

Wildfire Science: From Lab to Field

Making Homes and Communities More Survivable and Insurable

Laura Blaul

Sr. Wildfire Fellow

Insurance Institute for Business & Home Safety




"For those that have experienced *catastrophic loss* like we did the day of the Camp Fire, you're motivated not to go through that again, truly."

Top 25 US Most Destructive Fires Since 1990

#	Fire	State	Year	Acres	Structures
1	Camp	CA	2018	153,336	18,804
2	Eaton	CA	2025	14,021	9,413
3	Palisades	CA	2025	23,707	6,833
4	Tubbs	CA	2017	36,807	5,636
5	Tunnel	CA	1991	1,600	2,900
6	Cedar	CA	2003	273,246	2,820
7	Almeda Drive	OR	2020	3,200	2,659
8	North Complex	CA	2020	318,935	2,352
9	Lahaina	HI	2023	2,170	2,154
10	Chimney Tops 2	TN	2016	17,140	2,066
11	Valley	CA	2015	76,067	1,955
12	Bastrop Complex	TX	2011	34,068	1,673
13	Witch	CA	2007	197,990	1,650
14	Woolsey	CA	2018	96,949	1,643
15	Carr	CA	2018	229,651	1,614
16	Glass	CA	2020	67,484	1,520
17	LNU Lightning	CA	2020	363,220	1,491
18	CZU Lightning	CA	2020	86,509	1,490
19	Nuns	CA	2017	54,382	1,355
20	Dixie	CA	2021	963,309	1,311
21	Beachie Creek	OR	2020	192,873	1,288
22	Marshall	CO	2021	6,080	1,091
23	Thomas	CA	2017	281,893	1,063
24	Caldor	CA	2021	221,774	1,003
25	Old	CA	2003	91,281	1,003


Wildfires become
CATASTROPHES
when they move into our
BUILT ENVIRONMENT
and a CONFLAGRATION
UNFOLDS.
Insurance
Institute for
Business &
Home
Safety

