City of Louisville
COLORADO • SINCE 1878

CITY COUNCIL COMMUNICATION
AGENDA ITEM 10E

SUBJECT: **DISCUSSION / DIRECTION: COLORADO WILDFIRE RESILIENCY CODE AND CITY FIRE HARDENING CODE FOR STRUCTURES**

DATE: **DECEMBER 16, 2025**

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

PRESENTED BY: **ROB ZUCCARO, COMMUNITY DEVELOPMENT DIRECTOR**

SUMMARY:
Staff is presenting information on the State's minimum Wildland Urban Interface (WUI) code for discussion and direction. This discussion is intended to provide City Council with an overview of the State WUI code and provide an opportunity for feedback before staff drafts a local code for the formal adoption process. This review session will introduce the relevant topics, and staff anticipates that additional follow-up meetings and discussions will be needed before drafting a local code for adoption. The draft of the local code will also be reviewed by the Building Code Board of Appeals (BCBOA) before presenting the code to City Council for adoption.

Staff is also seeking direction on if Council is interested in adding defensible-space landscaping standards to the City's Fire Hardening Code for Structures (LMC Chapter 15.70). This code applies city-wide and is separate from the WUI code, which is intended to regulate only the developed areas at the interface with wildland vegetation that present elevated fire risk.

BACKGROUND / PRIOR DISCUSSIONS:

SB23-166
In 2023, the State passed SB23-166, which established the process for developing a minimum State WUI code and set requirements for local adoption of the State code or a local code meeting or exceeding State standards by April 1, 2026, with implementation required by July 1, 2026.

SB23-166 created the Wildfire Resiliency Code Board (WRCB) to develop and administer the State code. The Board membership is made up of a wide range of technical, industry, and local government experts. This includes 21 voting representatives from local municipal and county government, homebuilding and building code professions, fire behavior specialists, fire service professionals, property and casualty insurers, public and private utilities, and land-use planners. Three ex-officio members were also included on the WRCB from the State Forest Service, the State Department of Fire Protection and Control, and the Colorado Resiliency Office.

Development of the State code included extensive public outreach and feedback from the general public, industry representatives, building and fire science experts, local government representatives, and fire service professionals, which all informed the drafting of the code. Public meetings and public hearings were held throughout the State, exceeding the minimum requirements for public input included in the State legislation. The final draft of the code represents a consensus of the broad range of expertise included on the WRCB, extensive public input, and in consideration of the State-wide application of the code.

The WRCB adopted the 2025 Colorado Wildfire Resiliency Code (CWRC) and corresponding map on June 1, 2025, and adopted associated Rules and Regulations on July 1, 2025, establishing the State minimum standards.

Link: SB23-166
Link: Adopted Wildfire Resiliency Code
Link: Adopted Rules and Regulations
Link: Adopted Wildfire Resiliency Code Map (CWRC Map)

The CWRC defines the WUI as:
"That geographical area where structures and other human development meet or intermingle with wildland or vegetative fuels."

The purpose of the State minimum code is to establish standards for development at the interface with wildland or vegetative fuels. It is not intended to provide broader fire-resiliency standards across an urban environment, as Louisville's Fire Hardening Code for Structures (LMC Chapter 15.70) does.

Fire Intensity Classifications
The CWRC establishes and maps three Fire Intensity Classifications: Low, Moderate, and High. These classifications are based on factors including vegetative fuel types, anticipated flame length, terrain and topography, rate of spread and spotting, and suppression difficulty.

The CWRC map was developed with the State Forest Service and is based on the 2022 Colorado Wildfire Risk Assessment (CO-WRA), which is also used for the State Forest Service's Wildfire Risk Viewer. The CWRC Map uses the CO-WRA data and aggregates and "smooths" the base data to account for local variability.

Regulated Elements
The CWRC regulates both Structure Hardening (Chapter 4) and Site and Area Requirements (Chapter 5) for new or existing development within Fire Intensity Classification areas. Site and Area Requirements, commonly referred to as "defensible space" standards, govern landscaping, fencing, storage of materials, and related features around structures.

Two classes of requirements apply:

- Class 1 standards apply to Low-intensity areas
- Class 2 standards apply to Moderate- and High-intensity areas

Low Intensity

Key Characteristics Include:

1. **Fuels**: Light to medium surface fuels, including grasses, shrubs, and scattered vegetation (e.g., WNL, USL fuel types).
2. **Flame Length**: Less than 2 feet.
3. **Rate of Spread**: Low, increasing with *slopes* over 20 percent.
4. **Spotting**: Very short-range spotting is possible under windy conditions.
5. **Terrain Influence**: More active fire behavior on moderate *slopes* (20 to 30 percent).
6. **Suppression Difficulty**: Easily suppressed by trained firefighters using basic protective gear and hand tools. Direct attack is effective, and mechanized support is rarely needed.

Class 1 Structure Hardening and Site and Area Requirements

Moderate Intensity

Key Characteristics Include:

1. **Fuels**: Moderate to heavy fuels, including dense shrublands, small trees, timber litter, and canopy fuels (e.g., USH, UIH fuel types).
2. **Flame Length**: Up to 8 feet.
3. **Rate of Spread**: Moderate to high, increasing significantly on *slopes* over 30 percent.
4. **Spotting**: Short-range spotting is common.
5. **Terrain Influence**: Steep *slopes* (30 percent or greater) increase fire spread and intensity.
6. **Suppression Difficulty**: Challenging for ground crews without support from engines, dozers, or aircraft. Dozers and plows are generally effective on moderate terrain.

High Intensity

Key Characteristics Include:

1. **Fuels**: Heavy fuels, including dense forests, urban core areas with heavy fuel loads, and canopy-dominated regions (e.g., WNH, USH, UCH fuel types).
2. **Flame Length**: Up to 30 feet or more.
3. **Rate of Spread**: Rapid, especially on *slopes* greater than 40 percent.
4. **Spotting**: Short-range spotting is common; medium-range spotting is possible under windy conditions.
5. **Terrain Influence**: *Slopes* over 40 percent amplify intensity and spread, creating dangerous conditions for suppression.
6. **Suppression Difficulty**: Direct attack by ground forces and dozers is generally ineffective. Indirect strategies (backburning, aerial support) are often necessary. These fires present significant danger to life, property, and responder safety.

Class 2 Structure Hardening and Site and Area Requirements

Summary of the Main Provisions of the CWRC

Class 1 – Structure Hardening

Building material and construction standards for:

- Roof coverings
- Gutters and downspouts
- Vent openings

Class 2 – Structure Hardening

Includes all Class 1 standards, plus additional standards for:

- Exterior walls
- Flashing
- Underfloor enclosures
- Decking surface
- Building projections
- Exterior windows
- Exterior doors
- Garage doors
- Detached accessory structures within 50 feet

Class 1 – Site and Area Requirements

Immediate Zone (0–5 feet from structure):

- Noncombustible hard-surface ground cover
- Planting prohibited, except ignition-resistant plants from the State Forest Service's Low-Flammability Landscape Plants list

Additional Class 1 requirements include:

- Tree pruning within 10 feet of structures
- Fences and retaining walls within 8 feet of structures
- Marking roads, fire protection equipment, and addresses

Class 2 – Site and Area Requirements

Includes all Class 1 standards, plus:

Intermediate Zone (5–30 feet)

- Removal of dead plant materials
- Reduction of surface fuel accumulation
- Tree spacing and pruning
- Shrub spacing

Expanded Zone (30–100 feet)

- Tree crown spacing requirements

Additional Provisions

The CWRC includes appendices on Permits, Construction Documents, and Inspections and Enforcement.

