

# Community Planning Assistance for Wildfire

## Recommendations for Austin, Texas



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Prepared by:  
Clarion Associates  
Wildfire Planning International  
Wildland Professional Solutions



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*CPAW is a partnership between Headwaters Economics and Wildfire Planning International. The program is funded through a cooperative agreement with the USDA Forest Service and private foundations. More information is available at [planningforwildfire.org](http://planningforwildfire.org).*

# Executive Summary

Wildfires are increasing in frequency and intensity across the country as changes in climate are resulting in longer periods of drought and longer fire seasons. According to the National Interagency Fire Center, Texas had more fires in 2015 (9,272) than any other state (California was number 2 with 8,745 fires). The 2011 Bastrop Complex fire was the 7<sup>th</sup> most costly fire in US history at \$530 Million.

The City of Austin recognizes the threat of wildfire, and is eager to improve its planning framework accordingly. In 2016, the Austin City Council adopted a resolution focused on improving planning in the wildland-urban interface (WUI). In order to meet a goal of “zero wildland fire related fatalities,” the resolution calls for the city to “promote the development of wildland fire defensible strategies, and support incorporation of these strategies within the City’s existing regulatory framework to ensure communities and ecosystems are resilient to extreme fire behavior.”

In addition to eliminating wildland fire fatalities and protecting fire fighters, there are other motives for communities such as Austin to undertake community wildfire planning. As adapted from the National Fire Protection Association’s “*Community Wildfire Safety through Regulation*,” these include:

- **Protect the lives of residents.** Developing in appropriate areas, and to higher standards, allows fires to occur while minimizing risk to Austin’s citizens.
- **Limit property damage and protect community assets.** Providing safe development practices minimizes damages to personal property and other structural and natural assets.
- **Save taxpayer money.** When development is appropriately located and built to higher standards, the government spends less money on fire suppression and response.
- **Complement voluntary wildfire safety efforts.** Austin neighborhoods are already engaged in reducing wildfire risk locally and these citywide efforts expand and reinforce that culture.

The **Community Planning Assistance for Wildfire (CPAW)** program helps communities achieve these goals by engaging a team of consultants to assist with identifying strategies to reduce wildfire risk through improved planning. During 2015-16, Austin was competitively selected to receive CPAW assistance. Through that process, the CPAW team met with Austin stakeholders to assess and evaluate the City’s current wildfire planning framework. The nine-month process included an internal planning audit of key documents, stakeholder interviews and meetings, and feedback on draft recommendations.

This report is the culmination of that process, and provides recommendations for the City of Austin to improve its planning approach for wildfire in the following four categories. Each recommendation includes strategies for implementation as well as tips and resources for additional research and analysis.

1. **Improve understanding of WUI risk.** Improve the definition of the WUI and spatially delineate various risk levels.

**NOTE:** *Although not all of the recommendations in this report are in order of priority, this category comes first because it is a fundamental change necessary to accomplish the remaining recommendations.*

## Key Definitions:

**Risk** - A measure of the probability and consequence of uncertain future events.

**Wildland-Urban Interface (WUI)** - Any developed area where conditions affecting the combustibility of both wildland and built fuels allow for the ignition and spread of fire through the combined fuel complex.

**Wildland Fire** - any non-structure fire that occurs in vegetation or natural fuels.

**Wildfire** - an unplanned wildland fire resulting in a negative impact.

Recommendations:

- Define the wildland-urban interface
- Develop a spatial risk assessment that clearly delineates risk levels
- Assess and communicate the economic and social risks of wildfire

2. **Address wildland fire and wildfire in Austin's plans.** Better align Austin's various environmental policies with wildland fire management objectives, and use wildfire risk information to inform future planning efforts.

Recommendations:

- Align Austin's environmental policies with wildland fire management objectives
- Use wildfire risk information to inform Austin's plans

3. **Improve land use tools to reduce wildfire risk.** Develop new land use implementation tools and enhance existing tools to manage wildfire risk. Several approaches are described in this section, first and foremost the adoption of a WUI Code.

Recommendations:

- Adopt a WUI code
- Revise land development regulations to address wildfire risk reduction
- Update the zoning map to direct growth toward safe areas

4. **Make the system work for Austin.** Assign ownership and responsibility to wildfire risk reduction strategies, improve Austin's staff capacity to effectively administer and enforce the implementation mechanisms, and build on Austin's already strong public outreach and education programs.

Recommendations:

- Develop an implementation action table
- Improve coordination, capacity, and outreach

# Part 1: Overview

Wildfire is a growing threat to the City of Austin, with a changing climate exacerbating the potential damage to people, property, and the economy. The frequency and severity of wildfires are increasing, resulting in a yearlong fire season. It is important for the City to consider planning for this growing threat to:

- Protect the lives of residents;
- Limit property damage and protect community assets;
- Save taxpayer money otherwise spent responding to wildfire; and
- Complement voluntary wildfire safety efforts.

The **Community Planning Assistance for Wildfire (CPAW)** program supports communities' efforts to reduce wildfire risk through improved land use planning. CPAW provides communities with consulting services from professional land use planners, foresters, wildfire risk modelers, and hazard mitigation specialists to integrate wildfire mitigation measures into the planning process.

In 2015, CPAW officially launched in five communities, including Austin, Texas. The CPAW consulting team worked with local staff and other stakeholders to determine Austin's wildfire planning needs. Information was gathered through an in-person site visit, independent document analysis, and follow-up stakeholder discussions. These recommendations are the culmination of that research and analysis.

## Initial Site Visit

The primary purpose of the site visit was to develop an initial understanding of the City's planning and development practices and emergency management challenges specific to wildfire prevention and mitigation. The site visit allowed the CPAW team to solicit feedback on how wildfire mitigation could be better integrated into Austin's planning framework.

Over a two-day period, the CPAW team met with a diverse group of stakeholders from various City departments including planning, sustainability, development services, water utility, watershed protection, emergency management, and the fire department. City staff led a tour of some of Austin's most challenging subdivision issues that highlighted competing interests in the wildland-urban interface (WUI). The trip concluded with a debrief meeting with the core planning team to discuss our initial reactions and to generate follow-up action items.



*City staff and consultants tour the Balcones Canyonlands Preserve to discuss “the other-side-of-the-fence” issue pertaining to wildfire mitigation and risk reduction, and the shared responsibility between property owners and public land managers.*

## WUI Planning Audit

The CPAW team developed a WUI Planning Audit to analyze Austin's plans, policies, and regulations to determine their level of effectiveness for community wildfire mitigation. The WUI Planning Audit systematically walked through the City's various planning and regulatory documents, including but not limited to development regulations, Imagine Austin, criteria manuals, and the capital improvements



plan. The audit cast a wide net on Austin’s wildfire mitigation issues, and provided some initial high-level recommendations. Not all issues from the WUI Planning Audit are addressed by this document. Staff may wish to refer back to the WUI Planning Audit as a useful tool to inform the City’s various planning and capital projects.

## Summary of Approaches

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CPAW recommendations represent recurring issues noted in the WUI Planning Audit and those that were elevated in terms of their priority by the City. Recommendations are based on the objective of protecting people, property, and the environment from the risks of wildfire. Some of the approaches to achieving this objective through policies and regulations that are included in this report are summarized as follows:

- **Avoid development in hazardous areas.** Avoiding development in areas with higher risk is the most effective course of action; however, that option is not always politically and/or physically feasible. Land use policies and regulations should help mitigate risks associated with proposed growth and existing development in the WUI.
- **Protect structures and ensure they are constructed to a high standard.** When avoidance is not realistic, planning policies and land use regulations should address the quality of structures and the site around them. By raising the bar for wildfire mitigation by applying to both existing and future development, the City can allow “safe growth” to occur.
- **Ensure that the uses and activities on a property are appropriate and held to a high standard.** Planning for wildfire is not a one-size-fits-all approach. Some specific land uses or sites may require additional standards because the use is either on a property within the WUI, exacerbates the wildfire risk, or the site has particular constraints that increase the risk (e.g., slope and vegetation).

## Overview of the Recommendations

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Following this Part 1: *Overview*, the recommendations in this document fall within the following four categories:

- **Part 2: Improve understanding of WUI risk.** This section includes recommendations for improving the definition of the WUI and spatially delineating various risk levels. Although not all of the recommendations in this report are in order of priority, this category comes first because it is the fundamental change necessary to accomplish the remaining recommendations.
- **Part 3: Address wildland fire and wildfire in Austin’s plans.** This section includes recommendations to better align Austin’s various environmental policies with wildland fire management objectives, and to use wildfire risk information to inform future planning efforts.
- **Part 4: Improve land use tools to reduce wildfire risk.** This section focuses on developing new land use implementation tools and enhancing existing tools to manage wildfire risk. Several approaches are described in this section, first and foremost the adoption of a WUI Code.
- **Part 5: Make the system work for Austin.** This final set of recommendations focuses on assigning ownership and responsibility to wildfire risk reduction strategies, improving Austin’s staff capacity to effectively administer and enforce the implementation mechanisms, and building on Austin’s already exceptional public outreach and education programs.

Each category first provides an introduction before delving into the specific recommendations. Each specific recommendation includes the rationale for the recommendation, guidance for implementation, and any additional tips or resources for support.



## Part 2: Improve Understanding of WUI Risk

Without a clear understanding of Austin’s risk from wildfire, including a spatial delineation of that risk, many of the recommendations in this report would lack the fundamental basis for making sound planning and land use decisions. This section provides recommendations necessary for improving Austin’s overall understanding of the WUI risk level.

The influences of fuels (vegetation and the built environment), topography, and weather on the City of Austin create a complex wildfire environment. To add to this complexity, the rapid population growth of the City is resulting in continuous change to the spatial arrangement and relations of these factors. Additionally, the social and economic impacts of wildfire such as infrastructure loss or increase in acute and long-term health care costs add an element of complication to understanding the true risks of wildfire.

