



At the Wildland Urban Interface, Complying with the 2015 IWUIC Provides \$4 Benefit for Each \$1 Invested

Introduction

Natural hazards present significant risks to many communities across the United States. Fortunately, there are measures governments, building owners, developers, tenants and others can take to reduce the impacts of such events. These measures—commonly called mitigation—can result in significant savings in terms of safety, prevent property loss and disruption of day-to-day life.

The National Institute of Building Sciences Multihazard Mitigation Council (MMC) undertook a study in 2017 to update and expand upon the findings of its *2005 Mitigation Saves* study on the value of mitigation. In the *2017 Interim Report* (now included into the *2018 Interim Report*), the project team analyzed two areas of mitigation programs:

- **Federal grants:** The impacts of 23 years of federal grants made by the Federal Emergency Management Agency (FEMA), Economic Development Administration (EDA) and the Department of Housing and Urban Development (HUD), resulting in a national benefit of \$6 for every \$1 invested.
- **Beyond code requirements:** Designing new structures to exceed select provisions of the *2015 International Building Code (IBC)* and *International Residential Code (IRC)* and the adoption of the *2015 International Wildland-Urban Interface Code (IWUIC)*. This resulted in a national benefit of \$4 for every \$1 invested.

Results of Compliance with the IWUIC

If all new buildings built in one year in census blocks with a benefit-cost ratio (BCR) over 1 complied with the 2015 IWUIC, compliance would add about \$800 million to total construction cost for that year. The present value of benefits would total approximately \$3.0 billion, suggesting a BCR of approximately 4:1, e.g., \$4 saved for every \$1 of additional construction and maintenance cost.

Table 1 provides BCRs for each natural hazard the project team examined. Figure 1 shows the overall ratio of costs to benefits for the design of new buildings to comply with requirements of the 2015 IWUIC. The BCR only exceeds 1.0 where the fire risk is moderate or higher. Of the 47,870 census blocks, about 10,000 of them (21%) have a BCR greater than 1.0. About 10.5% have BCR > 2.6. About 2% have BCR > 8, and the highest BCR is 15.3. Figure 2 provides the BCR by county. The project team aggregated state and local BCRs to determine the national-level BCR.

If all new buildings built the year after were also designed to meet IWUIC requirements, the benefits would be that much greater, in proportion to the quantity of new buildings.

National Benefit-Cost Ratio Per Peril <small>*BCR numbers in this study have been rounded</small>		Federally Funded	Beyond Code Requirements
Overall Hazard Benefit-Cost Ratio		6:1	4:1
 Riverine Flood		7:1	5:1
 Hurricane Surge		Too few grants	7:1
 Wind		5:1	5:1
 Earthquake		3:1	4:1
 Wildland-Urban Interface Fire		3:1	4:1

Benefit: \$3 billion

- 70% – Property: \$2,100
 - 20% – Insurance: \$600
 - 5% – Casualties & PTSD: \$150
 - 3% – Additional living expenses & sheltering: \$100
 - 2% – Indirect business interruption: \$50
- millions 2016 USD

Cost: \$800 million

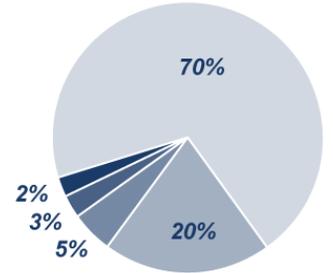


Table 1. Benefit-Cost Ratio by Hazard and Mitigation Measure.

Figure 1. Contribution to benefits from 1 year of compliance with the 2015 IWUIC where it is cost-effective to do so.

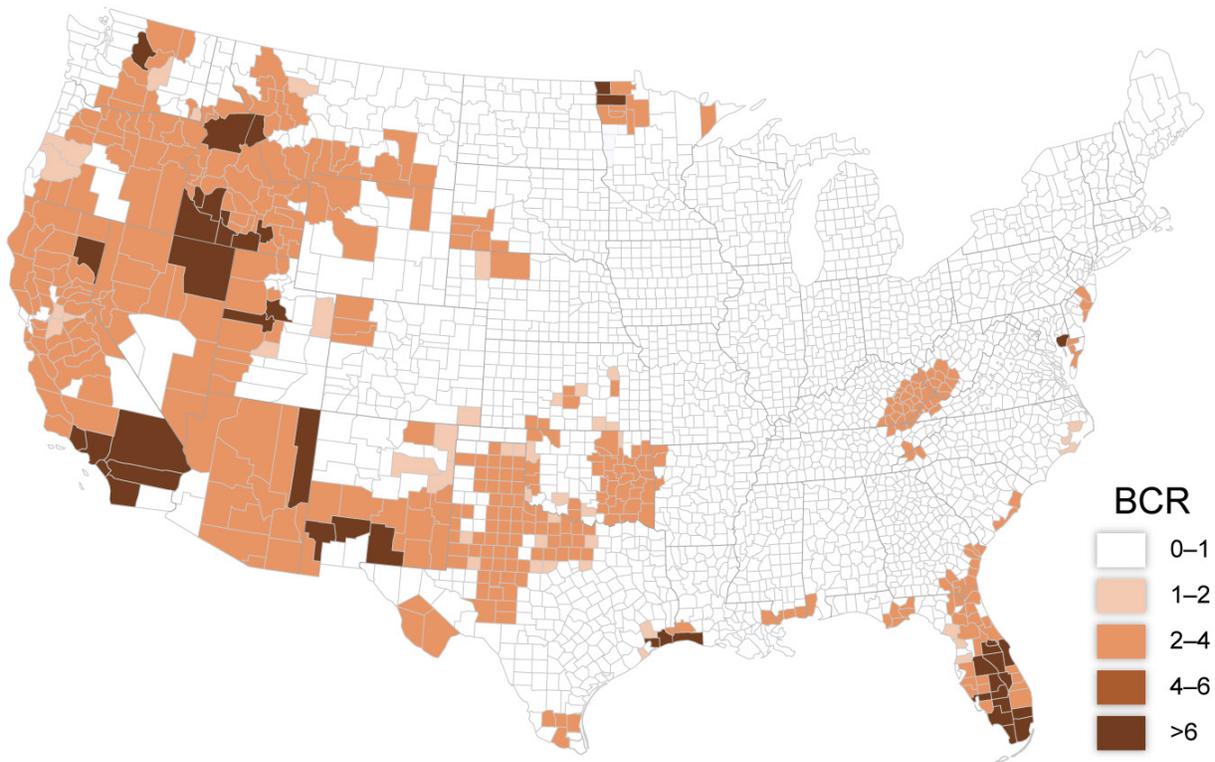


Figure 2. BCR of WUI fire mitigation by implementing the 2015 IWUIC for new buildings (by county).