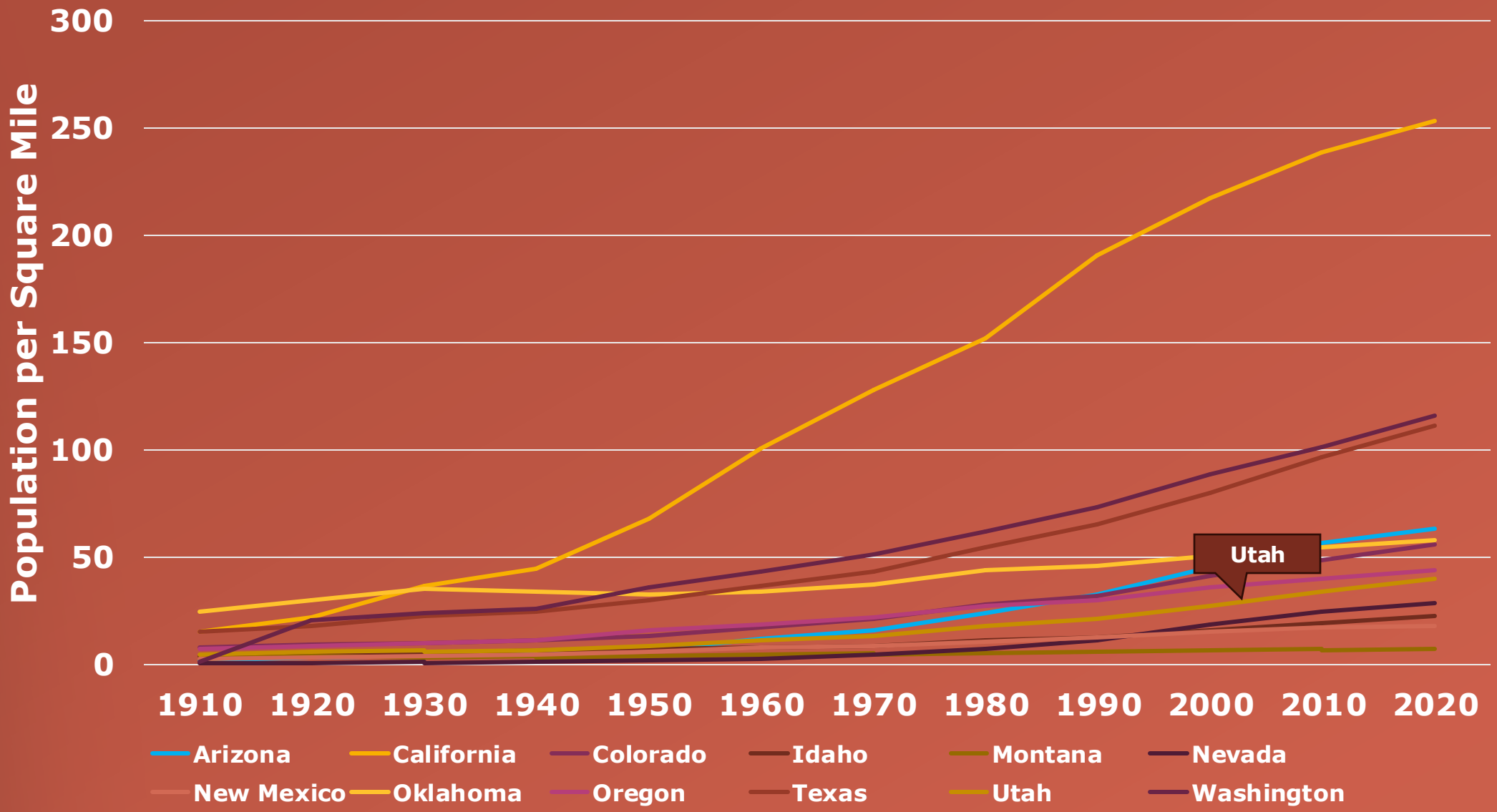


CONFLAGRATION: Uncontrollable Structure-to-Structure Fire Spread

Insurance Institute for Business & Home Safety


Conflagrations follow:
Humans
Drought
Wind

Population Boom in the West



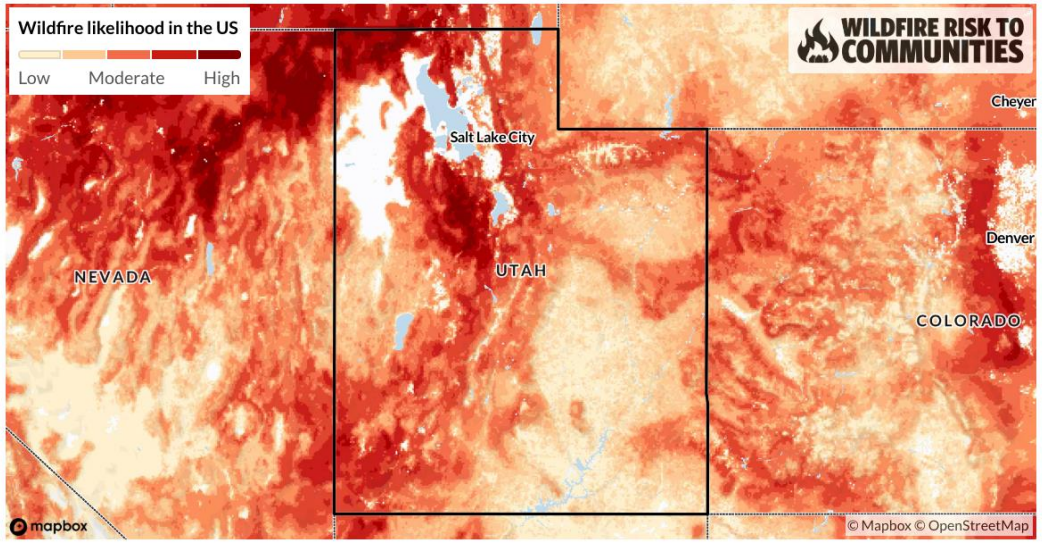
WILDFIRE RISK TO COMMUNITIES

Wildfire Likelihood in Utah

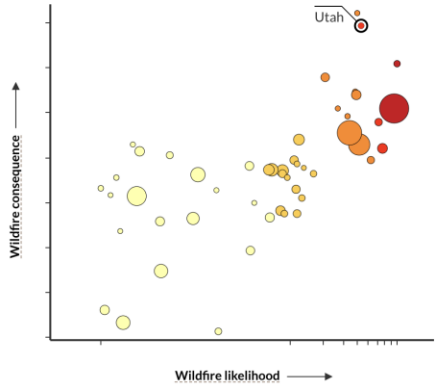
High

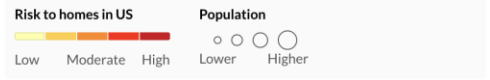
