



Wildfire Community Hardening Framework

California Wildfire Mitigation Program

Version 2.2

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INTRODUCTION

As part of the State of California's effort to strengthen community-wide resilience against wildfires, the California Governor's Office of Emergency Services (Cal OES) and the Department of Forestry and Fire Protection (CAL FIRE) have partnered under the California Wildfire Mitigation Program (CWMP) Joint Powers Authority (JPA) to encourage wildfire community hardening. This Framework document offers a roadmap to help communities develop programs that provide ignition resistant construction retrofits in tandem with defensible space for residential and commercial buildings at high risk to wildfires.

The CWMP has leveraged Federal Emergency Management Agency (FEMA) Hazard Mitigation Assistance (HMA) program grants to develop this framework document and to establish pilot home hardening programs in Lake, San Diego, Shasta, El Dorado, and Tuolumne counties. While federal grant funding is not required for the establishment of a successful wildfire home hardening program, Hazard Mitigation Grant Program (HMGP) or Building Resilient Infrastructure and Communities (BRIC) funding may provide the implementing entity with additional resources. As such, this framework recommends applying for this federal funding when it is available.

This framework provides a comprehensive approach to establishing a wildfire home hardening and defensible space program. In addition to the core framework document, there are additional appendices that will apply to entities participating directly in the CWMP and appendices for entities that are establishing programs with the support of HMGP or BRIC funding. A complete list of the appendices can be located at the end of this Framework document. The core framework document and primary appendices are intended to support any entity that is interested in establishing a wildfire home hardening and defensible space program including, but not limited to Counties, Cities, Fire Safe Councils, and Resource Conservation Districts.

The Wildfire Community Hardening Framework incorporates lessons learned from the pilot communities initially participating in the CWMP and FEMA Hazard Mitigation Assistance (HMA) programs. The Framework is intended to be a living document, that will be continuously referenced and updated as the CWMP, develops.

Note: Successful implementation of a wildfire home hardening program is reliant on properly maintained defensible space. For the purpose of this framework and its appendices, the term **home hardening** will be used to mean **wildfire home hardening and defensible space**.

PROJECT AREA SELECTION

While the home hardening retrofit measures and defensible space measures of the CWMP are applicable to any home under threat of wildfire, this framework recommends choosing a project site that is limited in scope and size and is located in an area with wildfire vulnerability. As an example, the CWMP

consulted CAL FIRE's Fire Hazard Severity Zones and implemented the pilot projects in Very High Fire Hazard Severity Zones.