The current description of the WUI and the resulting WUI risk assessment in the Travis County Community Wildfire Protection Plan (CWPP) conveys the complex physical environment through highly detailed descriptions and outputs. While these details are helpful in providing guidance to the wildfire expert, the current CWPP does not offer a clear and concise WUI definition, or a clear spatial delineation of risk that is useful for planning guidance. A concise WUI definition (as proposed below in Recommendation 2.1: *Define the Wildland-Urban Interface*) and spatial risk assessment representing clear delineation of the levels of risk will provide useful guidance to planners, developers, and the public in understanding the WUI risk present in Austin; together they form the primary decision support tools for all community wildfire planning initiatives.

The detailed recommendations in this section focus on the following key areas:

- **Improved understanding of the physical WUI risk levels (Recommendations 2.1 and 2.2).** Clearly define Austin’s wildland-urban interface as *“any developed area where conditions affecting the combustibility of both wildland and built fuels allow for the ignition and spread of fire through the combined fuel complex,”* and create a risk assessment and map (risk model) that conveys risk levels in compatible format to be used in the planning process.
- **Improved understanding of the social and economic wildfire risk (Recommendation 2.3).** It is important to also evaluate the economic and social WUI risks during the development of WUI policies, plans, and codes by quantifying the possible economic and social outcomes of sustaining wildfire losses within the City. This information could likely be integrated into future risk assessment and mapping processes.

### Recommendation 2.1: Define the Wildland-Urban Interface

#### Rationale

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A clear and universally applied definition of the WUI will aid City staff and the public in identifying and understanding the potential extent of the area of concern for communications related to the WUI.

#### Implementation

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##### Establish a New WUI Definition

To provide the basis for a true understanding of the risk that the City of Austin faces, the WUI should be defined as:

***Any developed area where conditions affecting the combustibility of both wildland and built fuels allow for the ignition and spread of fire through the combined fuel complex.***

This definition should be reflected as a standard definition in the CWPP, WUI code, and any other City documents that reference the WUI. Incorporating this definition will focus the risk assessments, planning processes, regulation and mitigation efforts on addressing the critical “pinch point” of the City’s WUI fire risk. Specifically, this will allow the City to identify, communicate and effectively reduce the potential for undesirable wildfire to spread from vegetation to structures and infrastructure (or vice versa) by assessing and mitigating direct flame/ember contact and radiant or convective heat transfer vectors (i.e. vegetation, wooden fences, other combustibles, or non-mitigated structures) within critical distances or locations. This approach will also allow the City to indirectly reduce the overall health, safety, economic, environmental, and social wildfire risks.

#### **Communicate New WUI Definition to Staff and Public**

The definition of the WUI should be widely distributed and communicated to City staff and to the public to influence public behavior changes and an overall cultural shift in how Austin perceives development and land management in the WUI.

### **Tips and Additional Support**

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#### **Staff and Public Outreach and Training**

The City of Austin is already active in outreach to communities and the public through implementation of the *Firewise* and *Ready, Set, Go!* programs, which support the concept of the proposed WUI definition. Consistent application of the proposed WUI definition throughout City publications and public outreach, along with the implementation of internal staff outreach (workshops and webinars) will continue to encourage a culture shift in how the WUI is understood. More on public outreach and training is provided in Recommendation 5.2: *Improve Coordination, Capacity, and Outreach*.

## **Recommendation 2.2: Develop a Spatial Risk Assessment that Clearly Delineates Risk Levels**

### **Rationale**

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Before the City of Austin can integrate wildfire risk reduction into local policies and regulations, they must first understand the various levels of risk, and then map those risks as a decision support tool. Establishing a spatial understanding of wildfire risk is the foundation for many of the other recommendations included in this report.

### **Implementation**

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#### **Modeling with Intterra**

The City of Austin is currently engaging in a risk modeling and mapping project with assistance from the Intterra Group (Intterra), a consulting firm that specializes in spatial risk modeling software development and integration. The project is focused on improving wildfire response and evacuation capabilities. The assessment of the City’s current capabilities rely on inputs such as existing vegetation type, building construction type and location, topography, weather, road network, water supply, fire station location, and critical infrastructure data. This data is then combined with predictive wildland fire behavior models to determine the spatially delineated probability (likelihood) and consequence (impacts) of wildfire occurrence. The process is based on the current industry best management practices.

The Intterra system provides a dynamic platform that can be updated with more current data, which will help City staff to anticipate, plan, and prepare for wildfire suppression and evacuation challenges. The risk assessment process outlined in the paragraph above, with modified outputs, is the same process used to determine the wildfire risk for planning purposes. The use of a single integrated platform results in a compatible and efficient process.

### **Integration of Risk Assessment into Planning Framework**

Through the CPAW process, collaborative discussions with City of Austin and Intterra staff confirmed that the risk modeling software platform used by Intterra can be modified to incorporate the ability to inform planning decisions (such as future growth concepts). The delineated levels of risk represented by the map will allow Austin's plans and codes to specify levels of mitigation appropriate to the risk of a given location. To ensure that the risk assessment will be successfully integrated into the planning process, it should be:

- Defendable based on the most current research and best practices
- Universally integrated and compatible among City stakeholders
- Easily interpreted by City staff and integrated into the planning process
- Adaptable to changing physical and/or environmental conditions

City staff should continue to work with Intterra on adding functionality to the risk assessment map that will provide delineated spatial risk levels appropriate for land use planning. To integrate the risk assessment map into the land use planning process, the following steps should be taken:

1. Relevant plans, codes, and planning processes should include language that references the risk map as a decision support tool.
2. Upon adoption, the WUI Code should directly reference the risk assessment map for application of specific code components appropriate with the delineated level of risk. (See Recommendation 4.1: *Adopt a WUI Code*.)
3. Location-specific planning decisions and code applications should reference the risk assessment map to determine specific levels of mitigation required.

The resulting risk assessment from the Intterra project should be added to and referenced as the primary decision support tool in the form of an addendum to the existing CWPP, or referenced as the primary risk assessment component in a new Austin-specific CWPP.

## **Tips and Additional Support**

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### **Prioritize and Monitor the WUI Risk Assessment**

Site-specific conditions (such as vegetation, building types, and slope, etc.) that generate data for the risk assessment can change with time. To maintain an accurate risk assessment and map, timely and accurate data collection is imperative. Wildfire planning direction and regulation are reliant on the WUI assessment for implementation; therefore, a priority should be placed on the City's WUI risk assessment. An individual property assessment program can follow at a later date to further enhance the assessment. The WUI risk assessment should be updated at least every five years, or if significant changes have occurred that may affect the assessment, such as wildfires, forest structure changes, or substantial new development.

### **Shift Assessment Responsibility to Developers/Landowners**

Collection of some of the data required for maintaining an accurate risk assessment relies on field assessments provided by appropriately trained and experienced professionals. Undertaking the

assessment process requires expertise and time, and may be limited by current staff capacity and resources. Additional analysis should be conducted to determine the required full-time employees (FTEs) and budgetary requirements to these facilitate field assessments either citywide or in targeted WUI areas.

To minimize the increased burden on City resources, Austin could rely on a “professional reliance” model whereby developers and landowners would be required to supply a standardized assessment by a qualified professional. This approach would likely require the City to develop a training program and establish minimum qualification standards. Again, additional analysis is required to determine resources required to conduct such training.

#### **Staff and Public Outreach and Training**

The addition of a wildfire risk assessment process into land use planning is a relatively new concept and is likely not intuitive to some City staff, developers, or the general public. For more on this topic, see Recommendation 5.2: *Improve Coordination, Capacity, and Outreach*.

## **Recommendation 2.3: Assess and Communicate the Economic and Social Risks of Wildfire**

### **Rationale**

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Understanding Austin’s wildfire risk extends beyond the quantification of immediate structure and infrastructure losses. Additional impacts on the economy and social resilience can impact a community long after a wildfire event. Some examples of these impacts are:

- **Physical and mental health impacts.** For example acute and chronic respiratory illnesses; or the effects of post-traumatic stress disorder (alcoholism, domestic violence).
- **Decrease in economic viability.** Including direct loss of businesses, loss of support for businesses, decrease in availability of workers (due to home or infrastructure loss), loss of employment (due to loss of businesses), or decreased tourism opportunities.
- **Loss of key community individuals.** Including police, fire, doctors, teachers, and other community leaders due to the loss of adequate housing or infrastructure (hospitals, schools, police stations, and fire stations), injuries and fatalities, or the physical and mental health impacts on these individuals.
- **Sudden and extensive loss of infrastructure.** Resulting in immediate and unexpected requirement for significant replacement expenditures.
- **Loss of important natural resources.** For example, watersheds and water quality, parks and open space, and critical habitat.
- **Loss of aesthetics.** Including loss of views, changes in overall community character, and other physical impacts making some areas less desirable.

It is important to attempt to quantify the possible economic and social outcomes of sustaining wildfire losses within the City to better plan for the future of the City and to improve communication and outreach as it relates to wildfire risk reduction. By proactively addressing the potential social and economic impacts related to wildfire, the City is also improving its ability to meet overall goals for citywide sustainability and resiliency.

### **Implementation**

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Additional data should be collected, and studies prepared, related to the economic losses associated with large fires in Austin and Travis County to help open the dialogue for developing wildfire risk

reduction policies and strategies. The information from those studies can then be integrated into future risk assessment processes to influence land use planning decisions with respect to wildfire risk reduction. Such studies should be coordinated with the Watershed Protection Department in Austin to collect similar data for post-flooding efforts. The hazards are interrelated and can have similar social and economic impacts.

