



Insurance Institute for Business & Home Safety

THE ROAD AHEAD: ADAPTING OUR SUBURBAN COMMUNITIES TO WILDFIRE

Wildfire spread into suburban communities brings disruption, displacement, and financial loss to thousands of people each year. These communities are often beyond the edges of the traditional wildland-urban interface (WUI), yet recent catastrophic wildfires underscore that they are clearly at risk. What's more, decades of land use, landscape, and development patterns present special challenges to implementing traditional mitigation efforts.

To protect suburban communities and the people who live in them, the Insurance Institute for Business & Home Safety (IBHS) has developed a new Suburban Wildfire Adaptation Roadmaps project. The roadmaps provide detailed risk reduction strategies that enable homeowners to assess the wildfire vulnerabilities of the homes and neighborhoods in which they live, and to lay out a path to reduce their risk. Like any good guide, the roadmaps provide a clear starting point, so that the most critical areas can be addressed first, and signposts to identify how to move forward. The roadmaps leverage

the best wildfire, design, and building science available, including testing at the IBHS Research Center and post-disaster field investigations by IBHS and partners in the wildfire mitigation community. While nothing guarantees the survival of a home during a wildfire, the Suburban Wildfire Adaptation Roadmaps provide the most comprehensive view yet of wildfire mitigation for suburban communities.



Figure 1: Aerial photograph of a neighborhood severely damaged during the Waldo Canyon Fire in Colorado in 2008.



For more information, visit [IBHS.ORG/WILDFIRE](https://www.ibhs.org/wildfire)



Figure 2: Aerial view of neighborhoods with ongoing new construction after the Southern California Witch Creek Fire in 2007.

SUBURBAN WILDFIRE CHALLENGES AND ADAPTATION STRATEGIES

Suburban communities generally were not designed and built with wildfire in mind. As a result, they pose a number of challenges when trying to implement wildfire mitigation strategies that were developed for more sparsely populated areas in the WUI:

- Suburban homes are closely spaced.
- Landscape designs have not historically considered the threat from wildfires.
- Wildfire was not necessarily considered when building materials and other components such as fences or decks were constructed.
- Fire protection resources are often limited and focused on smaller-scale conflagrations.

To be successful, effective suburban strategies need to address these challenges head-on by considering typical suburban density patterns, design and construction practices, landscaping and building surrounds, and neighborhood features. In addition, homeowners associations (HOAs) and other community groups may offer unique opportunities to scale up wildfire mitigation strategies beyond the individual home to the community at large.

In short, the goals of the Suburban Wildfire Adaptation Roadmaps are to reduce wildfire risk by slowing its spread, hardening the structures in its path, and reducing the intensity and production of embers that cause 90% of home ignitions.

CRITICAL LANES

The Suburban Wildfire Adaptation Roadmaps are organized around eight critical lanes that can increase or decrease the chance a home survives a wildfire. While each of these is important, the Starting Line (see below) focuses on the most critical actions a homeowner can take.



- | | |
|------------------------------|---------------------------------|
| 1. ROOF | 6. WALLS |
| 2. EAVE OVERHANG | 7. DECKS & FENCES |
| 3. ROOF VENTS | 8. YARD/LANDSCAPING MAINTENANCE |
| 4. BUILDING SHAPE | 9. OUTBUILDINGS |
| 5. 0 - 5' HOME IGNITION ZONE | |

Figure 3. Diagrams denoting the critical components of a suburban home and its surroundings identified in the Suburban Wildfire Adaptation Roadmap.

STARTING LINE

Based on IBHS laboratory testing and field observations, the most critical actions for suburban wildfire protection pertain to the **roof material, the 0–5 foot home ignition zone, decks, and vents**. This is the starting line for individual homeowners to reduce their home's vulnerability and increase the chances for a home to survive should a wildfire threaten. Each starting line element must be addressed before further actions can have a meaningful impact.

- **ROOF:** The roof material must have a fire rating from the Underwriters Laboratories testing program (Class A, B, and C). When re-roofing, all homeowners should use a product or full roofing assembly that has a Class A rating. All asphalt shingles currently on the market have a stand-alone Class A rating, but other roofing materials are not as universally protective.
- **HOME IGNITION ZONE:** The 5-foot area extending outward from a home (sometimes referred to as the noncombustible zone) is essential to stopping embers from igniting anything that may be immediately next to a home and allow a wildfire to spread to the structure itself. The most direct way to create and maintain a home ignition zone is to avoid placing anything that can burn in this zone; however, when used with gravel or rock ground cover/mulch, fire-resistant plants can help slow fire from spreading or reduce the intensity of fire in this area.

Post-event investigations have shown that when fires start or spread in the 0–5 foot home ignition zone, it can get behind noncombustible siding and ignite the plywood or oriented strand board (OSB) wall sheathing. The noncombustible siding or wall cover (i.e., brick veneer, concrete, or stone) must extend slightly below ground level. If it does not, it is imperative that the 0–5 foot home ignition zone be meticulously maintained and free of any material that could burn.