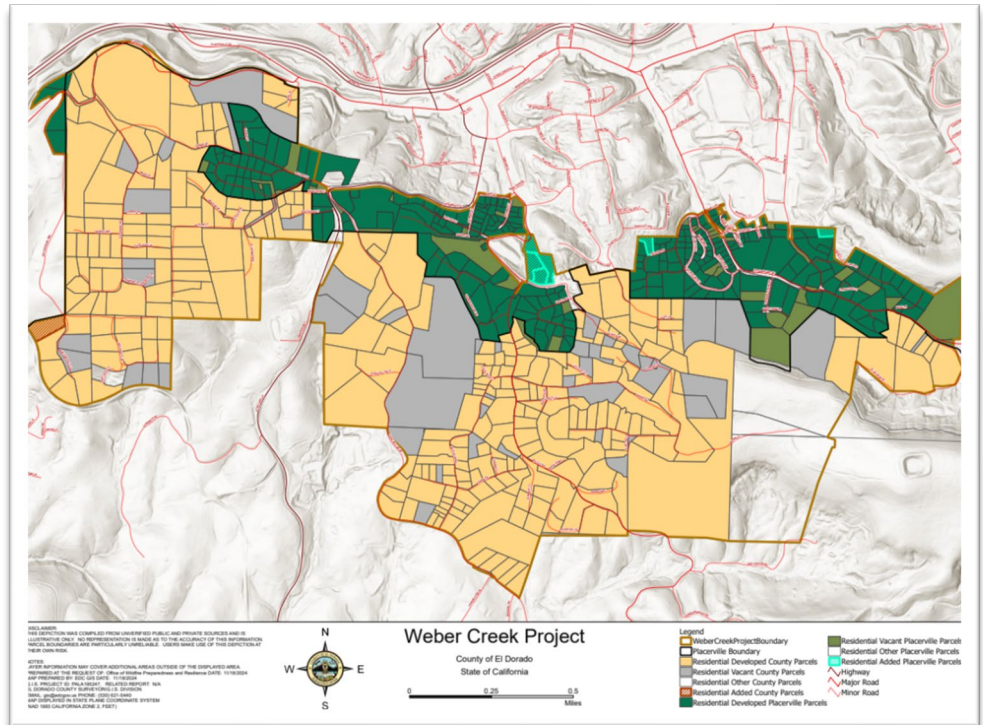


Project Boundaries

This framework's recommendations offer benefits for any home, but they are especially effective when homes within a cluster are hardened collectively. When neighboring homes are fortified together, the entire area gains enhanced protection, creating a more resilient community than if homes were hardened in isolation.

The below image is a map of the Weber Creek Project Area in El Dorado County. The project area contains a relatively dense development of homes located in the Wildland Urban Interface (WUI).

When choosing a project area, this framework recommends that the entity that is implementing the program consults with its local fire jurisdiction to determine wildfire vulnerabilities. The communities that are most likely to see a significant benefit from participation in a home hardening and defensible space program are those determined to be most vulnerable.



Note: For entities participating directly in the CWMP, please refer to the below paragraph for additional information on choosing a project area that benefits socially vulnerable communities.

Entities participating in the CWMP **must** select a project area with a high or comparatively high population of socially vulnerable people. The criteria for social vulnerability should include factors such as:

- Low income
- Residents with disabilities
- Residents with language barriers
- Residents without access to personal vehicles
- Residents under the age of 5
- Residents over the age of 65

Additional CWMP resources regarding Project Area Selection are available in the Appendices:

- [A7 - County Selection Methodology](#)
- [A8 - Outreach Toolkit](#)

ENVIRONMENTAL AND HISTORICAL PRESERVATION

This framework recommends that any entity that is implementing a home hardening program familiarizes itself with any applicable local, state, and federal environmental and cultural resource preservation policies, rules, regulations, and laws. Environmental and Historic Preservation (EHP) review is typically a time-consuming process and as such, this framework recommends incorporating the EHP review process into the earliest stages of project design. In broad strokes, this framework requires reviewing all properties and obtaining approvals and permits prior to any physical work commencing. It is a best practice for entities to work with subject matter experts (SME) in biology, botany, and architectural archeology, to conduct reviews of proposed treatment areas and identify issues or concerns.

Entities participating in FEMA Hazard Mitigation Assistance programs, HMGP or BRIC, must comply with the National Environmental Policy Act (NEPA). The CWMP has developed processes to streamline the Environmental and Historic Preservation (EHP) review. If you are participating in one of the specified programs, please refer to Appendices A1 – A through A1 - H.

Additional CWMP resources regarding Environmental and Historical Preservation:

- [A1 - A - Phase I and II SME EHP Deliverables](#)
- [A1 - B - CA Home Hardening HMGP Program Phase I 'No Issue' Property Conditions](#)
- [A1 - C - Connected Activities, Routine Homeowner Maintenance and Defensible Space Compliance](#)
- [A1 - D - Guidance for Feasibility, Structural Integrity, and Unforeseen Conditions](#)
- [A1 - E - Vegetation Management Defensible Space – Zones 0, 1 and 2](#)
- [A1 - F - Retrofit and Hardening Activities](#)

APPLICANT ELIGIBILITY

To determine eligibility for participation in the program, the following criteria should be considered. Additionally, factors related to income and social vulnerability may be used to prioritize funding needs.

- 1. Geographic Location**

The property to be mitigated must be located within the defined and approved boundaries of the participating communities.

- 2. Legal Right to Make Improvements**

The applicant must have the legal right to make improvements to the residential or commercial building. Proof of ownership, such as a deed, title, or property records, is required as part of the eligibility determination.

