Addressing Community Wildfire Risk: A Review and Assessment of Regulatory and Planning Tools

Final Report

Prepared by:

Chris Duerksen, Don Elliott and Paul Anthony

Clarion Associates
Denver, Colorado

FIRE RESEARCH

THE FIRE PROTECTION RESEARCH FOUNDATION
ONE BATTERYMARCH PARK
QUINCY, MASSACHUSETTS, U.S.A. 02169-7471
E-MAIL: Foundation@NFPA.org
WEB: www.nfpa.org/Foundation

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FOREWORD

The risk of catastrophic fire occurrence in the wildland urban interface (WUI) is a major issue in today's fire protection community. There are many potential tools for zoning administrators, planners, and fire/emergency managers to consider when addressing their community's wildfire risk. These tools include comprehensive planning, land use regulation, building codes and standards, voluntary programs (e.g., Firewise Communities/USA recognition program), Community Wildfire Protection Plans, and hazard mitigation planning.

The focus of this study is to review and assess the effectiveness of regulatory planning tools designed to address community wildfire risk, and to communicate lessons learned to communities considering such regulation. The project deliverables define the WUI regulatory landscape through the identification of regulatory tools, categorization of these tools, and their evaluation to clarify their effectiveness.

The Research Foundation expresses gratitude to the report authors Chris Duerksen, Don Elliott and Paul Anthony, with Clarion Associates located in Denver, Colorado. During this research effort, significant input and guidance was provided by Molly Mowery and Dave Nuss of NFPA's Wildland Fire Operations Division staff. In addition, the Research Foundation appreciates the guidance provided by the Project Technical Panelists and all others that contributed to this research effort. Special thanks are expressed to the National Fire Protection Association (NFPA) for providing the project funding.

The content, opinions and conclusions contained in this report are solely those of the authors.

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C L A R I O N

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THE
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EXECUTIVE SUMMARY

The Study

This report was commissioned by the Fire Protection Research Foundation (FPRF), in cooperation with the National Fire Protection Association (NFPA), to investigate how cities and counties are using local regulatory codes and ordinances to address wildfire risk. Particular attention was given to identifying how local governments use NFPA standards that address risk of wildfire in the Wildland Urban Interface (WUI). This report also outlines how certain key tools, such as zoning overlays and subdivision regulations, can be used to more comprehensively address the risk of wildfire. Recommendations are provided to identify achievable next steps that the FPRF and NFPA can take based on the findings of this report. The scope of the project does not include review of non-regulatory or voluntary WUI programs, such as Firewise Communities and Community Wildfire Protection Plans, as previous research has comprehensively addressed these efforts. The study methodology involved five tasks.

- **Task 1: Review of Literature.** The authors reviewed a wide variety of studies on WUI regulations from around the country. Particular attention was given to case studies of communities using innovative tools and best practices for addressing wildfire hazards as identified by fire professionals and other authorities in the field. This review is summarized in Section 2 of this report.
- **Task 2: Regulatory Review and Categorization.** Approximately 40 diverse communities were selected for detailed review of their WUI-related regulatory tools by searching their building code, fire code, land use code, subdivision code, and other local ordinances. This categorization is presented in Section 2 of this report.
- **Task 3: Phone Interviews with Key Communities.** Based on the results of Tasks 1 and 2, and with direction from the Project Technical Panel, 12 communities were selected for phone interviews in which each community was asked the same nine questions. The results of the phone interviews are presented in Section 3 of this report.
- **Task 4: Regulatory Assessment.** The data from the interviews was analyzed and presented in a draft report by the consultant that was reviewed by the Project Technical Panel. The results of this assessment are presented in Section 3 of this report. In addition, a list of potential land use regulatory tools to reduce fire risk in WUI areas is presented in Section 4 of this report.
- **Task 5: Final Report.** This task includes preparation of a final report that incorporates final comments from the project sponsor and Project Technical Panel and a final presentation of the report's results in Quincy, Massachusetts.

Significant Findings from Community Interviews

Some of the significant responses received during the community interviews include:

- *Most interview communities adopted their first set of WUI regulations in response to a major wildfire. A small minority of communities adopted WUI regulations proactively based on historical trends and concerns about imminent wildfire danger or due to state requirements or incentives. The public was often skeptical of proposed WUI regulations but usually came to accept or support the WUI standards if a strong public education effort (such as Firewise Community initiatives) was made to address concerns and correct misinformation in a transparent and open manner.*

- *Some communities adopted portions of a NFPA standard or ICC model WUI code (or both). No community adopted a model WUI-related code in full. However, the communities that adopted some portion of a NFPA standard or ICC code usually did not apply the standards directly from these codes; they relied primarily on their local standards that overlapped with the professional codes. A related approach taken by many communities was to use these models codes for some level of guidance in crafting their own regulations, but to not adopt them in any formal way.*

- *Most communities are generally happy with the technical aspects of their WUI standards because they are based on proven science and techniques for reducing wildfire risk.*

- *By far the most common WUI enforcement problem was the lack of continuing maintenance of defensible space due either to lack of political will or financial resources. In addition, the lack of funding to conduct public education and vegetative clearing were cited as significant deficiencies.*

- *The interview communities agreed that existing development presents a greater wildfire risk than new development because there is usually more of it in high hazard areas and it is often served by substandard infrastructure (streets, water supply, etc.), while new development is typically constructed in accordance with the latest WUI standards.*

- *Public education and non-regulatory programs that provide direct assistance to homeowners (e.g., debris pickup) are keys to the overall effectiveness of WUI regulations.*

- *WUI regulations are usually administered and enforced by the fire or building department. Rarely is the planning department given primary enforcement responsibility. However, the fire marshal and fire department personnel are often not trained to perform enforcement duties. Shifting enforcement duty to staff specifically trained to do code enforcement sometimes results in better compliance. Regardless of which department employs the WUI specialist (e.g. fire, building, or code enforcement), having one or more persons with clear responsibility for and*

expertise in WUI implementation is a significant aid to effective and consistent enforcement of WUI regulations.

- *Flexibility in the administration of WUI regulations is critical for maintaining community and political support for wildfire regulations. One-size-fits-all solutions that are unable to respond to the unique wildfire and development circumstances in the community are seldom effective and often create political opposition.*

The Potential Role of Land Use Regulations to Reduce Fire Risk

Some of the major suggestions included in this section:

- *Add mapped high and extreme fire risk areas as types of sensitive lands where plats may not locate buildable lots. If the area has already been platted in those areas, add a requirement that 'building envelopes' be defined to minimize those risks before building permits are issued.*

- *Ensure that risky businesses (e.g., lumber yards, gas stations), sensitive populations (e.g., hospitals), and large assembly uses (e.g., churches) are either not permitted in those zone districts that include high or extreme fire risk areas or are addressed with special conditions of approval.*

- *Ensure that landscaping standards and tree protection requirements are consistent with defensible space/vegetation management requirements for fire risk reduction, at least in high or extreme fire risks areas.*

- *Consider adding incentives such as waiver of application/processing fees to those willing to incorporate defensible space and structure controls into their applications and to sign development agreements to maintain those features over time.*

- *Require or encourage subdivisions in the WUI to be designed to maximize the use of natural (e.g., water, wetlands, open meadows) and man-made (e.g., ball-fields, golf courses, utility and road easements) features as buffers for wildfire protection.*

Next Steps

Section 5 provides recommendations for next steps that FPRF and/or NFPA may want to take based on the findings and other recommendations in this report.

- Reorganize existing WUI codes and standards in a modular form to allow local governments to more easily find and pick the elements they think would be more helpful and politically achievable.

- Do not create an additional model code or system of structure and vegetation controls – the ones already available are considered effective and adequate.

- Create a WUI best practices informational guide. No matter how well NFPA can tailor its WUI-related standards for local governments, some local governments will still choose not to adopt them because they are too complex or comprehensive, or for some other reason. In such cases, local governments could benefit most from a simple guide of proven best practices (i.e., a how-to guide) to address WUI hazards that could be readily adapted to their local circumstances. For example, the guide could include recommendations for mapping hazard areas, provide a spectrum of defensible space approaches, recommend ideas for public education, and address ways to efficiently administer and enforce WUI standards, such as how to resolve conflicts between WUI requirements and standards in sections (landscaping, environmental protection) of the land development code.

- Get planners more involved in controlling the density, location, and design of new development in high risk wildfire areas, even if another department has the primary responsibility for enforcement.

- Coordinate vegetation management/defensible space requirements desired by fire officials with landscaping/tree preservation regulations desired by planners. This is one area of obvious overlap where a model regulation might be helpful to develop and circulate for review.

- Develop a pilot project to better integrate NFPA's existing technical WUI codes and standards into the land use, subdivision, and zoning regulations of several communities. The communities chosen should reflect a diversity of geographic backgrounds and regulatory frameworks, such as those outlined in this report (i.e. State mandate, State model code, State mapping, and no State support), and should have in place well-established and well-functioning interdepartmental Development Review Committee procedures. The goal of this effort would be to "embed" WUI regulations zoning, subdivision, and site planning controls, and to modify non-WUI land use controls to avoid secondary adverse impacts on WUI risks area.

SECTION 1: INTRODUCTION

1.1 Purpose

This report was commissioned by the Fire Protection Research Foundation (FPRF) in cooperation with the National Fire Protection Association (NFPA) to investigate how cities and counties across the United States are using local regulatory codes and ordinances to address wildfire risk – with particular attention to the use and effectiveness of WUI codes and standards and the possible need for changes to those codes. The scope of the project did not include review of non-regulatory or voluntary WUI programs, such as Firewise Communities and Community Wildfire Protection Plans, even though such efforts were frequently discussed in order to provide the full context of a community's mandatory WUI requirements. The focus was on regulatory tools, their implementation, and their effectiveness.

The content of this report is based primarily on literature research and phone interviews with 12 local communities to document the different types of WUI tools in use, their effectiveness, and any lessons to be learned from on-the-ground experiences of local governments to address wildfire hazards through their development codes. A related purpose was to better understand how various local government staff, such as fire marshals, building officials, urban planners and others, work together (or not) to administer and enforce local WUI regulations and whether inter-departmental cooperation among local agency staff is a major factor in the implementation of WUI regulations. Based on the research results, Section 3 provides a list of lessons learned from the interviews, while Section 4 offers suggestions for how local communities can use key general land use regulatory tools, such as zoning overlays and subdivision regulations, to more comprehensively address the risk of wildfire. The final section recommends possible next steps for FPRF and NFPA as they continue to explore ways to better coordinate their knowledge of wildfire codes and standards with the needs of local governments.

Throughout the process, we worked closely with the Project Technical Panel that was composed of fire professionals from around the country.[1] The role of the Panel was to serve as a sounding board for ideas, review drafts of the report and other work products for accuracy, and help maintain the focus of the project.

[1] The Project Technical Panel included Jeff Bielling (Alachua County, Florida), Mike Bozzo (South Carolina Forestry Commission), Randy Bradley (NFPA Forest and Rural Technical Committee Chair), Robert Brzuszek (Mississippi State University), Ryan Depew (Forest and Rural Technical Committee Staff Liaison), Ethan Foote (Office of the California State Fire Marshal), Terry Haines (U.S. Forest Service Southern Research Station), Gary Marshall (City of Bend, Oregon), Jignesh Maun (New Jersey, Insurance Services Office), and Eric Philips (Boulder County, Colorado, Wildfire Mitigation Specialist).

1.2 Methodology

Task 1: Review of Literature

The authors reviewed a wide variety of studies on WUI regulations from around the country, some of which were written by members of the Project Technical Panel (See Appendix A for general bibliography). We focused on sources that analyzed efforts by states and local communities throughout the country to adopt or enforce WUI regulations in local codes. Consistent with the scope of this project, we did not focus on non-regulatory WUI programs (e.g., Firewise communities, CWPPs, or hazard mitigations plans) or non-land use regulatory tools (e.g., building material technology or the performance of fire-resistant materials). We paid particular attention to case studies of communities using innovative tools and best practices for addressing wildfire hazards as identified by fire professionals and other authorities in the field, but not all of the communities had strong controls in place.

Task 2: Regulatory Review and Categorization

Based on the literature research in Task 1, we selected approximately 40 communities (See Table 1) that were either highlighted in the literature as communities of importance or came to our attention through independent research. A major factor in the selection process was ensuring that a wide variety of communities with different WUI challenges were included. Once a community was selected, the goal was to find and analyze all WUI-related regulatory tools adopted by that community. Recognizing that WUI regulations are often located in multiple places in municipal codes, we searched the entire municipal code for each community for WUI standards, focusing mostly on the fire code, land use code, subdivision regulations, and any other local ordinances, such as tree protection ordinances or hazard ordinances, that might contain WUI-related standards. Comprehensive plans were reviewed to check whether the targeted communities had grounded their WUI regulations in strong or clear policy statements, but those plans were not evaluated as regulatory tools. From this research, the distinct WUI regulatory tools used in the 40 communities were consolidated into an outline organized according to the scale (e.g., community level, subdivision level) at which the regulatory tool is applied (See Section 2). An interim report summarized the research results of Tasks 1 and 2 for review by the Project Technical Panel and served as guidance for later project tasks.

The 40 communities reviewed in Task 2 are shown in Table 1 below.