Utah has, on average, greater wildfire likelihood than 88% of states in the US.

Wildfire likelihood is the probability of wildfire burning in any given year.



Selected place County line State line



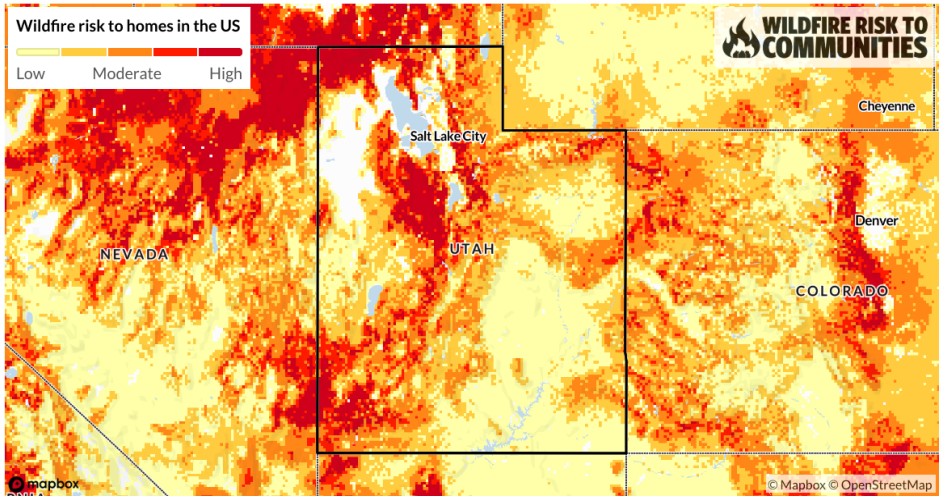


Wildfire Risk to Homes in Utah

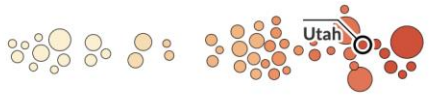
Very High

Homes in Utah have, on average, greater risk than 90% of states in the US.

