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Wildland-Urban Interface Codes in Colorado:

Perceptions & Messaging for a Statewide Building Code

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WUI Codes in Colorado

Perceptions & Messaging for a Statewide Building Code

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About Headwaters Economics

Headwaters Economics is an independent, nonprofit research group whose mission is to improve community development and land management decisions. https://headwaterseconomics.org/

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Executive Summary

Wildfires are a natural part of Colorado's environment, but their increasing destructiveness is driven in part by expanding development in the wildland-urban interface (WUI) — the area where homes and flammable vegetation intermingle. With 30 to 45 percent of Colorado homes in the WUI and numbers rising, the state is developing a WUI regulatory code to enhance wildfire safety, set for adoption in July 2025. This code will complement local fire and building regulations to ensure new development accounts for wildfire risk.

Headwaters Economics partnered with the University of Colorado-Denver's Center for Community Safety and Resilience to research the challenges and opportunities in adopting a statewide WUI code. The study examined two key questions: (1) What are the main barriers to adopting WUI building codes in Colorado? and (2) What messaging or policy tools could help address these barriers? Research methods included legislative analysis, interviews, and surveys of stakeholders in government, construction, and real estate.

Findings indicate more support than opposition for a statewide WUI code, with over 40% of respondents in favor and fewer than one-quarter opposed. Fire professionals and individuals working in local government showed the strongest support, while individuals employed in the construction and real estate industries were split. Regulations for ignition-resistant construction and emergency access were widely accepted, while zoning requirements and sprinkler mandates were more controversial.

Concerns about a WUI building code include uncertainty about the code's scope, its impact on local wildfire planning efforts, and potential increases in housing costs. Effective adoption will require early and ongoing engagement with stakeholders, clear communication about the benefits, and messaging tailored to different audiences.

Enforceable WUI codes are one of the most effective tools for wildfire resilience. This research provides insights to support the development of a strong, practical statewide WUI code for Colorado.

1. Wildland-Urban Interface (WUI) & Colorado's WUI Code

Wildfires are a natural and necessary ecological process in the western U.S., but they have become increasingly destructive, threatening communities, properties, and businesses.[1] Since 2010, more than 4,000 homes and other structures have been destroyed by wildfires in Colorado.[2] A major factor is expanding development in the wildland-urban interface (WUI)—the area where homes and flammable vegetation meet and intermingle. The WUI is growing faster than other land use types, increasing wildfire risk.[3]

A WUI code is a regulatory tool designed to reduce wildfire risk through requirements for home construction, vegetation management, emergency access, and infrastructure. WUI codes complement local fire and building codes. The responsible local authority is usually the building department, fire district, or land use department. These codes, often adopted at the local level, are increasingly being considered at the state level to ensure consistency in wildfire resilience.

Research consistently demonstrates that WUI codes are both highly effective in reducing risk and cost-efficient. Post-fire analyses show that homes built to wildfire-resistant standards—including those with defensible space—more often survive fires and have a lower risk of damage than neighboring properties.[4] In California, homes built to meet the state's WUI Code were 40% less likely to be destroyed than homes built before the standards took effect.[5] Additionally, studies indicate that the cost of constructing new homes to meet wildfire safety standards are comparable to traditional construction methods.[6,7] At a broader scale, investing in WUI Codes can yield significant savings—for every $1 spent a community can save $4.[8]

What is a WUI code?

A Wildland-Urban Interface (WUI) code is an ordinance with safety standards intended to prevent loss of life and property from wildfire in a specified area. It typically addresses structure density and location, building materials and construction, vegetation, emergency vehicle access, water supply, and fire protection.

Benefits of a WUI code may include:

- Safer neighborhoods
- Regulatory predictability
- Stronger municipal plans
- Reliable infrastructure
- Reduction of future damages and loss
- More available and affordable homeowner insurance

In 2023, the Colorado legislature approved legislation to pursue a statewide WUI code, set for adoption by July 2025. [9] In 2023, Senate Bill 166 (SB23-166)[10] established a Wildfire Resiliency Code Board to define the WUI, adopt minimum wildfire safety standards, and establish enforcement procedures. The Board includes representatives from building trades, local governments, fire services, hazard mitigation, insurance, and utilities. Jurisdictions identified as WUI will be required to adopt the statewide standards within three months of their finalization.

To inform this process, Headwaters Economics partnered with the University of Colorado-Denver's Center for Community Safety and Resilience to analyze barriers to adoption and strategies for engagement. Successful implementation will require clear communication, stakeholder involvement, and policies that balance safety with economic considerations.