TABLE 1: Communities Reviewed in Task 2: Regulatory Review and Categorization	
Florida	**Rocky Mountains**
City of Palm Coast, FL City of North Port, FL City of Ormond Beach, FL Alachua County, FL Flagler County, FL Collier County, FL Okeechobee County, FL	City of Colorado Springs, CO City of Boulder, CO Archuleta County, CO La Plata County, CO Summit County, CO Eagle County, CO Larimer County, CO Boulder County, CO Jefferson County, CO Douglas County, CO Missoula County, MT Tooele County, UT Boise County, ID
Northwest	
City of Ashland, OR City of Bend, OR Jackson County, OR Deschutes County, OR Josephine County, OR Yakima County, WA Clark County, WA	
California	**Southwest**
City of Glendale, CA City of Santa Barbara, CA Santa Barbara County, CA City of San Rafael, CA Orange County, CA Marin County, CA	City of Prescott, AZ City of Flagstaff, AZ Central Yavapia Fire District, AZ Apache County, AZ City of Santa Fe, NM Santa Fe County, NM Village of Ruidoso, NM San Miguel County, NM City of Borger, TX City of Austin, TX

Task 3: Phone Interviews

Based on the results of Tasks 1 and 2, and with direction from the Project Technical Panel, 12 communities were selected for phone interviews in order to hear directly from local government personnel how their WUI regulations are working. Interviews are critical because they provide the real life details and nuance that cannot be gleaned from reviewing code text. WUI regulations that look comprehensive and impressive on paper may turn out to be far less

effective and well-conceived when viewed in light of the realities of residential development and a politicized land use approval processes. The 12 communities were carefully selected to represent a diversity of geographic, regulatory, and demographic backgrounds. The goal was to speak to the local government officials most directly involved with administering and enforcing the WUI regulations, usually the fire marshal, building official, local forester, and/or land use planner, and to ask each person the same set of nine questions about their WUI standards (See Section 3).

Task 4: Regulatory Assessment and Development of Lessons Learned

The data from the interviews was then analyzed. In preparation for the final report, a draft report was produced that was reviewed by the client and Project Review Panel for their comments. The results of this assessment are presented in Section 3 of this report. In addition, a list of potential land use regulatory tools to reduce fire risk in WUI areas is presented in Section 4 of this report.

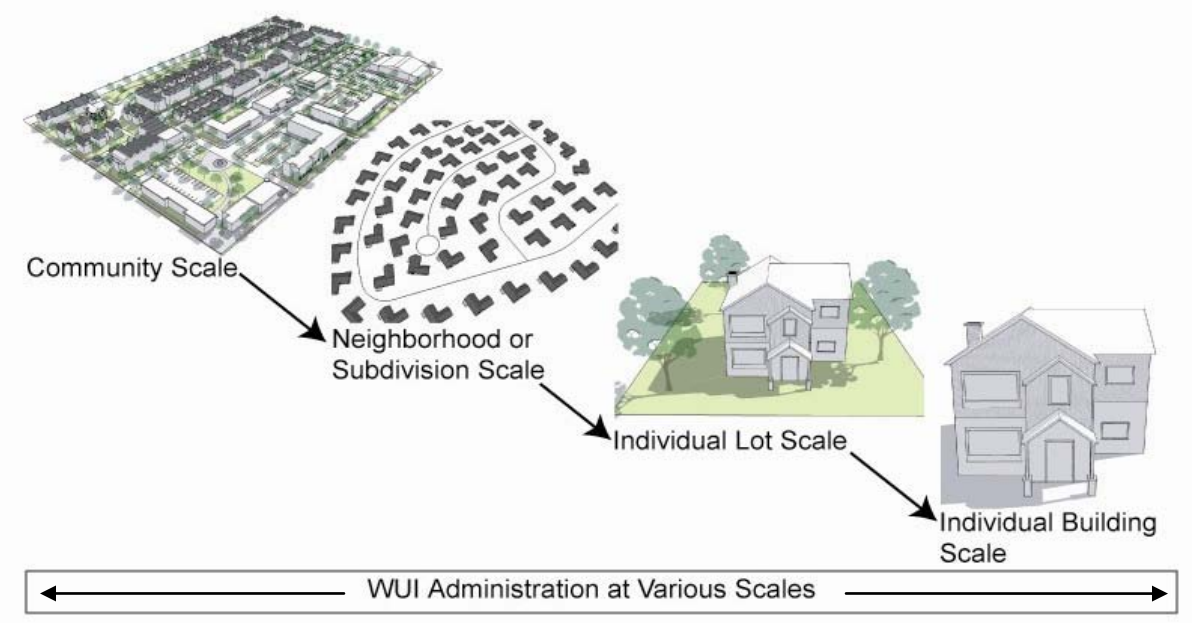
Task 5: Final Report

Following review of the draft report, this final report document was prepared. It incorporates final comments from the project sponsor and Project Technical Panel. A final presentation of these findings will be made in Quincy, Massachusetts in 2012.

SECTION 2: OUTLINE OF WUI REGULATORY TOOLS AND APPROACHES

This section outlines the universe of regulatory tools used by the 40 cities and counties analyzed during our literature search and code review, as supplemented by those WUI tools discovered or clarified through the phone interviews. No single community uses all of these tools. Not surprisingly, communities in more heavily regulated environments, such as California, tend to use more of the tools and communities in less regulated environments tend to use fewer tools. However, some small communities (e.g., Ruidoso Village, NM) have adopted aggressive and comprehensive WUI regulations that rival those in more heavily regulated states. The final part of this section summarizes general issues related to the implementation of WUI regulations at the local government level, such as enforcement, development review procedures, and code consistency issues (See section 2.4). This material provides a more complete picture of the administrative environment in which the various WUI tools are applied by local governments.

The WUI tools in this outline are organized according to common characteristics — in this case, according to the regulatory scale at which they apply. This approach has the advantage of providing a clear hierarchy of tools that allows the reader to quickly assess and compare at what "level" each WUI tool regulates (i.e., the house, the vegetation in the yard, the subdivision, or the entire community). While some tools may apply at multiple levels, this organization makes it easy for local regulators to select WUI tools that correspond most closely with their WUI hazard needs and political environment—because effective and fair land use regulation requires that the scale of the regulation properly match the scale of the problem.



2.1 Community Scale Regulatory Tools

Community scale regulatory tools are those that apply to an entire city or county, or to a subarea of the city or county that is larger than an individual subdivision. In general, community scale tools include community-wide or area-wide hazard mapping and city- or county-wide standards related to that mapping. At this broad scale, one of the key issues to address is to what types of development or redevelopment the community-wide standards will apply. In most cases the community-wide standards include (1) building safety standards – which are actually applied only when building permits are applied for (See Section 2.4) – and/or (2) defensible space/vegetation management standards –which are usually applied during subdivision site plan review (see Sections 2.2 and 2.3).

2.1.1 Hazard Mapping

The first step that nearly all communities take in addressing wildfire is to map wildfire hazard areas. Some states, such as California, Florida, and Colorado provide wildfire mapping resources that cities and counties can use or modify. In addition, the federal government makes available some mapping resources, for example, through the Communities at Risk program. In the southern and western United States some regional entities also provide fire hazard mapping resources.

Nevertheless, communities that have good maps available to them are the exception rather than the rule. In most cases, local jurisdictions produce their own maps (Arizona) or refine state mapping (Colorado, California). Hazard mapping can be based on a variety of factors, but the two primary strategies are to base the mapping on hazard assessment and risk assessment. Hazard assessment maps categorize the likelihood of wildfire occurring based on factors such as fuel/vegetation, slope, and weather patterns. Risk assessment maps categorize the likelihood of wildfire threatening something of value, such as life, property, natural/historic resources, or other features or resources of local value, and are generally based on roof types, road access, water supply, location and density of structures, and likelihood of post-fire flood damage. Hazard and risk assessment factors can also be combined to get one general "wildfire hazard rating" (Eagle County, CO).

Other mapping strategies include:

- Basing WUI maps on locally-derived factors such as slopes, distance from public roads, and proximity to fire district (Yakima County, WA);
- Applying WUI regulations based on existing overlays or regulations, for example, a hillside overlay zone for steep slopes (Colorado Springs, CO);
- Applying overlay maps to generally known high fire risk areas but then requiring site-specific evaluations for each property in that overlay to verify localized risks (Douglas County, CO);

Although mapping is the foundation of most community wide WUI approaches, WUI regulations are sometimes applied to an entire city or county with no map, particularly when the entire jurisdiction has major wildfire hazards (e.g., Ruidoso, NM).

2.1.2 Site-Specific Determination

Regardless of the mapping approach used (or not used), the wide areas covered by community-wide WUI controls often require refinement to reflect the character of specific parcels of land. So the final hazard determination is often made during a site review process. Site-specific fire hazard assessments are often completed during a subdivision or development review process that considers more detailed information than the general/overlay mapped data. In Douglas County, Colorado, for example, community-wide regulations are applied to specific parcels through the use of a scored checklist to determine the site's hazard rating. Site specific approaches to WUI regulations are reviewed in Sections 2.2 and 2.3 below.

2.1.3 Applicability

The question of applicability – of what types and levels of development and redevelopment will need to comply with the WUI regulations – is particularly important when the regulations in question are applied to a very broad area. While it is tempting to wish that "everyone" can be made to comply, that is very seldom the case. Most land use and building regulations are applied as and when new development or major reinvestments in property occur. Existing properties are generally ignored until they make a major investment or unless they create very clear and dangerous risks to public safety that elected officials are willing to address pro-actively. Broad-based initiatives to apply newer, safer standards to existing properties are extremely rare, not only because they are generally unpopular with voters, but because they tend to be expensive. For example, requiring an existing house to replace its wood shingle roof with a fire-resistant roof would result in considerable expense and inconvenience for the landowner and likely create opposition. However, the retroactive application of new regulations sometimes occurs – most commonly where significant health or safety risks are involved, such as requiring new technologies for existing septic systems to prevent groundwater contamination. In the future, WUI standards may be seen in a similar light.

One option for communities wanting to be aggressive about WUI protections is to apply only the WUI vegetative requirements to existing properties (and not the structural requirements) because complying with the vegetation requirements is less problematic given that nothing has to be "undone." The State of California, for example, requires a 100-foot defensible space buffer for both existing and future structures in very high hazard areas. For all these reasons, the question of "who will have to comply" takes on great importance whenever new regulations are adopted.

Community-wide WUI regulations are usually drafted to apply only in high or extreme hazard areas, and only to new development. Moderate or low danger areas and existing development are often exempted.

Types of new development applications that are typically required to comply with WUI standards (if they are located in high or extreme risk areas) include:

- All building permits for new structures;

- All building permits for significant expansions of existing structures;
- All subdivisions andPlanned Unit Developments (PUDs);
- Land uses with high fire hazard risks (e.g., lumberyards, power lines, tire storage, temporary uses, gas stations); and
- Land uses with vvulnerable residents or users (e.g. hospitals, schools, group homes).

When existing development is involved, however, requirements for WUI compliance are very rare. The vast majority of communities do not impose mandatory WUI standards on existing development. In those rare communities that do require compliance from existing development (such as Ruidoso, NM), the requirement is usually limited to defensible space standards. They do not extend to building structural standards or other WUI requirements. Instead, many communities use public education with landowners and participate in government-funded programs (such as hazard assessment, clearing of vegetation, chipping services, waste disposal of slash) to help existing homeowners protect their properties (e.g., Prescott, AZ).

The primary means of getting existing structures to comply is to require WUI compliance when a landowner applies for permits to expand existing development by a significant amount. One typical standard is to require compliance if the addition expands the existing building(s) floor area by 50% or more, or costs more than 50% of the current assessed value of the property. California requires compliance with its state-mandated requirements when new commercial uses occupy a building rather than tying it to new construction.

Another method is to apply WUI requirements to existing development or property through a "weed/vegetation" ordinance. These ordinances often require all developed and vacant properties in the jurisdiction to maintain vegetation so that it does not create a fire hazard or nuisance. Some of these ordinances are not WUI-specific -- they require maintenance of any vegetation that constitutes a nuisance to neighbors by creating wildfire hazard – but create a de facto defensible space requirement without using that name. Weed/vegetation ordinances often provide that if a violation occurs and the owner does not correct the problem then (particularly in the case of vacant lots) the city or county is authorized to clear the vegetation and bill the landowner for costs incurred in that work.

In some cases, existing development with vulnerable populations may be targeted for WUI compliance. For example, the City of Santa Barbara, California, has a requirement to "inspect all existing major facilities: public assemblies, educational facilities, institutions and hospitals, high-rise buildings, hazardous materials occupancies, malls and large retail centers." If an existing facility does not meet WUI standards, compliance can be required.

2.1.4 Exemptions

Community scale WUI regulations generally contain a list of types of development that do not have to comply, and that list commonly includes:

- Accessory structures less than a certain size (e.g. 120/200/400/600 square feet) that are located more than 30 to 50 ft. from each primary structure;
- Environmentally sensitive areas, such as riparian areas (e.g. Josephine County, OR);
- Historic structures (Prescott, AZ);
- Mobile homes (for structural requirements only, because safety standards for mobile homes are pre-empted by the National Manufactured Housing Construction and Safety Standards Act of 1974); and
- Agricultural structures.

2.2 Neighborhood or Subdivision Scale Regulatory Tools

Neighborhood scale WUI regulations are those that do not purport to cover an entire city or county, but are designed to apply when applications for major new developments are submitted. Typically, they apply when applications are made for the approval of new subdivisions or large Planned Unit Developments (PUDs), because these involve the layouts and location of lots (which could be in fire risk areas) and streets (which need to be accessible to firefighting equipment). In addition, PUDs involve unusual or innovative site layout approaches that need to be reviewed for public safety impacts. These tools are typically not applied when the application is for creation or development of a single platted lot.

2.2.1 Development Layout and Density

One common neighborhood scale regulation involves adjustments to the permitted density or Intensity of development – i.e. how many people can occupy or live on the site -- based on risk factors. These types of standards generally require density reductions based on the presence of wildfire hazard. However, this tool does not appear to be automatically or objectively applied, but is often negotiated, and density reductions or adjustments may be smaller than those called for in the regulations (e.g. Summit County, CO; Flagstaff, AZ).