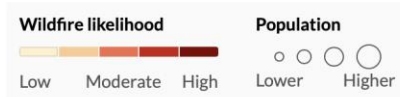
Risk to homes measures the relative consequence of wildfire to residential structures everywhere on the landscape, whether a home actually exists there or not.



Selected place County line State line



Wildfire likelihood





A RED FLAG WARNING is issued when winds of 20+ mph and low relative humidity occur, along with increased thunderstorm activity after a prolonged dry period.

Hot and dry conditions present early in the monsoon season can allow fires to spread quickly by thunderstorms that produce little rain, but gusty winds and lightning.

EMBERS

RADIANT HEAT



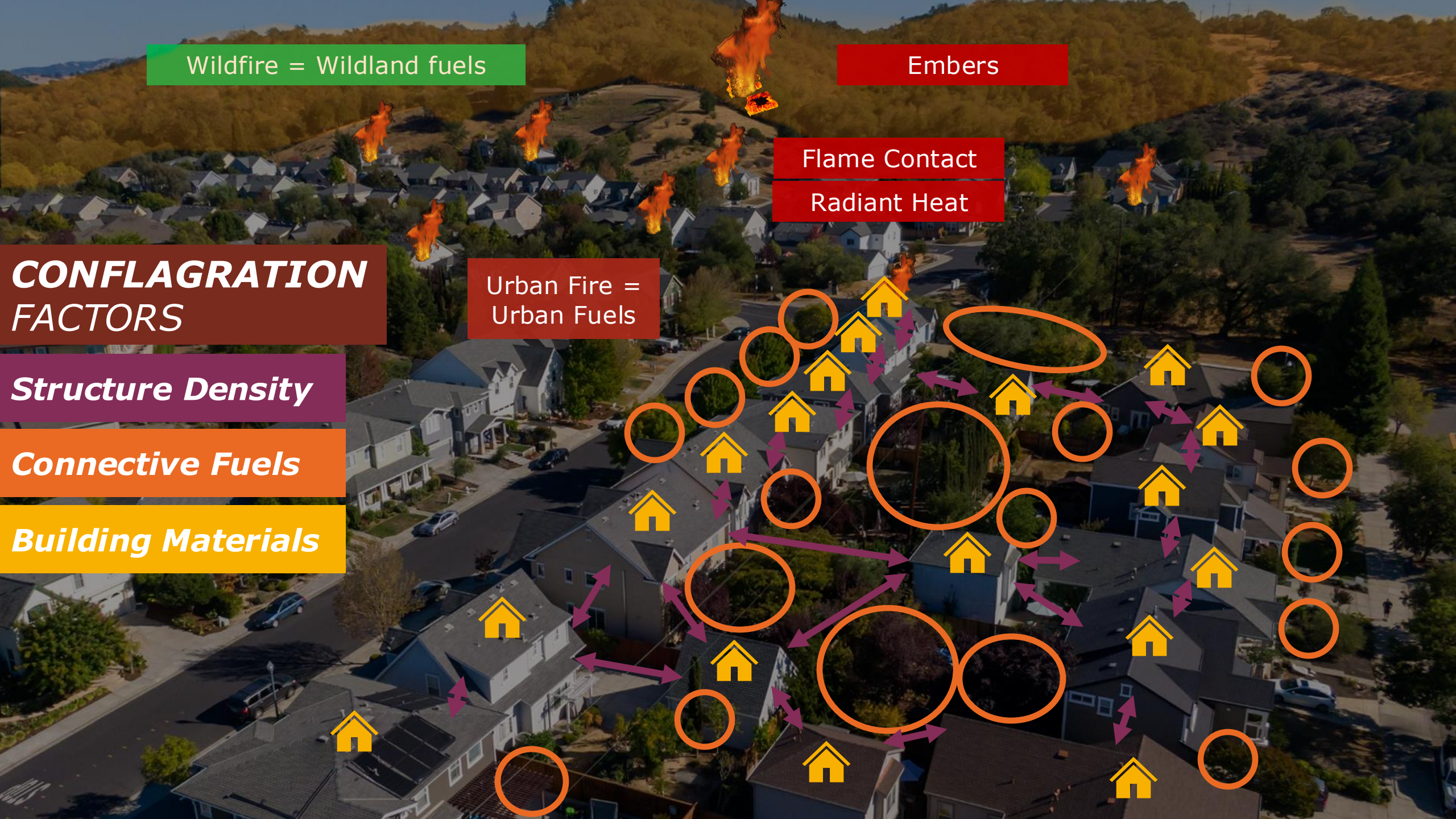
FLAMES

Insurance Institute for Business & Home Safety®



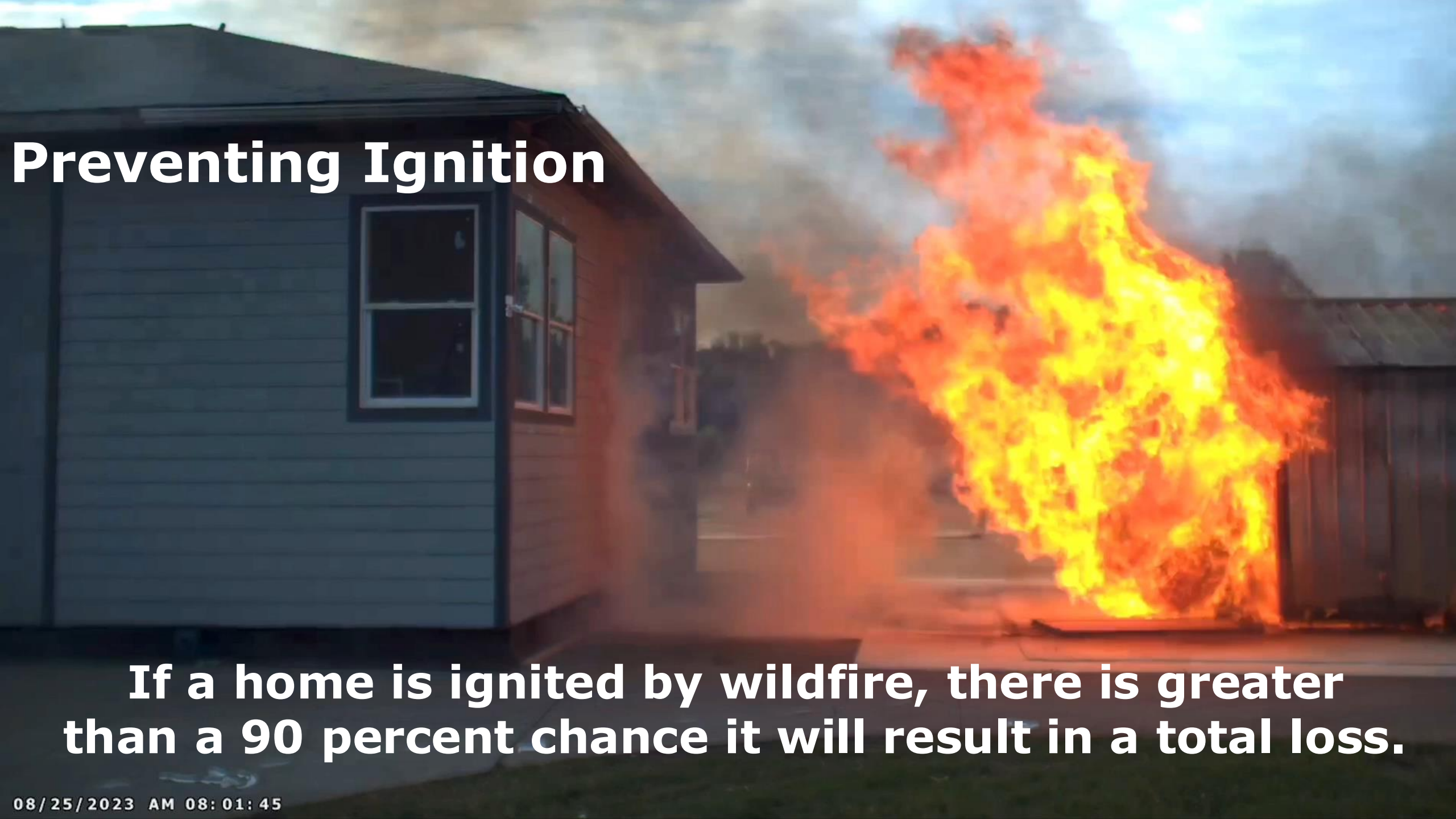
FROM START TO CONFLAGRATION