2. Research Methods

This study used a mixed-methods approach to understand and inform the development of a WUI code in Colorado, as well as any associated legislative or stakeholder engagement efforts. Specifically, the following research questions guided this study:

1. What are the likely barriers and points of opposition to adopting WUI (wildland-urban interface) building codes in CO?
2. What messaging or policy tools may help overcome these barriers/opposition?

To answer these questions, we focused our research on professionals in sectors that are the most likely to engage in the debate over WUI code development and passage. This included the private sector (e.g., builders, architects, realtors, other construction industry, etc.) and the public sector (e.g., local governments). We used three methods to collect data: legislative document analysis, interviews with key stakeholders, and a written statewide survey.

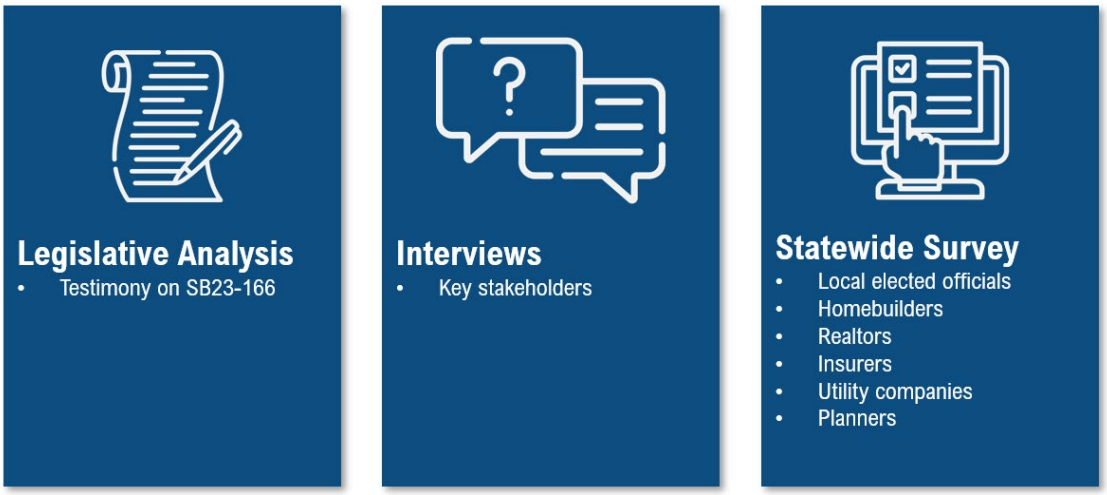

Figure 1: Methodological approach used in the study.

Legislative analysis

We examined legislative records including all witness testimony to identify individuals who were involved in legislative advocacy for or against SB23-166.

- 22 individuals representing 20 entities testified in support of SB23-166.
- 7 individuals representing 7 entities testified against SB23-166.
- 9 individuals representing 9 entities testified neither in support nor against SB23-166 while offering suggested amendments to the bill's language.

Legislative testimony data were analyzed using thematic coding.

Interviews with key stakeholders

We interviewed a subset of 6 key stakeholders from groups who organized or testified about SB23-166 to understand policy preferences, including major points of opposition, and determine whether specific messaging or policy solutions can change the level of opposition to a potential Colorado WUI code. Individuals were interviewed over the telephone, Zoom, and in person in the spring of 2024 using a standard list of questions. Interview data were analyzed using thematic coding and informed the development of a statewide stakeholder survey.

Statewide stakeholder survey

Data from in-depth interviews informed the development of an online survey that was distributed in the summer of 2024. A full copy of the survey is attached as Appendix A. Surveys were distributed to the following groups:

- Stakeholders identified as having participated in prior efforts to lobby WUI legislation in Colorado, or individuals in similar positions within regional and/or domain equivalent organizations. This included local governments, homebuilders, utilities, insurance.
- Local government building code officials and/or planners who would be responsible for implementing the eventual WUI code. This group included a mix of local governments selected for their size and location within the traditionally defined WUI.
- Local government planners across the state.

Surveys were distributed by email invitation to a total of 218 subjects. We received 42 responses, or a 19.3% response rate (Table 1). Survey data were analyzed using descriptive and inferential statistics and grouped by six professional sectors: the building and construction industry, fire professionals, local government officials, real estate industry, utility industry, and other (e.g., state government agencies, advocacy groups).