A second common form of neighborhood scale risk reduction is through subdivision layout standards. In their simplest form, these require clustering of structures in lowest risk areas (Larimer County, CO). In other cases they require community protection fire breaks; for example, by requiring a 30 to 50 foot fire protection zone on the perimeter of all PUD or residential developments (Flagler County, FL; Palm Coast, FL). Some encourage the use of natural features (e.g. lake, river, wetlands) and man-made features (e.g. roads, utility Rights-of-way, ball fields) as fire breaks.

A third set of tools is structure location standards that require structures to be located on the property to maximize the use and effectiveness of defensible space areas. This is sometimes done by requiring designation of specific building envelopes on the site plan or plat (Santa Barbara County, CA).

Finally, some neighborhood scale WUI tools require that prescribed burns occur before vegetation management and before development of lots in the subdivision. If that is not

possible or advisable, herbicide spraying, brush mowing, tree thinning, disking, or chopping of vegetation are sometimes required, with exceptions for environmentally sensitive areas and any associated buffers (Palm Coast, FL). Prescribed burns are sometimes done on neighboring public property (e.g., county open space areas) rather than private property.

2.2.2 Water Supply

In addition to addressing site layout and preparation of the site for development, many communities require the provision of an adequate water supply – both for domestic and for firefighting purposes. Some ordinances require hydrants with adequate pressure and volume at certain intervals. If hydrants are not available and not required in the area, regulations often require that the development provide a year round water source of 4,000 – 5,000 gallons, which can be in the form of a dry well, cistern, pond, or swimming pool.

2.2.3 Access

A large number of neighborhood scale regulations address access to and circulation within the proposed development for the purpose of ensuring access for firefighting equipment. For example, standards for public roads to and within the subdivision or PUD may require:

- A 20–28 foot minimum width, with an all-weather surface;
- At least 13.5 feet of vertical clearance;
- At least 10 feet of horizontal clearance on both sides of the street (up to 50 ft. in some California communities);
- A maximum grade of 10–15%, with additional requirements (e.g. sprinklers) if the grade standard cannot be met.

In addition, many city and county regulations include requirements such as the following:

- At least two ingress/egress points;
- If gates are used, they must be at least 30 feet from the public road, must open inward, and must incorporate a key box or access codes provided to the fire department;
- Turnarounds for roads and driveways more than 150 or 300 feet long; and/or
- Turnouts every 400 to 800 feet if access is through a single lane road or driveway.

In suburban and rural areas, neighborhood scale regulations often require that driveways:

- Have a minimum width of 12 feet (wider on sharp corners);
- Have an all-weather surface;
- Give access to within 150 feet of all sides of structure;
- Provide at least 13.5 feet of vertical clearance;
- Provide at least 5-10 feet of horizontal clearance on both sides (up to 50 feet in California); and/or

- Have a maximum grade of 10–15%, with additional requirements (e.g. sprinklers) if the grade standard cannot be met.

2.3 Individual Lot Scale Regulatory Tools

Individual lot scale tools are those that are applied to the layout or development of an individual platted lot or parcel for a single user or a small set of users. Since the parcel itself has already been approved, they generally assume that adequate street access and utilities are already in place. The review and approval process often involves the layout of driveways, loading areas, service areas, landscaping, buffering of adjacent uses, site lighting, fencing, and other standards that cannot be designed or reviewed until a specific user of the site is known. In many cities and counties, single-family residential lots are exempted from this level of review because it is assumed that all of the issues involved in the construction of one house on one lot have been or will be taken care of through the subdivision or building permit process. Obviously, that approach does not fit well with the requirements for defensible space on residential lots unless the defensible space requirements were, in fact, applied at the time the subdivision lot was approved. In other communities, single-family lots are subject to this level of review in order to confirm compliance with scenic protection standards or on-site requirements to protect sensitive areas (e.g. steep slopes, wetlands, wildlife habitat).

2.3.1 Vegetation Management / Defensible Space

Vegetation management is the primary lot scale WUI risk reduction tool. Generally, the regulations require the submittal of a vegetation management plan, because that is the simplest way to confirm compliance. In some communities only large developments must submit a plan, however, while smaller developments are simply required to comply (and cited for violations if they do not). The primary purpose of vegetation management plans is to show how vegetation requirements will be met for a specific user and site layout. Some communities require that the plan include details on meeting water supply and access requirements. Where vegetation controls include ”defensible space” provisions, regulations often require that the vegetation management plan demonstrate compliance with different standards for three different zones.

Zone 1

Zone 1 generally extends 15 or 30 feet from the primary structure, but that distance can be modified based on the hazard level of the area (e.g. 0-30 feet in moderate risk areas, 0-50 feet in high risk areas, and 0-100 feet in high risk areas). In addition, the distance is sometimes increased on the downward side of steep slopes (e.g. extension by 10% for every 10% increase in grade; double the standard on the downside where slopes exceed 30%, or quadrupling the distance on the downside where slopes exceed 55%). Occasionally, Zone 1 includes a subzone 1a with stricter standards than those applicable to the rest of the zone. Typical restrictions in zone 1 include:

- Removal of all dead materials, dry grasses, and ladder fuels;
- Thinning of trees (crown separation of at least 10–18 feet), with closer spacing allowed for less fire prone trees (e.g. aspen, cottonwood);
- Limbing of trees at 6-15 feet or no more than 1/3 of the live crown;
- Removal of most shrubs, with clumps allowed if separated by at least twice the shrub height;
- Cutting grasses to 3 or 4 inches maximum height, but sometimes allowing taller vegetation on steeper slopes to retain soil;
- Keeping trees 10 to15 feet from the roof or chimney; and
- Maintaining vegetation further than 10 feet from combustible fences and from utility lines (with distance depending on voltage).

Regulations often give the fire official or other decision-maker discretion to modify any or all of the standards to protect soil and other resources (e.g., snags for wildlife habitat).

Zone 2

Zone 2 generally extends 30 to 70-100 feet from the primary structure (or from the outer edge of Zone 1). Typical requirements include removal of most dead material, crown separation of 5-10 feet, limited grass heights, pruning of shrubs, and limbing of trees. Many of the standards parallel those for Zone 1 but with more lenient requirements.

Zone 3

Zone 3 extends from the end of Zone 2 to property line and generally only requires minimal vegetation management.

2.3.2 Related Regulations

While most communities limit vegetation management regulations to one's own property, some require vegetative management to extend to adjacent properties. For example, Palm Coast, Florida, requires a 30 foot defensible space buffer around all structures, even if this buffer area extends onto adjacent properties. Code enforcement officers then check to ensure that all affected properties, including vacant lots, are maintained to meet this standard. Others only encourage cross-property management if an easement to allow presence on the neighboring property for that purpose can be obtained. Still others require or encourage that structures be located to maximize on-site defensible space area to avoid the need to enter adjacent property. For example, in a high fire risk where Zone 1 generally extends 50 feet from the primary structure, locating that structure more than 50 feet from the property line avoids the need to seek an easement across a neighbor's property to maintain defensible space in Zone 1.

If the city or county already has a strict community-wide weed/vegetation ordinance, even one that does not specifically address WUI risks or defensible space, WUI regulations are often adjusted accordingly. If the weed/vegetation ordinance already requires adequate

maintenance, site level review for defensible space may not be required. In addition, cities and counties that have general landscaping ordinances sometimes coordinate those regulations with defensible space regulations by requiring that all ornamental landscaping installed be limited to an official list of fire resistant plants.

Because defensible space that is not maintained loses its effectiveness, landowners are generally made responsible for long-term maintenance of required vegetation controls. Finally, because every site is different, some communities allow for "alternative compliance". If the landowner cannot meet defensible space requirements for legitimate reasons such as site constraints that would make the required defensible space impracticable or ineffective, then other protections measures may be required (e.g., double paned windows, sprinklers, one-hour fire-rated walls, etc.).

2.4 Structure Protection Regulatory Tools

Structure protection controls are the regulatory tool most citizens anticipate when they think of fire risk, and they are still the most common form of fire-related regulation in use. Even communities that have not adopted defensible space requirements or included subdivision standards to reduce fire risk often adopt and enforce building codes designed with fire risk reduction as a primary goal. Often, structure protection regulations distinguish between "primary structures" (e.g. the house, office building, or other building where people live or work) and "accessory structures" (e.g. barns, sheds, garages, and other structures that are only occasionally occupied by people, and that exist to support the use of the primary structure). Because they are seldom occupied by people, building controls for accessory structures are generally more lenient.

2.4.1 Primary Structure Protection

Primary structure risk reduction standards often include some or all of the following:

- Roofing material standards requiring Class A or B roofs in highest risk areas, Class B in moderate risk areas, Class C in lower risk areas, banning all wood roofing materials (even if treated), or allowing only treated wood shake roofing materials;
- Siding standards requiring one-hour fire resistance, or requiring brick, stone, stucco, or large timber siding, and generally prohibiting metal siding in most fire hazard classifications;
- Attic ventilation standards requiring mesh coverings with a maximum mesh size of 1/4 inch, and in some cases not allowing vents on the high-risk side of the structure;
- Gutter standards requiring designs that do not collect leaves/needles and generally requiring regular cleaning;
- Eaves and soffits standards requiring that those features be covered, boxed in, or covered with mesh that will not allow embers into the attic;
- Chimneys spark arrester requirements;

- Window standards requiring or encouraging double-paned or small-paned designs. For example, California's building standards require that: "Exterior windows, window walls, glazed doors, and glazed openings within exterior doors shall be insulating-glass units with a minimum of one tempered pane, or glass block units, or have a fire-resistance rating of not less than 20 minutes, when tested according to NFPA 257, or in accordance with Section 715, or conform to the performance requirements of SFM 12-7A-2."
- Standards for decks, porches, and overhanging features requiring that under-deck areas of low structures (e.g. those 3 feet or less above the ground), be enclosed with wire mesh or fire resistive material, requiring that structures further from the ground be enclosed with a solid fire resistive skirt, and requiring that these features be constructed of heavy timber or other fire resistive material.

Internal sprinklers are generally not required for single-family homes (Glendale, California, is an exception), but their installation can reduce other mitigation requirements. If the structure is a mobile home, regulations often require that foundations be skirted with materials with a one-hour fire rating. Although technically aimed at the building structure itself, structure controls often expand to address the location of the building on the property by requiring, for example, that structures be located no closer than 10 feet from each other or 5 feet from a property line. If a zoning control requires a smaller setback, the building code generally controls, since a building permit will require compliance with the fire related building controls.

2.4.2 Accessory Structure Regulations

Common accessory structure controls including requirements that:

- Sheds and barns over a given size (e.g. 400 square feet) must be located at least 30 feet from a primary structure (unless they have one-hour fire-rated walls);
- Fences must be constructed of non-combustible materials (or at least the 5-10 feet closest to the house);
- Wood piles must be located 20-30 feet away from the house unless enclosed in a fire resistant shed; and/or that
- Gas tanks must be located 20-30 feet away from the house.

2.4.3 Sign Regulations

Many cities and counties have very extensive sign controls, but only a small minority of those controls relate to the reduction of WUI fire risks. Those that do may require that:

- Street signs shall be noncombustible, easy to read, and well-located;
- Dead-end warnings shall be provided;
- Address markers shall be large and easy to read; and/or
- Fire protection equipment (hydrants) shall be signed

2.5 Administration of WUI Regulations

Several issues and challenges arise regardless of whether community scale, neighborhood scale, lot scale, or building scale WUI controls are used, and those issues are discussed in the paragraphs below. The information in Sections 2.5.1 through 2.5.9 is based on the national literature review completed for Task 2 of this study, while specific information from the 12 communities interviewed appears in Section 3 of this report below.

2.5.1 Notification of Fire Hazard Area

Assuming that fire hazard mapping is available, who (if anyone) has the duty to notify prospective property owners of that fact, and how should it be done? Obviously, the answer to this question matters more in areas where property is bought and sold frequently (such as populous states and resort areas) than in rural areas with low volume real estate markets. In general, notice can be provided through a document filed in the real property records or on the face of a subdivision plat, although both approaches run the risk that a different fire hazard rating may be applied in the future. Both types of notice should be discovered and shown in a title insurance report when property is sold.

California requires notification to be made at the time properties are sold. Larimer County, Colorado, includes a plat note about the presence of fire danger and clarifies that the developer is required to perform initial mitigation before the sale of the lots, but that landowners are responsible for maintenance of the mitigation measures after the sale.

2.5.2 Implementation/ Timing of Compliance

When does compliance with WUI regulations have to occur? Defensible spaces are often required to be completed prior to intermediate approval (e.g. foundation inspections or driveway permits) or final permit approval (e.g. final building inspection, certificate of occupancy, or plat approval). The goal is to require appropriate vegetation clearance before use of combustible materials occurs on the site. Sometimes compliance is completed in stages. For example, in Prescott, Arizona, certain vegetative requirements must be done before foundation inspection and other requirements before final inspection. Some communities require that Homeowners' Associations (HOAs) include defensible space maintenance requirements for both private lots and common areas and make the city or county a beneficiary for enforcement purposes if necessary. Others go further to require that HOAs specifically budget for WUI maintenance needs.

2.5.3 Enforcement

Who enforces the WUI standards? Because potential WUI standards may be applicable at the community, subdivision, site, or building scale, different professionals will be involved at each stage. The following list of enforcement personnel appears in rough order of their frequency and depth of involvement in the enforcement process.

- Fire marshal or fire district personnel (Glendale, CA; Clark County, WA);

- Building Inspector;
- Code enforcement officer / Sheriff;
- Staff forester / landscape architect; and
- Planner.