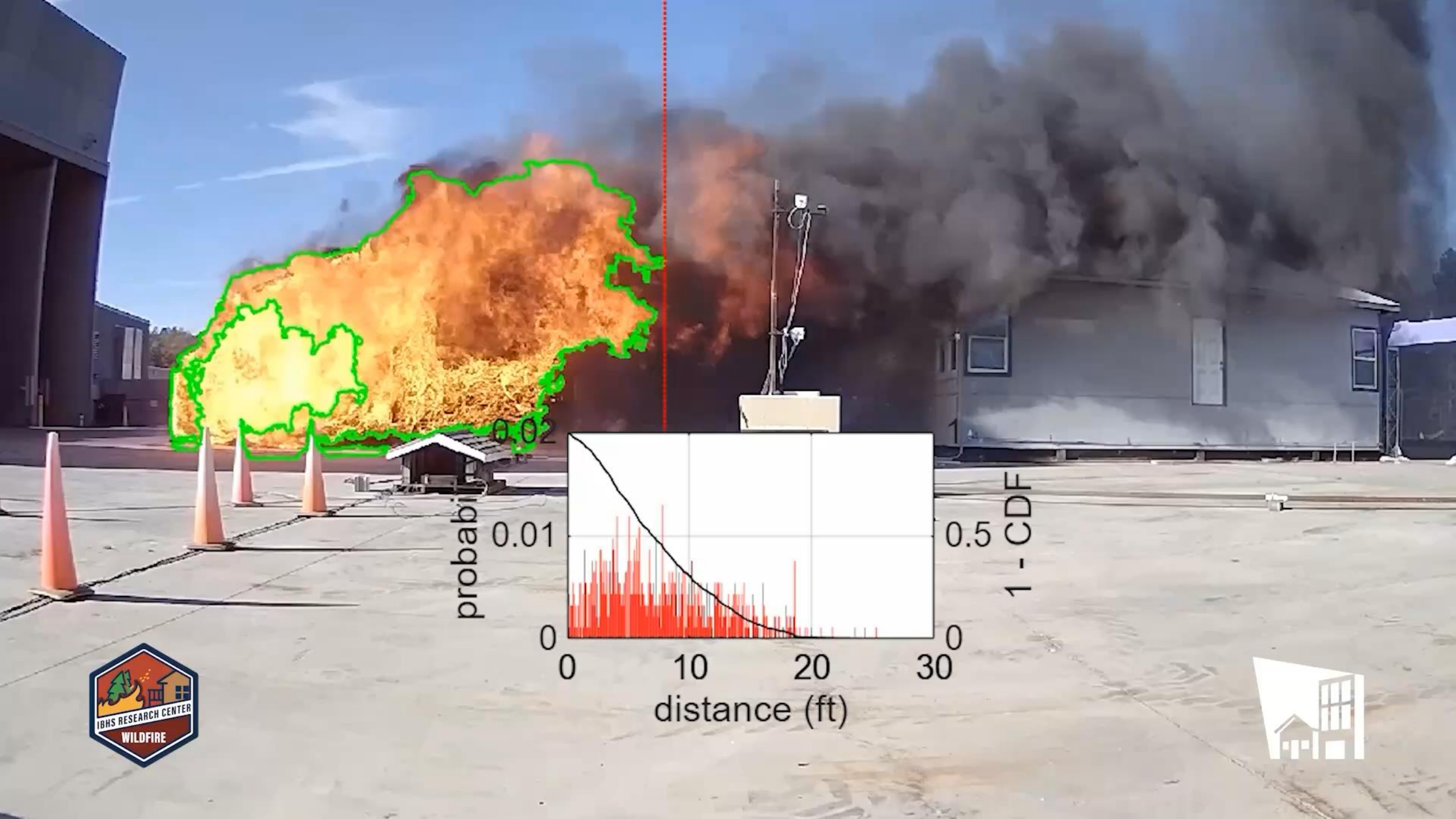

Wildfire = Wildland fuels
Embers
Flame Contact
Radiant Heat
CONFLAGRATION
FACTORS
Urban Fire =
Urban Fuels
Structure Density
Connective Fuels
Building Materials


Embers
Flames & Heat
Exposure
Connective Fuels
Structure-to-Structure


IBHS RESEARCH CENTER
WILDFIRE


Preventing Ignition
If a home is ignited by wildfire, there is greater than a 90 percent chance it will result in a total loss.
08/25/2023 AM 08:01:45


Reduce **ignition** + slow ***fire spread.***
= Reduce risk of ***conflagrations.***
Insurance Institute for Business & Home Safety


0.02
0.01
0
probabi
0
10
20
30
distance (ft)
1
0.5
0
1 - CDF
IBHS RESEARCH CENTER
WILDFIRE

DEFENSIBLE SPACE & ZONE 0

LAB OBSERVATIONS



Embers accumulate at the base of walls and within 5 ft
(Quarles et. al, 2023)