Table 1: Survey respondents

Professional Sectors	Number of Responses	Share of Total Responses
Local government	10	24%
Fire professional	11	26%
Real estate	10	24%
Building & construction	7	17%
Other	2	4%
Utility	2	4%
Total	**42**	**100%**

3. Results: Perceptions about WUI Codes

This section summarizes results from the survey pertaining to perceptions about WUI Codes, highlighting relevant insights from the interviews and legislative analysis. Representative quotes (anonymized) are included when they illustrate themes heard from multiple subjects. We summarize results into three key themes: trends of support and opposition for a code overall, for specific code components, and for potential enforcement mechanisms.

Overall Support and Opposition for a Statewide WUI Code

Overall, there is more support than opposition for a statewide WUI Code among respondents, though support varied by stakeholder category.

There is more support than opposition for a WUI Code

As shown in Figure 2, there is more support a than opposition for a statewide WUI code among respondents, with considerable neutrality. Overall, 42% of survey respondents supported a statewide WUI Code, 22% were opposed, and 36% were neutral.

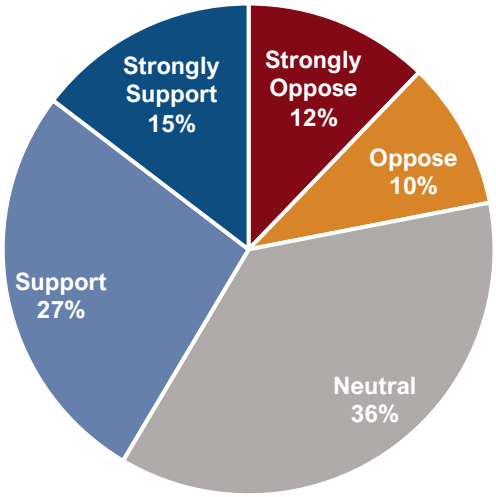

Figure 2: Survey responses to the question: Do you support or oppose the development of a WUI code in Colorado?

Support varies by professional sector

In the survey, support was strongest among fire and local government professionals (Figure 3). Real estate and building and construction industry professionals were split in their level of support or opposition. During the legislative process, local governments represented the most active group opposing SB23-166. Their position during the survey may signal a shift toward support, appeasement from board representation, uncertainty about code specifics being considered by the board, or reflect the unique perspective of interview respondents.

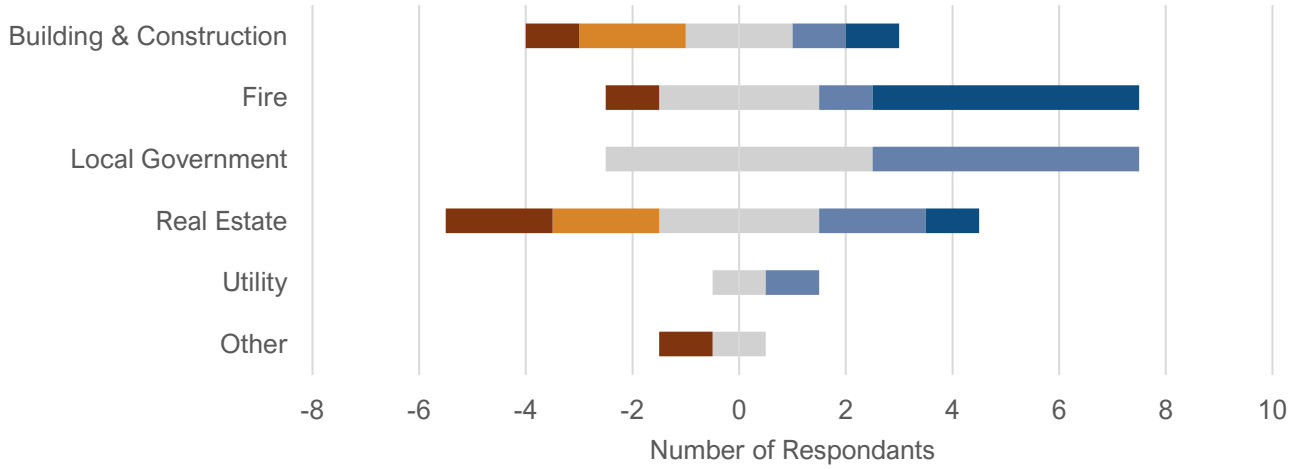

Figure 3: Level of support for a statewide WUI code by professional sector.