The CWRC is not retroactive and includes the following additional provisions:

- Additions to existing structures with a footprint of 500 sq. ft. or more must comply
- Roof covering replacement exceeding 25% of roof area must comply
- Exterior wall replacement exceeding 25% of exterior wall area must comply
- Exemptions and variances are provided for historic structures
- A "Ground Truthing" process allows Code Officials to adjust classifications based on site-specific conditions and vegetative fuels within 300 feet

The Rules and Regulations allow jurisdictions to adopt a local map consistent with State standards. Jurisdictions may also petition the WRCB for code modifications. Local Code Officials may approve alternative materials, designs, and methods that meet the code's intent.

Ordinance No. 1884-2024 – Fire Hardening Code for Structures
On November 4, 2024, City Council adopted Ordinance No. 1884, Series 2024, establishing city-wide minimum fire-hardening standards for all new residential and commercial structures – the Fire Hardening Code for Structures. Adoption followed City Council's July 30, 2024 discussion, which evaluated options for adopting local WUI and structure-hardening codes.

The code regulates the following building systems:

- Roof coverings
- Siding and eave materials
- Deck surface materials
- Vent coverings
- Gutter materials and guards
- Fencing materials (within 5 feet of structures)
- Solar panel screens

The code is intended to address both wildland fires and conflagration fires and was initiated based on a recommendation from the Louisville Fire Protection District. At the time of adoption, City Council was aware that the State WUI code was forthcoming and chose to limit scope pending adoption of a local WUI code.

The 2025 City Council Work Plan includes evaluation of adding defensible-space landscaping standards to the city-wide fire-hardening requirements.

LINK: July 30, 2024 City Council Discussion/Direction Memorandum
LINK: November 4, 2024 City Council Code Adoption Memorandum

ANALYSIS:

Wildfire Spread
Fire spreads from wildland areas to structures through embers, radiant heat, or direct flame contact. Ember spread is the most common mechanism for wildland fire ignition of structures. Embers can ignite fuels around a structure, enter through vents or other openings, or directly ignite exterior building materials. Understanding the most likely pathways for fire to transition from wildlands into urban areas helps prioritize appropriate mitigation strategies. For example, a Home Hardening building code may focus primarily on preventing ember intrusion, since it is the most frequent source of ignition. A WUI code, by contrast, may place additional emphasis on landscaping and vegetation maintenance to reduce the risk of direct flame contact and fire spread through nearby trees or shrubs.

Link: Summary of How Fire Spreads in the WUI (nist.gov)

In addition, three main environmental factors influence wildland fire intensity and spread: topography, weather, and fuel. Steep slopes, channels, and gullies accelerate fire spread, and these natural features offer limited opportunities for mitigation. Weather, particularly wind and drought, also plays a major role in fire behavior and cannot be controlled. During the Marshall Fire, extreme wind and prolonged drought significantly contributed to fire spread both from wildland areas into urban neighborhoods and to the rapid conflagration within the neighborhoods themselves.

The type and amount of vegetation, or vegetative fuel, also affects fire intensity. Different vegetation types produce different ember loads, radiant heat levels, and flame spread characteristics.

Staff Recommended Amendments to CWRC
Staff recommends using the CWRC as the baseline for a local code but recommends adding the following provisions to strengthen the code and align it with the city-wide Fire Hardening Code for Structures:

<u>Add the following provisions to Class 1 – Structure Hardening:</u>

- Fire resistant siding meeting Class A standards.
- Fire resistant eaves meeting Class A standards.
- Fire resistant decking surface, stairs, and railings meeting Class A standards and require the surface below a deck 6 feet or closer to the ground to be concrete or gravel above 6 mil plastic.
- Gutter covers to prevent accumulation of debris.

Add the following provisions to Class 2 – Structure Hardening:

- Fire-resistant siding meeting Class A standards.
- Fire-resistant eaves meeting Class A standards.
- Fire-resistant decking surface, stairs, and railings meeting Class A standards, and a requirement that the surface below any deck located 6 feet or closer to the ground be concrete or gravel placed above 6-mil plastic.

While the City's Fire Hardening Code for Structures only allows Class A exterior materials, the CWRC allows several alternatives to Class A building materials that are considered "Noncombustible." Some of these alternatives are less stringent than Class A standards in order to provide greater flexibility for meeting strengthened standards above base codes, adding to building resilience, while still taking into consideration other factors such as cost, feasibility, design preferences, and a wide range of building types across the State.

The CWRC also only regulates deck surfaces material, but not railings or materials under a deck, as does the City's Fire Hardening Code for Structures. Railings are typically open and do not have the same capacity to collect embers as would a solid property boundary fence. The deck surface material hardening addresses a primary safety concern around egress from the building in case of a fire.

Add the following provision to Class 2 – Site and Area Design:

- Dormant grasses and weeds must be mowed to a height not to exceed six inches

There may also be value in creating additional categories of regulation for Louisville depending on City Council direction. For example, the City could create a third class applicable city-wide that reflects the existing Fire Hardening Code for Structures, either as currently drafted or with amendments, and then establish two additional classes of regulations based on fire-risk levels.