CONNECTIVE FUELS

FIELD OBSERVATIONS: LA COUNTY



Bushes

Privacy Hedges





Trash Cans



Hot Tubs



Fences



Fence w/Veg



Decks



Pergola



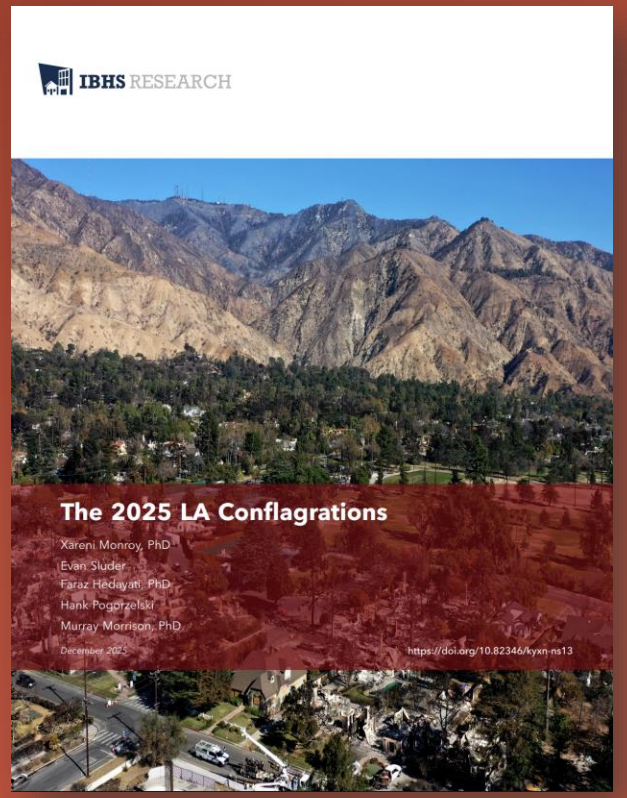
Vehicles

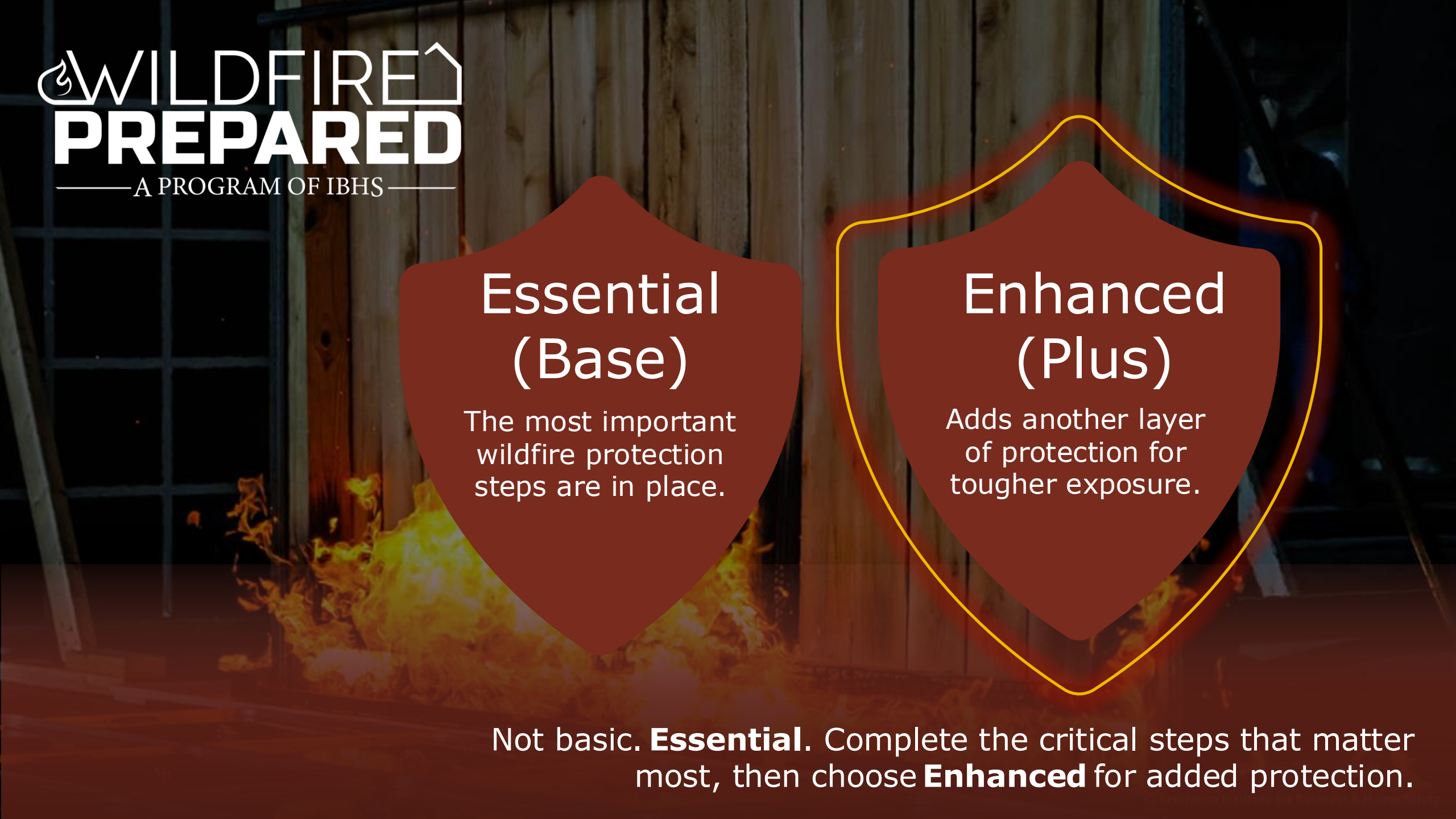


Sheds



Cut your risk in half with 4 or more hardening features




WILDFIRE PREPARED
A PROGRAM OF IBHS
Essential (Base)
The most important wildfire protection steps are in place.
Enhanced (Plus)
Adds another layer of protection for tougher exposure.
Not basic. **Essential**. Complete the critical steps that matter most, then choose **Enhanced** for added protection.



ADDITIONAL MITIGATIONS AGAINST FLAMES

- ✓ Cover gutters.
- ✓ Enclose eaves.
- ✓ Install noncombustible siding.
- ✓ Upgrade windows & doors.
- ✓ Upgrade to a noncombustible deck.
- ✓ Move accessory structures at least 30 feet away.
- ✓ Remove back-to-back fencing.