Support was centered on standardization and the need for cross-boundary approaches

Supporters acknowledged that having standardized regulations can be beneficial, and the cross-boundary nature of wildfire requires a landscape scale approach.

> *"I don't want to frame it all in kind of this local government control versus state control because I do think there are some things that, when standardized at a state level, certainly are beneficial to everyone."*
> - Local Government

> *"We need to acknowledge the risks that we can't address and start to implement solutions that will serve the greatest good.... Wildfire is not a municipal problem or county problem or even a state problem. We know it is a national problem. We have an opportunity to put our state on the right path to addressing this challenge."*
> - Fire Professional

Opposition and concern are centered on uncertainty, local control, costs, accountability, and capacity

Uncertainty. Several respondents acknowledged lack of support was due to uncertainty given where the Board was in its process. This also reflects testimony heard during the legislative process, which often expressed concern about the makeup of the board.

> *"State regulations can be really good and sometimes they can be really limiting. I think it depends on what the outcome of the Board's work is going to be. I think there's a lot of unknowns... at this point in time."*
> - Local Government

Local control & existing regulations. Several respondents noted that local government had already developed plans and codes to mitigate wildfire risk and expressed concern about how a statewide code may interact with previous, localized efforts.

> *"We're concerned that communities who have already invested in establishing codes and policies in their communities will be forced to change their programs."*
> - Local Government

> *"I think the other component is, is trying to understand how state code will interface with some very specific hazard mitigation plans that communities are required to create. So every community has... a hazard mitigation plan. It's required to be done every five years. We certainly have one. Ours is multi-jurisdictional. And it speaks to things like wildfire mitigation, hazard reduction planning."*
> - Local Government

Costs. Respondents expressed concern about the cost for home development and impacts to homeowner insurance.

> *"...the energy code, for example, that the state just passed, that will be a very significant, and is already going to be a very significant cost, for home development here. And there's good and bad to that, but there will be more costs, right? With protecting certain structures at a higher level than what I presume is already required. And so, oftentimes local governments have those difficult conversations...What's of greatest value -- to have a more affordable home or a more... wildfire-protected home?"*
> -Local Government

"… I've listened to builders like myself and realtors who complain that our business would be destroyed. It never was, and it put money back in the customer's pockets. So when we look at the benefits of fire resiliency, the ability of buildings to survive, the people in them to survive, the likelihood that they'll be able to get property insurance at lower cost, and cost avoidance of rebuilding with demolition and decontamination."
-Construction/Local Government

"…the insurance industry has the biggest stick in all of this. If folks can't get insured because of their risk, they will have to mitigate their risk or lose their insurance. They would have to pay in cash or forgo hazard insurance altogether."
-Construction/Trade

Federal land management accountability. Some respondents expressed lack of support stemming from concern that the responsibility for wildfire risk falls to federal land managers.

I think the concern about how our public lands are managed is one that we hear a bit from our agricultural community, but also development community... if... the feds manage their lands better, it wouldn't be such a hazard area for private property that abuts, or is close to."
-Local Government

Enforcement capacity. Local government officials expressed concern about having the capacity to manage and enforce the code.

"Enforcement and compliance of the adopted Board's decision will fall on local governments that are already strained from numerous other state requirements."
-Local Government

"The bill also places the burden of enforcement of those codes squarely on the backs of municipalities, without regard for the additional costs and resources that this will incur."
-Local Government

Levels of support for individual code components

WUI codes can govern multiple components that contribute to wildfire risk, from housing arrangement and spacing to construction materials, road design, and water supply. Survey respondents were asked if they supported different components of the code in different areas of wildfire risk.[1]

Respondents generally opposed interior and exterior sprinkler systems, but showed broad support for other requirements. Code components regulating ignition-resistant new construction and road widths had strong support across all risk areas and sectors. Trends of support for individual components did not vary significantly across areas of extreme and high risk, but did decline for areas of moderate risk (Figure 4).

[1] Wildfire risk areas were defined as follows: **Extreme risk:** "areas that have heavy fuels and steeper slopes and are considered the highest risk for wildfire." **High risk:** "areas that have moderate fuels and steep slopes and are also considered to be at risk from wildfires, but not at the same extent as extreme risk areas." **Moderate risk**: "areas that have lighter fuels and moderate slopes and somewhat lower levels of wildfire risk."

