

**SUBJECT: DISCUSSION/DIRECTION – CONSIDERATION OF WILDLAND-
URBAN INTERFACE AND HOME HARDENING BUILDING
CODES**

DATE: JULY 30, 2024

**PRESENTED BY: ROB ZUCCARO, AICP, COMMUNITY DEVELOPMENT
DIRECTOR
CHAD ROOT, CHIEF BUILDING OFFICIAL**

SUMMARY:

Staff is seeking direction from Council on the potential development of a *Wildland-Urban Interface* (WUI) and/or *Home Hardening* building code. A WUI building code provides standards for development that are meant to mitigate fire spread between human development and areas with wildland vegetation or vegetative fuels. The concept of Home Hardening is integral to a WUI building code but could also be more broadly applied to address issues of fire conflagration, which is the uncontrolled spread of fire between structures.

BACKGROUND/DISCUSSION:

Wildfire Spread

Fire spreads from a wildland area to structures by either embers, radiant heat, or direct flame contact. Ember spread is the most common form of wildland fire spread to a structure. This can occur by igniting fuel around the structure, penetrating the structure through a vent or other opening, or directly igniting the exterior of the structure. Understanding the most likely ways for fires to transition from wildlands into urban interfaces helps to prioritize mitigation standards. For example, a Home Hardening building code may put the most focus on ember spread, since it is the most common type of fire spread. A WUI building code may focus more on landscaping maintenance that could spread direct flame from trees or shrubs.

Link: [Summary of How Fire Spreads in the WUI \(nist.gov\)](https://www.nist.gov/publications/summary-how-fire-spreads-wui)

Link: [IBHS Video on Ember Spread https://www.youtube.com/watch?v=QQIHtMQ_y5k](https://www.youtube.com/watch?v=QQIHtMQ_y5k)

There are three main environmental factors that influence the potential for wildland fire intensity and spread: topography, weather, and fuel. Steep slopes and gullies will increase the rate of fire spread and there is limited control over these natural features. Wind and drought will also significantly influence fire spread and cannot be controlled. For the Marshall Fire, both wind and drought played significant roles in the spread of the fire both from the wildland into urban areas and the conflagration of the fire within neighborhoods. The type and amount of vegetation and vegetative fuels will impact fire intensity, and different vegetation types produce different characteristics related to ember, radiant heat, and flame spread potential. While grasslands that are largely

absent of trees and shrubs tend to have the lowest potential for fire intensity, with the right drought and wind conditions, grasslands can provide a considerable potential for fire spread from a wildland area into an urban environment.

Link: [Fuel Models for Colorado \(bouldercounty.gov\)](https://bouldercounty.gov/fuel-models)

Wildfires and Conflagration

A conflagration fire is one that spreads uncontrollably from structure to structure. It is important to acknowledge that wildfires are a natural part of our environment and needed to maintain healthy ecosystems and lower the amount of potential for wildland fire fuels. In addition, wildland fire suppression efforts over the decades have exacerbated wildfire intensity in many areas of the western United States where the natural fire cycles were disrupted. The graph below shows a trend line of a decreasing annual occurrence of wildfires but more acres burned with each fire. Population density and development has continued to increase in many areas prone to wildfire, resulting in an increasing number of wildfires entering urban environments and turning into conflagration fires. More information, including an analysis of the Marshall Fire conflagration event, can be found at the following link.

Link: [Return of Conflagration to the Built Environment \(ibhs.org\)](https://ibhs.org/return-of-conflagration-to-the-built-environment)

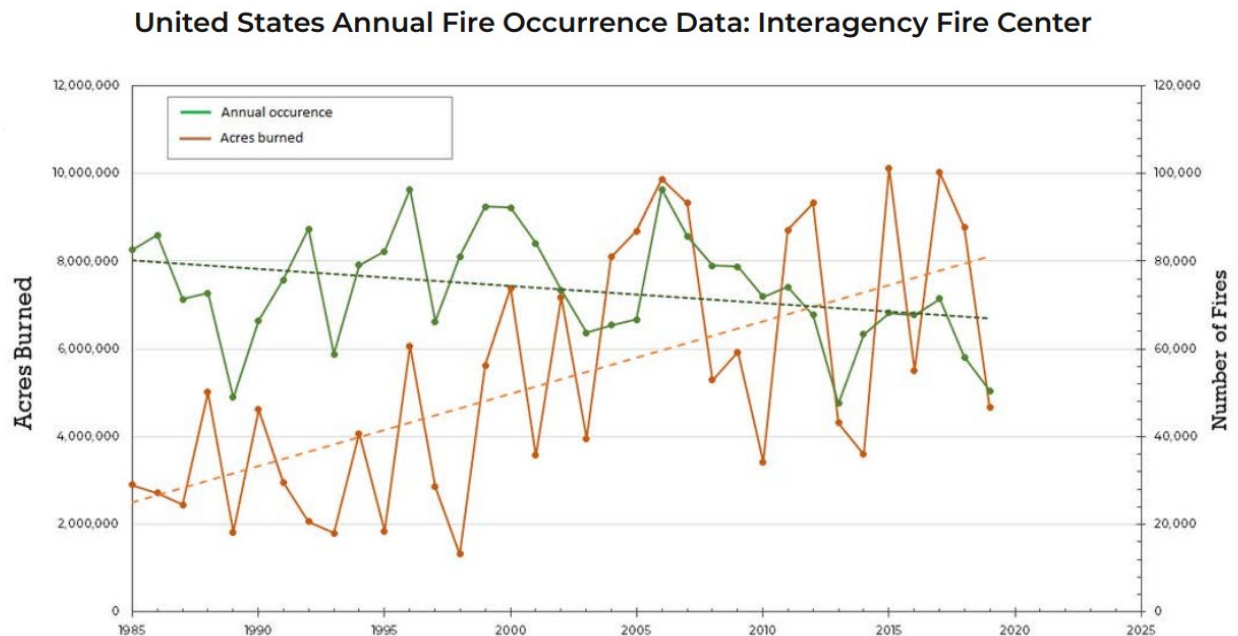


Figure 5. Number of fires (green) and acres burned (brown) since 1985. Linear trend lines (dashed) are also included. Data courtesy of the Interagency Fire Center.

