it also benefits future owners and the community by reducing the likelihood of damage, impact of loss to the community, and continuing climbing insured losses..

Increased resilience provides value to a variety of stakeholders who are known as co-beneficiaries, including real estate agents and brokers, the finance industry, insurers, and future owners. Working with these co-beneficiaries to help pay for resilience could further benefit homeowners, communities, and the nation. The NIBS Resilience Incentivization Roadmap 2.0 provides a framework for aligning the incentives and interests of these stakeholders. For example, the finance industry/mortgage holders may reduce the interest rate for homeowners who retrofit for resilience or offer discounts on other services or products they may provide. Resilience benefits them through lower default risk and higher property value in the event of a default.

To date, the property insurance industry is the one private sector industry that has historically provided incentives for resiliently constructed or retrofitted homes. In some instances, the incentive is based on insurability—a willingness to provide coverage in high-risk areas for homes that have met science-backed and verifiable standards. One such example is the return of certain admitted market carriers to Paradise, California for homes that have obtained an IBHS Wildfire Prepared Home designation. Increased insurability incentivizes homeowners by keeping them in the admitted insurance market and out of the residual market, such as the California FAIR Plan, which offers more limited coverage for higher premiums.

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[12] "Building the Financial Business Case for Resilience", Better Buildings Center, Department of Energy, 2019, https://betterbuildingssolutioncenter.energy.gov/finance-resilience/business-case

[13] "Making Section 8 Housing FORTIFIED, IBHS 2024, https://ibhs.org/wp-content/uploads/IBHS_Whatif_Section8.pdf

In other instances, whether mandated or voluntary, insurers offer pricing considerations for more resilient homes. In the hurricane and windstorm context, these include:

Alabama: Discounts of 25% to 55% on the wind portion of insurance policies for homes that meet the FORTIFIED home program standards.[19]

California: Discounts of 10% to 25% on earthquake insurance premiums if the home has been retrofitted to reach state standards.[20]

Connecticut: Unspecified but mandatory discount for homeowners who install hurricane shutters or impact-resistant glass.[21]

Florida: Unspecified but mandatory discount for homeowners who take steps to increase resilience to windstorms.[22]

Kentucky: Unspecified mandatory rate reduction for homes in the Strengthen Kentucky Homes Program that meet FORTIFIED Home standards.[24]

Louisiana: Unspecified mandatory rate reduction for homes that meet FORTIFIED Home standards.[25]

Maryland: Unspecified but mandatory discount for homeowners who take steps to increase resilience to hurricanes and other storms.[26]

Mississippi: Discounts of 12% to 55% off the wind portion of insurance for FORTIFIED homes.[27]

Oklahoma: Discounts of 3% to 42% off the wind portion of insurance for FORTIFIED homes.[28]

In another example, the National Flood Insurance Program's (NFIP) standard flood insurance policy provides up to $1,000 for expenses incurred to protect insured property, such as buying sandbags, a water pump, plastic, or lumber. The policy also provides up to $1,000 to relocate insured personal property away from a flood or imminent danger of a flood and to store those items.[17]

For wildfires, the Wildfire Prepared designation (currently available in California and Oregon) helps homeowners take preventative measures for their homes and yards to protect themselves and their property against wildfire. Homeowners can present the designation to their insurance company as proof that they have retrofitted their property to reduce potential damage or destruction from a wildfire and prevent the spread of wildfires. Some insurers offer discounts and renewals to homeowners who receive a designation. [29]

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[26] Bielenberg, Aaron et. al. "US water infrastructure: Making funding count." McKinsey and Company. November 24, 2012. https://www.mckinsey.com/industries/electric-power-and-natural-gas/our-insights/us-water-infrastructure-making-funding-count

[27] Lakhani, Nina. "Millions of Americans Can't Afford Water, as Bills Rise 80% in a Decade." The Guardian. July 10, 2020. https://www.consumerreports.org/money/personal-finance/millions-of-americans-cant-afford-water-as-bills-rise-80-percent-in-a-decade-a8273700709/