Where are the WUI controls found? Again, because of the different scales of tools in use, different regulatory documents may contain the WUI controls. In most cases the controls are located in more than one regulatory document (e.g., the vegetation management standards may be in the fire code or land use code, while structural protections may be in the building code). The following list of regulatory documents appears in rough order of the number of WUI controls found in them.

- Fire code;
- Building code;
- Land use code / subdivision ordinance; and
- A separate ordinance

How does enforcement happen? Because building structure controls are usually enforced at the time a building permit is issued (permits are only issued for complying buildings) and few communities conduct follow-up inspections except for buildings that host large assemblies of people or vulnerable populations (e.g. hotels, hospitals), most of the following discussion concerns enforcement of defensible space requirements rather than building requirements.

In general, violations of WUI regulations, like violations of all other land use controls, are enforced when a neighbor or observer files a complaint. Regular or periodic inspections are rare. The typical enforcement sequence for a defensible space violation is:

- Send notice of violation and allow 30 – 45 days to remedy the violation;
- If the problem has not been fixed, send a notice of intent to enter the property and abate the violation and that the landowner will be billed for full cost of abatement and/or a lien will be placed on the property to abate those costs (Glendale, CA); and
- Enter the property and carry out the abatement.

In addition, some localities send out free wildfire brochures to all properties in the WUI to alert owners of requirements in advance of any enforcement action. An appeal process is usually provided to challenge the enforcement action and/or costs. This is particularly important in communities with many vacant lots and absentee landowners who may not have received the initial or second notices.

In some states (e.g., Florida) the fire marshal has no authority over single-family and two-family dwellings, so WUI standards to address those structures would need to be located outside of fire code. Some localities state that any violation of the vegetation management standards is deemed a public nuisance due to the fire risk to adjacent properties, and give local officials authority to abate nuisances and charge the landowner for any costs of vegetation

clearance. In spite of this process, many communities report little or no success in enforcing the maintenance of defensible space over time, primarily when there is no budget, time, political will, or requirement to do so.

2.5.4 Consistency with Other Code Sections

Fire protection regulations exist alongside many other regulations designed to protect public health, safety, and welfare, and maintaining consistency between WUI regulations and other related code standards can be difficult. Some of the areas of potential conflict are listed below:

- Tree protection ordinances. An increasing number of cities and counties have adopted regulations limiting the cutting of mature or valuable trees. Defensible space standards may require cutting of tree protected by tree ordinance, or there may be conflicting permit or timing requirements. For example, the fire code may require that vegetation (including mature trees) be removed at the time site grading occurs, while a landscaping and tree protection ordinance is only applied when a building permit is applied (by which time the mature trees have been removed). To help address this possible conflict, some counties and city codes state that tree protection requirements do not apply to tree cutting to comply with WUI standards. Similarly, a landscaping ordinance may require the planting of species that do not meet WUI standards. Again, where communities have recognized this conflict they generally provide an exemption or alternative planting list for properties subject to WUI controls.
- Federal or state environmental protection laws. These regulations may also conflict with WUI regulations by prohibiting vegetation clearance in certain areas, or by prohibiting the construction of a primary structure in the only portion of the site that meets defensible space requirements. Examples include areas protected under the federal Endangered Species Act, wetlands and nearby areas protected by the federal Clean Water Act, and areas designated under state law for species of special concern (e.g. salmon). Some communities require that in case of a conflict between federal or state designations and WUI requirements, the WUI requirements will be adjusted or overridden (Josephine County, OR).
- Local sensitive land ordinances. Many rural and suburban jurisdictions have adopted regulations to protect sensitive lands such as steep slopes, rock outcroppings, wetlands, and stream edges. Others have prohibited development or vegetation removal in areas necessary to protect important views. These types of regulations may also prohibit removal of vegetation needed to create defensible space, or may prohibit construction of a house in the only feasible portion of the lot available for development while preserving defensible space.
- Local road or engineering standards. Almost all cities and counties have local standards for road widths, grades, and construction quality or use state model regulations addressing those matters. Allowed road grades, widths, and turning radii

in those documents may conflict with those in the WUI regulations. The same may be true of minimum standards for water supply to individual sites or subdivisions.

- Enforcement Triggers. The levels of construction or rebuilding that trigger compliance with WUI requirements may be larger or smaller than those that trigger required compliance with other types of land use regulations. For example, a WUI roof standard may require full compliance if 25% or more of a roof is proposed for repair, while the building code may require that the roof be brought into compliance when 50% or more of the roof is to be replaced.

In most cases these types of inconsistencies can be avoided – or clear direction as to which standard applies can be given -- if all related regulations are reviewed carefully before new standards area adopted.

2.5.5 Flexibility

How much flexibility in the application of the regulations should be allowed? Regardless of which levels of control are applied or how carefully they are drafted, there will be situations where the site, or access to the site, or the type of fire risk, or the level of property use, or some other factor will require flexibility in the application of WUI regulations. It is wise to build flexibility into the application of WUI standards for individual projects that demonstrate a legitimate reason for relief or alternative compliance. In addition, it is wise (and often legally required) to allow appeals to mapping, hazard assessment determinations, nuisance claims, interpretations of the WUI requirements, and the imposition of abatement costs, both in fairness to the property owner and to avoid potentially costly litigation.

2.5.6 Cost Sharing and Implementation

Should the city or county government provide programs or resources to help property owners comply with WUI regulations? Often these types of assistance programs are non-regulatory – they involve the spending of time or money or assigning staff to particular project rather than adopting or enforcing regulations. Some localities provide government crews to cut vegetation, as well as mulching and chipping services to dispose of waste. Others provide free inspections and assessments by fire or forestry staff to help landowners identify what needs to be done and suggest local contractors that can do the work. Some communities have tried to make removal of defensible space vegetation part of local economy (e.g. by creating business mills, chippers, landscapers, tree cutters, etc.). Ruidoso, New Mexico, is a good example of a community that has made significant resources available to assist in WUI compliance.

2.5.7 Prevention of Fires

Should the community adopt ordinances to restrict the lighting of fires that could spread and increase risks in WUI areas? In order to prevent wildfires from starting in WUI areas, some localities impose restrictions on outdoor fires, barbeques, burning, fireworks, smoking, gas-powered machinery, storage of combustible materials, or other activities that might spark a fire. In some cases, high fire hazard areas are seasonally closed to human entry.

2.5.8 Post-fire Regulations

Should the community adopt expedited procedures to mitigate damage after a fire occurs, or to expedite rebuilding and revegetation? In order to address long-term damage and issues from recent wildfires, some localities require post-fire rehabilitation of vegetation and soil in burned areas or allow expedited review for rebuilding of damaged or lost structures (La Plata County, CO).

2.5.9 Public Education

What kinds of public education efforts are most effective in reducing WUI risks? Glendale, California, operates a fire safety trailer under a joint agreement with Burbank and Pasadena. The trailer provides a scaled version of a house where children can learn and practice lifesaving procedures. Some jurisdictions distribute brochures on fire safety risk reduction to WUI landowners. Others offer educational programs and community presentations to educate the public about wildfire risks. Education is particularly important in those communities that do not have mandatory WUI regulations in place.

SECTION 3. INTERVIEW COMMUNITIES: RESPONSES TO QUESTIONS

This section presents the results of phone interviews conducted with local officials in 12 WUI communities with various forms of WUI controls. In selecting these communities, our intent was to cover a diversity range of cities and counties within each of four regulatory categories, namely: (1) states with a WUI regulatory mandate, (2) states with a WUI model code, (3)states that provide WUI mapping, and (4) states without WUI mapping, models, or requirements. A community in California, where the state requires local communities to mitigate WUI risk, must adopt aggressive WUI regulations by law. In contrast, Arizona has no state-required WUI standards and its cities and counties are under no obligation to adopt any WUI regulations. Understanding this regulatory spectrum is important to evaluate how each community developed its WUI programs and its responses to the interview questions. The goal of the interviews was to document the full experience of local wildfire hazard regulations across a wide variety of communities across the country – not as the drafters of WUI tools thought they would be used, but as they are actually being used

3.1 Profiles of WUI Interview Communities

Table 2 below summarizes the WUI regulatory characteristics of each of the 12 interview communities.

TABLE 2: Profiles of Interviewed Communities

Community	Population	State Regulatory Environment	Primary WUI Official(s)	Community-Wide tools	Neighborhood/ subdivision level tools	Lot-Specific tools	Structural tools
Palm Coast, FL	74,000	State WUI Mapping	Building Dept.	High	Medium	Medium	None
North Port, FL	56,000	State WUI Mapping	Fire Dept.	High	Low	Medium	None
Clark County, WA	425,000	No state WUI requirements	Building Dept.	Medium	Medium	Medium	Medium
Missoula County, MT	110,000	No state WUI requirements	Fire Dept.	None	Low	Medium	Low
Bend, OR	76,000	State WUI Mandate	Code Enforcement	High	High	High	Medium
Boise, ID	205,000	No state WUI requirements	Fire Dept.	Low	High	High	High
City of Santa Barbara, CA	88,000	State WUI Mandate	Fire Dept.	High	High	High	High
Glendale, CA	192,000	State WUI Mandate	Fire Dept.	High	High	High	High
Douglas County, CO	285,000	State WUI Mapping	Building (Fire Specialist)	High	High	High	High
Utah County, UT	530,000	State WUI Model Code	Fire Dept.	Medium	High	Medium	High

TABLE 2: Profiles of Interviewed Communities							
Community	**Population**	**State Regulatory Environment**	**Primary WUI Official(s)**	**Community-Wide tools**	**Neighborhood/ subdivision level tools**	**Lot-Specific tools**	**Structural tools**
Village of Ruidoso, NM	8,800	No state WUI requirements	Forestry Dept.	High	High	High	High
Prescott, AZ	40,000	No state WUI requirements	Fire Dept.	High	High	High	High

3.2 Summary of Responses to Interview Questions

This section summarizes interview responses to nine questions asked in our phone interviews. Rather than providing a detailed list of each community's response to each question we have synthesized and summarized the communities' responses to highlight major points of agreement and disagreement. The interview sheets with the raw data have been provided to the National Fire Protection Association.

The objective for each interview was to speak to the people who were the most knowledgeable about and directly involved in the administration and enforcement of the community's wildfire regulations. In different communities, these people were located in different departments or institutions. In most cases, we spoke to the fire marshal (or multiple people in the fire department) and a local land use planner. In other cases, we spoke to a building official, forester, code enforcement officer, landscape architect, or a WUI specialist.

The responses are not presented in quantitative form (i.e., five of twelve respondent said X) because many of the questions required nuanced or multi-layered answers that did not lend themselves easily to a straight yes or no format. Instead, answers are summarized according to the levels of general agreement and central themes, with indications of frequency where applicable (i.e., "most" communities do X). We believe that information about the range, effectiveness, and application of WUI tools is more useful to most communities considering new regulations than a simplified head count of how many communities are taking certain actions. For most communities, the goal is to find the best regulatory fit for local circumstances, not necessarily the tool most commonly used in other communities.

Question #1: Why did your community adopt WUI regulations and how did the public adoption process go?

Why did the community adopt WUI regulations?

Most Common Response:
Most interviewed communities adopted their first set of WUI regulations in response to a major wildfire, especially one that destroyed houses, cost lives, or both.

A recent wildfire makes the danger to human life, property, and sensitive natural and historic resources clear and motivates the public to take action. Memories can be short, so it is important to initiate change when the wildfire is still fresh in the public's mind. A recent wildfire also provides a credible public safety issue that local politicians can use to justify new land development regulations. Some communities adopted WUI regulations even before they were required to do so by state law. For example, Glendale, California, adopted WUI regulations before any state requirements to do so because of previous destructive wildfires.

However, Clark County, Washington, and Douglas County, Colorado, are examples of communities that adopted WUI regulations without the experience of recent wildfires. They adopted regulations proactively due to known historical wildfire cycles in the community and concerns that recent and anticipated population growth in the WUI were creating an increasingly dangerous situation that needed to be addressed.

Secondary Reason:
The state required or provided a strong incentive to adopt WUI regulations.

For many communities in California, local WUI regulations were adopted or strengthened to comply with stringent state requirements. While Oregon does not technically require communities to adopt local WUI standards, it makes property owners in WUI areas personally liable for up to $100,000 if their property starts or significantly contributes to a wildfire, unless they institute certain WUI mitigation measures. That potential penalty has created a strong incentive for some local communities in Oregon to adopt WUI standards. Utah uses a carrot rather than a stick – it disburses substantial fire suppression funds only to counties that adopt local WUI regulations that are equal to or more protective than the state-adopted model WUI code. That serves as a strong monetary incentive to adopt local WUI regulations, as evidenced by the fact that every county in the state has taken advantage of the state program and had their local WUI standards certified by the state.

How did the public process go?

Most Common Response:
The public was often skeptical of proposed WUI regulations at first but came to accept or support the WUI standards if a strong public education effort was made to address concerns and correct misinformation in a transparent and open manner.

Nearly all of the interviewed communities emphasized that a strong public education effort was critical to getting WUI regulations adopted. In particular, it was critical to reach out to certain constituencies, such as landowners, building contractors, landscapers, nurseries, and second-home owners, and to address their particular concerns, since these are often the primary skeptics or opponents of new WUI standards. For example, second-home owners often buy their property because they value the trees and privacy of the area and may resist the idea of thinning out their vegetation. Contractors are often concerned that new structural requirements (e.g., Class A roof and fire resistant siding) will significantly increase construction costs and reduce their profits. However, many of these concerns are based on misinformation that can be corrected with public education that explains how defensible space can still retain attractive vegetation and that the additional costs of fire safe building materials is often grossly overestimated.