In the publication “*Assessing the Environmental, Social, and Economic Impacts of Wildfire*” (2003)<sup>1</sup>, the following categories of wildfire impacts were considered:

- Total acres burned
- Cost of fire suppression
- Damage to homes and structures
- Alteration of wildlife habitat
- Damage to watersheds and water supply
- Damage to public recreation facilities
- Evacuation of adjacent communities
- Tourism impacts
- Damage to timber resources
- Destruction of cultural and archaeological sites
- Costs of rehabilitation and restoration
- Public health impacts
- Transportation Impacts

These may provide some guidance as a starting point for determining the impacts most relevant to the City of Austin. Consider partnering with local Universities and other subject matter experts to implement an assessment of the impacts of wildfire in Austin.

### **Tips and Additional Support**

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In addition to local education institutes, there are a number of publications, sources, and organizations that can offer guidance and assistance in determining the social and economic impacts of wildfire. For example:

- Headwaters Economics <http://headwaterseconomics.org/>
- Fire Adapted Communities Learning Network <http://fireadaptednetwork.org/>

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<sup>1</sup> Morton, D., Roessing, M., Camp, A., Tyrrell, M. 2003. *Assessing the Environmental, Social, and Economic Impacts of Wildfire*. GISF Research Paper 001 Forest Health Initiative Yale University School of Forestry and Environmental Studies. Accessed here: [http://gisf.yale.edu/sites/default/files/files/wildfire\\_report\(1\).pdf](http://gisf.yale.edu/sites/default/files/files/wildfire_report(1).pdf).

## Part 3: Address Wildland Fire and Wildfire in Austin's Plans

Austin's current planning framework is grounded in sustainability, including an emphasis on environmental protection. Imagine Austin places a high priority on protecting Austin's sensitive and unique environmental resources, such as the 13,000-acre Balcones Canyonlands Preserve and various watersheds, Karst areas, and wildlife preserves. Maintaining an adequate water supply and protecting water quality are emphasized as two of the most critical issues facing Austin as the population continues to grow dramatically. However, although the plan specifically notes the key challenge of "protecting our natural resources," Imagine Austin and other long-range planning policies are silent on the risks and benefits of wildland fire. **Wildland fire** (defined as any non-structure fire that occurs in vegetation or natural fuels), as opposed to **wildfire** (defined as an unplanned wildland fire resulting in a negative impact), is a natural ecological process often required for the health and/or restoration of an ecosystem. Revising existing and developing new land use policies should include the important role that wildland fire plays on Austin's natural landscape.

Additionally, Austin's planning framework should recognize wildfire risk, including policies and strategies to address unplanned and uncontrolled fires on the landscape. Planning for wildfires in Austin's current and future developed areas is as important as aligning the City's wildland fire management objectives with other environmental policies. Austin's primary planning documents for addressing wildfire risk are Imagine Austin and the City's current and future neighborhood plans.

Austin can better link land use planning and environmental protection policies to both wildland fires and wildfires. The following two recommendations focus on aligning Austin's environmental policies with its wildland fire management objectives, and using wildfire risk to further inform City plans and policies, including future growth and development.

### Recommendation 3.1: Align Austin's Environmental Policies with Wildland Fire Management Objectives

#### Rationale

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Wildland fire management should be coordinated and aligned with the City's environmental policies. Austin places a high priority on its natural assets – a diverse ecology, vast natural resources, and landscapes that make Austin unique. The City's residents depend on the health of these community assets, and wildfires (and in some cases, wildfire mitigation) are a potential threat. A holistic ecosystem-based fire management approach can be effective in integrating a healthy ecosystem with risk reduction objectives and should play an important role in how Austin's policies are developed and resources allocated.





*Looking southeast toward downtown Austin from the top of Mount Bonnell at the conclusion of the CPAW team's site visit.*

## Implementation

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As the City contemplates environmental and natural resource policies during its long-range planning processes, thoughtful consideration should be given to wildfire mitigation objectives. The ways in which Austin manages its forests and ecological assets should reflect not only preservation but also ongoing ecological restoration and post-fire recovery. There are many agencies and City departments that manage land in Austin, and fire management should be part of their planning process.

### **Inventory Austin's Environmental Resources and Existing Management Plans**

The first step in coordinating and integrating wildland fire management policies and objectives is to identify the environmental resources to be addressed. Similar to the recommendations in Part 2 of this report, a spatial understanding of where Austin's ecological resources are in relation to wildland fire management would provide a good foundation for developing and/or revising policies. For example, the *Parks and Recreation Long Range Plan for Land, Facilities, and Programs* calls for implementation of a wildland fire management planning program within Barrow Nature Preserve, the Bull Creek Upper and Lower Green Belts, and the Stillhouse Hollow Nature Preserve.

The inventory should note whether or not fire management plans have been established for these areas. Similarly, the inventory should include other City departments that manage land in Austin to ensure that appropriate consideration is given to wildfire management while still meeting the individual department's goals and objectives.

### **Establish and Integrate Wildland Fire Management Policies**

For areas requiring special environmental attention, including natural resource areas such as the Balcones Canyonlands Preserve, Austin's drinking water protection zones, parks and open spaces, and other ecological assets in the City, the City should integrate wildland fire management policies (or even entire separate wildland fire management plans) to memorialize the coordinated objectives of various City departments. For example, a parks and open space management plan should include wildland fire management policies and strategies that address planning and programming in forested areas.

Other specific recommendations for integrating wildland fire management policies include:

- Develop a consistent approach and language for introducing wildland fire management into existing plans for sensitive areas. When plans "speak the same language," the policies within them start taking hold and become part of Austin's culture.
- Reflect existing area-specific wildland fire management plans in fire management policies and implementation actions when the City develops an Austin-specific CWPP.
- Incorporate existing wildland fire management plans and policies in zoning and subdivision regulations by including them in the development review process (either by requiring review by the City or a statement of compliance with the application).



## Supplement the Current CWPP with Austin-Specific Strategies

In addition to Imagine Austin, neighborhood plans, and other long-range planning documents, Austin and Travis County have a jointly-adopted Community Wildfire Protection Plan (CWPP). This document is the primary resource for wildfire mitigation policies and strategies, and provides the basis for how to manage Austin's forests as they relate to wildland fire and wildfire. The City is currently considering developing Austin-specific strategies to provide more clear direction for land management, development, and wildfire mitigation within the City limits. It is unlikely that the City will prepare an entirely new CWPP. Rather, approaches to an Austin-specific CWPP may include one or a combination of the following:

- Develop an addendum to the current Austin/Travis County CWPP;
- Develop actions and policies for Austin City Departments through a series of Memorandum of Understanding (MOUs); and/or
- Include Austin-specific actions and policies for wildfire risk reduction in existing Department plans.

The recommendations in this report should be integrated into any applicable current and future CWPP strategies, and monitored by the team who develops those strategies. More on the implementation of these recommendations is provided in Part 5: *Make the System Work for Austin*.

## Tips and Additional Support

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### Remember the “Non-Specialists”

Although expert knowledge is required from wildland fire professionals to develop ecosystem-based fire management objectives and strategies, non-specialists also play an important role. For example, land use planners have unique knowledge of growth areas, demographic trends, and community values. The public works director will have intimate knowledge of the condition of the City's key infrastructure and any planned upgrades. These non-wildfire specialists can contribute to a more holistic view of how Austin's lands are managed.

### Additional Resources

- **Texas A&M Forest Service** provides various forest management services including preparing for and preventing wildfires, vegetation management, and other best management practices.  
<http://texasforestsservice.tamu.edu/default.aspx>
- **Boulder County, Colorado's**, Parks and Open Space division manages over 30,000 acres of forest with an emphasis on ecosystem-based forest and fire management.  
<http://www.bouldercounty.org/os/openspace/pages/forestry.aspx>



Approach	Advantages vs. Disadvantages
<b>Identify wildfire risk (and other hazards) on the FLUM.</b> As mentioned, the future land use map and growth concept maps indicate what the City believes are the most appropriate areas for future development. Incorporating wildfire risk into the discussion could have an impact on how those areas are mapped.	<b>Advantages:</b> Establishes thoughtful approach to “safe growth” by delineating risky areas for development. <b>Disadvantages:</b> Can be politically challenging when large areas that are otherwise developable are constrained by hazards.
<b>Crosswalk to the hazard mitigation plan and the CWPP.</b> By directly linking the reader to plans that already discuss wildfire risk, the long-range planning policies can be better aligned with strategies for reducing risk.	<b>Advantages:</b> Emphasizes the importance of risk reduction and aligns policies without repeating information. <b>Disadvantages:</b> Requires updates to links/hyperlinks since the HMP and CWPP are updated frequently.
<b>Include a Hazard Identification and Risk Assessment (HIRA) as an appendix.</b> Some communities choose to attach the HIRA as an appendix, and then cross-reference policies accordingly throughout the comprehensive plan. This approach could help to elevate the importance of wildfire risk reduction, but would make the plan substantially longer and would require frequent updates.	<b>Advantages:</b> Establishes quick access to hazard risk information without having to pick and choose appropriate policies or strategies for inclusion in the plan. <b>Disadvantages:</b> HIRAs can be large files (sometimes hundreds of pages), giving seemingly disproportionate attention to one issue and making the overall document lengthy.