Level of support by code component & risk level

Code Component	Extreme Risk	High Risk	Moderate Risk
Ignition-resistant new construction	79%	73%	51%
Road width	77%	76%	63%
Ignition-resistant attached structures	71%	70%	54%
Water Supply	68%	70%	59%
Vegetation Management	66%	65%	46%
Ignition-resistant unattached structures	61%	57%	46%
Zoning and land use	61%	51%	42%
Interior sprinkler	37%	29%	30%
Exterior sprinkler	19%	19%	8%

Figure 4: Level of support for individual WUI code components by wildfire risk level.

Trends were generally the same across public and private sectors (Figure 5), though support for individual components was stronger in the public sector overall.

Level of support by code component & sector

Code Component	Private Sector	Public Sector
Ignition-resistant new construction	69%	86%
Road width	69%	83%
Ignition-resistant attached structures	50%	86%
Water Supply	53%	78%
Vegetation Management	56%	70%
Ignition-resistant unattached structures	38%	77%
Zoning and land use	44%	51%
Interior sprinkler	19%	50%
Exterior sprinkler	25%	15%

Figure 5: Level of support for individual WUI code components by sector

Levels of support for enforcement mechanisms

Survey-takers were asked what type of enforcement mechanisms they support including in the WUI code. Written notices, progressive fines, and property liens were significantly more popular options than fines or abatement cost recovery (Figure 6).

Level of support for enforcement mechanisms

Mechanism	Support
Written notice with timeline for resolution	81%
Progressive fine that increases over time	51%
Property lien for unpaid fines	42%
Abatement cost recovery (government resolves and bills property owner)	31%
One-time monetary fine	26%

Figure 6: Level of support for potential enforcement mechanisms.

4. Results: Messages about WUI Codes

This section summarizes results from the survey pertaining to whether certain types of communication strategies could help garner greater levels of support for a WUI code. To test communication strategies, we used a survey experiment that randomly assigned survey respondents to different narrative "treatments," or different ways of communicating about the importance of a WUI code (Figure 6). Different narrative treatments were tested against a control message that contained only basic facts (shown in green in Figure 6).

To test narratives, respondents were randomly assigned to one of several message groups. The control group received only a basic problem statement and facts about WUI codes (shown in green in Figure 6). Other groups received the same baseline information, plus one of two types of additional messages: (a) an impact message—either about the public tax burden or the destruction of homes and businesses—and (b) a "hero" message, which framed the respondent's own sector (e.g., local government or the building industry) as playing a key role in reducing wildfire harm. Research on persuasive public policy messaging suggests that narratives featuring heroes, or actors who fix ongoing harms, are generally more persuasive than other types of narratives. After viewing their assigned narrative, respondents were asked how supportive they thought others in their industry would be of WUI codes.