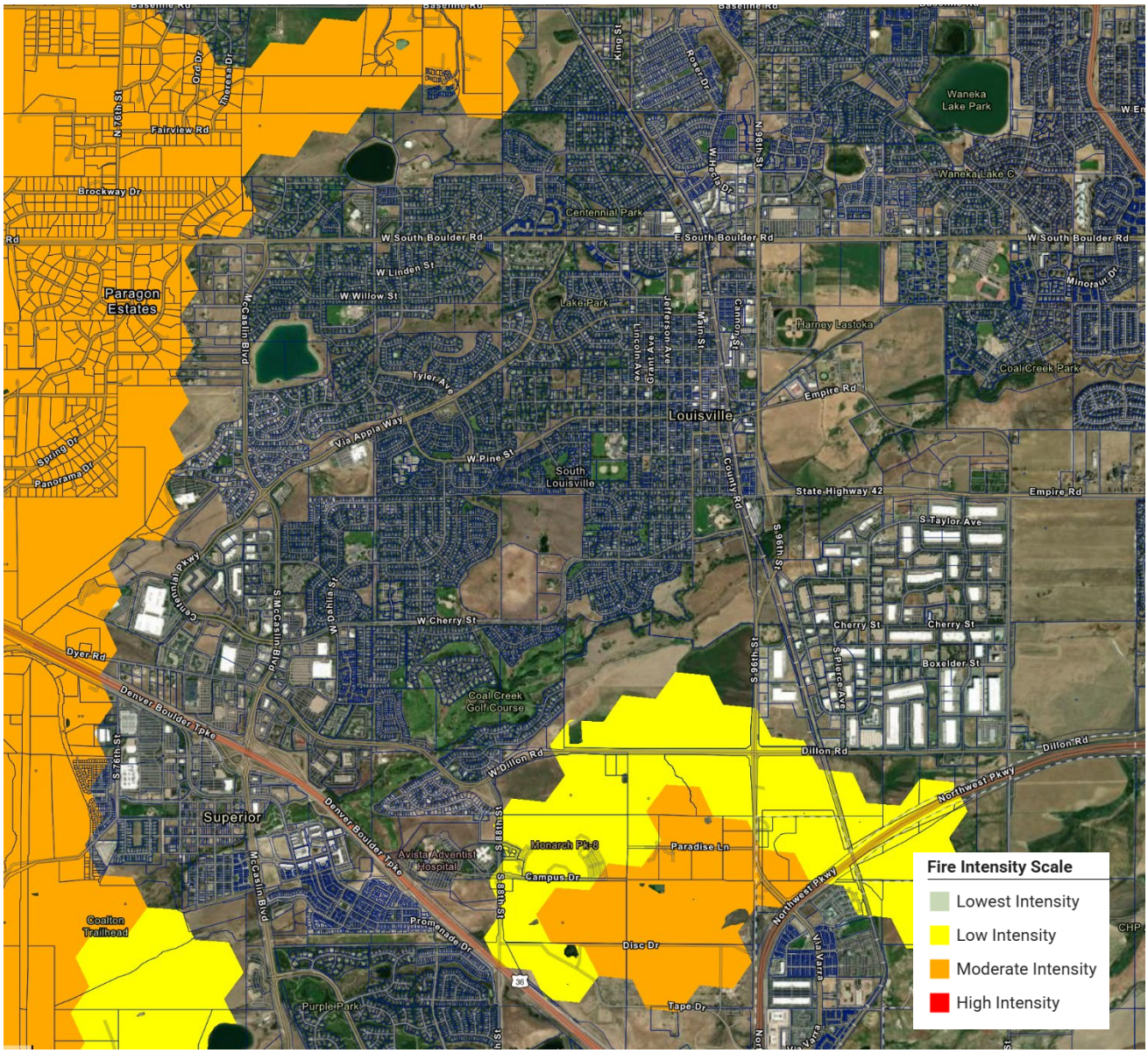
Regulatory Map

The CWRC Map designates the minimum areas subject to the State code standards based on probable fire intensity and the potential for fire spread within those areas. The classification layers have been adjusted using smoothing, filtering, and aggregation techniques to address the granular variability present in the underlying data and to eliminate small "occluded" areas in urban environments that present relatively low risk. As previously discussed, these mapping classifications determine where the Class 1 or Class 2 standards apply.

In Louisville, large areas to the west and north of the City are designated as Moderate Fire Intensity. There is also an area south of the City, including portions of the Warembourg, Bowes, and Admore Open Spaces; the Monarch K–12 Campus; the Coal Creek Medical Campus; Juniper Village Assisted Living; and parts of Redtail Ridge—

that is mapped as Low and Moderate Fire Intensity. There are no areas designated as High Fire Intensity within proximity to Louisville.

Figure 2: 2025 CWRC Map



Council will need to consider if there are desired amendments to this map. The City may consider adopting a map that is more stringent than the CWRC Map or conduct its own study to develop a local map based on the same technical factors used to develop the CWRC Map. The CO-WRA mapping data and the Wildfire Risk Viewer, which provide the baseline data for the CWRC Map, also include several other data layers and more granular data that may inform a local map for Louisville.

In addition, the Louisville Fire Protection District (LFPD) is completing a Wildfire and Conflagration Risk Assessment that is scheduled for completion in early 2026. The study is being conducted by the Ember Alliance in consultation with Dr. Husaam Mahmoud of InFoRM, LLC. Staff has been working with the consultants and LFPD on preliminary modeling that will inform the final assessment. The modeling focuses primarily on conflagration risks but may also provide useful insights into WUI fire spread and structure vulnerability. A conflagration fire is one that spreads uncontrollably from structure to structure, regardless of whether the fire originated in wildland vegetation.

Considerations for determining the extent of the City's local WUI map could include:

- Major roads can function as fire breaks and may serve as logical boundaries for the map.
- Neighborhood boundaries may also provide logical mapping lines and would allow uniform regulation within each neighborhood.
- Smaller "occluded" wildland areas surrounded by development, such as Coyote Run Open Space and Daughenbaugh/Warembourg Open Space, contain varying Fire Intensity Classifications in the Wildfire Risk Viewer but are not included in the CWRC Map. Mapping methodology may consider not regulating around such "occluded" areas, as they generally pose relatively low risk: fires in these locations are more likely to be detected early, fire personnel can typically access them quickly, and these areas do not provide the same opportunities for fire growth that could overwhelm suppression efforts.
- The Coal Creek corridor also shows varying Fire Intensity Classifications in the Wildfire Risk Viewer but is not included in the CWRC Map. While it shares some characteristics with "occluded" areas, it also poses additional fire-spread risk because it contains continuous wildland vegetation connected to larger wildland areas, increasing the potential for more extensive and harder-to-suppress fire spread.
- The potential for ember spread under high-wind conditions may also inform preferred mapping boundaries. Winds predominantly come from the west and southwest, and large areas of wildland vegetation lie west of the City. Although larger wildland areas also exist to the north, significant winds from the north are uncommon.
- The CWRC Fire Intensity Classifications are based on vegetative fuel type, anticipated flame length, terrain and topography, rate of spread and spotting, and suppression difficulty. Proximity of existing development to these areas is not fully accounted for in the CWRC Map. The CO-WRA and LFPD Wildfire and

Conflagration Risk Assessment modeling may provide additional guidance on areas that could be included within the regulatory boundaries.

City-Wide Defensible Space Standards
The 2025 City Council Work Plan includes consideration of adding defensible space landscaping standards to the city-wide Fire Hardening Code for Structures. Staff is seeking direction on if Council is interested in having further discussion on adding these standards City-wide.

With the initial adoption of the Fire Hardening Code for Structures, defensible space standards were discussed but ultimately not included in the final code draft. The LFPD's recommendations to adopt a structure hardening code did not include a request for defensible space standards.

In addition, there were concerns over the feasibility and staff capacity to implement city-wide defensible space standards. For such standards to be effective in reducing conflagration risk, there would need to be widespread compliance with such standards, including in already developed areas of the City.

If Council is interested in further consideration of adding defensible space standards City-wide, staff recommends that a follow-up discussion/direction session be scheduled where staff can provide additional information and analysis.

2025 COUNCIL WORK PLAN:
Both the WUI code adoption and consideration of city-wide defensible space standards are listed under the Council Priority for Safety.