- 3. Building Type**

The CWMP framework suggests prioritizing single-family residential homes, including mobile/manufactured homes. Multi-unit homes, such as duplexes and triplexes, apartment buildings, private businesses, schools, and other infrastructure types may be eligible depending on the goals and priorities of the entity implementing the program. A clear list of priority structure types should be established prior to accepting applicants to the program.

- 4. Structural Soundness**

The building must be structurally sound and able to support retrofit measures. FEMA mitigation programs may not fund mitigation for buildings that cannot accommodate retrofits. While the program intends to address unforeseen issues such as asbestos or termite damage, it cannot guarantee funds for remediation. Assessors will make a preliminary evaluation during the initial inspection, and contractors must notify the Subrecipient if the building is unlikely to withstand retrofitting.

- 5. Primary Residence**

While the needs of each jurisdiction may vary, this framework suggests prioritizing residential homes. To that end, while secondary homes or vacation homes may be eligible, they may be prioritized lower than primary residences and may require a higher homeowner cost share. Renters interested in hardening their leased property should inform their landlord or property owner about the program and encourage them to apply.

Additional CWMP resources regarding Applicant Eligibility:

- [A7 - County Selection Methodology](#)
- [A8 - Outreach Toolkit](#)

METHODOLOGY

CWMP has developed a Minimum Quality Standards (MQS) document which contains a list of retrofit and defensible space activities that may be eligible for funding for participating homeowners. This document was developed after consulting the National Institute of Technology and Standards (NIST) Hazard Mitigation Methodology (HMM) Technical Note 2205.

The HMM evaluates a property's vulnerability to embers, direct flame contact, and radiant heat exposure from adjacent combustible hazards. For ember exposure, the HMM recommends cost-effectively hardening exterior residential/commercial building components, such as the roof, vents, walls, windows, doors, skylights, and attachments, by fully or partially replacing exterior components in areas of the home that have been determined to be exposed to risk. To mitigate for direct flame contact or radiant heat exposure, the HMM recommends separation distances from adjacent combustible exposures and, when necessary, removal or relocation of the combustible hazards. Additional considerations are also recommended based on proximity to neighboring parcels or larger buildings such as detached garages. If removal is not possible, retrofit measures including targeted hardening of exterior components on the residential/commercial building's exposed side are employed.

The MQS was also intended to align with state, national and international codes, and standards from other programs such as the Insurance Institute of Business & Home Safety (IBHS) Wildfire Prepared Home, the California Department of Housing and Community Development (HCD) ReCoverCA and the California Department of Insurance (DOI) Safer from Wildfires.

Not all mitigation measures contained in the CWMP Minimum Quality Standards will be required or recommended for each property. The cost will constrain which of the recommended mitigation actions will be implemented on each property.

Below are photos of homes that participated in the CWMP before and after home hardening retrofits were completed. These images are for reference only.

This image shows a deck that has undergone home hardening retrofits. The space around the deck was cleared of miscellaneous flammable materials and the underside of the deck was fully enclosed. Enclosing the deck prevents flammable materials from accumulating below the deck and prevents flames and embers from igniting the deck from below.



The image above shows a deck that has undergone home hardening retrofits. The space around the deck was cleared of miscellaneous flammable materials and the underside of the deck was fully enclosed. Enclosing the deck prevents flammable materials from accumulating below the deck and prevents flames and embers from igniting the deck from below.



The image above shows an attached fence that has undergone home hardening retrofits. The combustible fencing material was replaced with ignition resistant material within 5 feet of the structure. This prevents fire from spreading along the fence and igniting the wall or eaves of the structure.