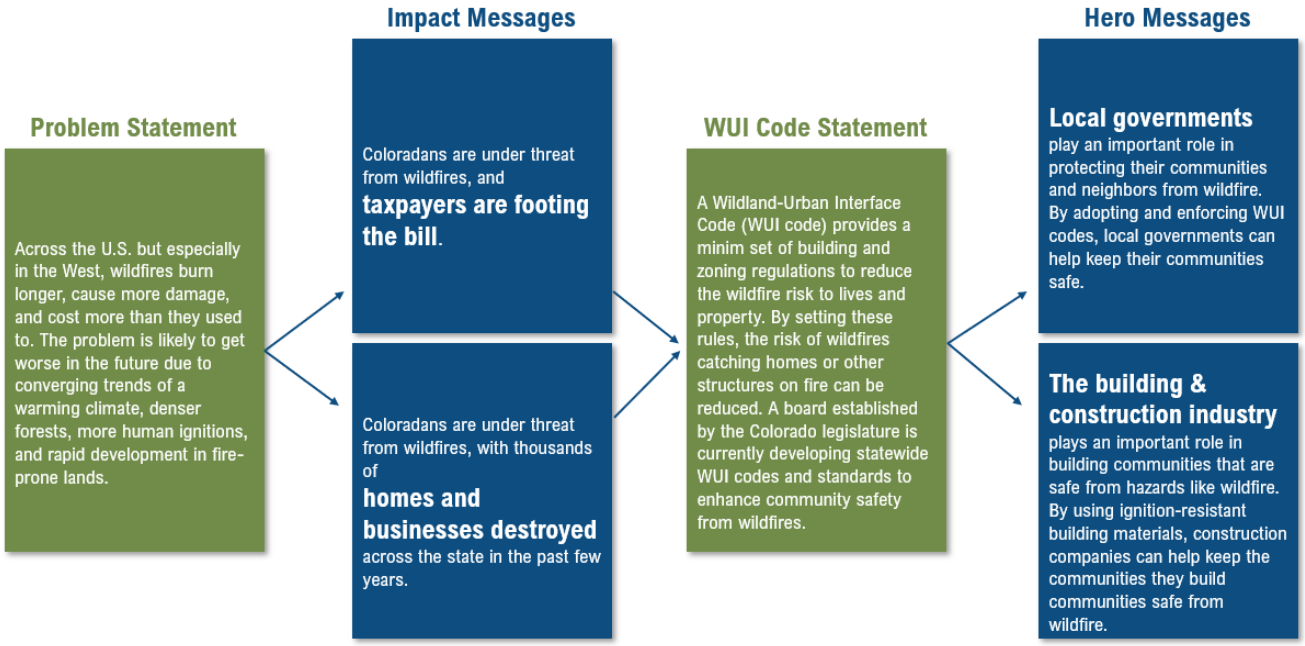

Figure 7: Narrative treatments included in the survey, providing respondents with different "impact" messages and "hero" messages.

Messaging that centers heroes improved private sector response

Individuals who work in private industry responded positively to narratives that treated builders as the heroes for implementing wildfire safe building practices. The impact of damage to homes and businesses was slightly more compelling than the impact to taxpayers.

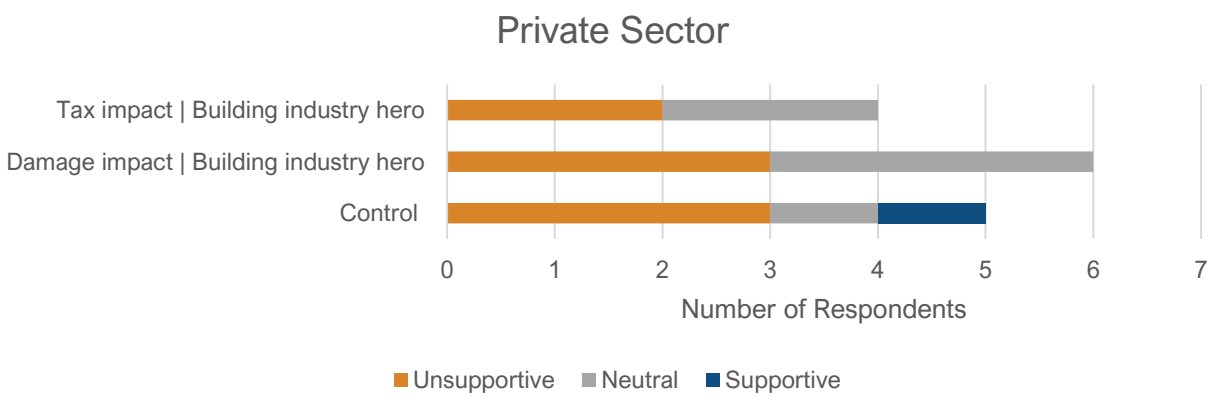

Figure 8: Public sector responses to different narrative treatments.

Facts-only messaging resonated most with the public sector

Those who work in public service responded less positively to either treatment, instead showing the most support for the "facts only" control narrative. Although the two narrative treatments were close in their persuasiveness for public service survey takers, the argument that taxpayers bear the burden was slightly more effective.