Source: IBHS – Suburban Wildfire Adaptation Roadmaps

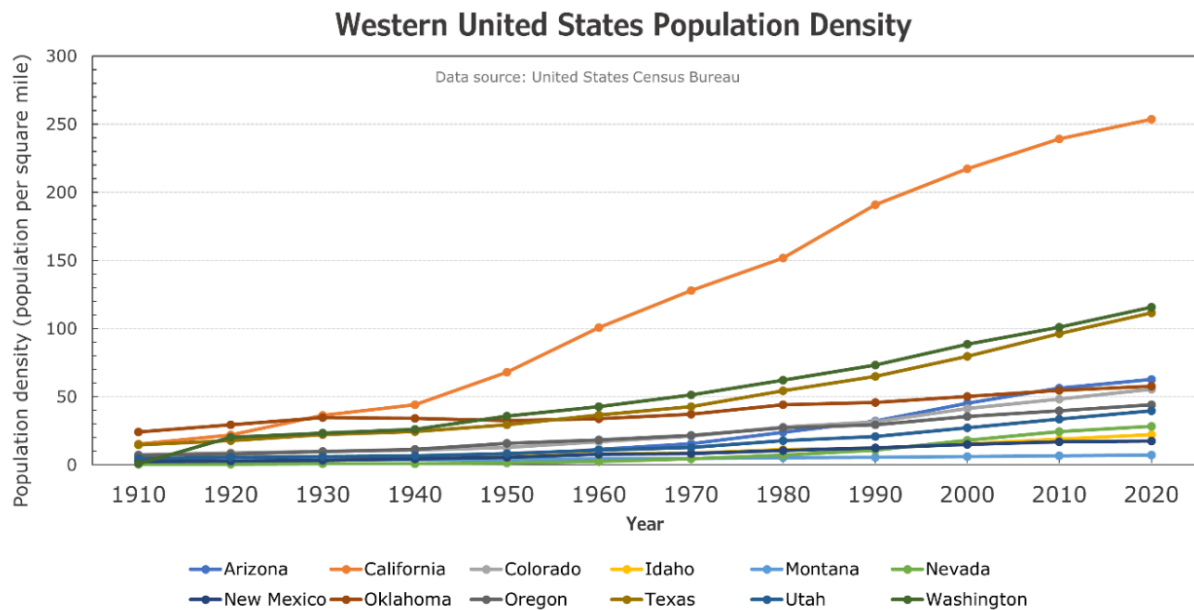


Figure 1: Time history of population density across thirteen western US states. Data source: US Census Bureau

Source: IBHS – *The Return of Conflagration in the Built Environment*

WUI Building Codes

There are many examples of local and national codes that have been developed for the regulation of development in the WUI. A few example codes are provided in the following links:

- [International Wildland Urban Interface Code \(IWUIC\)](#)
- [State of Washington WUI Code](#)
- [Boulder County WUI Code](#)
- [Colorado Springs WUI Code](#)

The City of Louisville utilizes the International Code series (I-Codes). The IWUIC is one of the codes within this series. The following is a description of the main elements of the IWUIC and how it would likely apply to Louisville:

Defining the Wildland Urban Interface: The IWUIC would require that the City define and map areas that would be designated as the Wildland Urban Interface (WUI). These areas would typically only include the parcels immediately adjacent to an area with wildland vegetation. The IWUIC lists two potential western grassland fuel types that could represent wildland vegetation (Fuel Model A and L, Appendix D). These are considered “light fuel” types and result in “moderate” fire hazard severity. The City would also need to determine if smaller areas of wildland vegetation would trigger inclusion in the WUI, or only larger contiguous areas of wildland vegetation (i.e. small internal greenways and

trail corridors within developed neighborhoods, vs. large contiguous open spaces such as the North Open Space and Davidson Mesa).

TABLE 502.1 FIRE HAZARD SEVERITY

FUEL MODEL ^b	CRITICAL FIRE WEATHER FREQUENCY								
	≤ 1 Day ^a			2 to 7 days ^a			≥ 8 days ^a		
	Slope (%)			Slope (%)			Slope (%)		
	≤ 40	41-60	≥ 61	≤ 40	41-60	≥ 61	≤ 40	41-60	≥ 61
Light fuel	M	M	M	M	M	M	M	M	H
Medium fuel	M	M	H	H	H	H	E	E	E
Heavy fuel	H	H	H	H	E	E	E	E	E

E = Extreme hazard;

H = High hazard;

M = Moderate hazard.

a. Days per annum.

b. Where required by the code official, fuel classification shall be based on the historical fuel type for the area.

Source: 2021 IWUIC

Area Requirements: The IWUIC “area requirements” address minimum emergency vehicle access and water supply requirements for development in the WUI. As an urbanized area, staff anticipates that most of Louisville could easily meet the access and water supply requirements.

