



National Institute of  
BUILDING SCIENCES

Multihazard Mitigation Council

Council on Finance, Insurance and  
Real Estate

# Residential Resilience Advantage Mortgage Summary Concept

June 26, 2018





# **Residential Resilience mortgage**

## **Summary Concept**

Prepared by the  
National Institute of Building Sciences  
Multihazard Mitigation Council  
Council on Finance, Insurance and Real Estate

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This concept paper introduces a new potential financial instrument for the residential mortgage industry to facilitate the construction of disaster-resilient homes or the retrofit of existing homes for the mutual benefit of borrowers, lenders and other stakeholders, including insurance providers and communities.

The development of a residential resilience mortgage is the first step in creating a comprehensive private-public consumer product that takes advantage of many of the available incentives for supporting mitigation. A resilience mortgage is so called because it builds upon the existing mortgage structure to achieve the advantages of resilience against natural disasters by incorporating financing for hazard mitigation into the primary mortgage. The resilience mortgage can be designed to be used when a property is purchased or upon refinancing, and can be used to make homes more resilient to many local hazards including riverine and coastal flooding, hurricanes and wind storms, earthquakes and wildfires. The intent of this concept paper is to promote interest in the resilience mortgage and possibly the establishment of an initial loan program by those interested in advancing resilience in the nation's communities.

Buildings and other infrastructure in the U.S. pose an enormous and growing economic and safety risk from floods, hurricanes, and other natural hazards. Disasters now regularly cost America tens of billions of dollars annually—on the order of \$100 per person. Three of the last 15 years saw losses exceed \$100 billion, and one year, 2017, produced natural hazard losses over \$300 billion—approximately \$1,000 per American and approximately equal to the cost of all new buildings built in the U.S. in an average year. While much of the existing risk could be cost-effectively reduced by elevating, strengthening, or removing buildings or by various other measures, the resources needed to do so greatly exceed the funds available from traditional public-sector mitigation budgets. As described in *Developing Pre-Disaster Resilience Based on Public and Private Incentivization*, a white paper developed by the Institute's Multihazard Mitigation Council (MMC) and Council on Finance, Insurance and Real Estate (CFIRE) and published in 2015, public funding for pre-disaster mitigation has been in decline for years. The budget bill passed by Congress in the wake of the 2017 disasters significantly increased funding for the FEMA Pre-Disaster Mitigation program<sup>1</sup>, but even this increase in funding will likely be short-lived, and in any case falls far short of filling the nation's resilience investment gap. Two remaining options include: (1) accept the large and growing natural-hazard losses and spend more to recover from disasters than to prevent them, or (2) harness private-sector resources layered with incentives, spread across multiple stakeholders, and combined with public programs to help reduce the threat.

The residential resilience mortgage, as a primary incentivization strategy, takes advantage of two suppositions: (1) the benefits of reducing certain natural hazards can greatly exceed the costs under certain conditions, and (2) many stakeholders enjoy those benefits besides the property owner, who would normally have to bear all of the costs for the mitigation.

An economic case for developing a resilience mortgage can be supported by drawing on recent MMC research used to develop the *Mitigation Saves 2017 Interim Report* to monetize the mutual benefit that a residential borrower and the lender, home insurer and community can all

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<sup>1</sup> Scata, Joel, After Disaster-Filled 2017, Congress Invests in Preparedness, March 23, 2018, <https://www.nrdc.org/experts/joel-scata/after-disaster-filled-2017-congress-invests-preparedness>

experience. For example, the research demonstrates that designing new construction to exceed select provisions in the *2015 International Building Code (IBC)* and the *2015 International Residential Code (IRC)* and the implementation of the *2015 International Wildland-Urban Interface Code (IWUIC)* results in a national benefit of \$4 for every \$1 invested. This analysis further provides evidence that lenders, insurers and communities would benefit from investing in mitigation by transferring some of the co-benefits back to the borrowers, who also have to invest in it. By receiving some of these co-benefits back from other stakeholders, the borrowers will find it less expensive to undertake mitigation, making it more likely that they will do so, thereby increasing the benefits to lenders, insurers, governments, and participants in the broader economy.