MITIGATIONS AGAINST EMBERS

ROOF

- ✓ Ensure the roof covering is Class A fire-rated & maintained clear of debris.
- ✓ Choose noncombustible gutters & downspouts.

BUILDING FEATURES

- ✓ Install ember-resistant vents or 1/8-inch metal mesh over vents.
- ✓ Ensure 6-inch vertical noncombustible clearance at base of exterior walls.
- ✓ Clear & maintain the underdeck area; enclose low-elevation decks.

0–5 FOOT NONCOMBUSTIBLE ZONE

- ✓ Establish a **0–5 foot noncombustible zone** around the home and decks; remove overhanging branches; replace combustible fences within 5 feet.

5–30 FOOT DEFENSIBLE SPACE ZONE

- ✓ Maintain yard with spaced vegetation, structures, & other connective fuels; clear debris; remove firewood.
- ✓ Move structures at least 10 feet away & maintain a 0-5 foot noncombustible zone around them.

wildfirepreparedhome.org

WILDFIRE PREPARED

A PROGRAM OF IBHS



ENHANCED ADDITIONAL REQUIREMENTS

- ✓ Cover gutters.
- ✓ Enclose eaves.
- ✓ Install noncombustible siding.
- ✓ Upgrade windows & doors.
- ✓ Upgrade to a noncombustible deck.
- ✓ Move accessory structures at least 30 feet away.
- ✓ Remove parallel fencing.

ESSENTIAL REQUIREMENTS

ROOF

- ✓ Ensure the roof covering is Class A fire-rated & maintained clear of debris.
- ✓ Choose noncombustible gutters & downspouts.

BUILDING FEATURES

- ✓ Install flame- and ember-resistant vents or 1/8-inch metal mesh over vents.
- ✓ Ensure 6-inch vertical noncombustible clearance at the base of exterior walls.
- ✓ Clear & maintain the underdeck area; enclose low-elevation decks.

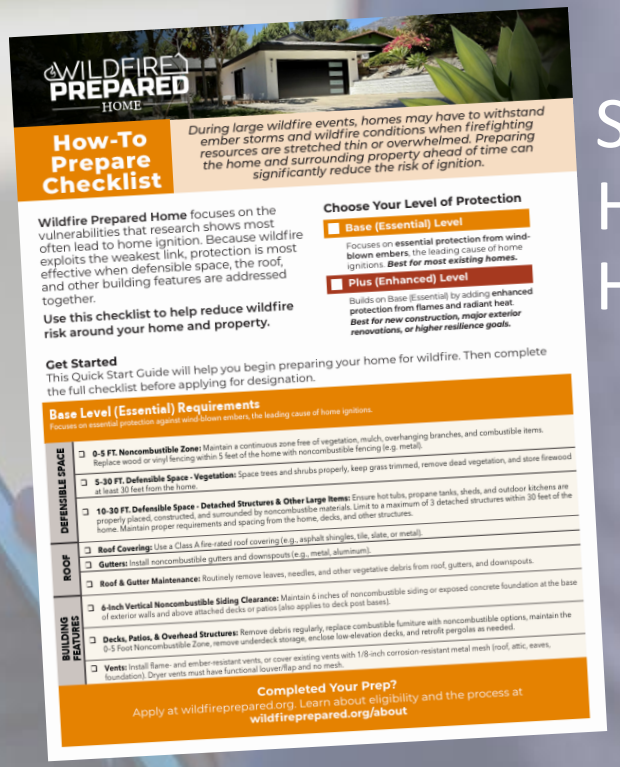
0–5 FOOT NONCOMBUSTIBLE ZONE

- ✓ Establish a **0–5 foot noncombustible zone** around the structure and decks; remove overhanging branches; replace combustible fences within 5 feet.

5–30 FOOT DEFENSIBLE SPACE ZONE

- ✓ Maintain yard with spaced vegetation, structures, & other connective fuels; clear debris; remove firewood.
- ✓ Move structures at least 10 feet away & maintain a 0-5 foot noncombustible zone around them.

Designation Process WFPH



Step-by-step checklist on How to Prepare Your Home for Evaluation

Initial Process

Prep Your Home With The How-To Checklist → Apply and Submit Eligibility Photos ($125) → IBHS QA → 3rd Party Evaluation → IBHS QA & Designation

Ongoing Process

Year 1 Annual Review ($25) → Year 2 Annual Review ($25)