Figure 5: Photograph following the Camp Fire in 2018 showing how the 0-5 foot home ignition zone helped stop the spread of fire to this home. Also note the noncombustible concrete fiber board siding.

- **DECKS:** Decks are a common feature of suburban homes, but unfortunately can be a vulnerable element that allows intense fire to spread quickly to a home. Even if the deck itself is made of noncombustible material, it is critical to keep areas underneath elevated decks clear of yard debris, firewood, and anything else that could ignite. IBHS testing has shown that a deck fire can become very intense and can easily spread toward the home. This exposes the home to extreme heat, direct flame contact, and burning embers from the deck itself.



Figure 6: Images of deck testing at the IBHS Research Center show how (left) an intense fire can develop under a deck and (right) can spread toward a home's wall.

- **VENTS:** Roof vents, gable vents, and crawl space vents are small but critical pieces of a home. During wildfires, wind-driven embers can easily enter a home through vents and ignite materials in the area of the house where they enter. A simple and cost-effective mitigation strategy is to ensure all vents have 1/8-inch or finer noncombustible (i.e., metal) mesh covering them. This will keep larger, more energetic embers from entering the home. While maintenance is needed to keep vents clear of any debris, this is an easy but critical step in combating an ember storm.



Figure 7: Time exposure photograph tracing embers entering the gable-end vent and a ridge vent on a test home at the IBHS Research Center.

PROGRESSING THROUGH THE ROADMAP

After crossing the Starting Line—by addressing the roof, home ignition zone, decks, and vents—a suburban homeowner should move forward toward a substantial system of wildfire protections. The roadmaps provide guidance through a series of decision trees that illustrate the range of positive steps forward—and what to avoid.¹

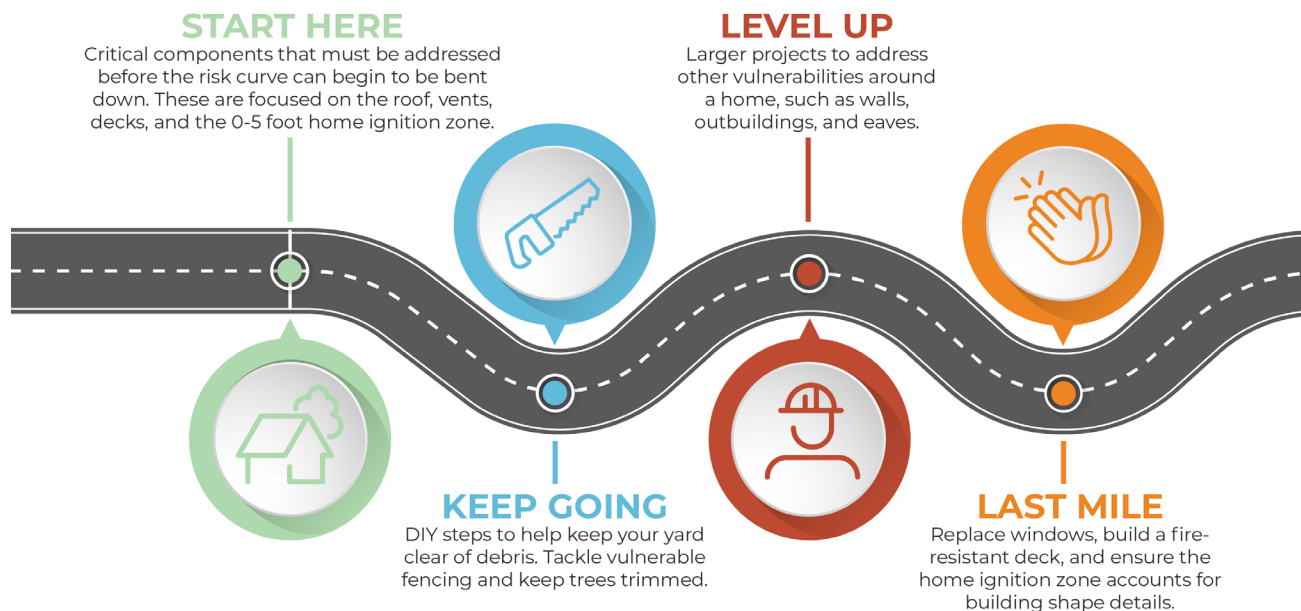


Figure 8. The road to adapting suburban communities to wildfire involves clusters of actions. The path ahead begins with a set of critical components that must be addressed. No one action can eliminate risk, but clusters of actions at the home and community level can bend down the risk curve.

KNOW YOUR NEIGHBOR AND GET INVOLVED IN YOUR COMMUNITY

In addition to steps property owners can take to protect their homes, neighborhoods and communities can improve resilience for everyone. Because of the way wildfires spread, in some cases, a neighbor's actions or inactions could determine whether surrounding homes survive.