Additional CWMP resources regarding Methodology:

- [A1 - E - Vegetation Management Defensible Space – Zones 0, 1 and 2](#)
- [A1 - F - Retrofit and Hardening Activities](#)
- [A5 – Minimum Quality Standards \(MQS\)](#)

LIFE CYCLE OF A HOMEOWNER APPLICATION

For entities running a home hardening retrofit program, especially programs that offer financial assistance to participating homeowners, a well-developed and consistent application process is crucial to ensure the smooth implementation of the program. Considering the amount of time that it takes to stand up a home hardening program including hiring and training staff, implementing processes, and working through any applicable EHP processes this framework suggests postponing homeowner outreach and applications until the previously mentioned steps are complete. Once these steps are finalized, applications can be accepted either through paper forms or an online platform. Additionally, it is recommended that entities implementing a home hardening program host in-person sessions at community centers or events to assist homeowners with completing their applications, and to offer guidance and support to facilitate accurate and timely submissions.

A general procedure for processing homeowner applications and completing home hardening retrofits is below.

- Homeowners within boundaries submit application
- Implementing entity reviews the application for eligibility
- The implementing entity approves or denies the application
 - The implementing entity sends denial to applicant specifying reason for denial.
 - Implementing entity conducts an assessment for each approved home site
- Implementing entity creates a Scope of Work (SOW) specific to each home site
 - SOW is reviewed with homeowner
 - Qualified Contractors provide quotes for all measures on SOW
- Contractors conduct Home Hardening and Defensible Space activities
- Community conducts Final Walkthrough to ensure that all measures were conducted according to the SOW.

Additional CWMP resources regarding Life Cycle of a Homeowner Application:

- [A3 - Participating in the CWMP – Roles and Responsibilities](#)
- [A8 - Outreach Toolkit](#)
- [F1 - Homeowner Application – English](#)
- [F2 - Homeowner Application - Spanish](#)

ORGANIZATIONAL STRUCTURE

The wildfire home hardening and defensible space work proposed in this framework, whether it is undertaken through the CWMP, as part of a standalone FEMA HMGP or BRIC grant, or independently, is a highly technical and involved process. This section of the framework will detail the roles and responsibilities of those implementing a home hardening and defensible space program as well as possible organizational structures that can be followed.

Primary responsibilities of the implementing entity can be broadly grouped into two categories: Project Management and Construction Management. Project Management includes program development, grant management, homeowner outreach, and managing homeowner applications. Construction Management includes contractor engagement, wildfire property assessment, scope of work development, construction bid selection, construction, implementation, and site closeout. This framework recommends splitting the Project Management and Construction Management roles. However, the size and scope of each program is different and variables from total budget to number of participating properties requires that each program is likely to have different staffing needs and a different organizational structure.

The roles and responsibilities mentioned in the preceding paragraph will be addressed below and can aid in determining the appropriate staffing requirements for specific programs.

| | |
|--|--|
| <p>Outreach Specialist</p> | <ul style="list-style-type: none"> • Promote the program and encourage homeowner participation. • Deliver presentations to community groups, partners, and stakeholders • Manage homeowner expectations while answering questions and addressing concerns. • Helpful if this individual is connected to the project areas |
| <p>Homeowner Liaison</p> | <ul style="list-style-type: none"> • Process homeowner applications, ensuring the applicant is the homeowner, determining the income bracket of the household, and coordinating the home assessment. • An eye for detail and accuracy will be important, as well as good communication skills for interacting with applicants |
| <p>Home Assessor</p> | <ul style="list-style-type: none"> • Perform home assessments using the mobile application provided by the program . • Communicate with homeowners about the home assessment findings, answer questions, and encourage their participation in the program. • An understanding of defensible space and basic construction terminology will be helpful. |
| <p>Construction Manager</p> | <ul style="list-style-type: none"> • Prepare quote specifications from the home assessment report • Coordinate a walkthrough for contractors • Monitor construction progress and manage change orders • Complete final walkthrough • Serve as liaison between homeowner and contractor during the construction process |
| <p>Project Manager</p> | <ul style="list-style-type: none"> • Oversee local implementation of the program to achieve programmatic goals and ensure regulatory compliance • Supervise program staff • Ensure qualified construction vendors are secured to perform site work |
| <p>Environmental and Historic Preservation Professional</p> | <ul style="list-style-type: none"> • Possess credentials required by Department of Interior to review sites subject to Section 106 • Possess credentials required by FEMA related to general biology to review sites which may impact critical habitats and endangered species. |

Grant Management

This section will apply for programs that operate using federal, state, or local grant funds. If the program is not utilizing grant funding, please proceed to the next section. While each grant and funding source will have its own reporting and tracking requirements, grant management is likely to be a considerable undertaking. More information about managing HMGP and BRIC grants can be found in [Appendix A2](#).