Defensible Space Requirements: The “defensible space” is the minimum area between the wildland vegetation and the structure where the landscaping is modified or maintained to limit the spread of a fire. Within the defensible space, trees must be setback and trimmed to maintain a minimum distance from structures. Storage of certain materials is prohibited and debris and deadwood must be removed within the designated area. Ornamental landscaping may be allowed. For areas designated with “moderate” fire hazard severity, the minimum required defensible space is 30 ft. (but may be modified depending on class of building construction).

Building Construction Requirements: The IWUIC includes three classes of ignition-resistant construction standards designated Class 1, 2 or 3, with Class 1 being the most fire resistant and Class 3 the least. The factors that determine which Class of construction is required are the 1) Fire Hazard Severity, 2) Water Supply Availability, and 3) Defensible Space. With the assumptions that our local WUI would have “moderate” fire hazard severity based on the predominate grassland vegetation and adequate water supply, construction standards would be a Class 2 if the minimum 30 ft. of defensible space is not provided, or Class 3 if a minimum of 30 ft. of defensible space is provided. If 1.5x the minimum defensible space is provided (45 ft.), then the code does not require any special

construction requirements. The following table from the 2021 IWUIC includes areas highlighted in red showing what standards would likely apply in Louisville.

TABLE 503.1 IGNITION-RESISTANT CONSTRUCTION^a

DEFENSIBLE SPACE ^c	FIRE HAZARD SEVERITY					
	Moderate Hazard		High Hazard		Extreme Hazard	
	Water Supply ^b		Water Supply ^b		Water Supply ^b	
	Conforming ^d	Nonconforming ^e	Conforming ^d	Nonconforming ^e	Conforming ^d	Nonconforming ^e
Nonconforming < 30ft	IR 2 Class 2	IR 1	IR 1	IR 1	IR 1	Not Permitted
Conforming ≥ 30ft	IR 3 Class 3	IR 2	IR 2	IR 1	IR 1	IR 1
1.5 × Conforming ≥ 45ft	Not Required	IR 3	IR 3	IR 2	IR 2	IR 1

a. Access shall be in accordance with Section 403.

b. Subdivisions shall have a conforming water supply in accordance with Section 402.1.

IR 1 = Ignition-resistant construction in accordance with Section 504.

IR 2 = Ignition-resistant construction in accordance with Section 505.

IR 3 = Ignition-resistant construction in accordance with Section 506.

N.C. Exterior walls shall have a fire-resistance rating of not less than 1 hour and the exterior surfaces of such walls shall be noncombustible. Usage of log wall construction is allowed.

c. Conformance based on Section 603.

d. Conformance based on Section 404.

e. A nonconforming water supply is any water system or source that does not comply with Section 404, including situations where there is no water supply for structure protection or fire suppression.

Source: 2021 IWUIC

Construction standards address the following areas to limit the ability of fire spread and ignition within these building components:

- Roof Assembly Rating
- Gutter Covers and Materials
- Eaves Materials and Eave Vent Coverings
- Exterior Wall Materials
- Fire Rating of Glazing (windows) and Doors
- Underfloor Enclosure Ratings
- Fire Suppression Systems
- Detached Accessory Structure Location and Construction

Cost Impact of WUI Building Codes and Affordability

Based on a 2020 study by the National Association of Homebuilders, implementing the 2018 version of the IWUIC in Colorado would result in an estimated increase in construction cost for a two-story, 2,600 sq. ft. home between \$6,248 and \$48,095. As Council is aware, the City has also adopted a net-zero residential code for new construction, with some exceptions for Marshall Fire rebuilding, that results in increased construction costs above the base I-Codes for residential construction (estimated at \$19,780 by a 2022 City study for an average size Marshall Fire home). Staff recommends that Council be cognizant of the total cost impact of the adoption of any

new building codes and cost in relation to surrounding jurisdictions, as this my impact affordability of housing and inclusivity of the community, and the ability to attract homebuilders into the community.

Link: [Cost Impact of Building a House in Compliance with IWUIC \(nahb.org\)](https://www.nahb.org/cost-impact-of-building-a-house-in-compliance-with-iwui/)

Community-Wide Home Hardening Building Codes

The Louisville Fire Protection District has submitted a letter requesting consideration of adopting certain Home Hardening standards that would be applied community-wide with new construction or when the building components were replaced (see Attachment No. 1). The building components that they recommend addressing include the following:

- *Class A Roof*
- *Double or triple-pane windows*
- *Fire resistance siding*
- *Fire resistance decking*
- *Fire resistance fencing within 5 ft of the home*
- *Small screen over attic vents*

This type of code would apply to the entire City and could be considered in lieu of or in addition to adoption of a WUI building code. The purpose of the code would be geared more towards addressing concerns with fire conflagration, whether the fire was a result of a wildfire or other source.

Additional detailed information on suburban-context home hardening options can be found at the following link.

Link: [Suburban Wildfire Adaptation Roadmap \(ibhs.org\)](https://www.ibhs.org/suburban-wildfire-adaptation-roadmap/)

Cost Impact Community-Wide Home Hardening Building Codes and Affordability

Costs for implementation of a Home Hardening building code would vary depending on the standards adopted under each category. Almost all new roof shingle installations and replacements are Class A asphalt shingles, thus, no cost increase would be anticipated for making this a minimum code standard. Additionally, the City's adopted energy code already requires double-pane windows at a minimum to meet energy efficiency standards. However, other components of a window, including providing metal or fiber glass frames and tempered glass, could be considered to provide additional fire resistance above a standard double-pane vinyl window and would have additional costs. Limiting the fire-resistant decking code to the decking boards and railings but allowing the posts and joists to be untreated, vs all components having fire resistant material, would have a significant difference in cost.