The public process was significantly smoother in communities where the state required or strongly incentivized local communities to adopt WUI regulations because the communities could 'blame' the state for the need to take action. A few communities warned against trying to 'hit a home run' (i.e., aiming for the most stringent and comprehensive regulations) when the first WUI regulations are adopted. It may be better to take a more modest first step that the community can better understand and accept. Once the community is accustomed to and sees the value of the WUI standards in practice, the standards can be strengthened in the future. Prescott, Arizona, failed to adopt WUI regulation on multiple occasions in the 1990s before finally succeeding in 2004, largely through an intensive and well-conceived public education effort that included a local committee created for that purpose.

Question #2: What WUI regulations, if any, did you use for guidance (e.g., NFPA, ICC, state model code, other community)?

Many Varied Responses
There was a diverse mix of responses to this question, with many communities either adopting some portion of a NFPA standard or ICC model WUI code (or both) but not the whole code. Often, communities did not apply the standards directly from adopted portions of those

these codes but relied on their local standards (which often overlapped with the professional codes).

A summary of how the 12 interview communities adopted model codes is shown in Table 3 below.

TABLE 3: Summary of Adoption and Use of Model WUI Standards by Interview Communities

Full NFPA/ICC adoption	Just NFPA adoption (w/ Amendments)	Just ICC adoption (w/ Amendments)	Both NFPA/ICC adoption (w/ Amendments)	NFPA/ICC as guidance, but not adopted	Local standards adopted (little NFPA/ICC guidance)
None	North Port, FL*	Ruidoso, NM*	Douglas County, CO*	Douglas County, CO	Ruidoso, NM
	Clark County, WA*	Prescott, AZ	Glendale, CA*	North Port, FL	Glendale, CA
		Utah County, UT*	Santa Barbara, CA*	Palm Coast, FL	Santa Barbara, CA
			Bend, OR*	Boise, ID	Bend, OR
					Utah County, UT
					Clark County, WA
					Missoula, MT

* Used as secondary or background source, rarely used directly (see other listed source as primary source)

This table oversimplifies the reality of model code usage because in some cases the interviewees did not know how adopted model codes were actually being used (an indication that they were not used regularly) or the text of local ordinances did not clearly specify how a model WUI code and the adopted WUI standards were to be jointly enforced. Some communities use the model codes as a "backstop" that could be applied as needed if additional WUI protections are desired on a particular project, leaving much discretion regarding when and how the model code provisions should be used. Among those that have adopted some version of a model code, only Prescott, Arizona, relies on model codes for direct or daily guidance on WUI standards. For example, Clark County, Washington, has adopted NFPA 1144 but the fire marshal stated that it was not being used in any direct manner because they simply relied on local written WUI standards. Similarly, many communities either adapt model code provisions to their local circumstances or adopt locally-derived WUI provisions, or both, and then include the full text in their ordinances as the primary source of WUI standards. The need to constantly refer to a model code is probably too inconvenient for many communities, most of which take a very pragmatic approach to WUI regulations.

No interviewed community adopted a model code in full as the exclusive source of their WUI regulations. Many communities find the models codes to be too complex and comprehensive for their needs. For example, if they need only 20% of the model code's provisions, or that is all the community can politically support, then it is usually easier to draft their own regulations using local terminology and concepts than to adopt portions of model code text and then try to synthesize the model code with the local code terminology. As a common example, Boise, Idaho, studied the ICC WUI code but found it too complex and

politically infeasible to adopt and instead borrowed and simplified some of the model code's provisions to fit their local circumstances.

Sometimes the decision to adopt or not adopt a model code is determined by which model codes the state has adopted. Bend, Oregon, is an interesting example because the state of Oregon relies primarily on the ICC model codes (fire code included). However, Bend has adopted the NFPA standards as gap fillers. The ICC standards apply first, but if there is an issue not covered in the ICC codes that is covered in the NFPA standards, then the NFPA provisions are enforceable. The state of Utah has adopted the ICC WUI code to serve as its minimum standard for local governments, but that code is only rarely applied directly. Thus, the relationship between and application of model codes at the local level can be complex and can become intertwined with state decisions about model codes

Question #3: What are most and least effective parts of your WUI regulation?

What is the most effective WUI tool?

General Response:
Most communities agreed that the two most important WUI tools are defensible space and fire-resistant roofs.

It was universal among the interviewed communities that a defensible space or vegetative thinning requirement was the key tool for addressing wildfire risk. While there was considerable variation regarding the specific requirements of defensible space standards, a 30 foot break was a standard minimum. Ruidoso, New Mexico, stated that its defensible space requirements are particularly effective because they apply to existing development, not just new development, which is very rare. In addition, because defensible space buffers need continuing maintenance to remain effective, every community emphasized long-term enforcement as critical to the success of the defensible space (even if they did not require maintenance themselves). Because properly thinning vegetation can be expensive and requires basic technical knowledge, nearly all communities stressed that aid or incentives to establish or maintain defensible spaces, such as free consultations, free "chipper" days, or regular debris pick up days during fire season are also critical.

A fire-resistant roof was generally cited as the second most important WUI tool. The roof was followed in importance by other important structural elements, such as siding, soffits, and proper deck covering and design.

Ensuring proper road and driveway access were also mentioned as important tools by a number of the communities, especially those with hilly terrain (Santa Barbara, CA), natural obstacles (Palm Coast, FL, which has many canals and water features that alter road design), and nonconforming development (Douglas County, CO). This is not to say that other WUI tools, such as community wildfire breaks and water supply requirements were not mentioned as important,

only that they were not raised as often as the three tools listed above. While not a WUI tool per se, public education was frequently mentioned as an inseparable part of any WUI program. The Clark County, Washington, fire chief stated that public education was even more important than their defensible space requirements in the larger scheme of making the community safer from wildfire hazard.

What is your least effective WUI tool?

No General Response:
Few communities identified any of their existing WUI tools as ineffective. Most felt that, while some of their existing WUI requirements could be better implemented, they did not see the need to remove any tools because they were doing more harm than good or because their costs outweighed their benefits.

Most communities are not doing things that are ineffective or counterproductive. It is likely that the existence and availability of the NFPA standards and ICC model codes is a major factor contributing to the spread of sound, professional regulatory techniques that can be successfully used or adapted by all types of communities around the country. The bigger barriers to comprehensive WUI regulations appear to be political will and the lack of financial resources to enforce whatever WUI regulations are adopted, rather than lack of technical standards or poor dissemination of the existing tools. However, a few communities reported that certain WUI tools were not working as well as intended.

North Port, Florida, stated that its nuisance abatement provision, which allows the city to enter noncompliant properties after proper notice and to mow vegetation to reduce wildfire risk and then bill the property owner was not working well. The process is expensive and time-consuming for the city to enforce and the city does not like being a debt collector, especially in the current economic times. However, other interviewed communities with the same or similar provision generally reported it to be working well. This is an enforcement issue, which is addressed in more detail in Question #6 below.

Glendale, California, also reported that its initial strategy to make their WUI program self-funding through citation fees from noncompliant properties did not work. They found that most people complied with WUI requirements before the need to assess fines, so revenue was less than expected. Their WUI program is now supported through general fund monies. In addition, a weakness of the original strategy was that it set up a counterproductive and adversarial system that was based on citing people rather than prioritizing compliance.

Question #4: Who Administers your WUI regulations? What is development review process for WUI regulations?

Who administers and enforces your WUI regulations?

General Response:
The fire marshal or other fire department personnel were most often identified as the primary administrators of WUI regulations. After the fire department, the building official and code enforcement officer were the most common administrators. No interviewed community mentioned planners as a primary or even secondary source of WUI administration.

While communities generally identified their fire departments as the lead agency, there is a lot of variation in how each community used its staff to enforce its WUI regulations. For example, many communities use a dual system where the fire department takes the lead on defensible space and other site-specific (and off-site) requirements (e.g., water supply, access), while the building department is responsible for the structural WUI requirements (e.g., roofs, siding, decks, etc.). However, the person responsible for enforcement of the vegetative requirements usually has more WUI-related duties because structural WUI requirements are enforced through a much more straightforward building permit process that achieves predictable and relatively permanent compliance (i.e., fire resistant roofs rarely fall out of compliance), whereas vegetative requirements require long-term efforts to ensure continued compliance.

Many communities have hired staff with demonstrated expertise in WUI regulation implementation to be their primary enforcement person. For example, Douglas County, Colorado, has a Wildfire Mitigation Specialist, and Prescott, Arizona, has a Wildfire Code Enforcement Officer. Ruidoso, New Mexico, has its own local Forestry Department staffed with people with extensive wildfire fighting and enforcement experience. Interestingly, these wildfire specialists were employed in a wide variety of departments, such as fire, building, forestry, and code enforcement. Regardless of where the wildfire specialists were located, having one or more people with clear responsibility for and expertise in WUI standard implementation is a significant aid to effective and consistent enforcement of WUI regulations.

In addition communities such as Bend, Oregon, and Palm Coast, Florida, have trained existing code enforcement officers to be the primary enforcement agents for WUI vegetation requirements. In the case of Bend this responsibility was deliberately transferred from the fire marshal to the code enforcement officer because enforcement work conflicted with fire personnel's primary function of fight fighting and emergencies service delivery, and because they were not properly trained to do code enforcement.

What is the development review process for WUI regulations?

General Response:

Most communities enforce their WUI regulations through a Development Review Committee (DRC) process in which development applications are accepted by the planning department and then distributed to all the relevant local review agencies (including the fire department) for their input. During this process, the fire department provides whatever comments it feels necessary, perhaps conducts a site visit, and gives clear conditions of approval or other recommendations to the planning department to ensure compliance with all WUI standards.

Nearly all interviewed communities reported that their DRC process worked well and that communication between the relevant local agencies was generally good. Some reported that good relationships were not the case when the WUI regulations were first adopted but that the situation improved over time as everybody became more familiar with the WUI regulations and what was required to effectively enforce them.

Many of the communities employ a two-step process in which some sort of initial defensible space (e.g., a 10 to 30 foot buffer) must be completed when the structure's foundation is installed or the building first starts to go vertical. The full defensible space requirements can be implemented later, but must be in place prior to issuance of a final permit certificate of occupancy. Once there is new construction that can either catch fire or start a fire, some level of defensible space is required.

In some communities, a critical part of the WUI development review process happens even before a development application is submitted for review. For example, Santa Barbara, California, credits a rigorous pre-application process for some of its success in enforcing WUI regulations. Under that process, the Development Review Committee meet with the applicant and project planner before an application is filed to discuss any difficult issues about the project (such as WUI requirements) and offer recommendations for how to best address each issue. This process allows applicants to learn how the project can be designed to comply with and incorporate WUI standards before they have spent considerable time and money designing the project.

Question #5: Have your WUI regulations been tested by an actual wildfire, and if so, how well did they work?

Have your WUI regulations been tested by an actual wildfire?

<u>General Response:</u>
Only Ruidoso, New Mexico, and Santa Barbara, California, have had their WUI regulations tested by a major wildfire.

There are a variety of reasons why most interviewed communities have not had their WUI tested by actual wildfires. First, wildfires that threaten newer structures with WUI protections are relatively rare, so opportunities to test them against local regulations are limited. Because there is much more pre-WUI development in most communities, wildfires that threaten those properties are more common, as are fires that burn in remote areas or that are contained before they reach populated areas. None of those types of fires allow the effectiveness of WUI regulations to be tested. In some cases, a community has adopted its WUI regulations so recently (e.g., Boise, Idaho) that there has been little time for wildfires to occur.

If a wildfire has occurred, how well did the WUI regulations work?

General Response:

In Ruidoso, New Mexico, and Santa Barbara, California, WUI regulations in place at the time of the fire were generally found effective in reducing the destructiveness and spread of the fire. In the summer of 2011, in Ruidoso, New Mexico, a homeless man started a major wildfire that destroyed eight houses, but no lives were lost. According to local forestry and fire officials, the fact that about 90% of the houses in the affected subdivision were treated for defensible space prevented the loss of more structures and allowed the fire to be put out in about two hours. It also enabled firefighters to gain better and safer access to the fire, which is one of the major purposes behind clearing vegetation away from structures. A post-fire investigation showed that the fire was spreading primarily by firebrands landing on and igniting older, non-resistant roofs, which the WUI regulations did not address. That conclusion suggests that the fire was not aided by any failure of the measures contained in the WUI regulations.

The City of Santa Barbara, California, had two major wildfires in 2009 and 2010 that threatened life and destroyed a substantial number of structures. The defensible space and other WUI requirements appeared effective at mitigating the intensity and destructiveness of the fires, and the fires provided an opportunity to test the fire department's program for increasing the efficiency of evacuations in fire hazard areas. Because much of the city's hazard areas are in steep terrain served by narrow, winding roads, the fire department had been conducting evacuation drills in vulnerable neighborhoods to help residents learn how to evacuate quickly and correctly. Fire officials believe that those drills made a significant difference in helping people evacuate during the most recent fires.

Similarly, the fire department participated in a related pilot program to create very detailed maps, using GPS technology, that pinpoint the location of notable road conditions and firefighting infrastructure in the WUI area. The pilot maps not only show where all the fire hydrants and other water sources are located, but precisely where extremely steep or narrow roads may hinder fire truck access, where locked gates are located, where all turnarounds are (or are not) located, and which private driveways can be used as a turnaround in an emergency. This information is critical not only for local fire fighters in an emergency but it is especially helpful for non-local fire fighters who may be called to the area to assist but who are not familiar with the local road network. Local fire officials believe that reliance on these maps

helped save lives in the recent fires by increasing the effectiveness of the firefighters, and they look forward to finalizing the maps.