### Update Imagine Austin

Imagine Austin illustrates its strategy for accommodating future growth on the growth concept map, which shows growth and development along the City’s activity centers and corridors. With an update to Imagine Austin already under consideration, the timing is appropriate to explore better integration of wildfire risk data and analysis. Austin should consider the following prior to an update to Imagine Austin:

1. **Incorporate wildfire risk maps into the growth concept map.** Decisions on future land use should be based partially on land availability and designated centers and corridors, but should not come without consideration of threats such as wildfire risk. The results from the City’s work with Intterra (as discussed earlier in Part 2: *Improve Understanding of WUI Risk*.) should inform specific areas where wildfire risk is particularly challenging. The City should determine how risk is delineated (e.g., low-medium-high or green-yellow-red, etc.) and what level of risk is appropriate under certain growth and development scenarios.
2. **Include policies in the “activity centers for redevelopment in sensitive environmental areas” related to managing wildfire risk.** These activity areas indicate where the City expects infill and redevelopment to occur, with the need for additional evaluation of how the growth will fit within its environmental context. These activity centers currently focus on protection of the drinking water supply, but could be expanded to include other environmental sensitivities such as ecological assets and wildfire risk.
3. **Integrate wildfire risk reduction into the key challenges and opportunities section.** This could be accomplished by adding wildfire risk reduction to the current six challenges and opportunities, or by weaving it into “protecting our natural resources.”
4. **Incorporate policies and strategies that address the interrelatedness of natural hazards, climate change, sustainability, and environmental protection.** Case studies or “sidebar” text boxes can help the City tell this story effectively in Imagine Austin. For example, with an increase in periods of drought, the wildfire risk also increases. Recent climate data can help develop a case study to illustrate the interconnectedness of a warmer climate on more frequent and severe wildfires and/or other hazards.

5. **Coordinate green infrastructure policies with wildfire risk reduction policies.** For example, the Balcones Canyonlands Preserve should be managed with a variety of objectives in mind, including environmental, ecological, growth management, and risk reduction.
6. **Analyze the “susceptibility to change analysis” in Imagine Austin.** Compare that section against wildfire risk data and analysis, and against the objectives within the current (or future Austin-specific) CWPP. In the current Imagine Austin plan, the greatest susceptibility to change appears to occur in northern and eastern Austin. Analyze whether or not the areas that are most susceptible to change are also most at risk to wildfire. With that analysis in mind, engage the public in a policy discussion related to how the City should grow safely and efficiently, while compact and connected.
7. **Consider greenfield vs. infill.** Some of Austin’s future growth will occur as “greenfield development,” development on raw land that has not previously been developed. An increasing amount of Austin’s growth, however, will occur as infill and redevelopment in established areas throughout the City. Wildfire risk can be reduced using planning policies and land use regulations for both greenfield and infill scenarios. When drafting policies for Austin, consider the applicability of both greenfield and infill development scenarios. For example, strengthening policies for defensible space may be logical for future greenfield development – but may require a softer approach when it comes to redevelopment or densification of previously developed areas by considering other solutions to reducing wildfire risk in developed areas (such as fuels reduction or structure hardening).
8. **Continue to embrace a regional approach to planning.** This includes addressing wildfire risk reduction policies in Travis County, other neighboring counties, and how future land use is impacted in the ETJ. Consider especially those “edge conditions” near political boundaries, and whether there are unique challenges to managing the WUI that require additional policy discussion.

### **Update Neighborhood Plans**

At the core of neighborhood planning is providing meaningful input for how neighborhoods move forward into the future while protecting neighborhood character. Neighborhood plans inform larger City policies, and identify unique conditions (such as infrastructure needs or neighborhood assets) at a smaller scale that should be treated as such when making future decisions. Most neighborhood plans in Austin also include a future land use map (FLUM) designating preferred use categories as the neighborhoods develop. Many of the same considerations mentioned above for Imagine Austin would also apply to any updates of Austin’s neighborhood plans, with the following additions:

1. Update the FLUMs to reflect known wildfire risk areas.
2. Develop a consistent approach to incorporating wildfire risk into neighborhood plans. Today, only two neighborhood plans even mention wildfire risk (the Oak Hill Combined and the Upper Boggy Creek plans). These plans and others should be improved to integrate policies and strategies from the CWPP and consistent WUI management strategies.
3. Consider incorporating sample language for neighborhoods and HOAs to develop potential covenants related to wildfire risk reduction. The current CWPP suggests potential covenants addressing landscaping materials, debris management, setbacks, building materials, and setbacks.
4. Reference the City’s evacuation plan (currently underway) within neighborhood plans.

## Tips and Additional Support

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### Use the Plan Update Process as an Education Opportunity

An update to Imagine Austin will bring out a large audience of citizens and subject matter experts. Use this opportunity to increase public outreach and engagement on wildfire risk reduction.

### Consider Policy Implementation

Regardless of how wildfire risk reduction is incorporated into Imagine Austin and the neighborhood plans, consider how each policy or recommendation could be implemented through regulatory measures such as subdivision, zoning, and building codes. By considering potential implementation mechanisms during the plan update, drafting future regulations will be easier to align with the plan.

### Additional Resources

The following resources provide more information on how to incorporate wildfire (and other hazards) into the comprehensive plan and neighborhood plans:

- ***Planning for Hazards: Land Use Solutions for Colorado***. Although tailored for Colorado, many of the land use tools, including integrating with the comprehensive plan, are relevant to communities nationwide. [www.planningforhazards.com](http://www.planningforhazards.com)
- **American Planning Association's *Hazard Mitigation: Integrating Best Practices into Planning (PAS 560)***. <http://www.fema.gov/media-library/assets/documents/19261>
- **FEMA's *Integrating Hazard Mitigation into Local Planning***. [http://www.fema.gov/media-library-data/20130726-1908-25045-0016/integrating\\_hazmit.pdf](http://www.fema.gov/media-library-data/20130726-1908-25045-0016/integrating_hazmit.pdf)

## Part 4: Improve Land Use Regulatory Tools to Reduce Wildfire Risk

Reducing Austin's wildfire risk requires moving beyond policy and into regulations. As discussed earlier in Part 1: *Overview*, land use and development regulations can help reduce wildfire risk by addressing various approaches:

- **Avoid development in hazardous areas.** A WUI Code can establish a set of baseline mitigation standards for development in moderate- to high-risk areas (or to another threshold risk scale determined by the City). Subdivision regulations can offer incentives (e.g., density bonuses, increased height) for keeping clear of specified slopes or vegetation types. Zoning can establish appropriate densities within the WUI.
- **Protect structures and ensure they are constructed to a high standard.** Zoning and development standards should also address the quality of structures and the site around them. A WUI code would be an effective tool to establish appropriate thresholds for when additional wildfire mitigation standards apply to a site, and the types of construction required for development in higher risk areas. The City's various criteria manuals and development standards should also be aligned with any adopted WUI regulations.
- **Ensure that the uses and activities on a property are appropriate and held to a high standard.** Some specific land uses should be managed more carefully because they present unique wildfire challenges (e.g., above-ground flammable substance storage or temporary fireworks stands). Additionally, critical facilities such as hospitals, schools, and other places where large populations congregate should also be considered during the development of wildfire risk reduction standards.

As with planning policies, land use tools should aim to reduce the community's risk to wildfire but should be developed with careful consideration of the need for wildland fire to contribute to the health of Austin's ecosystems.

As previously mentioned, it is also important to consider both greenfield and infill development scenarios when drafting land use tools for wildfire risk reduction. The remainder of this section identifies three specific detailed recommendations to improve Austin's land use tools to reduce wildfire risk.

### Recommendation 4.1: **Adopt a WUI Code**

#### **Rationale**

Although the City of Austin adopted various International Code Council (ICC) Codes (for building, fire, and property maintenance) with local amendments, there are no references to wildfire in such codes. The same is true for many of Austin's criteria manuals. A set of wildland-urban interface regulations, or the ICC WUI Code with local amendments, could move Austin beyond their current limitations in zoning and subdivision (which generally limits the City's ability to control development between the public right-of-way and the building). Often WUI Codes include additional regulatory mechanisms for building materials and construction, vegetation management, emergency vehicle access, water supply, fire protection, and structure densities and location.

Austin City Council adopted a resolution earlier in 2016 directing the City Manager to evaluate the ICC WUI Code and to determine its potential for protecting life, property, and natural resources from the catastrophic effects of wildfire. It was recognized in this resolution that adoption of a WUI Code had been recommended twice previously by the Public Safety Commission as recently as March 2016. Adoption of a WUI Code would help the City Council, and the City of Austin accordingly work towards their goal of zero wildland fire fatalities, and the integration of wildfire management strategies into Austin's existing regulatory frameworks to ensure resilient communities and ecosystems.

## Implementation

### Evaluate Internal Capacity

Prior to adopting a WUI Code, the City should evaluate their ability to effectively administer and enforce the code. As part of this evaluation, the City should:

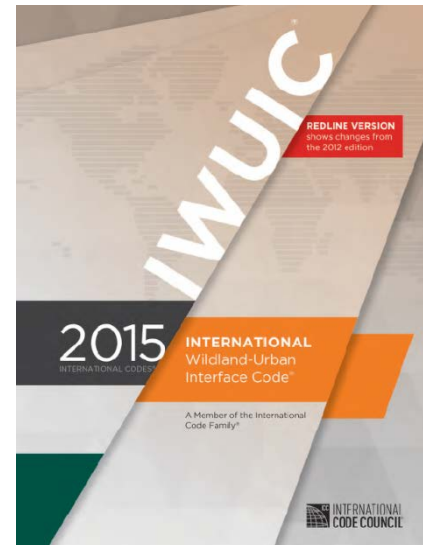
- Determine if administration or enforcement of the WUI Code would require additional FTEs.
- Determine whether or not administration and enforcement of the WUI Code would require new systems to be developed.
- Identify how adoption of the WUI Code would impact other City regulations. E.g., identify ordinances that would have to be updated for consistency with the WUI Code.
- Establish who, or what department, would be the administrator of the WUI Code.
- Evaluate how the WUI Code would impact development review timeframes given the current pace of development applications.

More discussion on this topic is provided in Part 5: *Make the System Work for Austin*.