Wildland Urban Interface (WUI) Code	In 2024 City Council provided direction to pursue a WUI code. Senate Bill 23-166 requires the state to adopt a state-wide minimum WUI code and define areas of applicability by July 1, 2025 and includes a three-month period for local adoption.
Potential Citywide Defensible Space	An opportunity to understand potential citywide defensible space policies to aid in wildfire mitigation and preparedness.

FISCAL IMPACT:
Budgeted?: **No**

City Fiscal Impact
Implementation of the WUI code and city-wide defensible space standards is not currently budgeted or staffed. Existing staffing levels are likely adequate for permit reviews and inspections related to Structure Hardening requirements, which can be incorporated into existing processes within the Building Division. However, Site and Area inspections and city-wide defensible space standards will require an expansion of current permit administration and may necessitate additional staffing and city resources.

Community Fiscal Impact
Based on a 2020 study by the National Association of Homebuilders, implementing the 2018 version of the International Wildland Urban Interface Code (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. The CWRC is based on the IWUIC, and therefore this provides an applicable comparison of cost to standards construction methods. Most standard commercial construction methods already utilize fire resistant materials, thus, the financial impact will be limited.

Link: Cost Impact of Building a House in Compliance with IWUIC (nahb.org)

One of the desired results of the State minimum WUI code is to stabilize insurance costs, especially for those building in and near the WUI. By establishing minimum building standards and incentivizing new development outside of high-risk areas, the hope is that there will be a more resilient built environment resulting in fewer insurance claims. It is staff's understanding that the insurance industry has its own proprietary WUI mapping and methodology, and does not use other sources, such as the CWRC Map, to underwrite insurance.

ALTERNATIVE(S):
The following are questions for Council to help inform next steps for drafting the City's local WUI code and map, and potential changes to the city-wide Fire Hardening Code for Structures:

Adoption of Local WUI Code

- Does Council support staff's recommended strengthening amendments to the base CWRC for Structure Hardening and Site and Area Design? Are there additional amendments Council would like staff to consider or include in the draft code, or any further information Council would like regarding the Structure Hardening and Site and Area Design requirements?
- Rather than identifying specific map boundaries at this meeting, staff recommends that Council take time to review and consider the various maps, datasets, and methodologies used in developing the different maps, and review the LFPD Wildfire and Conflagration Risk Assessment when it is complete early next year. Staff has also provided a list of mapping considerations outlined earlier in this report that Council may provide input or direction around. Staff

would then develop draft mapping options based on this preliminary Council input and provide analysis and pros and cons of the different mapping options at a future meeting.

- Would City Council like to have a public input meeting to review mapping options and the staff-recommended Structure Hardening and Site and Area amendments recommended by staff prior to further review and consideration?

Adoption of City-Wide Defensible Space Standards

Is Council interested in having further discussion on adding City-wide defensible space standards to the Fire Hardening Code for structures? If so, staff could develop further analysis of costs, administrative requirements, and other pros and cons for adding these standards city-wide.

RECOMMENDATION:

Staff recommends using the CWRC as the base code and adding the following provisions to strengthen the standards and align them with the city-wide Fire Hardening Code for Structures code:

Add the following provisions to Class 1 – Structure Hardening:

Fire resistant siding meeting Class A standards.

- Fire resistant eaves meeting Class A standards.
- Fire resistant decking surface, stairs, and railings meeting Class A standards and require the surface below a deck 6 feet or closer to the ground to be concrete or gavel above 6 mil plastic.
- Gutter covers to prevent accumulation of debris.

Add the following provisions to Class 2 – Structure Hardening:

- Fire-resistant siding meeting Class A standards.
- Fire-resistant eaves meeting Class A standards.
- Fire-resistant decking surface, stairs, and railings meeting Class A standards, and a requirement that the surface below any deck located 6 feet or closer to the ground be concrete or gravel placed above 6-mil plastic.

Add the following provision to Class 2 – Site and Area Design:

- Dormant grasses and weeds must be mowed to a height not to exceed six inches

Staff does not have a specific recommendation on the final WUI map at this time and is seeking feedback on Council's highest priorities and the key tenets and principles Council would like reflected in a local WUI map. Based on Council's direction, staff will develop mapping options and provide additional analysis, including pros and cons for the different options. Council will then be able to provide additional guidance on a final draft local map to be considered with the code adoption.

Staff does not have a specific recommendation regarding the addition of city-wide defensible space landscaping standards to the Fire Hardening Code for Structures and is seeking direction from Council. Based on Council direction, next steps would be for staff to develop further analysis of costs, administrative requirements, and other pros and cons for adding these standards city-wide.

ATTACHMENTS:

1. Staff Presentation

City Council Discussion/Direction

December 16, 2025

- **City Adoption of Colorado Wildfire Resiliency Code (CWRC)**
- **Addition of Defensible Space Standards to Fire Hardening Code for Structures (LMC Chapter 15.70)**

Presented by Rob Zuccaro, Community Development Director

City of Louisville

Council Questions

Staff is presenting four main topics for Council feedback:

1. Support for CWRC base code and staff recommended strengthening amendments to Structure Hardening and Site and Area Design
2. Consideration of adding Immediate Zone (0-5 feet from structure) defensible space standards to City-wide Fire Harding Code for Structures
3. Feedback on additional permitting and administrative processes for defensible space standards
4. Feedback on mapping priorities, key tenants and principles to be used in development of regulatory map

- *Other questions or direction for staff?*

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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.

- Wildfire is a natural part of many ecosystems and necessary for ecosystem health, and it reduces buildup of wildland fire fuels, lessening potential for fire intensity and spread.
- Widespread fire suppression in wildland areas has disrupted natural fire cycles and increased fire intensity in many areas.

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How Wildfires Spread

United States Annual Fire Occurrence Data: Interagency Fire Center

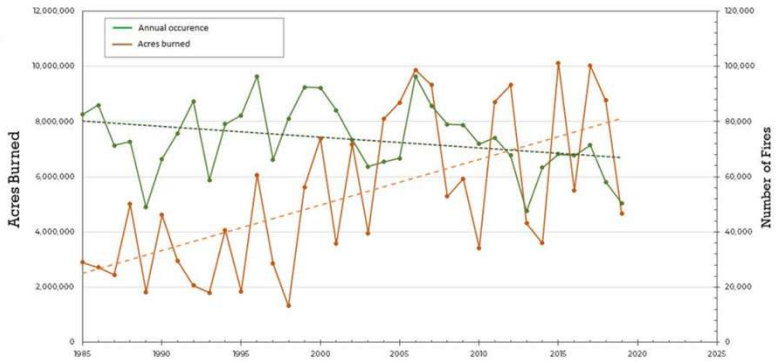

Figure 5. Number of fires (green) and acres burned (brown) since 1985. Linear trend lines (dashed) are also included. Data courtesy of the Interagency Fire Center.