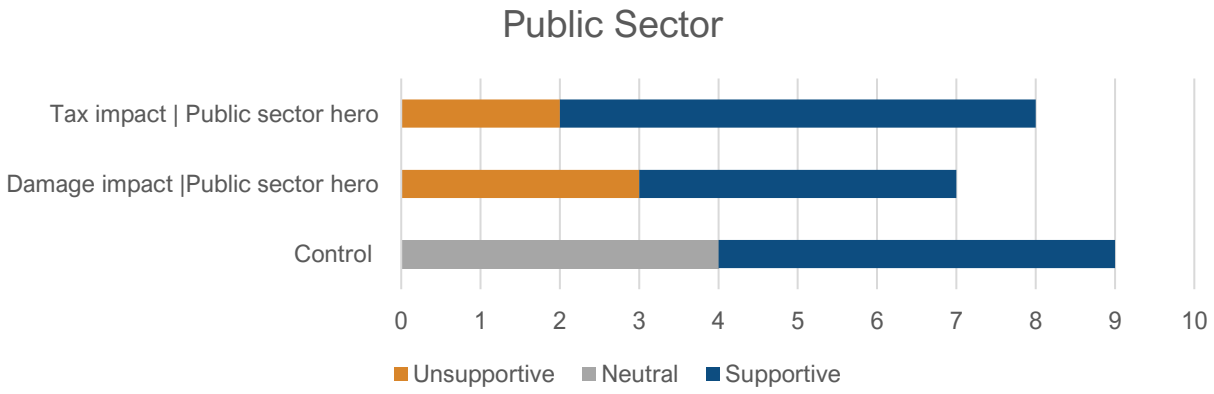

Figure 9: Private sector responses to different narrative treatments.

5. Discussion and Recommendations

This study captures current attitudes of key stakeholders in Colorado toward WUI codes and tests the efficacy of different communication strategies. Results may be useful as the state develops a statewide WUI code.

Key findings include:

- There is more support than opposition for a statewide WUI code in Colorado. More than 40% of respondents support a statewide code while fewer than one-quarter are opposed.
- Fire professionals and local government staff are the most supportive of a WUI code. The building/construction and real estate sectors are split.
- Support for specific components of a WUI code (e.g., ignition-resistant construction, vegetation management, interior sprinklers) does not vary significantly across the levels of wildfire risk.
- Some code enforcement mechanisms are preferred over others. The most popular enforcement action was a written notice with a timeline for resolution. The least popular was a one-time monetary fine.
- Qualitative data indicate that uncertainty about the scope and content of a statewide code is a major concern.
    - Respondents worried about what the code will include and where it will apply.
    - Many local governments have already done significant work on wildfire risk in their areas and worry about how new regulations will impact their local plans.
    - Cost of implementation and potential increase in housing costs are also concerns for stakeholders in real estate and building groups.
- WUI code regulations with the most expansive scope are the least popular. In this study, sprinkler requirements and zoning rules were the least popular of the potential wildfire mitigation strategies. Requirements for ignition-resistant construction, rules focused on emergency access, and even vegetation requirements were all more popular.

Stakeholder support is crucial for successful adoption of a WUI code. This study examined effective messages to garner support for new regulations. Findings for the communications component of this study include:

- Tailoring messages for different audiences may help generate support
- Impact messaging that frames people's suffering and that frames taxpayer burden are both effective.
- Centering the audience as a potential hero is especially effective for the private sector (e.g., "builders using ignition-resistant materials help keep communities safe).

Given the findings summarized here and presented in this report, we recommend that the Wildfire Resiliency Code Board consider the following recommendations when developing the Colorado WUI code, and that advocates for the code consider these recommendations in their advocacy:

1. Give due consideration to stakeholder concerns. Uncertainty around the results of the Board process is widespread, as is the concern about overreach in areas where local governments have already done considerable risk mitigation work. Look for listening opportunities with stakeholders.

2. A statewide WUI code can be the starting point. We recommend the Board consider the statewide code to be a floor beneath which local governments cannot go, but above which they are welcome to act. This would allow local governments that have completed successful and robust planning to mitigate fire risk to be assured their work was not in vain. Engage with communities that have already adopted local codes to explore how a statewide code can support their prior actions.

3. Use data to craft policies with broad support. If the Board implements the less popular policy tools (i.e., sprinklers, zoning requirements), we recommend it does so with a focused and clear campaign of communications to explain the necessity of these rules.

4. Prioritize transparent, ongoing stakeholder engagement. As the Board and the state roll out the WUI code, stakeholder engagement and outreach will be critical. We recommend that the Board work with the state and the governor to ensure that all stakeholder groups are engaged when a draft of the code is released. Specific and clear talking points must address the necessity of the code, mapping strategies, and the reasons for specific provisions that may be perceived as broad or onerous.

5. Develop persuasive messages for specific audiences. For example, public agencies and builders can play heroic roles to prevent wildfire disasters in Colorado. Highlight the impact to people's lives and the harm of inaction.

Appendix A: Survey Questions

Organization

1. What is your organization affiliation?

2. What best describes the sector within which you work?

Existing Codes (questions provided only if *respondent was local government or fire professional)*

3. Does your community have existing codes that specifically address wildfire risk (i.e., a WUI code, building code, zoning code, fire code)?

4. When was that code adopted or last updated?

Prior & current involvement in wildfire code issues

5. Were you aware that the state of Colorado established a board that is developing a state-wide WUI code?

6. Do you have an opinion about the development of a statewide WUI code?

7. Have you personally been involved in efforts to lobby, testify, or otherwise provide input to policymakers about the WUI code?