At the community-wide level, up-to-date, well-enforced building codes can help assure that newly constructed homes incorporate fire-resistant materials and design. Many of the relevant best practices contained in the IBHS Suburban Wildfire Adaptation Roadmaps appear in the California Chapter 7A wildland urban-interface (WUI) code and across the recommendations of the Firewise USA® program from the National Fire Protection Agency (NFPA). Yet, they have not been adopted in suburban communities that may be outside the WUI, but nonetheless face a significant and growing wildfire risk.

¹ Later in 2020, IBHS will release its Wildfire Ready Guide. The web-based guide will provide the key pieces focused on the needs of suburban homeowners. Information is synthesized through groups of best practices, giving suburban homeowners the complete picture of activities and their expected cost. The steps range in cost from "do-it-yourself" at little cost, to large renovation projects and considerations for new construction.

IBHS explored how WUI codes were applied across the country and found they have only been adopted statewide in California, Nevada, Utah, and Pennsylvania. Only nine other states provide guidelines and programs to reduce wildfire risk. Their applicability is also reliant on the definitions of the wildland-urban interface.² Enforcement has also been a challenge because landscapes around a home can change even within seasons, home details are difficult to inspect, and many components are tied to diligent maintenance and upkeep.

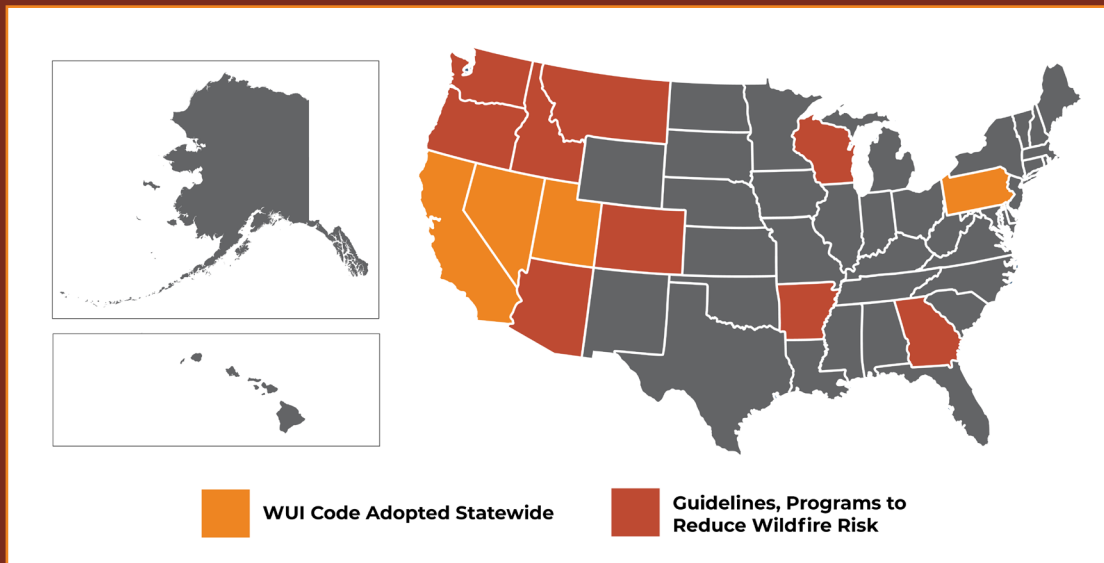


Figure 9: Map of states that have adopted a state-wide WUI-code and those that have active wildfire guidelines and mitigation programs but no state-wide code.

Homeowners associations (HOAs) also can play a large role in helping scale up mitigation protections for individual homes. HOAs can develop and enforce covenants that are in alignment with the steps necessary to reduce the neighborhood's vulnerability to fire, or less formally, provide forums for homeowners to share best practices. However, HOAs can also be a hindrance by restricting the use of building materials and landscaping that may be more fire resistant, due to aesthetic concerns. Homeowners should be encouraged to work with HOAs to implement community protections and explore serving on neighborhood boards.

Wildfires have been part of the natural environment for centuries but are most destructive when they threaten people and their communities. Increasingly, this includes suburban areas that are beyond the WUI that has traditionally been the focus of wildfire mitigation action. Although nothing guarantees the survival of a home during a wildfire, the roadmaps offer the most comprehensive view yet of wildfire mitigation for suburban communities. The IBHS Suburban Wildfire Adaptation Roadmaps provide tools to help protect the places where more people live and work, often closely together, so that they can manage this risk as they live and thrive.

Request the full report by emailing info@ibhs.org.

Neighbors, HOAs, policy makers, fire protection engineers and all stakeholders share a common desire to reduce the impact of wildfire, yet success will be defined by our ability to work in unison to implement the pragmatic and effective solutions.

² <https://ibhs.org/wildfire/wildfire-building-codes-and-standards/>