City of Louisville

How Wildfires Spread

- Increasing development encroachment in and near wildland areas, along with more fuels has led to more wildland fires turning into conflagration fires.
- Conflagrations are fires that spread uncontrollably from structure to structure, regardless of whether the fire starts within a wildland area.
- Wildland fires have higher likelihood of being not being detected early and spreading to large areas that are difficult to suppress.

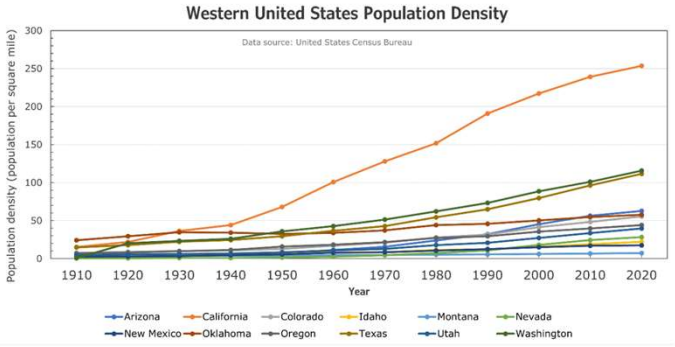

Figure 1: Time history of population density across thirteen western US states. Data source: US Census Bureau

City of Louisville

SB23-166: Colorado Wildfire Resiliency Code

- Establishes State-wide minimum code standards for a Wildland Urban Interface (WUI) building code.
- Code developed by Wildfire Resiliency Code Board (WRCB)
  - 21 Voting Members: representing local government, homebuilding and building code professions, fire behavior specialists, fire service professionals, property and casualty insurers, public and private utilities, and land-use planning. Ex Officio Members: State Forest Service, the State Department of Fire Protection and Control, and the Colorado Resiliency Office
- 2025 CWRC, CWRC Map, and Rules and Regulations Adopted in June and July 2025. City must adopt code or local code that meets or exceeds standards by April 1, 2026, and implement code by July 1, 2026
- WUI Definition: “That geographical area where structures and other human development meet or intermingle with wildland or vegetative fuels.”

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SB23-166: Colorado Wildfire Resiliency Code

- Establishes three Fire Intensity Classifications and Two Classes of Regulations

Low Intensity

Key Characteristics Include:

1. **Fuels**: Light to medium surface fuels, including grasses, shrubs, and scattered vegetation (e.g., WNL, USL fuel types).
2. **Flame Length**: Less than 2 feet.
3. **Rate of Spread**: Low, increasing with *slopes* over 20 percent.
4. **Spotting**: Very short-range spotting is possible under windy conditions.
5. **Terrain Influence**: More active fire behavior on moderate *slopes* (20 to 30 percent).
6. **Suppression Difficulty**: Easily suppressed by trained firefighters using basic protective gear and hand tools. Direct attack is effective, and mechanized support is rarely needed.

Class 1 Structure Hardening and Site and Area Requirements

Moderate Intensity

Key Characteristics Include:

1. **Fuels**: Moderate to heavy fuels, including dense shrublands, small trees, timber litter, and canopy fuels (e.g., USH, UIH fuel types).
2. **Flame Length**: Up to 8 feet.
3. **Rate of Spread**: Moderate to high, increasing significantly on *slopes* over 30 percent.
4. **Spotting**: Short-range spotting is common.
5. **Terrain Influence**: Steep *slopes* (30 percent or greater) increase fire spread and intensity.
6. **Suppression Difficulty**: Challenging for ground crews without support from engines, dozers, or aircraft. Dozers and plows are generally effective on moderate terrain.

High Intensity

Key Characteristics Include:

1. **Fuels**: Heavy fuels, including dense forests, urban core areas with heavy fuel loads, and canopy-dominated regions (e.g., WNH, USH, UCH fuel types).
2. **Flame Length**: Up to 30 feet or more.
3. **Rate of Spread**: Rapid, especially on *slopes* greater than 40 percent.
4. **Spotting**: Short-range spotting is common; medium-range spotting is possible under windy conditions.
5. **Terrain Influence**: *Slopes* over 40 percent amplify intensity and spread, creating dangerous conditions for suppression.
6. **Suppression Difficulty**: Direct attack by ground forces and dozers is generally ineffective. Indirect strategies (backburning, aerial support) are often necessary. These fires present significant danger to life, property, and responder safety.

Class 2 Structure Hardening and Site and Area Requirements

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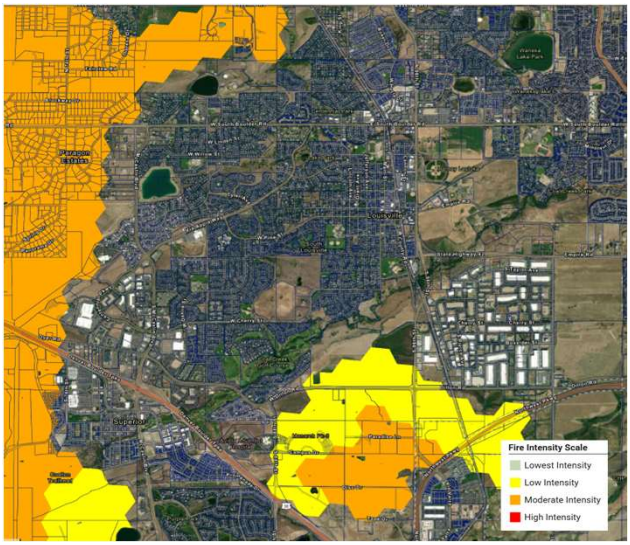
SB23-166: Colorado Wildfire Resiliency Code

- CWRC Map – Aggregates and “Smooths” Fire Intensity Scale Boundaries
- Based on 2022 CO-WRA Data



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SB23-166: Colorado Wildfire Resiliency Code

- Class 1 Structure Hardening
  - Roof coverings
  - Gutters and downspouts
  - Vent openings

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

- Class 2 Structure Hardening

  Includes all Class 1 standards, plus:
  - Exterior walls
  - Flashing
  - Underfloor enclosures
  - Decking surface
  - Building projections
  - Exterior windows
  - Exterior doors
  - Garage doors
  - Detached accessory structures within 50 feet

  Allows several options for "Ignition Resistant" and "Non-Combustible" materials.

City of Louisville

SB23-166: Colorado Wildfire Resiliency Code

- Class 1 Site and Area

  Immediate Zone (0–5 feet from structure):
  - Noncombustible hard-surface ground cover
  - Planting prohibited, except ignition-resistant plants from the State Forest Service's Low-Flammability Landscape Plants list

  Additional requirements outside of Immediate Zone:
  - Tree pruning within 10 feet of structures
  - Fences and retaining walls within 8 feet of structures
  - Marking roads, fire protection equipment, and addresses

- Class 2 Site and Area

  Includes all Class 1 standards, plus:

  Intermediate Zone (5–30 feet from structure):
  - Removal of dead plant materials
  - Avoidance of surface fuel accumulation
  - Tree spacing and pruning from structure and above ground
  - Shrub spacing from structures and trees

  Expanded Zone (30–100 feet from structure):
  - Tree spacing from other trees (crowns 6-10 feet apart)

City of Louisville

SB23-166: Colorado Wildfire Resiliency Code

Additional Provisions in CWRC:

- Appendices on Permits, Construction Documents, and Inspections
- Additions with footprint of 500 sq. ft. or more must comply for the addition
- Exterior wall replacement exceeding 25% triggers compliance for all wall materials
- Roof covering replacement exceeding 25% triggers compliance for all roof materials
- Exemptions and variances allowed for historic structures
- "Ground Truthing" process established to all adjustments based on site-specific conditions, taking into account vegetation within 300 ft. (Addresses new developments with over-lot grading that removes vegetative fuels.)