8. Has your company, organization, or a professional association been involved in efforts to lobby, testify, or otherwise provide input to policymakers about the WUI code?

9. Do you plan to be involved in providing feedback on the WUI code when a draft is released?

10. Does your organization plan to be involved in providing feedback on the WUI code when a draft is released?

11. Please tick how strongly you agree or disagree with the following statements related to the development of the WUI code. Note that this is not focused on the legislative process that took place in 2023, but on the current development of the actual code.
    A. Colorado's WUI code development process has been transparent and information is available to know what is happening.
    B. Colorado's WUI code development process has been open and I can participate if I want to
    C. Colorado's WUI code development process has been fair and all perspectives are welcome.
    D. There has been a high-level of stakeholder participation in Colorado's WUI code development process.

Policy tools & levers

12. Policy tools in a WUI Code can include the following:
    - Building codes that require new construction to be ignition-resistant (e.g., shingles, siding, etc.)
    - Building codes that require new attached structures to be ignition-resistant (e.g., fences, decks)
    - Building codes that require new unattached accessory buildings to be ignition-resistant (e.g., sheds, ADUs)
    - Road width standards for emergency vehicle access
    - Water supply standards for emergency use

- Vegetation management requirements within 100 ft of a home or building (e.g., establishing defensible space)
- Interior sprinkler system requirements for new construction
- Exterior sprinkler system requirements for new construction
- Zoning and land use standards (e.g., housing density requirements, neighborhood design, etc.)

13. Indicate your level of support for each of the policy tools in each wildfire risk area:
    a. Extreme risk areas: these areas have heavy fuels and steeper slopes and are considered the highest risk for wildfire
    b. High risk areas: these areas have moderate fuels and steep slopes and are also considered to be at risk from wildfires, but not to the same extent as extreme risk areas.
    c. Moderate risk areas: these areas have lighter fuels and moderate slopes and somewhat lower levels of wildfire risk.

14. Please indicate how you believe each code or standard might impact your work or organization if it was required in the community (or communities) where you work.

15. The Colorado WUI code will require local governments to adopt WUI codes that meet or exceed a state minimum. Below are some potential enforcement approaches that have been included in other WUI codes around the U.S. to ensure compliance. Please read through this list and indicate your support of each tool.
    a. Written notice of violation (with timeline for resolving the issue)
    b. Abatement cost recovery (government works to resolve the issue and sends a bill to property owner)
    c. One-time monetary fine
    d. Progressive fine that increases the longer the issue is unresolved
    e. Property lien for unpaid fines

16. If answers to #14 are negative:
    a. You indicated that the code will be difficult to enforce because of the resources needed. Please provide any additional details about what resources your community is lacking to enforce a WUI code.

17. If answers to #14 are positive:
    a. You indicated that you are optimistic about potential positive effects from Colorado's wildfire code. Below are some potential benefits mentioned by stakeholders involved in the wildfire code development process. Please indicate which points you agree with, or provide other points you think are important below.

Beliefs

18. Please indicate your level of agreement with each of the following statements.
    - The risk of wildfire in Colorado has increased over the past 20 years.
    - Wildfire in Colorado is a severe problem.

19. Please drag and drop to order your choices below to indicate your opinion about the nature of wildfire problems in Colorado and what the most important aspects of the problem are, in your opinion.
    - Wildfires in Colorado are an infrastructure problem.
    - Wildfires in Colorado are an economic development problem.
    - Wildfires in Colorado are a public health problem.
    - Wildfires in Colorado are a land use planning problem.
    - Wildfires in Colorado are a public safety problem.

- Wildfires in Colorado are a forest management problem.
- Wildfires in Colorado are a _____ problem (please fill in with your own wording, if there's something we missed).

20. In your opinion, who has the primary responsibility for reducing wildfire risk?

21. To the best of your knowledge, what percent of the community you work in meets the definition of the WUI? If you work in multiple communities, think about the general profile of the communities where you work.
22. As far as you know, do neighboring communities contain more or less area than your own community that could be considered part of the WUI?

Narratives

Respondents are given different narrative treatments to read and then asked the following questions.

23. Based on what you've read and your own experience, how important do you think it is for the State of Colorado to develop a WUI code?
24. How supportive do you think people in your industry or organization would be towards such a WUI code?

Endnotes

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