### Consider the Applicability of WUI Code Standards

For any codes that impact development, identifying the applicability of the regulations is essential to successfully administering and enforcing the code. Austin should consider the following as part of the WUI Code adoption process:

- Determine where the WUI Code should apply, including certain geographic areas, specified risk levels, specific zoning districts, or within other environmentally-sensitive areas. The spatial data resulting from the City's work with Intterra can help inform this discussion. These areas should be mapped at the parcel level wherever possible.
- Determine if the WUI Code should only apply to new construction, or if it should also apply to retrofits and remodels. One of the most effective ways to manage WUI risk is to apply standards to existing structures where possible.
- Determine whether or not the City should employ size thresholds for when the WUI Code would apply (e.g., for new buildings over 10,000 square feet, or expansions of existing buildings of more than 25 percent gross floor area). Consider tying the WUI Code to new builds, retrofits, and remodels at similar thresholds to those presented in CodeNEXT for nonconformities or the applicability other development standards such as parking or landscaping.
- Determine whether or not the WUI Code should apply to both subdivision and site development applications. (See discussion on condominium regime below.)



**Cover of the 2015 ICC WUI Code. Many communities across the nation have adopted the WUI Code, often with local amendments.**



- Identify certain land uses (such as hazardous materials storage, fireworks stands, or uses associated with large congregations of people) where WUI Code standards may need to be stronger than for other land uses. These use-specific standards may be incorporated through CodeNEXT and not in the WUI Code directly, but should be identified as part of the adoption of the WUI Code. Conversely, the City should also consider whether or not certain uses and/or activities should be exempt from the WUI Code standards.

### **Apply WUI Code Standards Throughout the City Based on Risk**

WUI Code standards should focus on protecting Austin’s neighborhoods on the east (and north and south), not just limited to established neighborhoods and subdivisions in traditional forested WUI areas on the City’s west side. Much of the future growth in Austin is expected to occur on the east side, which may actually create new grassland WUI issues.

### **Apply WUI Code to Condominiumization Regimes**

One issue that Austin struggles with is that large single-family “subdivisions” are exempted from subdivision regulations by developing all of the homes on a single lot and selling them off using a condominiumization regime. This exemption, mandated by Texas Property Code Chapter 82 (the Uniform Condominium Act), creates a loophole that diminishes Austin’s authority to address access, water supply, and appropriate densities. With adoption of the WUI code, the applicability standards should clearly include condominiumization projects, including those with private roads, where permitted by Texas Property Code.

### **Coordinate with Imagine Austin**

For Imagine Austin, updates to policies and to the FLUM should reflect the areas where the WUI Code applies. Additionally, the plan should provide narrative on why the WUI Code exists, and how it relates to other policies and regulations within the City’s planning framework. All policies in Imagine Austin should be reviewed for potential conflicts with defensible space standards, and other areas where the WUI Code may state different objectives. The integration of wildfire risk reduction and management of the WUI was discussed earlier in greater detail in Recommendation 3.2: *Use Wildfire Risk Information to Inform Austin’s Plans*.

### **Coordinate with CodeNEXT**

As the City continues to move forward with land development regulation updates through CodeNEXT, and as it prepares for an update to Imagine Austin, elements of the WUI Code should be carefully coordinated. For the CodeNEXT project – consider how the WUI Code would relate to both subdivision controls and the lineup of zoning districts. Should access to adequate water supply be covered in general subdivision requirements, or rather provide a cross-reference to the WUI Code section number? Consider how the landscaping section of CodeNEXT would relate to vegetation management standards within the WUI Code. For example, what happens if defensible space within the Home Ignition Zone (HIZ – generally including the area within 200 feet from a structure) conflicts with minimum tree or shrub requirements? As previously mentioned, who (or what department) enforces the WUI Code? These distinctions will be important to how the City adjusts its workload.

### **Align with Other Plans and Regulations**

Additional plans and regulations should be reviewed carefully for consistency with adopted WUI Code standards. For example the current CWPP makes recommendations for defensible space, landscaping materials, building materials, fence materials, and fuels management, among others. Regardless of which comes first, an Austin-specific CWPP or a WUI Code, they should “speak the same language” and

compliment the other. Austin's criteria manuals should be updated to include wildfire risk reduction and to align with any adopted WUI Code standards.

## Tips and Additional Support

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### Enhance Community Buy-In

Austin is already ahead of the curve in community support based on the City Council's resolution for further consideration of the WUI Code. That being said, Austin should proactively involve local groups such as local developers, the Board of Realtors, the National Association of Home Builders, and the general citizenry in discussions about the basics of a WUI Code, why the City is considering it, and how the community would be better off with such regulations. Early engagement on this subject will highlight any misperceptions and allow the City to adjust with local amendments to the ICC WUI Code as necessary.

### Additional Resources

- To learn more about the potential impacts of WUI Code adoption on internal capacity, contact the following individuals that manage WUI Code regulations in their communities:

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**Paul Summerfelt, Wildland Fire Management Officer**

*City of Flagstaff, Arizona*

[psummerfelt@flagstaffaz.gov](mailto:psummerfelt@flagstaffaz.gov)

**Amy Ray, Fire Marshal**

*Truckee Meadows Fire Protection District, Washoe County, Nevada*

[aray@tmfpd.us](mailto:aray@tmfpd.us)

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According to the ICC's website (<http://www.iccsafe.org/about-icc/overview/international-code-adoptions/>), as of January 2016 four Texas communities have adopted the IWUIC, including Alamo, Grand Saline, Hutchins, and Lake Jackson.

- **Teton County and the Town of Jackson, Wyoming**, adopted the WUI Code in 2006 (and subsequently the 2012 version) as they recognized the necessity for preventing structure losses in the event of future fires. To view the adoption resolution for the 2012 edition, which includes several local amendments, click here: <http://www.tetonwyo.org/fire/docs/Prevention%20Docs/FireCodeResolution20130507.docx>
- **Flagstaff, Arizona**, serves as an excellent case study on the adoption and enforcement of the WUI Code. Their systematic approach to generating widespread community support involved "Three E's," Education, Engineering, and Enforcement, with the latter being partially accomplished through the WUI Code. Read a white paper written by Flagstaff Fire Department's Paul Summerfelt and Jim Wheeler on "*How to Avoid the Agony*" when considering WUI Code adoption. <http://www.flagstaff.az.gov/DocumentCenter/Home/View/15342>

## Recommendation 4.2: Revise Land Development Regulations to Address Wildfire Risk Reduction

### Rationale

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The Land Development Code is possibly the most important tool for making an impact on the built environment. Because the City is currently updating its Land Development Code through CodeNEXT, the timing is appropriate to incorporate wildfire risk reduction strategies where possible. Updates to the Land Development Code should be aligned with strategies in the CWPP, the WUI Code, and other City

policies and regulations associated with wildfire risk reduction. There are various opportunities throughout the Current Title 25 to effectively integrate wildfire risk reduction, as indicated in the earlier WUI Planning Audit. Below are some specific recommendations to consider during the CodeNEXT update that we think are either priority updates and/or would require minimal staff time and resources to accomplish.

## **Implementation**

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### **Development Assessments**

The City should identify wildfire risk and mitigation early in the development review process. For example, a development assessment is optional for large projects in Austin (See §25-1-62 of the LDC). In that procedure there is no specific reference to assessing wildfire risk, other than indirectly through “significant environmental issues.” The City should develop a program by which Austin Fire and/or another trained professional reviews a development site for wildfire risk and suggests potential mitigation solutions. Both the developer and the City benefit from early indications of site-specific issues that could be avoided prior to submitting an official application. The same is true for the pre-construction conference procedures in §25-1-283 and §25-1-314 (for preconstruction conferences and final acceptance by the City, respectively). Although “appropriate City departments” are mentioned in these procedures, Austin Fire Department should be specifically called out (either for all projects, or for those within mapped risk areas as determined in Part 2 of this report). Of course, adding this review to AFDs already demanding workload may require additional FTEs and resources.

### **Zoning**

There are several opportunities within Chapter 25-2 to integrate wildfire risk reduction. Some initial suggestions include:

- In district purpose statements, such as those in §25-2-51 for residential districts, include specific reference to adequate access to emergency services to supplement the current “facilitate the planning for and provision of...public service requirements.” This is a quick fix to establish more of a focus on emergency services for flood, fire, or other types of emergencies.
- Criteria for approval of zoning or rezonings should be tied to general conformance with Imagine Austin (and the growth concept map), and could also include adequate mitigation provisions for proposed rezonings in areas with wildfire risk. The current LDC §§25-2-282 and 283 do not include such criteria.
- The Tier One Planned Unit Development Requirements (Article 2, Division 5, Subpart B, §2.3) state that all PUDs must exceed the minimum landscaping requirements of the City Code. This standard could potentially conflict with defensible space standards by forcing applicants to provide additional fuels proximate to structures. A qualifying statement could be added here that says “except where additional landscaping would exacerbate a wildfire hazard” or “except for areas within a [mapped hazard area],” or similar.
- In the Development Bonuses (Article 2, Division 5, Subpart B, §2.5), ensure that bonuses above baseline development densities are not promoted in the WUI or other mapped hazard areas without proper mitigation. This could be accomplished through site-specific assessments discussed earlier.

### **Use and Development Regulations**

The following suggested recommendations for updates to the LDC (through CodeNEXT) Use and Development Regulations will help Austin reduce its potential wildfire risk:

- One of the biggest challenges communities face with reducing wildfire risk is addressing existing development. In §25-2-984, consider additional landscape maintenance standards (pruning, trimming, fuel reduction) for properties in the WUI or high-hazard areas.
- The Hill Country Roadway Requirements should be revised to allow wildfire mitigation (especially fuels reduction) in the roadway vegetative buffer that currently prohibits such clearing within 50 feet of the right-of-way unless “necessary to provide utilities and access to the site” (§25-2-1023). Additionally, the density bonuses within the Hill Country Roadway Requirements (§25-2-1128) should be amended to discourage additional landscaping that would increase wildfire risk.
- The visual screening requirements in §25-2-1027 require “dense massing of trees, native understory vegetation, shrub massing, or berms.” These should be coordinated with defensible space and fuels reduction best practices to allow for exceptions in the WUI and/or high-hazard areas.
- Assess the City’s current list of permitted uses for those that would benefit from stronger regulations related to wildfire risk reduction. For example, development near hazardous pipelines could include use-specific standards that apply to properties within the WUI or other mapped wildfire risk areas. Other uses that may require additional standards could include those that typically use or store hazardous/flammable materials, uses that attract large congregations of people, and critical infrastructure uses (fire stations, police services, hospitals, etc.). Use-specific standards might include minimum distance requirements from forested areas, or could prohibit or require conditional use approval if they are proposed within the WUI or high-wildfire hazard areas.