[28] Build FORTIFIED Oklahoma Insurance Discounts https://fortifiedhome.org/wp-content/uploads/fortified-discounts_OK.pdf

[29] Wildfire Prepared Designation, a program of IBHS. https://wildfireprepared.org/

Solution: Public Sector Incentives for Resilient Retrofits

Sharing the costs of retrofitting for resilience acknowledges that the burden for improving outcomes after a storm or other disaster cannot be placed entirely on homeowners, particularly when the actions taken to strengthen their homes are just as likely to benefit future owners, insurance companies, government agencies, and communities. Historically, the federal government has provided funding sources through different agencies to incentivize pre-disaster mitigation. However, the status of those funding streams is currently in flux.

Various states have developed programs such as tax credits and special savings accounts to help homeowners pay for home retrofits that may reduce damage and injuries during disasters. Some offer cash grants that are not means-tested to all homeowners, while others focus their incentive programs on low or middle-income households who might otherwise be unable to afford home improvements.

Some examples of these policies include:

- Cash grants up to an established limit without means testing or matching expenditures by homeowners. The grants are paid directly to homeowners or contractors and must meet specified construction standards. This model is available in the following states with limits from $3,000 to $10,000 for retrofits: Alabama, California, Kentucky, Louisiana, Minnesota, Mississippi, North Carolina, and Oklahoma. Hawaii and Texas have had cash grant programs in the past.[30]
- Cash grants that require homeowner expenditures to match the grant amount are available in Florida and South Carolina and have been available in Hawaii.[30]
- Cash grants that are means-tested and reserved for lower-income households are available in California and South Carolina.[30]
- Free, subsidized, or cost-controlled residential wind inspections are available in Florida, Mississippi, North Carolina, South Carolina, and Texas.[30]
- Community block grants are available in Alabama that target specific areas with higher needs and fewer resources and allow community organizations to partner with residents.[30]
- Contractor training, licensing, and certification programs are available in some states to help contractors learn best practices for retrofitting, which also helps homeowners find experienced contractors. These programs are available in Alabama, California, Florida, Mississippi, and South Carolina.[30]
- Rebate program for tornado-safe rooms. In Kansas and Oklahoma, FEMA Hazard Mitigation Grants are available after a declared major disaster so homeowners can retrofit their homes with a safe room.[30]
- Sales tax exemptions or credits are available in some states to lower the cost of materials and supplies needed for retrofitting homes, including Alabama, Florida, Louisiana, South Carolina, Texas, and Virginia.[30]
- Income tax credits and deductions are available in some states for homeowners who have invested in retrofitting their homes for resilience, including Alabama, Colorado, Louisiana, and South Carolina.[30]
- A tax-advantaged catastrophe savings account for homeowners to prepare for a natural disaster financially is available in Alabama, Mississippi, and South Carolina.[30]

Some incentive programs are offered on a local basis for areas prone to intense storms or wildfires. For example, in North Carolina, homeowners who live in the Outer Banks and Barrier Islands whose property is insured by the North Carolina Insurance Underwriting Association (NCIUA) may be eligible for the Strengthen Your Roof program. Those eligible policyholders, at any income level, can apply for a grant of up to $10,000 to help cover the costs of a FORTIFIED roof.[32]

Florida's Division of Emergency Management created the Hurricane Loss Mitigation Program (HLMP) to act as a specialized, state-funded mitigation program aimed at minimizing damage caused by hurricanes. While the program was initially designed to help with rebuilding efforts after the devastation of Hurricane Andrew in 1992, today, the fund supports activities that promote property resiliency through retrofits made to residential, commercial, and manufactured home properties, the promotion of public education and public information, and through hurricane research activities.[33]

Communities in Florida can apply for HLMP grants of up to $3.5 million to improve community resiliency by partnering with local housing authorities, non-profit organizations, and local governments. Funded activities for residential and commercial buildings include retrofits such as elevating mechanical equipment or window replacements, inspections, tree trimming, property acquisition and demolition, localized flood risk reduction, and construction or modification of building components designed to increase a structure's ability to withstand hurricane-force winds and flooding. A $250,000 reimbursement grant may also be used for local mitigation strategy projects, including risk assessments.[33]

Homeowners in many counties in Florida can apply for PACE (Property Assessed Clean Energy) funding, which provides up to 100% financing for retrofits that make homes more resilient to hurricanes and increase their energy efficiency.[34] In addition, the Elevate Florida program provides funding for homeowners to expedite and complete hurricane resilience projects.