While Douglas County, Colorado, reported that its WUI regulations have not been tested by a wildfire, a recent major wildfire was significantly hindered from reaching populated areas due to the county's previous fuels treatment of a significant area of public land surrounding the affected neighborhoods. So while this was not a test of the WUI regulations, it demonstrated that community fire breaks can be an effective tool for protecting communities from an actual wildfire.

Question #6: Has enforcement of WUI regulations been a significant problem, and, if so, what has been the problem?

Has enforcement of WUI regulations been a significant problem?

General Response

Most interview communities reported that enforcement of WUI standards was going well, with few major problems. They noted that interdepartmental coordination was generally good, especially with the planning departments.

The local officials interviewed generally agreed that enforcement of WUI regulations was not a major problem. One of the primary reasons cited was good cooperation between the local departments involved in the development review process, such as the planning, building, code enforcement, and fire departments. As a result, WUI requirements were correctly identified on applicable projects and relevant requirements were timely enforced both at the development permit stage (e.g., subdivision or site plan approval) and at the construction stage (e.g. building permits and final building inspections). However, a number of communities noted that the level of cooperation had not always been good and that it took some time and effort to streamline their internal procedures to achieve their current satisfactory level of coordination. Ensuring that there is one person or department with clear responsibility for review of development applications and enforcement was a key feature of the communities that reported good enforcement results.

The primary enforcement issue was establishment and maintenance of the vegetative requirements (i.e., defensible space) and not the structural requirements. This is because the structural requirements are relatively clear and objective and are enforced as part of a one-time building permit approval process. Once the WUI structural requirements are verified during final inspection and a certificate of occupancy is issued, those particular WUI requirements are likely to stay compliant for the indefinite future. In contrast, because vegetation grows over time,

compliance with vegetative requirements is a continual process that creates special enforcement challenges.

In addition, a number of communities, such as Santa Barbara and Glendale, California, Prescott, Arizona, and Utah County, Utah, emphasized that flexibility was a key ingredient to successful enforcement. Lack of flexibility can lead to overly burdensome requirements in certain development scenarios that can create an unnecessary backlash against the WUI regulations and complaints to local elected officials. These communities acknowledged that written regulations cannot always account for the complexity of actual development issues, such as unique topographical features, environmental resources, neighborhood characteristics, and unanticipated challenges. Local governments need to have the flexibility to apply common-sense alternative solutions when circumstances warrant, so long as there are criteria to guide this discretion, such as an "equal to or better than" alternative compliance option.

The interviewed communities also reported that enforcement was greatly aided by any type of local program that could assist landowners in creating their defensible space. For example, curb-side programs to pick up vegetative debris, free debris drop-off sites, free on-site consultations for vegetative thinning, or cost-share programs (Ruidoso, New Mexico, pays up to 30% of a landowner's cost of vegetative clearing), are critical to helping landowners who are often hindered from completing or maintaining their defensible space due to a lack of knowledge or resources and not because they oppose the regulations.

Some communities, such as Ruidoso, New Mexico, and Glendale, Arizona, mentioned that their enforcement efforts were enhanced by insurance companies that threatened to increase premiums or not insure homes without proper WUI protection. It is much easier to justify local WUI regulations when insurance companies and local government are requiring the same or similar measures.

One source of significant WUI enforcement issues is a conflict with other local development regulations, such as protections for natural resources, tree protection, scenic vistas, soil erosion, and landscaping requirements. However, the interview communities generally stated that when such conflicts arose during the development review process (which was not uncommon), the respective local departments were able to agree to some sort of compromise that fairly balanced the impacted interests. This was true even though no community indicated that their code provided any clear criteria to resolve such conflicts or to prioritize regulatory goals when they do conflict. To a large degree, this success was based on the existence of a well-functioning Development Review Committee in which department heads regularly meet and personally discuss strategies for addressing conflicting regulatory requirements and then provide those recommendations to the project planner for incorporation into the development permit. Clark County, Washington, and Douglas County, Colorado, were two communities that identified conflicts between WUI and other standards as an occasional problem, but also noted that those conflictswere usually resolved without significant difficulty.

A number of communities mentioned that it was a great benefit for the fire marshal to be the lead enforcement officer because the elected officials and landowners generally have a high level of respect and confidence in the judgment of fire officials. The fact that the fire marshal can always use safety to life and property as the justification for a WUI regulation increases the credibility of WUI standards (i.e., they are not based on personal taste or esoteric planning theories), which makes them more difficult for politicians to ignore or overrule. In short, a fire marshal is usually a better messenger for WUI standards than a planner or building official. However, a number of fire marshals mentioned that they and their staff do not like being the "bad guy" who shows up at people's doors, especially single-family homes, to tell them they are out of compliance and might be fined. They prefer to spend their time as firefighters and emergency response personnel and are not trained for the sometimes contentious work of code enforcement. For these reasons, Bend, Oregon, transferred WUI enforcement responsibilities from the fire marshal to the code enforcement officer and reported very good results.

Nearly all of the communities emphasized that public education was a constant and fundamental part of their enforcement efforts. The reason is that some communities face strong political and/or financial barriers to effective enforcement because current elected officials may not ideologically support WUI regulations or want to provide enough funding for proper enforcement. Faced with those challenges, local enforcement officials have taken a more cooperative approach that focuses less on issuing citations for noncompliance and more on working with noncompliant landowners to achieve voluntary compliance in a cooperative way that will hopefully encourage others in the community to do the same, saving time and money for the local government in the long run.

What have been the enforcement problems?

<u>Most Common Response:</u>
By far the most common WUI enforcement problem was the lack of ongoing maintenance of defensible space due either to lack of political will or financial resources. While obtaining initial establishment of the defensible space requirements was relatively straightforward, keeping vegetative fuels property maintained over time was a major challenge.

Maintaining defensible space area is especially difficult in communities with a high number of new or part-time residents or absentee landowners, because they may not be familiar with the WUI requirements or how to comply with them. Aggressive public education is key to reaching these residents. In some cases, such as Utah County, Utah, and Missoula, Montana, a general political sentiment against land use regulations hindered enforcement of continuing maintenance requirements (and WUI regulations in general). In some cases, such as Clark County, Washington, lack of funds and personnel were the primary barriers to effective long-term enforcement.

Some of the interviewed communities have no requirements for long-term maintenance of defensible space (e.g., Prescott, Arizona) so keeping wildfire fuels controlled is not technically an enforcement issue, yet these communities still often mentioned defensible space as a de-facto enforcement issue because there is little point in creating defensible space if it is not going to be maintained. Communities without defensible space maintenance requirements often have very aggressive outreach programs that target existing properties and subdivisions for voluntary continuing fuel reduction.

A second barrier to effective WUI enforcement mentioned by Glendale, California (and raised in a variety of contexts with other communities), is that the land use approval process can be very political. This allows landowners to get variances or other forms of relief from WUI standards that weaken protection. Because variances are not generally allowed from fire code standards, placing the WUI requirements in the fire code can make them more enforceable and less subject to political interference.

Another barrier to enforcement is that, in some states, the fire marshal has limited (or no) authority to enforce certain fire code regulations on one and two-family dwellings. In such cases it may make more sense to designate another official the community's primary WUI enforcement official for single-family and duplex homes. More problematic, in Utah County, Utah, the fire marshal does not have any citation authority, so all WUI violations have to go through the county attorney or sheriff for enforcement, which can be time-consuming and difficult because WUI violations are seldom highest priority cases for those public officials.

Question #7: Do you consider existing development or new development to be the greater problem?

General Response:
The interviewed communities were unanimous in stating that existing development presents a greater wildfire risk than new development because there is generally more existing development in high hazard areas and new development is constructed in accordance with the latest WUI standards.

Existing development was identified as a much higher wildfire threat than new development. This is because existing development is often constructed of flammable building materials, located in dispersed development patterns, served by narrow, steep roads that lack multiple access points and turnarounds, and frequently lack an adequate firefighting water supply. Many older developments are also not part of organized Home Owners' Associations (HOAs) that can help organize and manage open space areas and activities on private lots to reduce wildfire hazards.

Palm Coast, Florida, has a particularly unique problem created by existing development patterns. In 1969, 30 years before the city was incorporated , the ITT Corporation obtained approval of a master plan for 48,000 lots on 42,000 acres. Paved streets and water and sewer infrastructure were installed by the developer to serve all of these lots at the outset of the development (instead of phasing the development according to market demand). The result is that thousands of the lots have not been developed and many of the developed lots are scattered throughout the development in low densities, often surrounded by vacant properties. The primary problem from a wildfire perspective is that many of the lots with structures are surrounded by vacant properties with unmanaged vegetation and so are in perpetually high danger from wildfire. The city has responded with an aggressive weed/vegetation ordinance that requires all structures have a 30 foot defensible space buffer, regardless of whose property is affected. This ordinance is strictly enforced by the city's code enforcement division.

In contrast, new development is less problematic because it is usually in compliance with most or all local WUI requirements. Even when a new subdivision is built in a high or extreme wildfire hazard area, it likely has integrated modern techniques to reduce fire hazard, such as two ingress/egress points, community wildfire breaks, adequate water supply, fire-safe signage. It may also have been comprehensively designed to locate lots and future structures in the least fire-prone areas. However, if the full "buildout" of potential future development is considered some of these communities might express greater concern about new development. Local officials in Glendale, California, specifically mentioned their frustration that new development continues to be approved in high hazard areas, which diverts their limited resources and complicates their ability to make progress on protecting the community from wildfire.

Question #8: Does your community have significant areas of public land within or surrounding it, and, if so, how does this affect your community's WUI efforts?

No General Response:

While nearly all of the interviewed communities have public lands adjacent to their boundaries, there is considerable diversity in the types and extent of public land. In addition, the level of interaction with the adjacent public lands ranges from minimal to very high.

Most of the communities that are surrounded by federal lands (mostly lands of the Forest Service and Bureau of Land Management) reported good but relatively minimal levels of interaction with federal lands managers on WUI topics. One major exception is Prescott, Arizona, which has cooperated with surrounding federal lands managers to create an inter-agency coordinating committee that meets monthly to discuss strategies for addressing wildfire hazards in the Prescott area. Members of the committee work together to identify and schedule prescribed burning and other fuels reduction activities on federal lands and often target areas

near vulnerable development in the city. Ruidoso, New Mexico, reported a similarly close relationship with surrounding federal lands managers, but without the formal meeting structure. Douglas County, Colorado, and Utah County, Utah, noted that they periodically consult with federal lands managers about nearby WUI activities but that most federal decisions are made without extensive involvement from local officials. This seems to be the most typical situation.

A number of communities reported having close relationships with state foresters. Palm Coast and North Port, Florida, Bend, Oregon, and Clark County, Washington, reported having substantial contact and interaction with state foresters regarding WUI issues, often consulting with state foresters for their expertise in addressing WUI issues on private lands and coordinating state WUI activities, such as prescribed burning, with affected neighborhoods. Clark County, Washington, often works closely with private forestland owners on WUI management issues.

In a variation of this theme, the City of Boise, Idaho, is currently buying land along its foothills to create a public open space buffer and recreational area that will help serve as a community wildfire break if the vegetation is properly thinned and maintained.

Question #9: Do you think your WUI regulations go far enough in addressing the community's wildfire hazard or do you hope to see major amendments in the future?

General Response:
While most of the interviewed communities are generally satisfied with their WUI regulations, a few noted a major deficiency or change that they would like to make. Many of the communities acknowledged that, even though some improvements could be made, the current political and economic environment is not conducive to adopting WUI changes that would further restrict property rights or impose additional costs on landowners or the jurisdiction.

Below is a list of the WUI changes suggested by the interviewed communities. These comments represent the views of the interviewees and may or may not represent the views of the community as a whole. Some of these comments pertain to non-regulatory measures but are included because they impact or are closely related to WUI code issues.

- Would like to apply defensible space requirements to existing development (Prescott, AZ);
- Would like to find of way to replace the likely loss of federal funds for WUI programs (Prescott, AZ);

- Would like to have a requirement for long-term maintenance of defensible space (Douglas, County, CO);
- Would like to adopt structural requirements related to WUI protection (Palm Coast, FL);
- Would like additional money to do more extensive public education (Palm Coast, FL);
- Would like to have authority to enforce WUI standards on one and two-family dwellings, instead of just three-family dwellings and above and commercial structures (North Port, FL);
- Would like to design regulations to encourage residents to stay safely in their houses during a wildfire so that they can assist in keeping their land and house clear of fire (i.e., put out smoldering embers) and reduce the complications and dangers of evacuations (Glendale, CA);
- Would like more money to do fuels reduction on city-owned property (Glendale, AZ);
- Would like to see the Insurance Services Office do more to address wildfire risk, especially for single-family dwellings that can be politically sensitive for local communities to regulate (Bend, OR); and
- Would like to standardize WUI standards and terminology among local jurisdictions to facilitate implementation of WUI requirements in the area (Bend, OR).

3.3 Lessons Learned from Interviews

The above interview responses point to a number of important lessons:

- Most communities are generally happy with the technical aspects of their WUI standards because the menu of proven WUI tools is well-established and relatively well-known (or at least discoverable with a little effort). It is likely that the existence and availability of the NFPA standards and ICC model codes is a major factor contributing to the spread of sound, professional regulatory techniques that can be successfully used or adapted by all types of communities around the country.
- Because WUI regulations often exist in multiple codes (fire, building, and land use codes) their enforcement often requires coordination from staff in multiple departments.
- For many communities, the greatest deficiencies in their WUI standards are the lack of coverage of existing development and enforcement of continuing maintenance of defensible space. While Initial enforcement of WUI regulations is usually not a problem, enforcing the long-term maintenance of defensible space is labor and cost intensive. In addition, the lack of funding to conduct public education and vegetative clearing was cited as a significant deficiency.
- Because thinning vegetation properly can be expensive and requires basic technical knowledge, nearly all communities stressed that financial or advisory aid or incentives to establish or maintain defensible spaces, such as free consultations, free “chipper” days, or regular debris pick up days during fire season are critical to the overall effectiveness of WUI regulations.