Using the 2020 study by the National Association of Homebuilders as a guide, staff has the following estimates for the potential costs to implement the Fire District's recommendations:

- *Class A Roof*: \$0 considering Class A shingles are near universally used
- *Double or triple-pane windows*: \$0 if limited to requirement for double pane windows with no other requirements. \$2,661-\$2,840 for adding tempered glass. Requiring fiberglass frames would add additional cost, potentially up to double the cost.
- *Fire resistance siding*: \$0-\$33,665. Depending on comparison siding material there could be cost savings (e.g. natural wood vs fiber cement siding).
- *Fire resistance decking*: \$1,371
- *Fire resistance fencing within 5 ft of the home*: Not addressed in NAHB report. Staff estimates approximately \$500-\$1,000
- *Small screen over attic vents*: \$410

As previously mentioned, staff recommends that Council be cognizant of the total cost impact of the adoption of any new building codes and cost in relation to surrounding jurisdictions, as this may impact affordability of housing and inclusivity of the community, and the ability to attract homebuilders into the community.

Community Education and Mitigation Plan Development

An additional option is to continue to offer, promote, and educate community mitigation through the Fire Department, Recovery & Resilience Division as well as already established partner programming. This could include having a neighborhood audit and creation of a mitigation plan that would be voluntary but encouraged for implementation. An example of this is the Wildfire Partners program for the development Community Mitigation plans throughout the City.

Link: [Community Mitigation – Wildfire Partners](#)

Boulder County's Community Wildfire Protection Plan (CWPP) will also be released this Fall, which includes recommendations to reduce risk of fires and increase resilience practices over the next five (5) years. The City intends to use the CWPP and implement mitigation programming to align with some recommendations from the CWPP and the Wildfire Risk Assessment (WRA). The City's Wildfire Risk Assessment (2023) provides recommendations to drive mitigation efforts within public spaces. An additional option is to continue to use this Risk Assessments to educate, promote, and offer community mitigation programs.

General Resources on WUI

For more in-depth information on WUI code considerations, staff recommends the following resources.

Link: [National Institute of Standards and Technology \(NIST\) Wildland Urban Interface Fire Group](#)

Link: [Insurance Institute for Business and Home Safety \(IBHS\) Wildfire Building Codes and Standards](#)

Link: [National Fire Protection Association \(NFPA\) Wildfire Division](#)

PUBLIC COMMENTS:

Public comments are included as Attachment No. 2.

FISCAL IMPACT:

Implementation of a WUI or Home Hardening building code will take additional staff and city resources that could require funding. Staff would provide a more detailed fiscal impact analysis as part of consideration of a code adoption depending on the scope of the code directed by Council.

STAFF RECOMMENDATION:

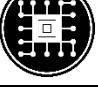
Staff is seeking direction on drafting a WUI and/or Home Hardening building code for consideration. Any potential code would be reviewed by the Building Code Board of Appeals for their recommendation before being presented to City Council for adoption. Options for consideration include, but are not limited to, the following:

1. Development of a WUI building code that is limited to regulating new development and redevelopment in areas where development is adjacent to wildland areas. The IWUIC is an example code that could be adopted to meet this option.
2. Development of a Home Hardening building code that is broadly applicable to all development in the city. This would likely not include defensible space standards, but instead focuses on some of the more common building standards for mitigation of fire spread.
3. Development of both a WUI and Home Hardening building code. The WUI building code would likely have more stringent building construction standards than the Home Hardening building code and standards for maintenance of defensible space.
4. If not adopting a WUI or Home Hardening build code, expand and continue programs for community mitigation planning and providing technical assistance to promote best practices for WUI development and Home Hardening. An example of this is the Boulder County Wildfire Partners Community Mitigation Program.
5. Council may direct other options for consideration.

ATTACHMENTS:

1. June 12, 2024 Louisville Fire Protection District Letter
2. Public Comments
3. Staff Presentation

STRATEGIC PLAN IMPACT:

☐	 Financial Stewardship & Asset Management	☒	 Reliable Core Services
☐	 Vibrant Economic Climate	☐	 Quality Programs & Amenities
☒	 Engaged Community	☐	 Healthy Workforce
☐	 Supportive Technology	☐	 Collaborative Regional Partner



LOUISVILLE FIRE
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"OUR FAMILY SERVING YOUR FAMILY"

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HEADQUARTERS: 303.666.6595 | FAX: 303.666.7659
LOUISVILLEFIRE.COM

June 12, 2024

City Council
City of Louisville

Dear Mr. Mayor and City Council,

I believe the City will be reviewing and adopting new building codes this fall. The Louisville Fire Protection District would like to suggest adopting an amendment to help the Fire District protect homes. The amendment would have the following items for home hardening;

- Class A roof
- Double or triple-pane windows
- Fire resistance siding
- Fire resistance decking
- Fire resistance fencing within 5 ft of the home
- Small screen over attic vents

These items would be required only if it was new construction or if the above item is being replaced.

Hardening homes in the City will help the District protect homes from exposure to a next-door structure fire or another wildland fire. I would happily answer any of your questions or concerns and look forward to conversations as we get closer to the new codes.