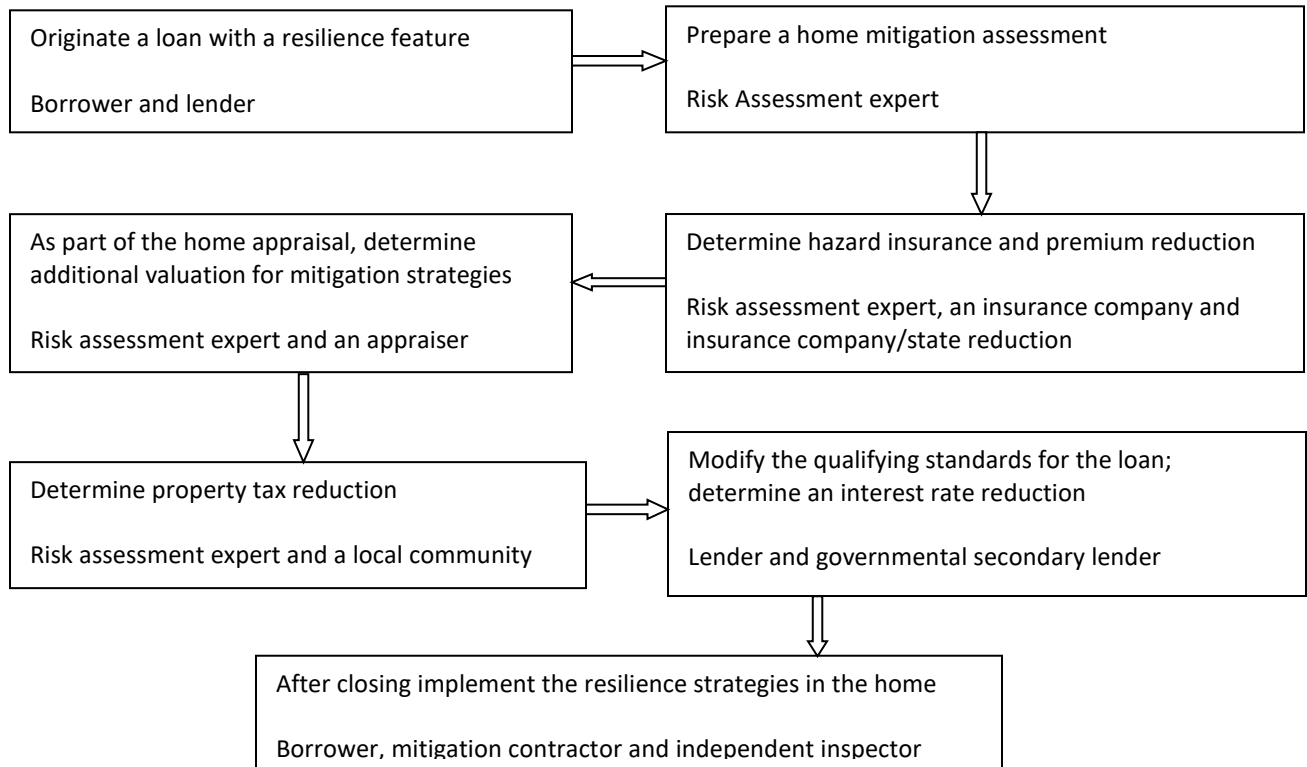
When a residential property owner mitigates natural-hazard risk to a property purchased with a residential resilience mortgage, the lender also benefits through a lower default risk, which has monetary value. A mechanism to fund natural-hazard mitigation is introduced here that voluntarily redirects some of the lender's benefits back to the borrower to help pay for resilient construction, that is, to help the borrower build a house that better resists natural hazards. The mechanism benefits the borrower through lower cost and the lender through lower risk, without necessarily involving public funds. (The rest of society still enjoys various co-benefits, such as lower risk to the regional economy, less demand for local emergency services, less risk of debris and ecological impact, greater employment, and generally greater stability and efficiency.) The resilience mortgage works by aligning the financial interests of several parties to a potentially costly but cost-effective resilience decision.

In particular, the *Mitigation Saves 2017 Interim Report* found that building new homes to exceed certain minimum wind-resistance requirements of the building code throughout much of the U.S. Gulf and Atlantic coasts saves more than it costs. Research by others also has found increased resale value of such homes, adding to the benefits the homeowner enjoys from reduced property risk. In such cases a higher home valuation will reduce the LTV (loan-to-value) ratio and increase the stability of the loan. Most relevant here is that the lender enjoys reduced default risk. The resilience mortgage recognizes the lender's co-benefits and possibly can feature an interest rate reduction that provides the same above-1.0 benefit-cost ratio for both the borrower and lender, thereby aligning their mutual interests in resilience. Alternately, the mortgage interest deduction could be provided by a governmental secondary lender that would enjoy its own co-benefit.