Program Development

Program development includes but is not limited to developing the sub application if the program is utilizing HMGP or BRIC funding, creating program documents, determining participant eligibility, and more. The amount of time that will need to be dedicated to developing the program to the point where it is appropriate to accept homeowner applications depends on the scope of the project and source or sources of funds involved in the program but should be expected to extend from at least six months to multiple years. Please refer to [Appendix A2](#) for sample documents related to applying for HMGP and BRIC grants.

Homeowner Outreach

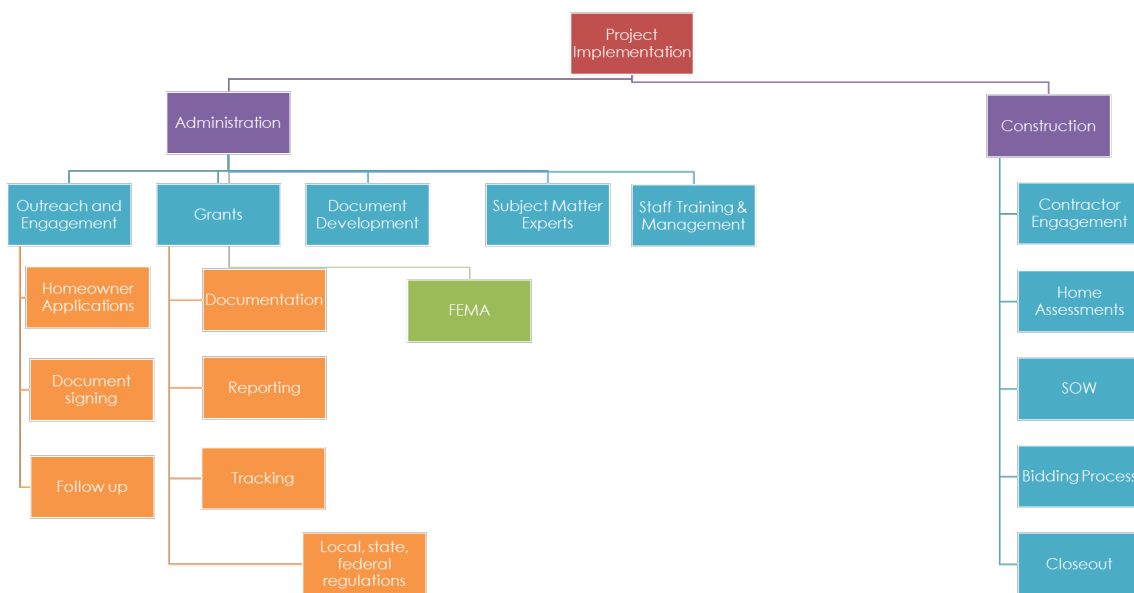
Appropriate and timely homeowner outreach and communication is crucial to the successful implementation of a home hardening and defensible space program. While implementing a program that hardens homes and assists homeowners with maintaining their defensible space is an exciting prospect for many homeowners and community members, there are many factors that may delay the implementation of such a program. This framework therefore recommends waiting until much of the program processes have been developed. Engaging the community too early in the process can often set unrealistic expectations and lead to community dissatisfaction with the program. The framework suggests beginning community outreach only after the project area has been chosen and applicable, initial Environmental and Historic Preservation reviews are completed. Outreach should target homeowners that are specifically within the project area and should aim to introduce them to the concept of home hardening. As the project begins to take shape, in person or online meetings may be appropriate to drive engagement and provide more detailed answers about how your program will impact homeowners. Sample outreach materials can be found in [Appendix A8](#).

Managing Homeowner Applications

Program staff will also be responsible for reviewing applications to ensure homeowner eligibility, communicating specific timelines, meeting with

homeowners at their homes. Staff will be responsible for tracking and moving homeowners along the home hardening retrofit process from the time that they apply to the program until the time that home hardening retrofits and defensible space work is completed.