In Fire Safety



John Willson
Fire Chief

From: [Joanne Speirs](#)
To: [City Council](#); [Building Safety](#); [Chad Root](#)
Subject: Home hardening for wildfires
Date: Monday, July 15, 2024 8:55:48 PM

I understand that in the next couple of weeks, the City will be addressing potential updates to the building codes. I have attached a recent article in The NY Times discusses home hardening, insurance rates, and “firewise” communities. Clearly the Insurance Industry supports home hardening practices and in a very effective demonstration in the article, shows the impact of fire hardening on homes.

My husband and I recently moved into our rebuild in the Enclave neighborhood. We have home hardened our rebuild in the hopes that it will help save our lives, (we have BOCO alerts), save some insurance costs and just might slow the fire down so that it won’t burn out our neighbors. In the meantime, a neighbor near us just planted 21 juniper trees.

I know folks are tired of hearing from fire survivors, but safety is in the forefront of our minds. This is a minor but important measure that the City could take to help prevent or mitigate another disaster.

Here's a gift link: https://www.nytimes.com/2024/07/15/business/wildfires-home-insurance-building-standards.html?unlocked_article_code=1.7U0.VIwh.XiLqhzUToo6G&smid=url-share.

Please contact me if you are unable to open the attachment.

Kind Regards,
Joanne Speirs
1112 W. Enclave Circle
Louisville, CO 80027
303 589 2877

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From: [Ann Brennan](#)
To: [City Council](#); [John Willson](#); jhenderson@louisvillefire.com
Cc: [Kevin Brennan](#)
Subject: fire hardening for spec houses
Date: Sunday, April 21, 2024 6:16:39 PM

Dear Council members:

We would like to ask you again to take up urgent consideration of requiring Marshall Fire lots being bought and developed to implement fire hardening techniques including landscaping and fencing. We believe the LFPD should be supporting this as well as a public safety measure.

We are disheartened by the inconsistency of voluntary hardening happening in the rebuilds, especially the cedar fencing going up. We understand it's an economic issue for our neighbors, but disappointed that we're missing this opportunity to help protect the community.

Two spec homes are now for sale in the Cornerstone neighborhood for \$1.78 million and \$2.15 million respectively. They are being built setback-to-setback, further exacerbating the community's fire risk. These huge, expensive homes and those that will come on the lots being sold will change the character of our neighborhood. Money is clearly not an obstacle at those list prices. Now is the time to require these homes to fully fire harden. We need both fire-resistant building materials and designs, and firewise landscaping and fencing. This is a proven technique in California for slowing the progression of wildfires, and it is urgent that we capitalize on the opportunity of these rebuilds to add some resilience to our community.

Respectfully,

Ann & Kevin Brennan
888 Larkspur Court
Louisville, CO 80027

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From: [Lisa Hughes](#)
To: [City Council](#)
Subject: Emergency consideration of fire hardening in Marshall Fire areas
Date: Friday, November 17, 2023 10:40:22 AM

Dear Louisville Mayor Maloney and City Council Representatives:

I am writing to ask you to take up consideration of an emergency requirement for WUI fire hardening and mitigation under certain circumstances in the Marshall Fire rebuild areas. Specifically regulations should apply to lots being sold, and could be made an opt-out option for fire victims who are rebuilding. We are at a critical time as vacant lots in the area are beginning to be purchased by developers and non-locals for investment purposes with spec and production houses being built. Although some builders like Homebound are doing WUI-compliant houses in Superior, they are choosing to not do it in Louisville because it's not required. Many of us fire survivors who are rebuilding are voluntarily complying with WUI requirements to help protect ourselves, our neighborhoods, and the entire community. If developers or non-locals are allowed to come in and build conventional housing it will significantly reduce the impact of our voluntary compliance and miss a critical opportunity to make Louisville safer. This would be the City's chance to draft ordinances that work for our residents before the City will have to comply with state WUI code in 2025 if you don't come up with your own first. The opportunity in rebuild areas will be missed long before 2025 though. Our own experience is that simple hardening and mitigation measures add less than \$10,000 to the purchase price, of which \$5,000 has been offset by the state grant. Additionally, people not impacted by the fire who are lower income are eligible for a \$5000 retrofit as a result of Rep Junie Joseph's bill that was passed last session.

We are at the east--downwind--end of Larkspur Court and back up to City open space and near the fire dept open space which has very high grass. As a result, we are fire hardened as those grasses and the neighbors upwind and to the west of us pose a threat in the event of another fire. Three lots are currently for sale, with another 2 standing vacant with no decisions by their owners. If those are sold, that would be 5 of the 13 houses immediately upwind of us that could be built without fire hardening, partially negating all our hard work. I understand this is a complicated conversation for the whole community, but an emergency ordinance focused on a subset of fire properties would be an important first step in improving the resilience of the community. This is a climate resilience issue as well and we as residents on the W side of the city are the buffer to protect other neighborhoods .