### **Subdivision**

Subdivision is a key step in the development review process by which staff can review proposed lots for their ability to provide required infrastructure and adequate densities in compliance with City policies. Staff is updating the subdivision standards as part of CodeNEXT, and we suggest the following considerations as part of that process:

- Include a purpose statement at the beginning of the subdivision chapter that includes intent statements to provide for safe development, adequate mitigation of natural hazards (including wildfire), and access to emergency services. These should be drafted to coordinate with City policies in Imagine Austin, the CWPP, the City’s evacuation plan, and other relevant plans and policies.
- Include additional criteria for the approval of preliminary and final plats that relate to adequate mitigation of wildfire hazards, and providing safe access to emergency services.
- Apply the recommendations above to Title 30: Austin/Travis County Subdivision Regulations.

### **Conservation Subdivision**

One way to protect environmentally sensitive areas (or in this case, wildfire risk areas) is to adopt a conservation subdivision ordinance. A conservation or cluster subdivision protects sensitive areas by “clustering” development in areas that are less sensitive (e.g., outside of forested areas, floodplains, or Karst topography features) and conserving the remaining areas free from development. With these conservation subdivisions, the developer is typically granted some added benefit in exchange for the conservation of sensitive lands such as reduced minimum lot sizes, density bonuses, or increased height maximums.

**NOTE:** *With increased densities on clustered lots, a different type of fire risk is introduced through home-to-home ignition potential. High-density structural regulations can help mitigate home-to-home ignition in these development patterns.*

Travis County adopted a conservation subdivision ordinance more than a decade ago, but the development community has not taken advantage of the tool. At the time Travis County adopted the ordinance, the City of Austin was not inclined to adopt its own conservation subdivision ordinance. As growth pressure continues, the City may wish to add this important tool to its subdivision regulations.

A new conservation subdivision tool could be adopted by a new ordinance, or by an amendment to the existing subdivision ordinance. Because the City is already underway with CodeNEXT, which includes revamping the subdivision regulations, we recommend including a conservation subdivision tool within the proposed ordinance as part of that project. Austin should consider the following when developing the conservation subdivision regulations:

- Which area(s) will the conservation subdivision procedure apply to?
- Will the conservation subdivision tool be required for any particular areas or site conditions?
- In addition to state mandated subdivision exemptions, should additional areas or scenarios in Austin exempt from the conservation subdivision requirements?
- What should the benefits or incentives be for developments taking advantage of the conservation subdivision?

#### Elements of a Conservation Subdivision Tool:

The following basic elements should be considered when developing a conservation subdivision ordinance:

- **Purpose.** Clearly articulate the intent of the ordinance and the benefits for this type of development pattern. Use similar language from Imagine Austin for “compact and connected.”
- **Applicability.** As stated above, make sure it is clear whether or not the conservation subdivision is optional or mandatory. Also, if tied to specific areas, make sure those areas can be accurately mapped.
- **Incentives and Benefits.** Describe the benefits that the developer achieves, such as reduced minimum lot sizes, reduced setbacks, increased densities, additional number of lots, increased heights, or expedited review times, etc.
- **Conservation Subdivision Design Standards.** Include specific regulations on minimum project size (if any), how the subdivision should be laid out (including common open space areas), and the dimensional standards for lots.
- **Review Procedures.** Review procedures for conservation subdivisions can be located within the conservation subdivision ordinance, or located with all other development review procedures depending on the City’s chosen organizational approach, from those proposed in CodeNEXT annotated outlines.

#### Coordinate Conservation Subdivision with Other Land Use Tools:

Conservation subdivision programs work best in concert with other benefits and incentive programs. For example, the City may want to tie conservation subdivisions to the existing TDR program or to the density bonus program. The conservation subdivision ordinance has not been applied in Travis County, in part because the incentives have not yet warranted consideration by the development community.

## Tips and Additional Support

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### Consider Administration and Enforcement

With any change to development regulations, it is important to consider how the regulation would be administered and enforced. Some of the recommendations above may require additional staff time than is currently dedicated to a particular process such as subdivision review, or site-specific assessments. It is important to analyze how much development is expected to fall within a particular provision, and what the particular impacts may be to staff resources. Pressure on staff resources can be relieved by placing more of the burden on landowners and developers to hire qualified professionals (as determined by the City) during the development review process. Additionally, provisions should not be adopted if staff does not think they will be enforced. For example, it is one thing to require enhanced landscape maintenance standards to reduce wildfire risk on existing developed sites, but without regular monitoring and enforcement these standards can lose their effectiveness. More on building staff capacity is included in Part 5: *Make the System Work for Austin*.

### Tie Wildfire Risk Reduction to Competing Interests

Take advantage of any opportunity when a suggested change in policy or regulation can be coordinated with other competing interests. For example, if the Parks and Recreation Department is suggesting changes to development standards to address floodplain issues, consider how such proposed changes might be adjusted slightly to address wildfire risk reduction. As another example, if the City Council is emphasizing affordable housing, make the connections between affordable housing and wildfire risk reduction measures – e.g., affordability should not come at the expense of safety, or conservation subdivisions can result in density bonuses that can improve affordability. Placing a lens of wildfire risk reduction on all City efforts can help staff develop the necessary messaging.

### Additional Resources

#### General Land Use Regulations:

- **Community Wildfire Safety Through Regulation – A Best Practices Guide for Planners and Regulators.** Published by the National Fire Protection Association. Includes recommendations for adopting wildfire regulations, understanding different contexts and scales, and illustrates examples through case studies.  
<http://www.nfpa.org/~media/Files/Wildland/WildfireBestPracticesGuide.pdf>
- **Planning for Hazards: Land Use Solutions for Colorado.** Although tailored for Colorado, many of the land use tools, including zoning and subdivision tools, are relevant to communities nationwide. [www.planningforhazards.com](http://www.planningforhazards.com)

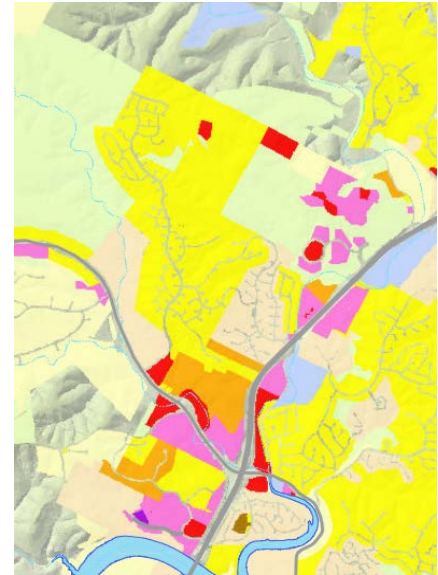
#### Conservation Subdivisions:

- **City of Boerne, Texas.** Rural cluster subdivisions. See Article 4, Section 03.  
<http://www.ci.boerne.tx.us/DocumentCenter/View/3079>
- **Town of Flower Mound, Texas.** Conservation development option. See Section 98-277.  
[https://www.municode.com/library/tx/flower\\_mound/codes/code\\_of\\_ordinances?nodeId=SPB\\_LADERE\\_CH98ZO\\_ARTIIIDIRE\\_DIV3AAGDICODIRUDE\\_S98-277CODEOPST](https://www.municode.com/library/tx/flower_mound/codes/code_of_ordinances?nodeId=SPB_LADERE_CH98ZO_ARTIIIDIRE_DIV3AAGDICODIRUDE_S98-277CODEOPST)
- **City of Pearland, Texas.** Cluster development plans.  
<http://www.pearlandtx.gov/departments/community-development/planning/cluster-development>
- **City of Longmont, Colorado.** Cluster lot subdivisions. See Section 15.07.040.  
[https://www2.municode.com/library/co/longmont/codes/code\\_of\\_ordinances?nodeId=PTIICO\\_OR\\_TIT15LADECO\\_CH15.07SUIMST\\_15.07.040CLLOSU](https://www2.municode.com/library/co/longmont/codes/code_of_ordinances?nodeId=PTIICO_OR_TIT15LADECO_CH15.07SUIMST_15.07.040CLLOSU)

## Recommendation 4.3: Update the Zoning Map to Direct Growth toward Safe Areas

### Rationale

The zoning map is an efficient mechanism to directly implement the future land use maps and growth concept map series. Austin's official zoning map identifies the City's boundaries for zoning districts, illustrating the type and intensity of development permitted within those areas. Once the wildfire risk areas become part of the equation for determining appropriate growth concepts (see Recommendation 3.2: *Use Wildfire Risk Information to Inform Austin's Plans*), the City should review the zoning map to ensure consistency with those maps and objectives. The City may learn from this exercise that the current zoning allows for too much development (in terms of uses, densities, and intensity) in certain areas, or not enough development in areas designated for future growth. As City Staff is already aware, an update to the zoning map equates to changes to what is allowed on real property. Because of this, zoning map updates require a public process.



*Segment of Austin's zoning map near Hwy 360 and 2222 on the west side of the City. Wildfire risk areas could be overlaid to analyze whether or not appropriate zoning is in place.*

### Implementation

#### Types of Zoning Map Changes

There are two types of updates to the zoning map: 1) legislative map changes, and 2) quasi-judicial map changes. **Legislative map changes** are typically initiated by the City and affect multiple properties with multiple owners. For example, if a city updates their zoning regulations and the new regulations require a new map with new or revised districts, a legislative map update may be included in the process to rezone multiple properties throughout the city. **Quasi-judicial map changes** are those typically proposed by an applicant for a development of one or more properties. For example, if a developer wants to build a new hotel, but the current zoning prohibits hotels, the developer may choose to file an application with the City for a map change (rezoning) to a district that allows hotels.