In addition to a mortgage interest rate reduction, benefits to the borrower can be further increased by a set of complementary or layered incentivization strategies including an insurance premium reduction and local property tax incentives, all of which will reduce the borrower's PITI (principal, interest, taxes and insurance) and improve the home expense ratio and debt-to-income ratio used to qualify the borrower for the loan. Such incentives reduce the borrower's monthly payment that could be lower than payments on a conventional mortgage, and increase the likelihood that the borrower will build a more resilient home, thus increasing co-benefits to the lender and to other stakeholders. Additionally, the borrower enjoys these benefits even if the home is not exposed to a significant natural hazard. A resilience mortgage in turn provides decreased risk to the insurer that offers a premium reduction and contributes to the resilience of a community that offers a property tax incentive.

The features and steps for the resilience mortgage are summed up in the following diagram:

*Figure 1: The Resilience Mortgage*



After originating a loan with a resilience feature, constructing a resilience mortgage will require the application of expertise in natural hazards, such as hurricane wind, engineering expertise in the vulnerability of buildings to that hazard, and financial expertise in the mechanisms of mortgages. Many individuals in the catastrophe risk modeling industry possess the necessary expertise in all three fields. And much of the necessary knowledge can be encoded into written and electronic guidelines, on which a person, referred to here as a risk assessment expert, can be trained.

The risk assessment expert will develop the technical basis for a particular resilience mortgage by determining a home's hazard (meaning, for example, the frequency with which it experiences winds of various speeds), appropriate natural-hazard mitigation strategies (to make a home more resilient), and the benefits to the borrower and the lender, using data from or the underlying methodology of the *Mitigation Saves 2017 Interim Report*. The risk assessment expert also will estimate the increase in the home's resale value using academic studies such as the University of Alabama's market study, where and as they become available. This information will be passed on to the appraiser. Some insurers offer premium incentives for disaster-resistant construction or retrofit of individual buildings and of communities, which the resilience expert will also document. When local governments recognize the public-sector benefits of resilient private-



sector buildings, they might offer property tax incentives, which the resilience expert will also document.

The lender will use this information to calculate the home expense ratio and the total debt-to-income ratio and to determine allowable monthly housing expense, or how much of a mortgage that incorporates the additional cost of mitigation that the borrower can afford. A net change in the payment, or PITI, will consist of a mortgage principal (P) and interest payment (I) that covers the cost of resilience implementation offset (where applicable) by lower hazard insurance (I) payment and a property tax reduction (T). Either the lender or a secondary mortgage entity can offer an additional interest rate reduction based on co-benefits or a lower LTV (loan to value ratio) afforded by the increased value of the resilient home. As with a standard loan, the lender and underwriter will then qualify the borrower for the loan, process the loan and close it.

Following closing, the borrower will implement the mitigation strategies on a timetable specified in the mortgage agreement, either through retrofit (in the case of an existing home) or by purchasing a new home built to the standard of resilient construction specified by the risk assessment expert. A second independent assessor will verify that the mitigated property meets specifications. As a result of a resilience mortgage, the borrower will not only be able to afford a larger loan, but will have a reduced total cost of ownership, as well as reduced risk from property and other losses resulting from a natural hazard. In higher hazard areas, this total payment might be less than the total payment for a home constructed without measures to increase resilience.

An additional intent of this summary concept paper is to introduce the resilience mortgage to gain information from stakeholders that will assist in the establishment of an initial loan program or pilot study by those interested in advancing resilience in the nation's communities. Stakeholders include insurance providers, lenders and communities that can enjoy the co-benefits of a resilience mortgage. Stakeholders also include realtors that understand borrowers' needs, appraisers that support the lending process and risk assessment experts.

Additionally, private and public sector organizations will need to begin discussions on resilience mortgage institutionalization that includes: providing certified risk assessment experts, standardized resilience strategies, a benefit cost analysis method that is available to risk assessment experts; hazard insurance with premium reductions for mitigation; home value studies based on mitigation, and guidance for incorporating mitigation strategies and valuation into an appraisal; and guidance for lenders engaging in resilience mortgages and for communities that might provide a property tax reduction. As a benefit of institutionalization, resilience mortgages can contribute to creating a "resilience economy" within communities that creates additional loan and construction activity. The resilience mortgage also could be extended to create a combined single mortgage product for resilience and energy savings with broad benefits to society.

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