City of Louisville

SB23-166: Colorado Wildfire Resiliency Code

- **Potential Strengthening Amendments and Alignment with City-Wide Fire Hardening Code for Structures:**

Class 1 – Structure Hardening:

- Fire resistant siding meeting Class A standards.
- Fire resistant eaves meeting Class A standards.
- Fire resistant decking surface, stairs, and railings meeting Class A standards and require the surface below a deck 6 feet or closer to the ground to be concrete or gavel above 6 mil plastic.
- Gutter covers to prevent accumulation of debris.

Class 2 – Structure Hardening:

- Fire-resistant siding meeting Class A standards. (The State code allows several alternatives, including one-hour rated wall assemblies, that would not meet Class A standards.)
- Fire-resistant eaves meeting Class A standards. (The State code allows several alternatives, including one-hour rated eave assemblies, that would not meet Class A standards.)
- Fire-resistant decking surface, stairs, and railings meeting Class A standards, and a requirement that the surface below any deck located 6 feet or closer to the ground be concrete or gravel placed above 6-mil plastic. (The State code only addresses the walking surface of decks and allows a broader range of materials.)

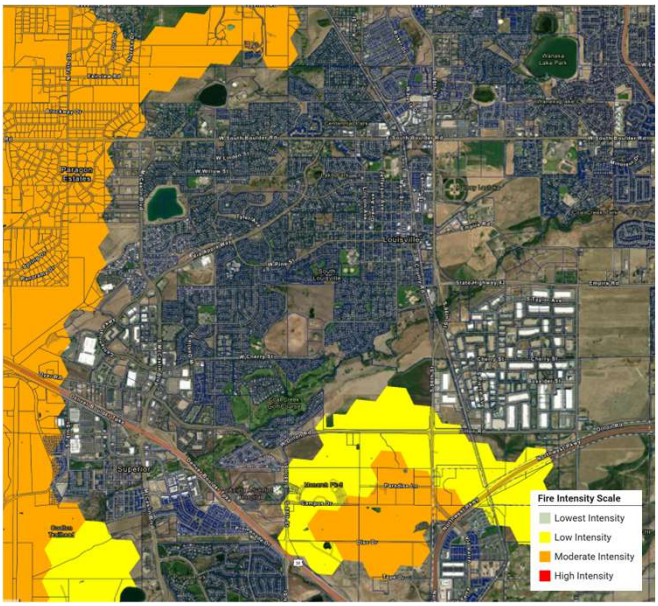
Class 2 – Site and Area Design:

- Dormant grasses and weeds must be mowed to a height not to exceed six inches

City of Louisville

CWRC Map

- The City has the option to adopt a map that meets or exceeds CWRC Map or develop a custom map based on same technical standards used in CWRC Map to develop Fire Intensity Classifications.
- The classification layers have been adjusted using smoothing, filtering, and aggregation techniques to address the granular variability present in the underlying data and to eliminate small “occluded” areas in urban environments that present relatively low risk.
- New and existing development within the designated fire intensity areas would be required to meet either the Class 1 or Class 2 standards.



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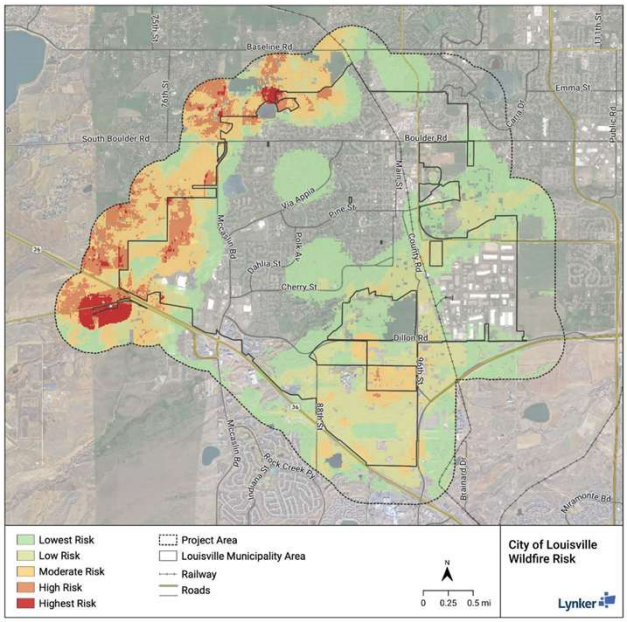
Mapping Input

- **2023 Wildfire Risk Assessment for Public Lands**
- Uses same CO-WRA data as CWRC Map



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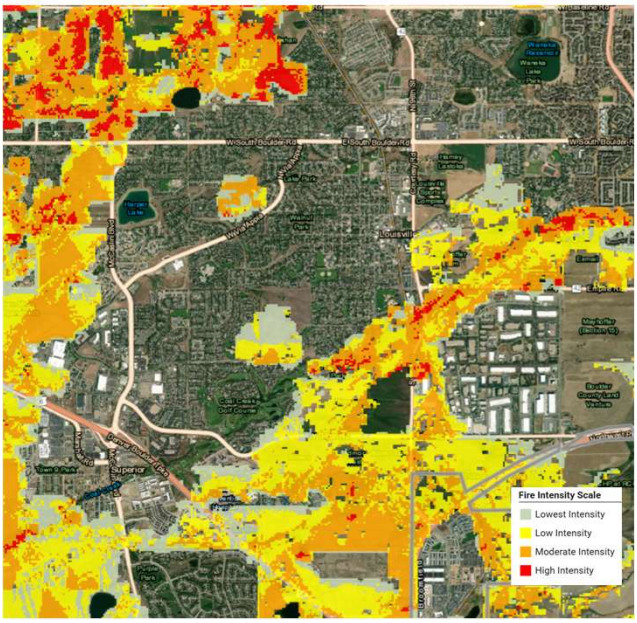
Mapping Input

- **Colorado State Forrest Service Wildfire Risk Viewer**
- Uses same CO-WRA data as CWRC Map
- More granular 20-meter square data sets
- Includers additional layers to inform potential map boundaries, e.g.:
  - Wildland Urban Interface Risk
  - Building Damage Potential