#### Assess the Current Zoning Map

The first step in implementing the effectiveness of the zoning map in reducing wildfire risk is to prepare an analysis. This analysis should include a side-by-side comparison of the areas targeted for growth, areas with higher risk to wildfire, and other areas to be preserved or protected. In some cases, it may become apparent that the zoning of a particular area is inconsistent with stated policies and could place additional people and property in harm's way with future development.

In the case of implementing the growth concept and future land use maps, these changes would likely require a legislative action that affects multiple areas throughout Austin.

#### Determine an Approach for Zoning Map Changes

Based on the analysis of the current zoning map compared against the FLUM and growth concept maps, Austin should determine the best approach for making zoning map changes to address wildfire risk, including:



- Consider City-initiated legislative rezoning for consistency with Imagine Austin, or following the CodeNEXT adoption.
- Develop incentives for down-zoning properties (reduction of density and/or intensity) in high-risk areas, through mechanisms such as incorporating WUI risk reduction into the transfer of development rights (TDR) program, or expanding Austin’s existing density bonus program.
- Reduce or eliminate development application fees for individual properties to rezone for consistency with Imagine Austin, such as up-zoning a property in an activity center.
- Consider whether a new overlay zoning district is necessary to effectively manage development in the WUI.

## **Tips and Additional Support**

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### **Communicate Relationships between Zoning and Wildfire Risk Reduction**

The City has many competing interests, in addition to wildfire risk reduction, to consider when determining where and how Austin should grow, and which zoning districts and map amendments are necessary to implement the preferred growth scenarios. Do not wait to begin engaging residents, developers, City officials, and other stakeholders in a conversation about wildfire risk and its relationship to zoning districts. Early and frequent communication with stakeholders on these issues will improve the public process for any proposed zoning map change.

Provide information related to risk areas, and discuss options for how the City could mitigate the risk. Use data wherever possible to communicate how one particular area may or may not be at a particular disadvantage when it comes to wildfire risk (e.g., greater densities, fewer points of egress, substandard building materials, etc.). Try to draw connections between wildfire risk reduction and other City policies and frameworks – such as Austin’s desire to grow in a “compact and connected” development pattern.

## Part 5: Make the System Work for Austin

Effective implementation of recommendations in this report requires City capacity and resources to understand its wildfire risk, strengthen the role of wildfire risk in the planning framework, and introduce new or improved planning tools and development regulations. Without careful consideration of how these recommendations could be implemented, who would be responsible, and how success would be monitored, efforts could be undermined or less effective.

Recommendations are either directly related to, or connected in some way to Austin's planning and development review department. Following the 2015 organizational assessment by Zucker Systems, changes are underway to resolve stated problems within planning and development review and among other City departments. To that end, identifying resources for the recommendations in this report is important to ensure that these projects are weighed against the many competing duties and priorities falling on staff and their budgets. Additionally, there is the potential for an increase in cost to developers and emergency services providers. Estimating those costs requires further analysis and should be part of the implementation of any of the recommendations in this report.

Building capacity among departmental leaders and clearly identifying roles and responsibilities will ensure that wildfire planning efforts are successful in Austin. The remainder of this section identifies specific detailed recommendations to make the wildfire planning system work for Austin, built on a foundation of collaboration, capacity building, and ownership.

### Recommendation 5.1: Develop an Implementation Action Table

#### Rationale

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Administering and enforcing current and future wildfire policies and regulations requires coordination between multiple City departments and often external agencies. Several stakeholders during the CPAW site visit and subsequent follow-up interviews indicated that many departments are already struggling with capacity issues and that additional workload may overburden individuals and/or departments. With so many current planning projects and citywide initiatives underway, the City must establish ownership and responsibility for each of the recommendations included in this report. An implementation action table can effectively organize and track recommendations.

#### Implementation

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An effective implementation action table should include the following categories (columns) that would apply to each recommendation and/or specific action (row):

- **Recommendation or action.** Identify and describe the actual action and tasks to be accomplished.
- **Timeframe for completion.** Identify whether or not each action item is an ongoing action item, or if it is a short-, mid-, or long-term action. Alternatively, specific years and/or months could be assigned.
- **Applicability.** Describe the geographic area where each action applies. May include actions that are citywide, or some that only apply to the WUI or other mapped areas.
- **Primary responsibility.** Identify the lead agency or department assigned to each specific action. Where possible, identify specific individuals that can take the lead on the action.
- **Support responsibility.** Determine what other agencies, departments, or individuals should be involved to ensure success of each action.

- **Potential funding sources.** Identify funding sources that are available to assist with the implementation of each action. Determine whether or not there are federal or state grants available, and/or if each action would require a line item in the City’s budget.
- **Additional resources required.** Identify other resources necessary to successfully implement the action, such as additional FTEs, additional office space, and/or access to specific software.

The table can include other categories for staff commentary, links to relevant documents, or notes on progress. Some recommendations in this report may be divided into multiple tasks. For example, “Adopt a WUI Code” may require several individual actions such as choosing an approach, drafting applicability standards, drafting local amendments, and coordinating WUI Code standards with other City plans and regulations.

If the City develops Austin-specific CWPP strategies, regardless of the approach, the mitigation strategies and actions from that effort could be combined with the recommendations in this report for a more holistic view of the tasks to be accomplished. The same lead agency or committee for development of the Austin-specific CWPP strategies could also take the lead role in managing and implementing the action table, as well as other recommendations and strategies included in this report.

## Tips and Additional Support

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### Monitor Success

With any new program, policy, or regulation, it is important to monitor its success over time. Such monitoring should occur regularly and should identify shortfalls, necessary amendments, or specific aspects that are working well. Whenever possible, data should be gathered to help support reporting on the success of a particular action. For example, instead of simply “checking it off the list,” staff could track quantifiable data related to a task – e.g., number of staff hours conducting site assessments, dollars allocated to WUI Code enforcement, or number of applications received for conservation subdivisions.

When reporting on progress, incorporate a success story into the results. For example, when presenting to City Council that four applications for conservation subdivisions were approved in a given year, include information on how many acres were preserved for open space or fuel breaks, or how many additional housing units were added to a project based on the density bonuses achieved.

### Adjust the Table as Necessary

Implementation of these actions may evolve based on their success (or lack of success). Depending on available resources and shifting City priorities, some of the actions may move up or down the line in terms of their importance. Regular monitoring will ensure that the table remains current, and that additional resources or responsibilities are assigned appropriately.

## Recommendation 5.2: Improve Coordination, Capacity, and Outreach

### Rationale

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Austin staff is especially knowledgeable when it comes to land use planning and wildfire risk reduction, in addition to various other specialty fields such as water conservation, wildlife protection, climate change, and emergency management. However, there is an opportunity for enhanced cross-training of internal City departments so that each is more familiar with other department’s responsibilities, priorities, and special skill sets. Austin’s City Departments are somewhat isolated currently, and the various efforts underway (CodeNEXT, CPAW, and soon Imagine Austin) present a forum for enhanced

coordination and training. There is also a unique opportunity to enhance Austin’s public education and outreach materials related to planning for wildfire. This recommendation applies more broadly than planning for wildfire risk reduction, but the implementation section below focuses on the recommendations contained in this report.

## Implementation

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### Establish the Team

Updates to Imagine Austin, neighborhood plans, CodeNEXT, and the creation of an Austin-specific CWPP (or similar strategies using another approach) will require coordination of City planners, Austin Fire Department (AFD), and input from the Austin Travis County Wildfire Coalition (among other stakeholders) to effectively integrate the City’s risk-reduction policies with future land use and environmental protection policies. To make the recommendations in this report work for Austin, the team should be established thoughtfully to include the necessary perspectives to be successful.

### Build Staff Capacity

Many of the recommendations included earlier in this report require trained professionals to properly execute. For example, conducting a site assessment on an individual property related to wildfire risk and potential mitigation requires a trained forester or wildfire expert with a keen eye for problem areas and a deep understanding of potential solutions. That being said, Austin Fire Department staff is already taxed beyond their existing capacity, and site assessments could be accomplished by those already in the field conducting inspections and/or site visits for other purposes. The City should consider organizing training sessions for planners and building code inspectors, led by expert foresters or wildfire mitigation specialists, to inform them on the types of issues they look for on a site and to discuss solutions.



*Justice Jones (AFD) describes some of the wildfire mitigation concerns in and around the Balcones Canyonlands Preserve to other City staff and land managers.*

This is a two-way street – Austin planners should also be cross-training the fire department on their top priorities for development patterns, site-specific issues such as landscaping, parking lot design, building setbacks, etc. This knowledge-sharing process not only improves the culture within the City, but also highlights potential conflicts in priorities or regulations.

Cross-training should not be limited to fire and planning departments. The same goes for public works, parks, water, and generally any other department that regulates land or development. Additionally, divisions within departments should be cross-training. With more broad knowledge of City processes and priorities, staff will be better equipped to administer and enforce the recommended policies and regulations in this report.

### Enhance the Internal Development Review Process

One repeated theme during the site visit and WUI Planning Audit was that Austin Fire Department (AFD) does not have a “seat at the table” when it comes to most types of development review procedures. The City currently uses the Amanda system for processing applications, by which individuals or departments are assigned a particular electronic review responsibility depending on the application type. Priorities for the Wildfire Division of AFD may be better addressed earlier in the development

process if there were a mechanism in place for application review. This could range from subdivision reviews, to conducting site-specific assessments.

It is important to remember – **adding review authority will require additional (and potentially substantial) staff time and resources.** This should be evaluated in greater detail prior to making such a change.