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[30]"Resilience Policy Resource Guide and Retrofitting Program Playbook for State Insurance Regulators" by the National Association of Insurance Commissioners – Center for Insurance Policy and Research (NAIC-CIPR) and the Federal Alliance for Safe Homes (FLASH), August 15, 2024

[31]"Climate Resilience Implementation Guide: Single-Family Retrofits," HUD Exchange, April 2023 https://www.hudexchange.info/resource/6754/climate-resilience-implementation-guide-singlefamily-retrofits/

[32]FORTIFIED incentives for residents of North Carolina https://strengthenyourroof.com/Home/Policyholders

[33]Florida Hurricane Loss Mitigation Program https://www.floridadisaster.org/dem/mitigation/hurricane-loss-mitigation-program/

[34]Florida PACE funding agency. https://floridapace.gov/about-pace/

[35]FEMA Case Studies: Financing for Climate Resilience, September 2024 https://www.fema.gov/sites/default/files/documents/fema_financing-climate-resilience_092024.pdf

In many cases, financing to increase resilience requires combining numerous programs and solutions from federal, state, and local organizations. Access to funding for communities and property owners depends on their location and the hazards they face. For example, in Minot, North Dakota, a town of less than 50,000 people, damage from a record-breaking flood of the Souris River in 2011 was catastrophic for the local economy, residents, and business owners. Local government leaders estimated that the flood, which severely damaged or destroyed 3,100 homes and six schools, would generate a $76.8 million economic loss for the community over the next 20 years after the flood. The town's annual budget was just $68 million. By leveraging federal, state, local, and private funds to invest in flood risk reduction, building affordable and resilient housing, and fostering economic resilience, the community recovered and is in a better position to avoid future devastation. More than $7 million in private funds, primarily donations from individuals from North Dakota and elsewhere, were disbursed over 10 years to help clean-up efforts and to restore the town.[35]

For business owners, investing in retrofits for resilience can be essential to avoid incurring significant losses. For example, the Anheuser Busch Brewery in Van Nuys, California, experienced severe damage from a 6.5 earthquake in 1971, which interrupted production and cost the company market share losses. Anheuser-Busch spent $11 million on seismic retrofits and new construction on its $1.3 billion brewery facility to limit property damage, business interruption, and market share losses from a future earthquake. More than 20 years later, the 6.7 Northridge earthquake hit the facility, but none of the retrofitted structures or equipment sustained significant damage. Buildings that were not retrofitted were damaged and needed $17 million in repairs. Because the essential buildings had been retrofitted, the brewery could resume operations quickly without losing market share. Anheuser-Busch estimated direct and business interruption losses, had there been no strengthening, could have exceeded $750 million, over 60 times the cost of their retrofit program.[36]

Solution: Code Updates for Resilience

While retrofitting homes to increase their resilience to severe storms, earthquakes, and wildfires is necessary to preserve property and protect lives, building code updates for additions and new construction are also essential. National model construction codes are updated every three years. It is important for jurisdictions to regularly update their construction codes to incorporate changes that improve resiliency and affordability. Energy efficiency gains in modern energy codes and standards, such as the International Energy Conservation Code and ASHRAE Standard 90.1, can save building owners money while protecting occupants from extreme heat or cold in the event of a power outage. Further, researchers have found that stronger codes do not necessarily mean higher building costs and increase community resilience by lessening strain on the electrical grid. In many cases, small changes such as a simple shift in the way a roof is connected to a building can make a massive difference in the resilience of a property to wind events and hurricanes, and save money for property owners, insurance companies, and government agencies who might otherwise need to step in after a disaster.