Thank you for your consideration.
Lisa Hughes
887 Larkspur Court
Louisville Co 80027

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From: [Ann](#)
To: [City Council](#)
Cc: [Jeff Durbin](#); [Kiana Freeman](#)
Subject: emergency consideration of fire hardening in Marshall Fire areas
Date: Wednesday, November 1, 2023 5:49:38 PM

Dear Louisville Mayor Maloney and City Council Representatives:

I am writing to ask you to take up consideration of an emergency requirement for WUI fire hardening and mitigation under certain circumstances in the Marshall Fire rebuild areas. Specifically regulations should apply to lots being sold, and could be made an opt-out option for fire victims who are rebuilding. We are at a critical time as vacant lots in the area are beginning to be purchased by developers and non-locals for investment purposes with spec and production houses being built. Although some builders like Homebound are doing WUI-compliant houses in Superior, they are choosing to not do it in Louisville because it's not required. Many of us fire victims who are rebuilding are voluntarily complying with WUI requirements to help protect ourselves, our neighborhoods, and the entire community. If developers or non-locals are allowed to come in and build conventional housing it will significantly reduce the impact of our voluntary compliance and miss a critical opportunity to make Louisville safer. Our own experience is that simple hardening and mitigation measures add less than \$10,000 to the purchase price, of which \$5,000 has been offset by the state grant. We are at the east--downwind--end of Larkspur Court and are fully WUI-hardened. Three lots are currently for sale, with another 2 standing vacant with no decisions by their owners. If those are sold, that would be 5 of the 13 houses immediately upwind of us could be built without fire hardening, partially negating all our hard work. I understand this is a complicated conversation for the whole community, but an emergency ordinance focused on a subset of fire properties would be an important first step in improving the resilience of the community.

Thank you for your consideration.

Ann & Kevin Brennan
888 Larkspur Court
Louisville, CO 80027

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From: [Lisa Hughes](#)
To: [City Council](#)
Subject: WUI risk
Date: Wednesday, August 16, 2023 7:20:10 AM

Dear Council,

The article below is from today's Denver Post. Improves as many residents and survivors of the Marshall Fire have said over and over again the need for a WUI code. The article references the fact that the six major metro counties are now more at risk for wildfire than other areas. This should be a wake up call to you to enact a wildfire urban interface code in this city, or at least to begin the discussion. If you don't, you'll be forced into the states one in 2025 and it may not turn out the way you want. Our surrounding neighbors are doing it now. Since you were working on updating the comprehensive plan for the city, this would be a perfect time to enact a code.

This is an issue for us as an entire city, and an important one not just for fire survivors, and those of us rebuilding. The next fire can easily happen in the eastern part of Louisville or Lafayette, or somewhere nearby and more people will be impacted. Many residents in the city have been doing extensive research on this topic around mitigation, fire, hardening, etc. and would be happy to talk with you all about it.

Thank you,
Lisa Hughes

Report: More than 332,000 homes at risk

https://edition.pagesuite.com/popovers/dynamic_article_popover.aspx?guid=7af4121c-c40a-44a5-8e87-5ca38dcb5988&appcode=DEN371&eguid=fd578b64-2961-4cbc-b115-6a91226bb093&pnum=21#

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From: [Tawnya Somauroo](#)
To: [City Council](#)
Subject: Maui fire
Date: Saturday, August 12, 2023 12:01:51 AM

Dear Council,

For anyone that thinks the Marshall fire was a 'fluke', please note that 5 years ago there was another fast-moving brush fire in Lahaina, Maui that burned 7 homes and 1500 acres:

<https://www.cnn.com/2018/08/24/us/maui-hawaii-brush-fire/index.html>

We should be asking, did they learn all the lessons they could have learned from the previous fire? Did they improve their disaster preparedness, did they pass WUI code, did they mitigate open space fuels? The emergency evacuations in Lahaina appear to have largely failed this week, scores of people died including small children on foot trying to escape.

I asked Mt. View Fire Protection District how many fires have started upwind of our community in the past 10 years and was told there were 29 grass and structure fires with an electrical origin alone (exclusive of the Marshall fire). That does not include fires of other origins.

We need to acknowledge that fast-moving grass fires are an existential threat to our community and promote fire hardening in the rebuilt areas, possibly by passing WUI code. We cannot rely on open space fuels mitigation alone to protect us. As the recent Watershed Center [Grasslands Management in Boulder County report](#) states:

In these extreme conditions, the reality is that almost no combination or scale of mitigation practices is able to fully prevent wildfires from spreading as rapidly as the Marshall Fire did, **which is why it is important that individuals take specific measures on their property that will help stack the odds towards reducing hazards, and therefore risks.**

Please table discussing home fire hardening at a Council meeting soon. We must learn from Maui - another grass fire could very well come our way and we have not done everything we can to reduce the risks to our community. We even have grant money for property owners to fire harden, Louisville should be requiring all home owners to use that money.

Boulder County passed WUI code. Superior passed WUI code. Even Loveland recently passed WUI code. Louisville stands out alone in its shortsightedness.

Regards,
Tawnya Somauroo

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City Council

July 30, 2024

Wildland Urban Interface (WUI) and Home Hardening Building Codes

Discussion/Direction

WUI and Home Hardening Building Codes

- **Wildland Urban Interface (WUI) Building Code** – Regulates the built environment (buildings, landscaping, emergency access, water supply, etc.) where development abuts wildland areas with vegetative fuels to limit the potential for spread of a wildland fire.
- **Home Hardening Building Code** – Regulates building construction to limit potential for conflagration fires, which is the uncontrolled spread of fire from building to building.

How Wildfires Spread



How Fire Spreads in the WUI

PREVENTING OR ISOLATING FIRE THROUGHOUT A COMMUNITY CAN SAVE HOMES.

Large destructive fires transition from wildlands into urban/urban-interface conflagrations via radiation, direct flame contact, and ember exposures.

- **Radiant** exposures occur when large flames from either wildfire or structural fires are close to exposed structural elements. The intensity of thermal radiation reduces with increasing distance.
- **Direct flame contact** occurs when flames from nearby fires, such as burning wood piles, vegetation, or structures come in direct contact with structural components.
- **Embers** are responsible for the majority of structure losses in WUI fires. Embers present high fire hazards as they can:
 1. directly ignite exterior structural components by radiant heating.
 2. accumulate and the pile of smoldering embers can ignite the fuel which may transition to flaming.
 3. penetrate the structure via openings and ignite flammable components within the structure.
 4. ignite vegetative fuels and other combustibles.
 5. spread fire hours after the "fire front" has passed.