### Enhance Public Outreach and Education

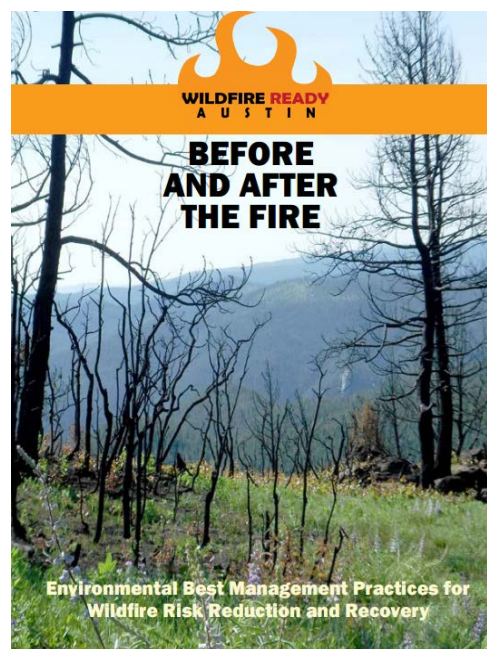
Whenever a large group of citizens, subject matter experts, and City staff are assembled to discuss a planning or mapping project, the City should take advantage of the opportunity to increase public outreach and engagement on wildfire risk reduction. Public education on wildfire could occur with Imagine Austin, during development of an Austin-specific CWPP, or during code updates through CodeNEXT. Additionally, use these opportunities to report on the benefits of wildland fire to the ecosystem since the general public is typically trained to view all fire as “bad fire.”

#### Open Staff Training to the Public

Training planners and fire departments about their respective skillsets may also be an opportunity to educate the public about the ins and outs of Austin’s government. The general citizenry, neighborhood organizations, and the development community, among other stakeholders would likely be interested in learning more about the types of things they can do on their property to reduce wildfire risk. They might also be interested in learning how various City departments are coordinating on certain projects to protect the health, safety, and welfare of the community.

#### Develop Additional Educational Materials

Austin should continue to develop useful public educational materials related to wildfire risk reduction. Materials may include publications, flyers and posters, model presentations (that can be downloaded or presented by a speaker’s bureau), interactive website engagement tools, and in-person “ask a wildfire mitigation specialist” forums. Educational materials should be developed using a coordinated approach to effectively align the varied perspectives of Austin’s internal departments.



*Austin’s 2014 “Before and After the Fire” publication describes how to understand wildfire risk, modify properties, and evaluate post-fire conditions to establish long-term recovery plans.*

## Tips and Additional Support

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### Remember the Interrelatedness of Hazards

Austin’s planning efforts should emphasize the interrelatedness of hazards, including wildfire and flooding. Policies and regulations should be developed with particular consideration of both pre- and post-event relationships between hazards. For example, planning for wildfire should also incorporate planning for post-fire flooding of a scarred landscape.

### Additional Resources

**Fire Adapted Communities Learning Network.** The Fire Adapted Communities (FAC) Learning Network provides communities with an opportunity to exchange information and collaborate to improve fire adaptation and to help communities live safely with fire. The City of Austin is already a member of the

FAC Learning Network. The implementation action table (Recommendation 5.1) could be incorporated into Austin’s FAC work plan. Learn more at <http://fireadaptednetwork.org/>.

## Definitions

The following definitions are intended to aid understanding of terms associated with CPAW recommendations. Not all of these terms are used in this report, but are included as a reference tool.

### **Built Fuels**

Man-made structures (buildings and infrastructure).

### **Burn Probability**

The probability or effect of a wildland fire event or incident, usually evaluated with respect to objectives.

### **Burn Severity**

A qualitative assessment of the heat pulse directed toward the ground during a fire. Burn severity relates to soil heating, large fuel and duff consumption, consumption of the litter and organic layer beneath trees and isolated shrubs, and mortality of buried plant parts.

### **Community Based Ecosystem Management**

With an emphasis on local stakeholder participation, allowing the local community to manage their ecosystem based on the unique characteristics of an area.

### **Community Wildfire Protection Plan (CWPP)**

Established by the 2002 Healthy Forest and Restoration Act, A CWPP is a plan that identifies and prioritizes areas for hazardous fuel reduction treatments on Federal and non-Federal land that will protect one or more at-risk communities and essential infrastructure and recommends measures to reduce structural ignitability throughout the at-risk community. A CWPP may address issues such as wildfire response, hazard mitigation, community preparedness, and structure protection.

### **Convection Heat**

The movement caused through the rising of a heated gas or liquid.

### **Conduction Heat**

Transfer of heat through direct contact of material.

### **Critical Facilities**

FEMA defines critical facilities as “facilities/infrastructure that are critical to the health and welfare of the population and that are especially important following hazard events. Critical facilities include, but are not limited to, shelters, police, fire stations, and hospitals”. In addition, CPAW recognizes emergency water pumping stations, egress routes, communication facilities, and backup power supplies as critical facilities.

### **Ecosystem Based Fire Management**

The incorporation of the natural or desired ecological role of fire into the management and regulation of community’s natural areas.

### **Embers**

A small piece of burning material that can be thrown into the air due to the convective heating forces of a wildfire. Larger embers and flammable materials have the ability to sustain ignition through transport.



**Exposure**

The contact of an entity, asset, resource, system, or geographic area with a potential hazard. Note: In incident response, fire responder exposure can be characterized by the type of activity.

**Fire Adapted Communities**

A group of partners committed to helping people and communities in the wildland urban interface adapt to living with wildfire and reduce their risk for damage, without compromising firefighter or civilian safety.

**Fire Effects**

The physical, biological, and ecological impacts of fire on the environment.

**Fire Intensity**

Commonly referred to as fire line intensity, this is the amount of heat energy that is generated by burning materials.

**Firewise**

Program teaches people how to adapt to living with wildfire and encourages neighbors to work together and take action to prevent losses. The program encourages local solutions for wildfire safety by involving homeowners and others in reducing wildfire risks by fostering defensible space and resilient structures for homes and communities.

**Frequency**

The number of occurrences of an event per a specified period of time.

**Hazard**

Any real or potential condition that can cause damage, loss, or harm to people, infrastructure, equipment, natural resources, or property.

**Hazard Reduction**

Coordinated activities and methods directed to reduce or eliminate conditions that can cause damage, loss, or harm from real or potential hazards.

**Home Ignition Zone (HIZ)**

The characteristics of a home and immediate surrounding area when referring to ignition potential during a fire event.

**Infrastructure**

The basic physical structures and facilities (e.g., buildings, roads, and power supplies) needed for the operation of a community.

**Prescribed Fire**

A planned controlled wildland fire that is used to meet a variety of objectives for land managers.

**Radiation Heat**

Transmission of heat through waves or particles.

**Residual Risk**

Risk that remains after risk control measures have been implemented.

**Resilience**

The ability to recover from undesirable outcomes, both individually and organizationally.

**Risk**

A measure of the probability and consequence of uncertain future events.



**Risk Acceptance**

A strategy that involves an explicit or implicit decision not to take an action that would affect all or part of a particular risk.

**Risk Assessment**

A product or process that collects information and assigns values (relative, qualitative, quantitative) to risks for the purpose of informing priorities, developing or comparing courses of action, and informing decision making.

**Risk Avoidance**

A strategy that uses actions or measures to effectively remove exposure to a risk.

**Risk Based Decision Making**

A decision making process that relies on the identification, analysis, assessment, and communication of wildland fire risk as the principal factors in determining a course of action to improve the likelihood of achieving objectives.

**Risk Communication**

An exchange of information with the goal of improving the understanding of risk, affecting risk perception, or equipping people or groups to act appropriately in response to an identified risk.

**Risk Management**

A comprehensive set of coordinated processes and activities that identify, monitor, assess, prioritize, and control risks that an organization faces.

**Risk Mitigation**

The application of measure to alter the likelihood of an event or its consequences.

**Risk Perception**

Subjective judgment about the characteristics and magnitude of consequences associated with a risk.

**Risk Reduction**

A decrease in risk through risk avoidance, risk control, or risk transfer.

**Risk Transfer**

A strategy that uses actions to manage risk by shifting some or all of the risk to another entity, asset, resources, system, or geographic area.

**Values-at-Risk**

Those ecological, social, and economic assets and resources that could be impacted by fire or fire management actions.

**Vulnerability**

The physical feature or attribute that renders values susceptible to a given hazard.

**Wildfire**

An unplanned wildland fire resulting in a negative impact.

**Wildland Fire**

Any non-structure fire that occurs in vegetation or natural fuels. Wildland fire includes prescribed fire and wildfire.

**Wildland Fuels**

All vegetation (natural and cultivated).

**Wildland Urban Interface (WUI)**

Any developed area where conditions affecting the combustibility of both wildland and built fuels allow for the ignition and spread of fire through the combined fuel complex.

**Wildland Urban Interface Hazard**

Combustibility of the wildland or built fuels, fuel type or fuel complex.

**Wildland Urban Interface Risk**

The WUI hazard accounting for factors that contribute to the probability and consequences of a WUI fire.

**References for Definitions**

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Cohen, J. D. (2000, April 10). *What is the Wildland Fire Threat to Homes?* Missoula: US Department of Agriculture, Forest Service.

Mathew P. Thompson, T. Z. (2016). *Risk Terminology Primer: Basic Principles and a Glossary for the Wildland Fire Management Community*. Rocky Mountain Research Station.

National Wildfire Coordinating Group. (2014, August). *Wildland Urban Interface Wildfire Mitigation Desk Reference Guide*. Retrieved from NWCG.gov: <http://www.nwcg.gov>

National Wildfire Coordinating Group. (2016, August 26). *Community Wildfire Protection Plan*. Retrieved from NWCG.gov: <http://www.nwcg.gov>