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[35]FEMA Case Studies: Financing for Climate Resilience, September 2024 https://www.fema.gov/sites/default/files/documents/fema_financing-climate-resilience_092024.pdf

[36]"Economic Benefits of Earthquake Retrofits and Resilient Design" Evan Reis, Executive Director, U.S. Resiliency Council, and Ali Sahabi, Chief Operating Officer, Optimum Seismic, Inc., May 30, 2020 https://www.usrc.org/wp-content/uploads/ECONOMIC-BENEFITS-OF-EARTHQUAKE-RESISTANT-BUILDINGS-WHITEPAPER-PART-2.pdf

In Florida, which IBHS ranked the highest for adopting stronger building codes between 2018 and 2023, it is estimated that building code protections prevented between $1 billion and $3 billion in damage to single-family homes from Hurricane Ian in 2022. That financial savings would be higher if it included multifamily buildings and other commercial properties.[37]

Besides reducing property damage and financial and economic costs, code changes that require resilience can also reduce the higher mortgage delinquency rates that frequently follow a disaster. In a 2023 study, IBHS and property data analytics firm CoreLogic found that modern building codes reduced the expected spike in mortgage delinquency rates by about 50% after hurricanes. Borrowers who owned homes built after 2007, which typically meet more stringent building codes than older homes, were less likely to default on their mortgage payments after a hurricane.[38]

As mentioned, the cost of building a home resilient to floods, wildfires, wind, hail, and hurricanes that meet modern building code standards is not always significantly more expensive. A 2018 IBHS and Headwaters Economics study found negligible cost differences between typical homes and those constructed with wildfire-resistant materials and design features.[39] The NIBS Mitigation Saves Study found that adopting up-to-date codes saves $11 per $1 invested. According to the study, building codes have greatly improved society's disaster resilience, while adding only about 1% to construction costs relative to 1990 standards.

Retrofitting for Resilience: Recommendations from the Consultative Council

More frequent incidents of floods, tornadoes, hurricanes, hail, and wildfires, along with the increased severity of those disasters, make retrofitting homes, businesses, schools, healthcare facilities, and communities for resilience imperative. The costs to retrofit a property vary widely depending on the location of the property, how and when it was built, construction materials, and the hazards faced. In some cases, the expenses can be negligible; in others, they are high. However, the benefits of saving lives and the economic viability of a community go far beyond the upfront costs to improve resilience.

Policy leaders on the local, state, and federal levels and leaders in the private sector should work together to promote retrofitting for resilience. Our recommendations include:

Shared Costs: Rather than burdening the cost to enhance resilience to disasters on property owners, all the beneficiaries of retrofitting buildings and strengthening communities should share the expense. When damage from a wildfire, earthquake, or storm is mitigated and prevented, insurance companies face fewer claims, government agencies avoid massive emergency aid payouts, nonprofit organizations can conserve personnel and protect their budgets, and property owners benefit from less damage. Communities benefit from less economic disruption and displacement and less pressure on their emergency lifelines. When communities and individuals can share the costs of strengthening their resilience, they are more likely to take the necessary steps than if one person, business, or agency must pay for everything alone.

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[37] https://www.corelogic.com/intelligence/building-codes-combat-climate-change/#

[38] "New IBHS, CoreLogic study shows modern building codes cut post-hurricane mortgage delinquency rates in half," IBHS and CoreLogic, August 9, 2023 https://ibhs.org/ibhs-news-releases/new-ibhs-corelogic-study-shows-modern-building-codes-cut-post-hurricane-mortgage-delinquency-rates-in-half/

[39] "Report: New Wildfire-Resistant Homes Cost Roughly Same as a Typical Home," IBHS and Headwaters Economics, November 26, 2018 https://headwaterseconomics.org/wildfire/homes-risk/building-costs-codes/

Federal, state, and local governments should facilitate shared expenses with homeowners, business owners, insurance companies, and nonprofit organizations through grant programs and tax and other incentives.

The NIBS Resilience Incentivization Roadmap provides strategies for this approach.