How Wildfires Spread

TABLE 502.1 FIRE HAZARD SEVERITY

FUEL MODEL ^b	CRITICAL FIRE WEATHER FREQUENCY								
	≤ 1 Day ^a			2 to 7 days ^a			≥ 8 days ^a		
	Slope (%)			Slope (%)			Slope (%)		
	≤ 40	41-60	≥ 61	≤ 40	41-60	≥ 61	≤ 40	41-60	≥ 61
Light fuel	M	M	M	M	M	M	M	M	H
Medium fuel	M	M	H	H	H	H	E	E	E
Heavy fuel	H	H	H	H	E	E	E	E	E

E = Extreme hazard;

H = High hazard;

M = Moderate hazard.

^a. Days per annum.

^b. Where required by the code official, fuel classification shall be based on the historical fuel type for the area.

How Wildfires Spread

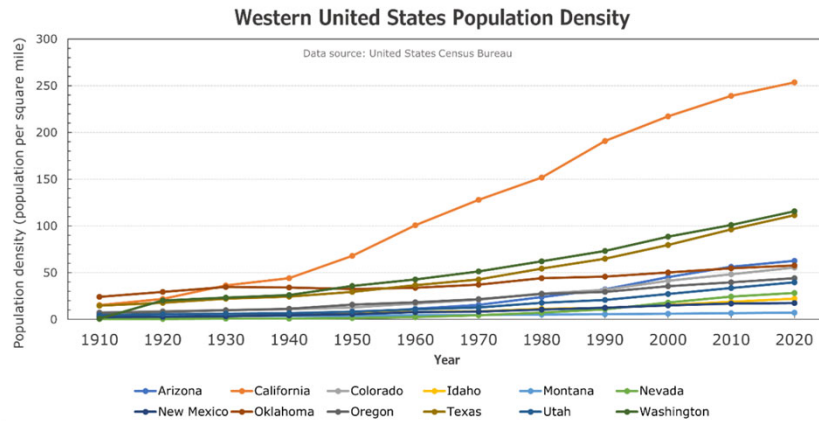


Figure 1: Time history of population density across thirteen western US states. Data source: US Census Bureau

How Wildfires Spread

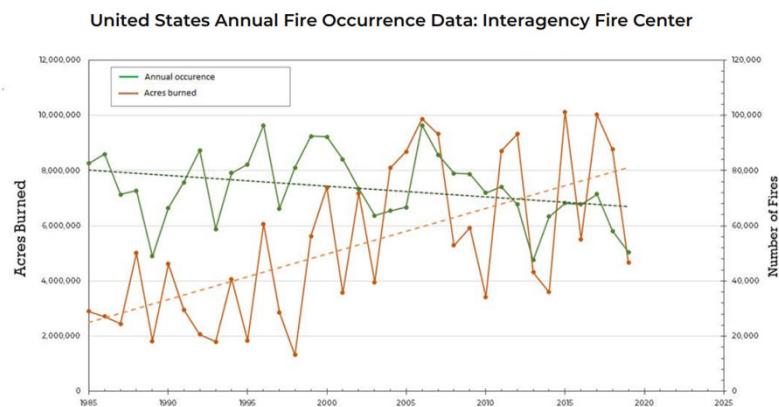
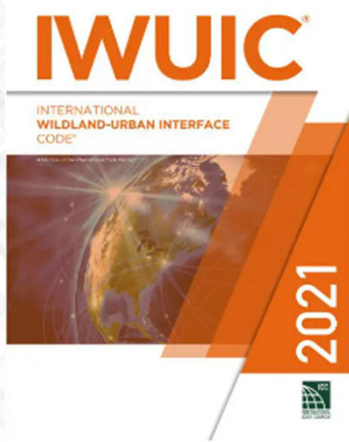


Figure 5: Number of fires (green) and acres burned (brown) since 1985. Linear trend lines (dashed) are also included. Data courtesy of the Interagency Fire Center.

International Wildland Urban Interface Code (IWUIC)



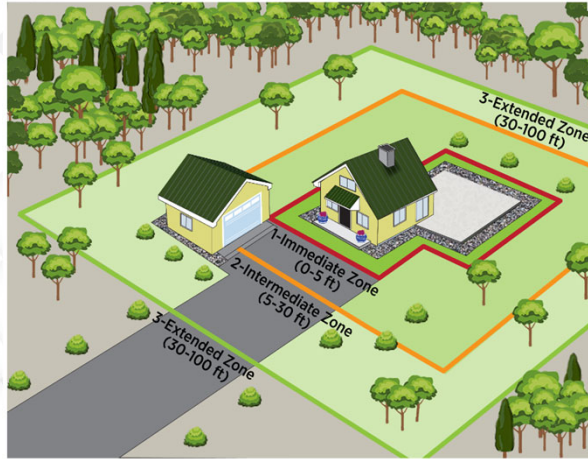
- Identify WUI – Map areas with wildland vegetation subject to regulation
- Area Requirements – Access and water supply
- Defensible Space – Landscaping, debris and storage of materials
 - ✓ 30-foot minimum distance for moderate fire hazard areas
- Building Construction – Ignition resistant materials and systems
 - ✓ E.g. Class A roofs, vent covers, wall and eave materials, tempered and double-pane windows, decking materials

International Wildland Urban Interface Code (IWUIC)



Figure 11. Importance of 0-5 ft noncombustible zone (home ignition zone) for a home under ember attack.