- WUI regulations are usually administered and enforced by the fire or building department. Rarely is the planning department given primary enforcement responsibility. However, the fire marshal and fire department personnel are often not trained to perform enforcement duties and so shifting enforcement duty to staff specifically trained to do code enforcement may result in better compliance. Code enforcement officers can be trained inWUI hazard identification and mitigation, or the community can hire an individual with specific training in WUI mitigation techniques to be the lead person in charge of most or all of the WUI compliance issues.
- Regardless of which local department employs the WUI specialist, having one or more persons with clear responsibility for and expertise in WUI implementation is a significant aid to effective and consistent enforcement of WUI regulations.
- A rigorous pre-application process, where members of the Development Review Committee meet with the applicant and project planner before a development application is submitted to discuss WUI requirements and to offer recommendations for how to best address those issues, can help set realistic expectations for project outcomes and significantly reduce unpleasant surprises late in the process.
- Flexibility in the administration of WUI regulations is critical for maintaining community and political support for wildfire regulations. Communities should avoid one-size-fits-all solutions that are unable to respond to the unique wildfire and development circumstances in the community.

SECTION 4: LAND USE REGULATIONS TO REDUCE FIRE RISK IN WUI

Many of the tools discussed in Sections 2 and 3 above are structural regulations implemented through building permit controls. In fact, it appears that the cooperation between fire officials and building code officials is already strong, because most local governments have a long history of requiring buildings to be built with materials and techniques that reduce fire risk and slow the spread of fire if it occurs. The emerging frontier in fire protection in the WUI is to go beyond structural control to look at land use regulations that can reduce the chances that fire will come near the structure.

4.1 Comprehensive Plan / Zoning Policies

Land use regulation should, and in some states must, be based on local government policies that send clear messages about what its regulatory scheme is trying to achieve. Sometimes those policy statements appear in the community's comprehensive plan and sometimes they appear in the "purpose statements" in its zoning and regulatory document. Often the statements are general and aspirational – such as "create a walkable, mixed use community" – and cannot be used to approve or deny proposed development. However, if and when a community's land use regulations are challenged, the courts will ask "was this regulation 'rationally related' to a goal that the city is authorized to pursue". If it is not, then it may be invalid. So when challenged a local government needs be able to defend that rational relationship to an articulated and legitimate goal. There is no question that the reduction of fire risk is a legitimate goal of local government, but it needs to be listed as a goal of land use regulation in either the comprehensive plan or the zoning purpose statements. In many communities it is not; it is listed in regulations related to the building code or fire code, but not in zoning or subdivision documents.

Suggestion:
List reduction of fire risk and protection of the ability to fight fires in the WUI in the zoning purpose statements.

4.2 Subdivision

Subdivision controls are one of the two most fundamental land use regulatory tools – the other being zoning. Subdivision controls do NOT address what types of uses can occur on a property (that's zoning), they address how larger tracts of land can be divided into smaller parcels – generally in anticipation of development on those smaller parcels. In the U.S. subdivision controls actually predate zoning controls, because they were created to reduce fraud in the purchase and sale of property. Even the oldest of subdivision controls require that corners of lots be documented, that every lot have frontage on a street that meets local standards, and that each lot either have access to community water and sewer or enough land to accommodate a well and septic system. Subdivision controls also often include requirements for avoidance of sensitive lands (e.g. steep slopes, wetlands), the pattern of streets (e.g. grid, curvilinear, cul-de-sacs), and sometimes the dedications of lands to help meet fair shares of required parks and trails. The most recent generation of subdivision regulations also define 'building envelopes' within lots designed to avoid risks, protect privacy, or protect views. Generally, the

subdivision regulations also require that the resulting lots meet the requirements of the zoning district in which the land is located.

An increasing number of rural counties also use subdivision regulations to allow, encourage, or require 'clustering' of residential lots to protect sensitive lands, habitat, or views, or to reduce the costs of providing infrastructure or public services. For example, if the zone district requires that lots be at least one acre or larger, a clustering provision might allow or require the owner to set aside at least 30 percent of the site as open space and plat the remaining lots at a half-acre minimum size on the least sensitive or risky portions of the site. Clustering allows the applicant to build shorter roads and pipes to serve the (development because the lots are closer together) and to provide wide views over the protected open space to each lot buyer. The county gains lower road maintenance costs, fewer miles of road for the sheriff to patrol, and protection of rural character.

Importantly, local government powers to regulate subdivision are independent of their powers to zone (i.e., to control the use of land). Several states that do not require local governments to adopt zoning (like Colorado) do require that they adopt subdivision regulations. And many rural communities that oppose zoning controls as unnecessary intrusions on private property rights accept the need for subdivision controls as a necessary function of government.

When it comes to fire protection in the WUI, subdivision controls are important for at least four reasons. First, because subdivision regulations can define high and extreme wildfire risk areas as a form of sensitive land that must be avoided. Local governments clearly have the power to deny the proposed creation of lots that increase risks to the health and safety of those who will live there. Second, subdivision regulations can require adequate provision of water for firefighting purposes. At present those requirements are often included in fire codes – the planners refer subdivisions to fire officials, who impost those conditions. But the size and location of a fire pond or a utility system adequate to fight fires, and its integration into good site design, are typically included in subdivision regulations. It is not clear why fire protection standards should live in a second, separate document.

Third, subdivision controls are important because they can include regulations on the design, width, grades, turning radii, and functioning of required roads in order to allow adequate access by firefighting equipment. The time to ensure adequate roads is when the lots are laid out and platted; after that, retrofitting roads to allow efficient firefighting requires the spending of scarce public dollars. Fourth, some local governments require that subdividers create private Covenants, Conditions, and Restrictions (CCRs) that require private enforcement of standards and/or private maintenance and funding of improvements that the city or county does not want to fund or enforce itself, and those can be drafted to include defensible space requirements.

Suggestion:
Add mapped high and extreme fire risk areas as types of sensitive lands where plats may not locate buildable lots. If the area has already been platted without that protection, add a requirement that 'building envelopes' be defined to minimize those risks before building permits are issued. The right to build a house on a platted lot does not generally include the

right to build it anywhere on the lot that you want – or the right to build a new house on the same risky location where the previous house was torn down.

<u>Suggestion</u>:
Ensure that subdivision regulations include adequate standards for fire protection water supply and access roads to allow efficient fire-fighting.

<u>Suggestion</u>:
Adopt a cluster subdivision regulation that requires lots to be grouped away from high and extreme fire risk areas, or add a reference to fire risk areas to an existing clustering regulation.

<u>Suggestion</u>:
Require or encourage new subdivisions to adopt defensible space standards in their Covenants, Conditions, and Restrictions (CCRs) with clear language for enforcement by the Homeowner's Association.

4.3 Zoning

The second most basic form of land use regulation is zoning – which is the local government's right to control what uses can occur on legally platted lots and tracts of land and the size and location of structures on those lots and tracts. Originally, zoning was used to separate residential, commercial, and industrial areas from each other, but modern codes often have scores of districts carefully tailored to allow different sizes and mixes of those types of uses (and sometimes to NOT separate them). In established and mature cities, zoning controls are used much more often than subdivision controls. The lots have already been platted, their corners and legal descriptions are known, they front on streets, and they have utilities. As a result, few urban property owners need to subdivide or re-subdivide land – and WUI wildfire controls that are located in subdivision regulations will not come into play.

Typically, zoning controls divide the city or county into different 'districts' and each district has a separate list of permitted uses and a separate list of dimensional standards. In general, zoning controls for each district separate land uses into three categories: (1) permitted 'by-right', (2) conditionally permitted if you apply for a permit and a city panel decides that the use will not create adverse impacts, and (3) prohibited. Dimensional standards in each district include required setbacks from property lines and maximum heights (at a minimum) and sometimes also address the maximum amounts of each lot that can be covered with buildings or structures (or minimum amounts of each lot that must be left as open/green space). More modern zoning ordinances can get much more complex, with standards addressing 'build-to' lines, the location of parking on each site, and/or the form and shape of buildings that can be built (to fit in with the fabric of the neighborhood). Other portions of zoning regulations address required landscaping, restrictions on signs, and minimum and maximum amounts of parking. Still, the essence of most zoning ordinances is to control permitted uses of land by district.

From the perspective of fire risk reduction in the WUI, zoning can be used to prevent the establishment of business with potential fire risks (e.g., industry using or storing combustible or

hazardous materials, gas stations) in high and extreme fire risk areas. It can also be used to keep sensitive populations (e.g., hospitals, group homes, homes for the elderly) out of those areas. And it can be used to prevent the establishment of land uses that include large numbers of people (e.g., hotels, churches, stadiums, theaters) in high and extreme fire risk areas.

In addition to indicating that a particular use is allowed, conditional, or prohibited, many zoning ordinance apply 'use-specific standards' to some uses. For example, a city may allow bed and breakfasts to operate in residential neighborhoods but require that they not offer dinners to the general public (to avoid the traffic impacts that come with a restaurant). If it is not possible to prohibited the uses listed above in fire risk areas, a second option is to attach use-specific standards that reduce fire risk. For example, churches, stadiums, and theater uses in fire risk might be limited in size or required to provide two entrances to the property.

Zoning is already used to achieve these goals in areas designated as floodplains. In fact, most cities and counties have special land use controls preventing the creation of avoidable risks in floodplains because the Federal Emergency Management Agency (FEMA) provides maps of various risk areas and penalizes communities that do not participate by making flood insurance less available to their residents. The risks involved in WUI areas are different, but the legal principles are the same – local governments can always prevent risky businesses, sensitive populations, and large assemblages of people from occupying lands with higher risks to public health and safety.

Suggestion:
Ensure that risky businesses, sensitive populations, and large assembly uses are either not permitted in those zone districts that include high and extreme fire risk areas, or are permitted only as conditional uses subject to a public hearing where fire risks can be considered and a permit denied if the risks cannot be adequately mitigated.

Suggestion:
If sensitive, dangerous, or people-intensive uses cannot be prohibited in high or extreme fire-risk areas, add use-specific standards that limit the risks to human life and property, such as limitations on the size or capacity of the facility.

4.4 Overlay Zoning

Overlay zoning is a special form of zoning. Overlay zones arise from the same state statutes giving local governments the power to zone. They are a 'second level' of zoning control designed to address a specific risk, or opportunity, or planning goal. If one envisions a zoning map as a map showing each zoning district in a different color, overlay zoning might be envisioned as a transparent sheet of plastic laid over the top of the base zoning map with hatching showing areas where special regulations apply. The boundaries of the hatched areas seldom if ever match the boundaries of underlying zone districts – that is why a second level of control is needed. Landowners whose property is located in an overlay zone must comply with the requirements of both the base and the overlay zone districts.

The most common example of an overlay zone involves flood risk prevention. Many cities and counties have used FEMA flood risk maps to create overlay zones that prohibit specific uses (such as sewage treatment plants and mobile home parks), to require that buildings be located on portions of the lot further from the flood risk areas, and to require that buildings be 'floodproofed' to reduce the risks of damage to life and property and to prevent downstream properties from being damaged from poorly built structures that are washed downstream during a flood event. Again, the parallels to reduction of WUI fire risk are obvious,especially where fire risk mapping is available.

Suggestion:
Draft an overlay district based on high and extreme fire risk mapping to prevent the establishment of risky businesses in the overlay zone, or to require specific construction techniques (e.g. fire retardant roofs, special soffit or vent design) or specific site management practices (e.g. vegetation control) within the overlay zone.

4.5 Development and Design Standards

In addition to dividing the city or county into districts based (usually) on land use and/or creating overlay districts governing land use, local governments may adopt standards requiring that development occur or be designed in certain ways. For example, zoning may allow you the right to build a house on your lot in X zone district, but design and development standards may require that the façade be built of brick, or that it have a sloped roof, or that the garage be located in the rear yard. Usually, development and design standards are included in a zoning ordinance, but they could also be included in subdivision regulations or in a freestanding ordinance adopted under the city's general police powers. As cities and counties mature and their citizens' desires for quality development increase (or tolerance for low-quality development decrease), the number of development and design standards expands. These days, development standards regularly address the required location and quality of parking, lighting controls to prevent glare on adjacent properties or to require energy efficient lighting, sustainable development, green building, and all aspects of permitted signs other than the message itself (which is protected by the First Amendment to the U.S. Constitution).

Importantly, development and design standards often require various types and locations of landscaping. Many cities require the planting of street trees along the front property line, as well as landscaped buffers along the side and rear lot lines if your property is taller or generates more traffic than your neighbors'. Communities of all types now routinely require the planting of landscaped 'islands' to break up the visual impacts of large parking lots. Even rural low density counties often require that a 'buffer' of trees to be left along the edges of the property to avoid burdening neighboring undeveloped land with the impacts of new development. In addition, an increasing number of cities and counties are adopting tree preservation requirements. The simpler version of these controls simply requires that trees above a certain size that are removed from the property be replaced by new trees. The stricter version makes it difficult to remove some big mature trees, often by requiring a public hearing before they are removed – a hearing that may result in denial.

Landscaping and tree preservation requirements are particularly important to the reduction of fire risk in the WUI because they can easily be inconsistent with the requirements of defensible space and vegetation control. In the worst case, landscaping requirements could be requiring the planting or retention of trees in exactly the places where defensible space requirements would like them removed. It is therefore very important the zoning, building, and fire officials come to a common understanding of where vegetation must be planted, retained, or removed.