Invest in Innovation: Federal agencies such as the Department of Energy Building Technologies Office, and the National Institute of Standards and Technology, should fund their research and development programs to support innovations such as offsite construction or stronger building materials that address some of the critical needs of building resilience, and should be encouraged to work in public-private partnerships with the building industry to push new innovations into the market, in order to speed up adoption of new technologies in private sector construction and renovation.

Tax Incentives: A credit or deduction on income taxes for property owners is a strong incentive to encourage retrofits for resilience. Sales tax breaks for the materials and other retrofit costs are also an option, although they provide a smaller financial incentive for property owners.

Federal, state, and local governments should recommend and implement a range of tax incentives for property owners to make retrofits more financially viable.

In addition, jurisdictions may want to consider exemptions for resilience improvements from property tax assessments because increased property taxes due to added value could be a disincentive for homeowners to invest in retrofits for resilience.

Grants: In locations with a high threat of severe damage from wildfires or storms, grant programs that provide direct funds to communities and property owners are likely to be one of the fastest ways to implement resilient retrofits and catalyze market supply and demand for resilient solutions.

Federal, state, and local governments should work with communities to identify households and businesses at high risk of damage and provide them with the tools to strengthen their resilience to storms, fires, and other hazards.

Private Sector Incentives: The beneficiaries of resilient housing and other structures include a variety of private sector actors, including the property insurance industry, the mortgage industry, local businesses, lenders, and others. To date, the insurance industry is the only private sector industry that often recognizes and incentivizes resilience through considerations regarding both insurability and pricing. Insurers should continue to identify opportunities to communicate to property owners the value of resilient retrofits. Other private sector entities that benefit from resilient retrofits should identify ways to incentivize such investments by property owners. Collectively, private sector incentives, when combined with public sector incentives, can help increase the ROI sought by property owners when considering resilient retrofits.

Tax-advantaged Savings Accounts: When property owners are incentivized with a tax break, they are more likely to contribute to a savings account designed specifically to pay for retrofits or post-disaster repairs.

State and local governments should explore options for assisting property owners to self-fund retrofits or repairs with a catastrophe savings account.

Certifications and Education: Many property owners and communities only pay attention to the benefits of retrofitting buildings after a major disaster that takes lives and incurs high financial costs. A proactive approach to educate homeowners, business owners, and other community stakeholders to potentially beneficial retrofits could prevent physical, emotional, and economic damage. Programs such as CalFire's Ready for Wildfire program, Federal Alliance for Safe Homes (FLASH) for Homeowners, and others can encourage people to take steps before disaster

strikes. In addition, certification programs such as the National Green Building Standard (NGBS) Green+ Resilience badge that train contractors, construction workers, and remodelers to understand the techniques, designs, and materials that improve resilience can increase their adoption. Both government agencies and trade associations can participate in creating training programs that will add to the skills and knowledge needed to strengthen buildings and communities.

Federal, state, and local governments, nonprofit organizations, trade associations, and third-party building certification organizations should collaborate to educate property owners and contractors about opportunities to increase their resilience as well as financing opportunities.

Consultative Council Members

American Institute of Architects (AIA)

American Institute of Steel Construction (AISC)

American Society of Civil Engineers (ASCE)

ASHRAE

Associated Builders and Contractors (ABC)

Associated General Contractors of America (AGC)

ASTM International

Building Owners and Managers Association International (BOMA)

Construction Management Association of America (CMMA)

Construction Specifications Institute (CSI)

Design-Build Institute of America (DBIA)

EPDM Roofing Association

Green Building Initiative

International Institute of Building Enclosure Consultants (IIBEC)

Insurance Institute for Building & Home Safety (IBHS)

International Association of Plumbing and Mechanical Officials (IAPMO)

International Code Council (ICC)

Modular Building Institute (MBI)

National Building Museum

National Ready Mixed Concrete Association (NRMCA)

New Buildings Institute (NBI)

Royal Institution of Chartered Surveyors (RICS)

Steel Tube Institute (STI)

U.S Green Building Council (USGBC)

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