International Wildland Urban Interface Code (IWUIC)



International Wildland Urban Interface Code (IWUIC)

TABLE 503.1 IGNITION-RESISTANT CONSTRUCTION^a

DEFENSIBLE SPACE ^c	FIRE HAZARD SEVERITY					
	Moderate Hazard		High Hazard		Extreme Hazard	
	Water Supply ^b		Water Supply ^b		Water Supply ^b	
	Conforming ^d	Nonconforming ^e	Conforming ^d	Nonconforming ^e	Conforming ^d	Nonconforming ^e
Nonconforming < 30ft	IR 2 Class 2	IR 1	IR 1	IR 1 N.C.	IR 1 N.C.	Not Permitted
Conforming ≥ 30ft	IR 3 Class 3	IR 2	IR 2	IR 1	IR 1	IR 1 N.C.
1.5 x Conforming ≥ 45ft	Not Required	IR 3	IR 3	IR 2	IR 2	IR 1

a. Access shall be in accordance with Section 403.

b. Subdivisions shall have a conforming water supply in accordance with Section 402.1.

IR 1 = Ignition-resistant construction in accordance with Section 504.

IR 2 = Ignition-resistant construction in accordance with Section 505.

IR 3 = Ignition-resistant construction in accordance with Section 506.

N.C. Exterior walls shall have a fire-resistance rating of not less than 1 hour and the exterior surfaces of such walls shall be noncombustible. Usage of log wall construction is not allowed.

c. Conformance based on Section 603.

d. Conformance based on Section 404.

e. A nonconforming water supply is any water system or source that does not comply with Section 404, including situations where there is no water supply for structure protection or fire suppression.

Source: National Association of Homebuilders

International Wildland Urban Interface Code (IWUIC)

Table 6 Cost Impact Summary, Two-Story House

Component*	Southern California		Colorado		Eastern Texas	
	Low Cost	High Cost	Low Cost	High Cost	Low Cost	High Cost
Roof covering	\$0	\$0	\$0	\$0	\$0	\$0
Soffit and Fascia	\$1,247	\$1,247	\$1,323	\$1,323	\$1,235	\$1,235
Gutters and Downspouts	\$470	\$470	\$499	\$499	\$466	\$466
Exterior wall (siding)	(\$5,628)	\$31,364	(\$5,969)	\$33,265	(\$5,571)	\$31,047
Windows	\$2,509	\$2,678	\$2,661	\$2,840	\$2,483	\$2,651
Door	\$0	\$0	\$0	\$0	\$0	\$0
Vents	\$386	\$386	\$410	\$410	\$382	\$382
Total impact for house components	(\$1,016)	\$36,146	(\$1,077)	\$38,337	(\$1,005)	\$35,781
Exterior Deck	\$1,293	\$1,293	\$1,371	\$1,371	\$1,280	\$1,280
Defensible space	\$1,550	\$1,550	\$1,644	\$1,644	\$1,534	\$1,534
Automatic Sprinklers	NA	NA	\$4,311	\$6,743	\$4,024	\$6,294
Total	\$1,827	\$38,989	\$6,248	\$48,095	\$5,832	\$44,888

**Net Zero Code Cost Estimate: Average of \$19,780 above base code



Community-Wide Home Hardening Building Code

Louisville Fire Projection District Request

Dear Mr. Mayor and City Council,

I believe the City will be reviewing and adopting new building codes this fall. The Louisville Fire Protection District would like to suggest adopting an amendment to help the Fire District protect homes. The amendment would have the following items for home hardening;

- Class A roof
- Double or triple-pane windows
- Fire resistance siding
- Fire resistance decking
- Fire resistance fencing within 5 ft of the home
- Small screen over attic vents

These items would be required only if it was new construction or if the above item is being replaced.



Community-Wide Home Hardening Building Code

- *Class A Roof*: Not required by base code, but standard roof type installed in city
- *Double or triple-pane windows*: Double-pane required by energy code
- *Fire resistance siding*: \$0-\$33,665. Depending on comparison siding material there could be cost savings (e.g. natural wood vs fiber cement siding).
- *Fire resistance decking*: \$1,371
- *Fire resistance fencing within 5 ft of the home*: Not addressed in NAHB report. Staff estimates approximately \$500-\$1,000
- *Small screen over attic vents*: \$410

Community-Wide Home Hardening Building Code

SUBURBAN WILDFIRE ADAPTATION ROADMAPS

A PATH TO COEXISTING WITH WILDFIRES
November 2021



IBHS RESEARCH

Community Mitigation Planning and Education



Wildfire Partners Expands Services to East County Residents

Wildfire Partners hosted a [Community Mitigation Planning Information Session](#) on Dec. 12, 2023. The meeting was recorded and [posted online](#).

The information on this page applies to homeowners of Boulder County outside the City of Boulder

Your community is located in Unincorporated Boulder County, Erie (Boulder County portions), Jamestown, Lafayette, Longmont, Louisville, Lyons, Nederland, Superior and Ward.



Discussion/Direction

- ✓ Development of a WUI building code limited to regulating development adjacent to wildland areas?
- ✓ Development of a Home Hardening building code that is broadly applicable to all development in the city?
- ✓ Development of both a WUI and Home Hardening building code?
- ✓ If not adopting a WUI or Home Hardening build code, expand and continue programs for community mitigation planning and technical assistance?
- ✓ Other options?