Suggestion:
Ensure that landscaping standards and tree protection requirements are consistent with defensible space/vegetation management requirements for fire risk reduction, at least in high or extreme fire risks areas.

Suggestion:
Ensure that sign regulations do not prohibit those types of signs required by WUI regulations or necessary to allow firefighters to locate the property and to locate structures on rural and remote properties.

4.6 Incentives

In addition to adopting standards and requirements for the division or development of land, cities and counties can adopt incentives to encourage the division, development, operation, or maintenance of land in preferred ways. Incentives are a popular discussion topic in many local governments, because they avoid arguments about private property rights; the government is not restricting you from doing X, it is simply encouraging you to do Y instead. Historically, the most commonly used incentive is the right to divide the land into more lots, or to build bigger buildings on the property, than would otherwise be permitted. Other forms of incentives can include the waiver of permitting or processing fees, reduced parking requirements, or expedited application processing.

Because many WUI areas occur in rural, relatively low density areas, which tend to be more reluctant than cities to adopt restrictions on land use, incentives are an important tool in promoting fire risk reduction. For example, a local government could offer to waive platting or site plan approval fees for a development application that agrees to implement and maintain defensible space protections or install a fire-resistant roofs. Or it could agree to allow construction of a larger house in return for commitment to build a more fire-resistant house and agree to good vegetation management practices. Increasingly, county governments that experience strong growth pressure are realizing that applicants not only value the right to build a house, but also the right to build a large house. Some of those counties establish a maximum 'base' house size and then requiring safer or better construction or better site planning to approve a larger house. Since a larger house may take more resources to protect in case of fire and may be more likely to spread fire from surrounding areas (since there is a larger roof area on which embers may fall), requirements for safer construction and location would be 'rationally related' to the legitimate government goal of fire risk reduction.

Suggestion:

If it is not possible to add fire risk reduction standards as requirements in zoning, subdivision, or development/design standards, consider adding incentives such as waiver of application/ processing fees to those willing to incorporate defensible space and structure controls into their applications and to sign development agreements to maintain those features over time.

4.7 Site Plan Review

Site plan review is a process that generally complements general zoning controls. In essence, a city or county with a site plan review process gets a 'second look' at the proposed development before issuing building permits. Even if a legal lot has been created through subdivision approval and the proposed use of the land and the size of any proposed structures comply with the requirements of the zoning district where the land is located, site plan review can give the city or county an opportunity to review the layout of the access to the site, circulation through the site, landscaping, lighting and other features that may create impacts on neighboring property owners. Site plan review may be conducted by staff, the planning commission, or even the elected officials, and they often have the power to recommend changes to the site plan or to deny it if it creates unacceptable impacts. In many communities, site plan review does not apply to single-family houses, however, because it is assumed that subdivision controls have addressed all of the issues regarding house location, access, and safety.

As an example, the site plan for an apartment building may show access from a local street, where entering traffic would impact single-family homeowners across the street, rather than from a collector street along a different side of the property. Or the applicant may have included the required amount of landscaping but placed it to improve the view of the property from the street rather than using it to buffer neighboring properties from the impact of headlights in the parking lot at night. Or the applicant may have designed an entrance sign that complies with size and height requirements but placed it in a location that produces glare on neighboring single-family homes. In many communities, site plan review could be used to require a redesign to address these aspects of the proposed development even if the project otherwise complies with zoning and subdivision requirements.

Suggestion:
If the local government requires site plan review of proposed development, ensure that the criteria for site plan review include avoidance of high and extreme fire risk areas, the provision of adequate and well-signed access, and (if possible) the inclusion of defensible spaces.

4.8 Growth Management

A small number of cities and counties have implemented growth management programs that can also be used to reduce fire risk in the WUI. While the structure and functioning of growth management systems differ widely, the general approach is to limit the amount or timing of new growth that the community will approve each year and set the criteria used to grant development approvals when demand for new development exceeds that limit . In communities with regulatory growth management systems (as opposed to advisory planning or policy statements) those interested in obtaining a plat or site plan or building permit approval are required to fill out an application that is then

the subject of a 'beauty contest' or a 'lottery'. In a beauty contest-type system all of the applications received during a six month or 12 month period are reviewed to see which ones are most consistent with the community's codes or best implement its planning goals. For example, if the community values views from a specific highway to a defined mountain peak, an application that protects that view better will score higher than one that does not protect it well. After scoring, building permits are awarded to the highest scoring applications, and the remainder will need to reapply again in the future. In a lottery system, a specific number of applications are chosen randomly from those submitted, and they get the building permits. However, even in lottery systems the local government sometimes reviews the applications against its planning goals before conducting the lottery. In the above example, an application that clearly blocks the desired view of the mountain peak may not be admitted to the lottery, and the property owner may be encouraged to redesign the application to better protect the view and submit it for the next lottery.

Suggestion:
If the city or county uses a growth management system to ration development approvals, ensure that avoidance of high and extreme fire risk areas is reflected in the criteria for evaluation of proposals or for admission to a lottery system.

4.9 Transfers of Development Rights or Credits

Over 100 communities across the United States operate Transfer of Development Rights (TDR) or Transfer of Development Credits (TDC) systems. Under these systems, the local government identifies 'sending areas' where development is being discouraged and 'receiving areas' where it is more acceptable. Often the sending areas are environmentally sensitive lands, wildlife habitat, wetlands, steep slopes, prime agricultural lands, or desired view corridors. Receiving areas are usually urbanized areas that already have the roads and utilities necessary to support more development. Property owners in the sending areas are then allowed to sell 'rights' or 'credits' for development that would otherwise happen on their lands and the buyers use those rights or credits to create larger developments in receiving areas (often 10 or 20% more homes than could otherwise be built).

In theory, the seller gains the cash that they would otherwise have to gain by selling or developing the land itself (which some rural landowners don't want to do) and the buyer makes money by selling additional homes on a given area of land. Purchases and sales of rights and credits are private market transactions and the local government rarely sets the price or acts as a buyer or seller. The vast majority of TDR/TDC systems are voluntary – no one forces the seller to sell or the buyer to buy. However, a few systems are mandatory – the owner of sensitive lands is prohibited from developing the land but allowed to sell TDRs or TDCs as a form of compensation for the restriction.

Suggestion:
If the city or county (or both) operate a Transfer of Development Rights/Credits system, ensure that high or extreme fire risk areas are included in the 'sending areas or suggest that the 'sending areas' be revised to include those lands in the future. Ensure that high or extreme fire risk areas are not included in 'receiving areas'.

4.10 Maintenance and Operation Standards

Originally, zoning, subdivision, and site planning controls addressed only the design and construction of property. Once the property was built the owner's only obligation was not to expand or modify the building to be larger, taller, or closer to other properties than the land use regulations allowed. However, an increasing number of local governments are now including maintenance and operating standards in their zoning ordinance. Generally, these require that the property owner keep in place all of the features of the property that were required for it to be approved. Most commonly, maintenance agreements cover landscaping, tree preservation and signs. Landscaping that was required to be installed and trees required to be protected must be kept alive and replaced if they die, and signs must be maintained in safe and attractive condition. Operating standards often require that activities not create glare, odor, vibration, smoke, radiation, or noise beyond specific limits. In the context of WUI risks, maintenance and operation standards could be used to require continued vegetation management or maintenance of legible addressing and signage.

Suggestion:
Include operating and maintenance standards in the zoning code obligating all property owners subject to defensible space requirements to ensure that vegetation is removed and the resulting debris disposed of safely on an annual basis, and that required address signs and/or directional signs on the property be maintained in legible condition.

4.11 Development Agreements

Development agreements are contracts between a property owner and the city or county obligating each party to perform certain duties with regard to a development. Typically, they address the order in which a property will be developed and infrastructure installed, the dedication of specific lands for police or fire facilities or roads, the timetable in which the government will take over specific improvements, and/or the owner's duty to post a bond or financial assurance that improvements will be installed correctly and the city or county's obligation to release that security as the items are built and accepted. Matters involving dedication of specific lands, payments of money, or the timing (as opposed to the type and size) of development are generally not included in zoning regulations themselves, because failure to comply does not change the nature of the development. An owner who has approval to build ten apartments and builds them but fails to install the required turn lanes into the development is generally not considered to have a land use violation – the approval said ten apartments in this location and that is what was built. The owner's failure was in related obligations that many communities feel are better enforced through a contract. Whereas most zoning ordinances only allow the city or county to impose fines or to require that a building be modified to comply with the law, contracts can more easily be used to extract from the property owner the cost of finishing the required infrastructure.

Suggestion:
If the local government is negotiating a proposed development for a property located in a high or extreme fire risk area, ensure that it contains clauses requiring the owners to maintain required defensible space and structural controls – for example to always replace the roof with

an equally fire-resistant roof or to replace vents or equipment with those recommended by a fire protection agency as replacements are needed over time.

4.12 Enforcement

Zoning, subdivision, and site planning laws almost always contain provisions for enforcement of the law. Those that do not often cross-reference a state law addressing enforcement. However many enforcement provisions are based on very old state enabling acts or contain only partial lists of the powers granted by the state (or available to home rule governments) to enforce the laws. Typically, land use violations are linked to specific fines, and after notice has been given to the property owner each day of non-compliance with the regulation is considered a separate violation accruing a separate fine. In addition, enforcement provisions that cross-reference state-established classes of misdemeanors can be enforced through jail sentences, but that is rarely done. At a minimum, zoning and subdivision enforcement clauses should clarify that failure to maintain any required fire protection feature – defensible space, structure controls, access, or firefighting water source maintenance – is a violation of the code. If some of the fire-related requirements are contained in a separate fire code, the enforcement provisions could also state that violation of the fire code is a violation of the zoning and subdivision controls. That gives the city or county to put pressure on property owners to bring their properties back into compliance through an administrative procedure and daily fines rather than through a court proceeding.

Suggestion:
Ensure that the zoning and subdivision enforcement provisions clarify that failure to maintain required fire risk reduction features is a violation of the code, and cross-reference violations of the fire code so they can (at the local government's option) be enforced through administrative land use enforcement procedures.

SECTION 5: NEXT STEPS

In light of the literature review summarized in Section 2 of this report, the community interviews summarized in Section 3, and the opportunities for stronger implementation, coordination, and enforcement suggested in Section 4, we have the following recommendations for next steps that FPRF and/or NFPA may want to take to reduce wildfire risks in WUI areas.

1. Disseminate this Study

The insights in this study regarding what has already been done well (e.g. the creation of technical regulations and model codes) and what still needs improvement (e.g. coordination in enforcement and integration with other land use regulations) would benefit from wider review and comment within the fire risk reduction community.

2. Reorganize Technical Materials to Reflect their Actual Use

Most cities and counties do not adopt model codes – they use them as references from which they 'cherry-pick' the elements they think would be more helpful and politically achievable. Existing technical materials (e.g. NFPA 1141, 1142, 1143, and 1144) could be reorganized to make them easier to use in this way. One example of such an organization is the Sustainable Development Code developed by the Rocky Mountain Land Use Institute and available for public use at http://law.du.edu/index.php/rmlui/rmlui-practice/code-framework/model-code. The material is organized by topic area (including steep slopes, coastal areas, solid waste/recycling, and WUI risks). Within each topic area users can select from tools that offer an easy, moderate, or aggressive approach to the issue. Users can also choose between tools that remove barriers in existing regulations, those that offer incentives for desired development practices, and those that add new regulations in order to focus on the approach that is most politically feasible in their community.

3. Another Generation of Technical Codes is Probably Not Needed

There is no evidence that the existing ICC WUI code and NFPA standards are inadequate to address the risks of wildfire in the WUI. Instead, interviews clarified that weakness in the current WUI risk reduction system are not technical. They are due to poor coordination, funding, political will, education, or enforcement – none of which require new technical solutions.

4. Create a WUI Best Practices Guide for Local Governments

No matter how well NFPA can tailor its WUI-related standards for local governments, some local governments will still choose not to adopt them because they are too complex or comprehensive, or for some other reason. In such cases, local governments could benefit most from a simple guide of proven best practices to address WUI hazards that could be readily adapted to their local circumstances. For example, the guide could include recommendations for mapping hazard areas, provide a spectrum of defensible space approaches, recommend ideas

for public education, ways to efficiently administer and enforce WUI standards, and how to resolve conflicts between WUI requirements and development standards in zoning and subdivision controls.

5. Better Integration with Strong Land Use Regulations Would Add Value

Many of the current WUI regulations at the community, neighborhood, and lot levels parallel or have corollaries in other land use controls. Lot and block layouts, access roads and driveways, vegetation and landscaping, boundary buffers, fencing, grading, and even building façade materials addressed in WUI regulations are also addressed in subdivision, zoning, and site planning regulations. Integrating WUI land use controls into those existing regulatory tools could enhance implementation and enforcement of WUI standards as well as avoiding inconsistencies between local regulations on the same topic.

6. Develop a Pilot Project for Regulatory Integration

Develop a pilot project to better integrate its existing NFPA technical WUI standards into the land use, subdivision, and zoning regulations of several communities. The communities chosen should reflect a diversity of geographic backgrounds (ideally a minimum of three) and regulatory frameworks, such as those outlined in this report (i.e. state mandate, state model code, state mapping, and no state support), but should have in place well-established and well-functioning intergovernmental Development Review Committee procedures. The goal of this effort would be to 'embed' WUI regulations zoning, subdivision, and site planning controls, and to modify non-WUI land use controls to avoid secondary adverse impacts on WUI risks area. From this experience, NFPA should develop and disseminate short, concise versions of key WUI regulations designed to be integrated into the lot, access, vegetation, and sign portions of local development codes. Some of the lessons learned could be integrated into the best practices guide recommended above.

APPENDIX A: BIBLIOGRAPHY

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