Below is one example of an organizational chart for a theoretical home hardening project. In this example, overall project implementation is the responsibility of the program manager with project management and construction management overseen by project and construction managers respectively. The responsibilities under each manager may be delegated as needed.



Contractor Engagement

The success of home hardening and defensible space programs lies with the implementing authorities' ability to conduct the work at each participating parcel. To this end, it is imperative that the Construction Manager can engage with contractors and encourage them to participate in the program. For any programs utilizing public funds, it is important that a competitive bidding system is in place, and to that end, there must be an acceptably large pool of contractors. The Construction Manager should be familiar with how to work with local contractors and how to adequately convey the Minimum Quality Standards and expectations of the program.

Developing Scopes of Work

Each parcel that participates will have its own unique set of vulnerabilities. While the CWMP provides a comprehensive list of retrofits and Minimum Quality Standards, no single home or parcel will undergo every retrofit. It is therefore up to the Construction Manager to create a Scope of Work for each participating home that prioritizes the mitigation efforts that most adequately addresses the risks that are most likely to impact that specific home. CAL FIRE has developed training that will directly support the construction manager in making those prioritizations, however the retrofits and defensible space measures in the SOW will be the direct responsibility of the Construction Manager.

Construction Oversight and Site Closeout

The Construction Manager will be responsible for following all applicable local, state, and federal contracting guidelines when selecting winning construction and defensible space bids. Construction Managers will use their expertise and knowledge of contracting rules to select the bid that most closely matches the Minimum Quality Standards and the Scope of Work. The construction manager will then ensure that the work is completed as laid out in the MQS, SOW and winning bid. This framework recommends that the Construction Manager conduct site visits at various stages of construction implementation including before soliciting bids, during construction, and after construction is complete. The final walkthrough should include a checklist to ensure that all work was completed according to the MQS and that the retrofits provide an increased level of protection to the structure.

For additional information please also refer to [Appendix A3](#) – Participating in the CWMP – Roles and Responsibilities.

Additional CWMP resources regarding Organizational Structure:

- [A3 - Participating in the CWMP – Roles and Responsibilities](#)
- [A5 – Minimum Quality Standards \(MQS\)](#)
- [A6 - Contractor Procurement](#)

Inputs From Other Areas of Expertise

To successfully execute the program, the input of other departments or areas of expertise may be required, depending on the organizational structure of the lead implementing entity. These include:

Finance / Controller – Depending on the scope and size of the program and the funding sources involved in the implementation of the program, the implementing entity may want to retain the services of a finance professional.

Procurement Department/Lead – The implementing entity must use the most stringent of local, state, and federal procurement guidelines. This may include conducting a Request for Qualifications/Request for Proposals from professional services firms, contractors, or vendors.

Public Information – During demonstration phase, the outreach efforts and program promotion is very targeted to specific neighborhood(s). Input from the public information office or other staff with expertise or skillset in design or communications may support the successful development of outreach materials and strategies and can help ensure consistency with branding requirements. This department or contact may also be able to support the translation of materials into Spanish if necessary.

Information Technology – The local implementing entity will establish a program specific email address and web page for the program. If the entity is participating in the CWMP, a link to the California Wildfire Mitigation Program – Homeowner Application Portal will be provided for the local webpage.

Legal – This framework suggests, as a best practice, the implementing agency, the contractor, and the homeowner enter into a tri-party agreement that guarantees that the home hardening work will be conducted to a minimum quality standard. As this is a legal document, the framework suggests working with or retaining a legal professional who is qualified to review contractual and legal documents.

Key Partners

There are a few key partners that a local implementing agency should engage early in the planning process. These include:

County Building Official – Obtain input on proposed measures to gain understanding of local ordinances which may be more stringent, measures requiring permits, and inspection process and timeline. Other insights may be gained about construction dynamics unique to the area, such as issues that arise during inspection, contractor engagement, and potential roadblocks, and pitfalls to avoid when working with this pivotal local department. During development of the subgrant application, this contact will be asked to provide input on current building costs (required for developing the budget and Benefit Cost Analysis portion of an HMGP or BRIC subgrant application).