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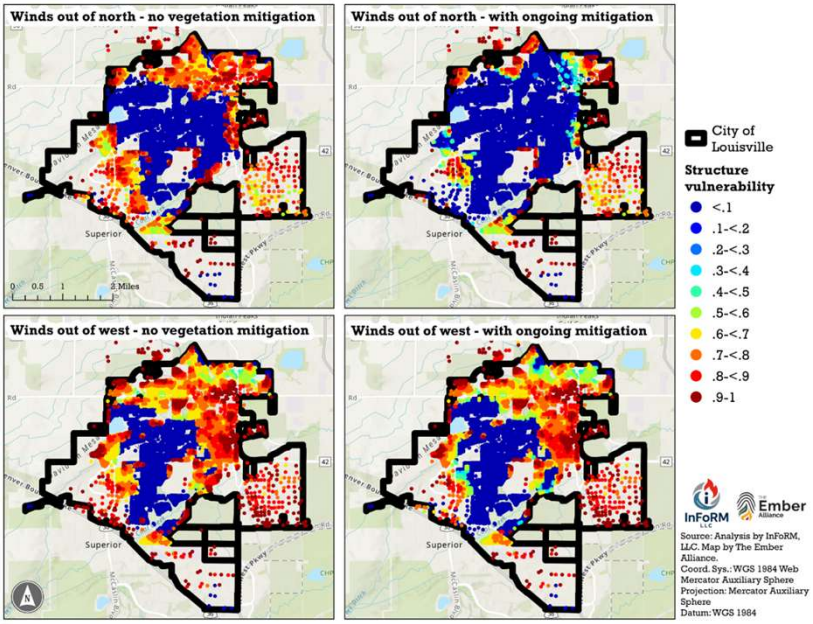
Mapping Input

- **LFPD Wildland and Conflagration Risk Assessment**
- Study in progress, due early 2026
- Modeling focuses on Conflagration Risk but provide insights on WUI fire spread
- Analysis based on random sampling of 1,000 ignition points and represents Cumulative Potential Fire Boundaries and Structure Vulnerability
- Rating of 0.7 or greater associated with greater predicted fire spread potential
- Modeling with and without public land management and north and westerly winds.



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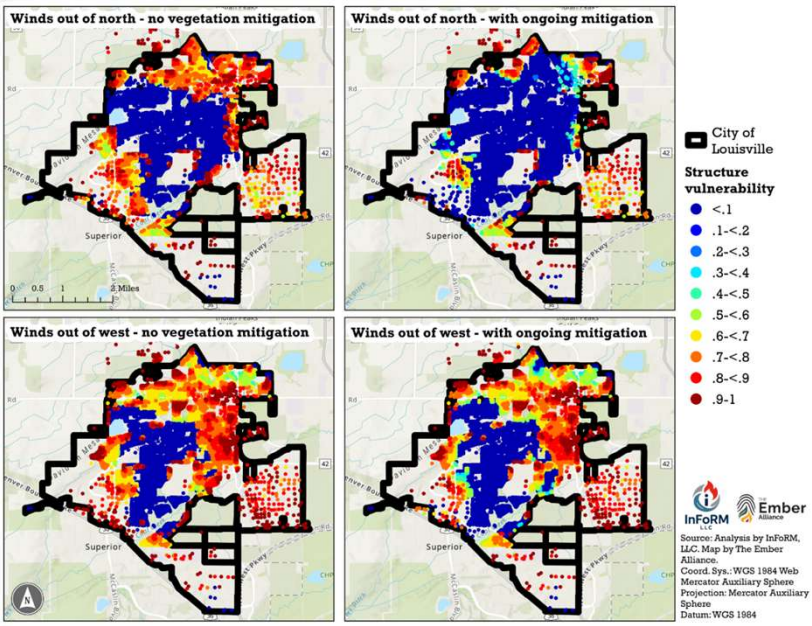
Mapping Input

- **LFPD Wildland and Conflagration Risk Assessment**
- **Preliminary findings:**
  - In Louisville, having more properties complete high-quality defensible space treatments may be more effective than treating random vegetation throughout the city.
  - In Louisville, having a greater number of properties implementing at least some mitigation measures may be more effective than having only a few properties complete all recommended mitigation work.
  - The City's current public land vegetation mitigation efforts are reducing vulnerability.



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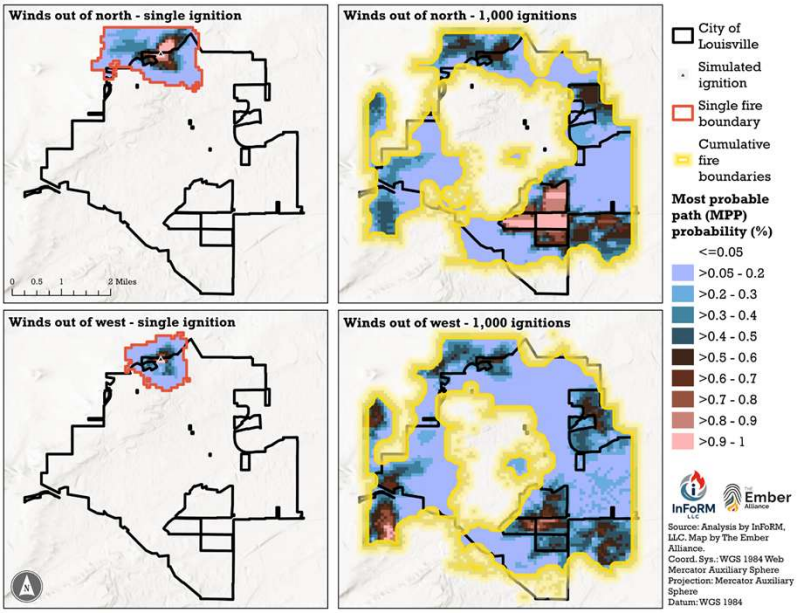
Mapping Input

- **LFPD Wildland and Conflagration Risk Assessment**
  - Single ignition point example vs. 1,000 ignition cumulative potential fire boundary



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Mapping Considerations

- Major roads can function as fire breaks and may serve as logical boundaries for the map.
- Neighborhood boundaries may also provide logical mapping lines and would allow uniform regulation within each neighborhood.
- Smaller "occluded" wildland areas surrounded by development, such as Coyote Run Open Space and Daughenbaugh/Warembourg Open Space, contain varying Fire Intensity Classifications in the Wildfire Risk Viewer but are not included in the CWRC Map.
  - Mapping methodology may consider not regulating around such "occluded" areas, as they generally pose relatively low risk: fires in these locations are more likely to be detected early, fire personnel can typically access them quickly, and these areas do not provide the same opportunities for fire growth that could overwhelm suppression efforts.
- The Coal Creek corridor also shows varying Fire Intensity Classifications in the Wildfire Risk Viewer but is not included in the CWRC Map.
  - While it shares some characteristics with "occluded" areas, it also poses additional fire-spread risk because it contains continuous wildland vegetation connected to larger wildland areas, increasing the potential for more extensive and harder-to-suppress fire spread.

Mapping Considerations Cont.