County Housing/Community Development Official – Funds allocated to County Government for the purposes of housing rehabilitation, emergency repairs, and purchase assistance are typically operated by this Department. Unique insights may be gained from contacts within this Department in areas such as working with low-to-moderate income populations and current strategies and programs which may be leveraged to support homeowner engagement. This department will have a working relationship with the local building department and local contractors performing similar work on behalf of a comparable population and housing stock. This department will be familiar with the environmental clearance process and will have other administrative management tools they may be willing to share, such as homeowner agreements, right of entry forms, general contractor specifications and procurement packages, change orders, etc.). There may also be the opportunity to combine homeowner outreach and engagement efforts by promoting this program to past, current, and future participants of their programs. This department may also have information on current costs for performing comparable measures, such as roof re-covering, window replacement, etc.

Fire Safe Council/ Resource Conservation District/ Citizen Emergency Response Teams – Not only are these groups knowledgeable about fire safety, defensible space, and other life-saving measures, they are well-connected to the community and often have other programs which may be layered with this program to improve homeowner education on safety measures. These partners may support program promotion at their meetings and events, and in some cases even directly perform some of the outreach efforts or home assessments. These organizations may have information on current costs for performing defensible space measures.

Local Fire Department – Defensible Space Inspectors are directly connected to neighborhoods and homeowners. They may promote the program in interactions with homeowners or leave door hangers. Crews at local fire stations may also be able to identify homeowners most in need and support engagement efforts.

Developing Future Partnerships

Collaborating with other programs which serve low- to moderate-income households is a great way to build upon respective efforts and may generate leads to interested homeowners. Likewise, additional resources a homeowner may need could be identified. For example, a home that cannot be issued a building permit may benefit from a home rehabilitation program to correct issues before proceeding with this program.

CONCLUSION

While wildfires may never be fully preventable, Wildfire Home Hardening Programs do and will continue to play a crucial role in reducing their impact on communities. Focusing home hardening efforts on areas most likely to be impacted by wildfires, implementing standardized mitigation methods informed by science, and offering financial support to individual homeowners significantly enhances resilience and helps minimize the potential devastation caused by these fires. This framework underscores the importance of adopting a methodological approach to targeted, science-backed mitigation strategies in safeguarding lives, property, and infrastructure. By focusing on wildfire structural hardening, defensible space, and community preparedness, this framework not only mitigates immediate wildfire risks, but also fosters a self-sustaining cycle of community resilience through strategic investments

APPENDICES

Critical Appendices

- **A1 – FEMA Environmental & Historic Preservation**
 - [A1-\(A\) – Phase I and II SME EHP Deliverables](#)
 - [A1-\(B\) - CA Home Hardening HMGP Program Phase I 'No Issue' Property Conditions](#)
 - [A1-\(C\) - Connected Activities, Routine Homeowner Maintenance and Defensible Space Compliance](#)
 - [A1-\(D\) - Guidance for Feasibility, Structural Integrity, and Unforeseen Conditions](#)
 - [A1-\(E\) - Vegetation Management Defensible Space – Zones 0, 1 and 2](#)
 - [A1-\(F\)- Retrofit and Hardening Activities](#)
- [A2 - Hazard Mitigation Assistance Program and Policy Guide](#)
- [A3 - Participating in the CWMP – Roles and Responsibilities](#)

Other Appendices

- [A4 – Homeowner Cost Share](#)
- [A5 – Minimum Quality Standards \(MQS\)](#)
- [A6 – Contractor Procurement](#)
- [A7 – County Selection Methodology](#)
- [A8 – Outreach Toolkit](#)

Sample Forms and Templates

- [F1 – Homeowner Application \(English\)](#)
- [F2 – Homeowner Application \(Spanish\)](#)
- [F3 – Sample Tri-Party Agreement](#)
- [F4 – Sample Master Agreement](#)
- [F5 – Sample Scope of Work Form](#)