- The potential for ember spread under high-wind conditions may also inform preferred mapping boundaries.
  - Winds predominantly come from the west and southwest, and large areas of wildland vegetation lie west of the city. Although larger wildland areas also exist to the north, significant winds from the north are uncommon.
- With staff's recommendations for strengthening amendments to the Class 1 Structure Hardening Standards, the City's Fire Hardening Code for Structures and Class 1 standards would have the same general level of mitigation on Structure Hardening.
  - If Council adds Immediate Zone (0-5 feet from structure) defensible space standards, then in effect, the entire City would be regulated under the Class 1 standards developed for areas mapped as Low Fire Intensity.
- The CWRC Fire Intensity Classifications are based on vegetative fuel type, anticipated flame length, terrain and topography, rate of spread and spotting, and suppression difficulty. Proximity of existing development and development density are in this areas is not fully accounted for in the CWRC Map
  - The Wildfire Risk Viewer's Wildland Urban Interface Risk layer or the LFPD Wildfire and Conflagration Risk Assessment modeling may provide additional guidance on areas that could be included within the regulatory boundaries.

LMC Chapter 15.70 – Fire Hardening for Structures

- Adopted in 2024, applicable City-wide for new development and redevelopment or certain alternations
- The code regulates the following building systems:
  - Roof coverings
  - Siding and eave materials
  - Deck materials
  - Vent coverings
  - Gutter materials and guards
  - Fencing materials (within 5 feet of structures)
  - Solar panel screens
- Defensible space landscaping standards not included in original code.
- Adopted based on recommendations by the LFPD
- City Council Workplan Item for 2025

Potential Citywide Defensible Space	An opportunity to understand potential citywide defensible space policies to aid in wildfire mitigation and preparedness.

City of Louisville

LMC Chapter 15.70 – Fire Hardening for Structures

Louisville Fire Protection 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.

City of Louisville

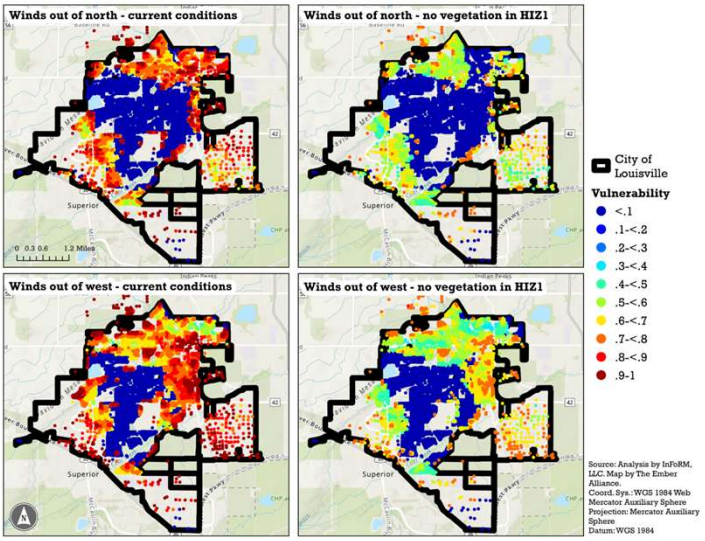
LMC Chapter 15.70 – Fire Hardening for Structures

- Consideration of including City-wide Immediate Zone (0-5 feet from structures) defensible space standards
- CWRC Class 1 Site and Area requirements
  - Immediate Zone (0-5 feet from structure) standards for Non-combustible ground surfaces
  - Exceptions for plants on the State Forest Service Low-Flammability Landscape Plants list
  - Also includes tree crown trimming within 10 feet of structure and non-combustible fences within 8-feet of a structure
- City-wide Immediate Zone standards would in effect result in City-wide Class 1 Site and Area Requirements applicable to Low Fire Intensity zones

City of Louisville

LMC Chapter 15.70 – Fire Hardening for Structures

- LFPD Wildland and Conflagration Risk Assessment modeling shows reductions in relative vulnerability when Immediate Zone defensible space standards implemented
- Results dependent on wide-spread implementation and ongoing management of defensible space standards



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Defensible Space Permitting

- Considerations for permitting standards
  - Structure Hardening code could be incorporated into current building permit processes. Structure differ from landscaping in that the structure does not change over time and incremental changes already require permitting.
  - Current City-processes only regulate landscaping on commercial and multi-family residential PUDs.
  - Effectiveness would need wide-spread implementation and maintenance of standards in already developed areas.
  - Annual or periodic inspections/compliance checks would be needed to ensure long-term success.
  - New permitting program would likely be needed to effectively manage new development, redevelopment, and compliance. This may require additional staff and the budget for staffing and resources.
  - Extensive Code enforcement would likely be needed to monitor new landscape installations to achieve widespread compliance that results in effectively lowering structure vulnerability.
  - Property owners would need to become accustomed to landscape permitting requirements, and potentially additional fees and process.
  - For existing development, landscaping often is installed incrementally – should these types of landscaping changes be regulated? Without this oversight, effectiveness could be limited.

City of Louisville

Council Questions

Staff is presenting four main topics for Council feedback:

1. Support for CWRC base code and staff recommended strengthening amendments to Structure Hardening and Site and Area Design
2. Consideration of adding Immediate Zone (0-5 feet from structure) defensible space standards to City-wide Fire Harding Code for Structures
3. Feedback on additional permitting and administrative processes for defensible space standards
4. Feedback on mapping priorities, key tenants and principles to be used in development of regulatory map

- *Other questions or direction for staff?*

City of Louisville

Council Questions

Does Council support staff's recommended strengthening amendments to the base 2025 CWRC for Structure Hardening and Site and Area Design?

- Are there additional amendments Council would like staff to consider or include in the draft code, or any further information Council would like regarding the Structure Hardening and Site and Area Design requirements?

City of Louisville

Council Questions

Would Council like to consider adding Immediate Zone (0–5 feet from structures) defensible space landscaping standards to the city-wide Fire Hardening Code for Structures?

- Should this include only treatment of ground cover and plantings within the Immediate Zone, or should it also include tree pruning within 10 feet of structures, consistent with the 2025 CWRC standards?
- As previously mentioned, adding all Immediate Zone standards city-wide would effectively regulate the entire city as a Low Fire Intensity Classification area subject to the Class 1 Structure Hardening and Site and Area Design standards.

City of Louisville

Council Questions

Does Council have feedback or questions regarding the additional permitting and administrative processes that would likely be necessary to implement defensible space landscaping standards for both the WUI code and the Fire Hardening Code for Structures?

- Does Council support adding a new landscape permitting processes for new development and for retrofitting existing landscaping on already developed property?

City of Louisville

Council Questions

Rather than identifying specific map boundaries at this meeting, staff recommends that Council take time to review and consider the various maps, datasets, and methodologies, as well as the mapping considerations presented by staff.

- For this meeting, staff is seeking input on Council's most important priorities, and the key tenets and principles Council would like reflected in a local WUI map?

Staff would then develop draft mapping options based on this guidance and present them for discussion at a future meeting.

City of Louisville

Council Questions

Does Council have any other questions or direction for staff?

City of Louisville