Re-Designation

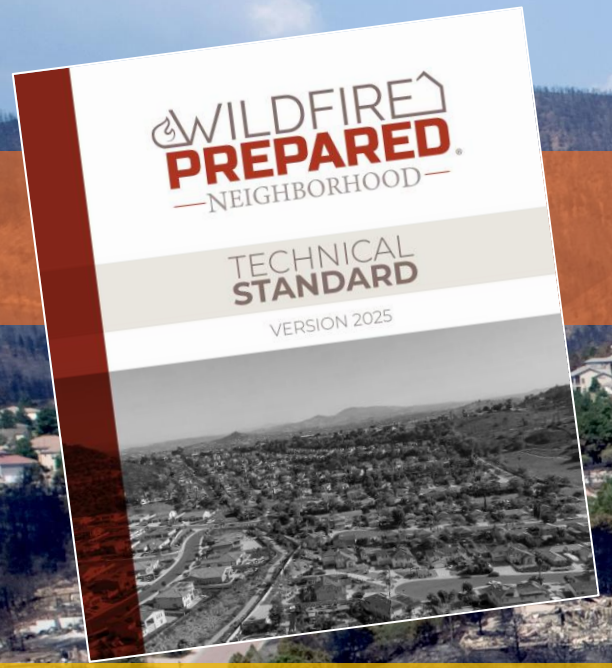
Year 3 Re-Designation




WILDFIRE
IS UNIQUE


THE SURVIVABILITY
OF ONE PARCEL


IS DEPENDENT UPON
THE COMMUNITY
STOP
STOP



WILDFIRE PREPARED NEIGHBORHOOD

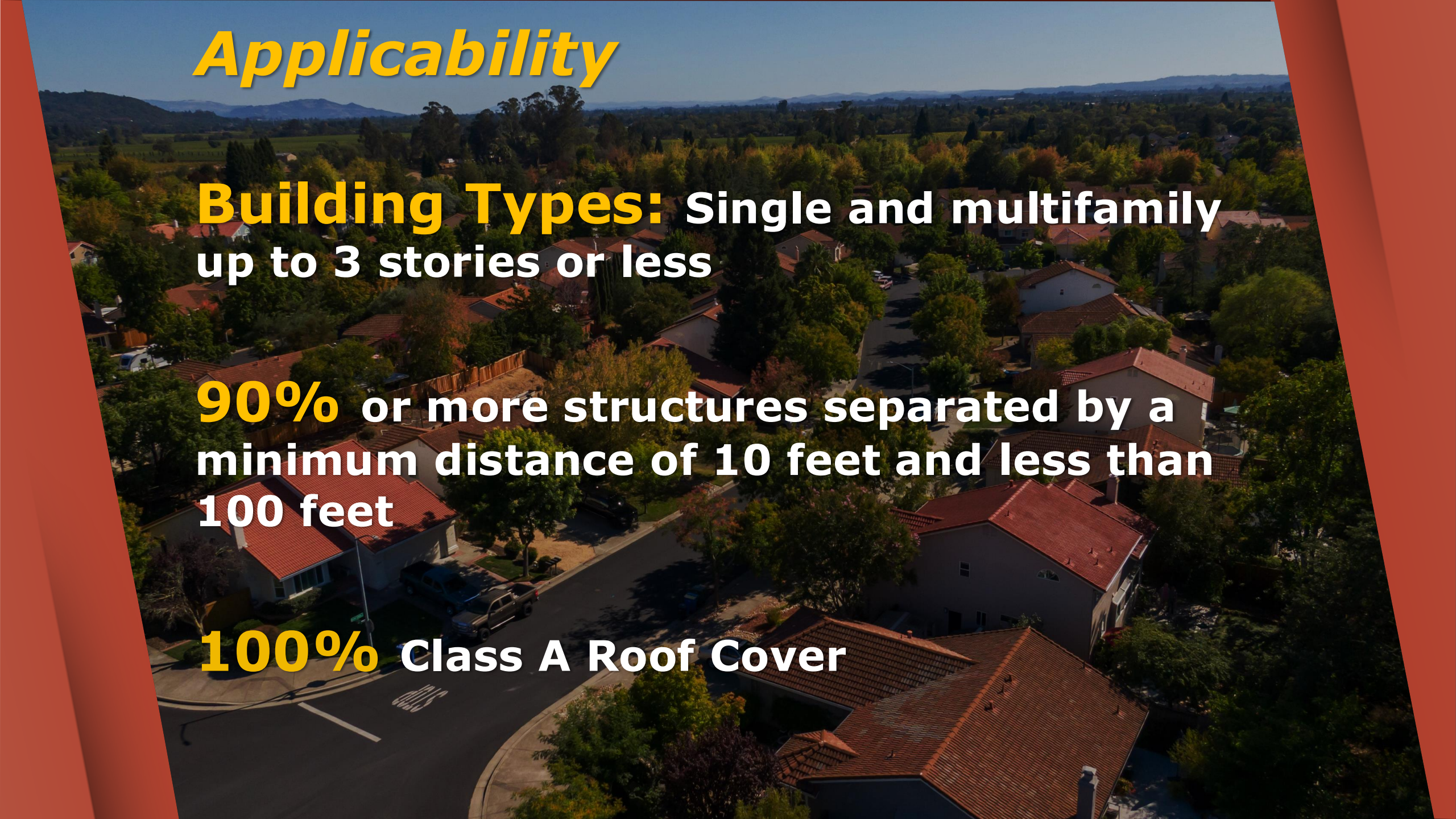
Decrease probability of initial ignitions from direct flame/radiant heat

Makes the neighborhood more defendable, not a dense fuel source

Protect the neighborhood from ember attack

Slow fire spread within the neighborhood if ignitions do occur

Applicability



Building Types: Single and multifamily up to 3 stories or less

90% or more structures separated by a minimum distance of 10 feet and less than 100 feet

100% Class A Roof Cover



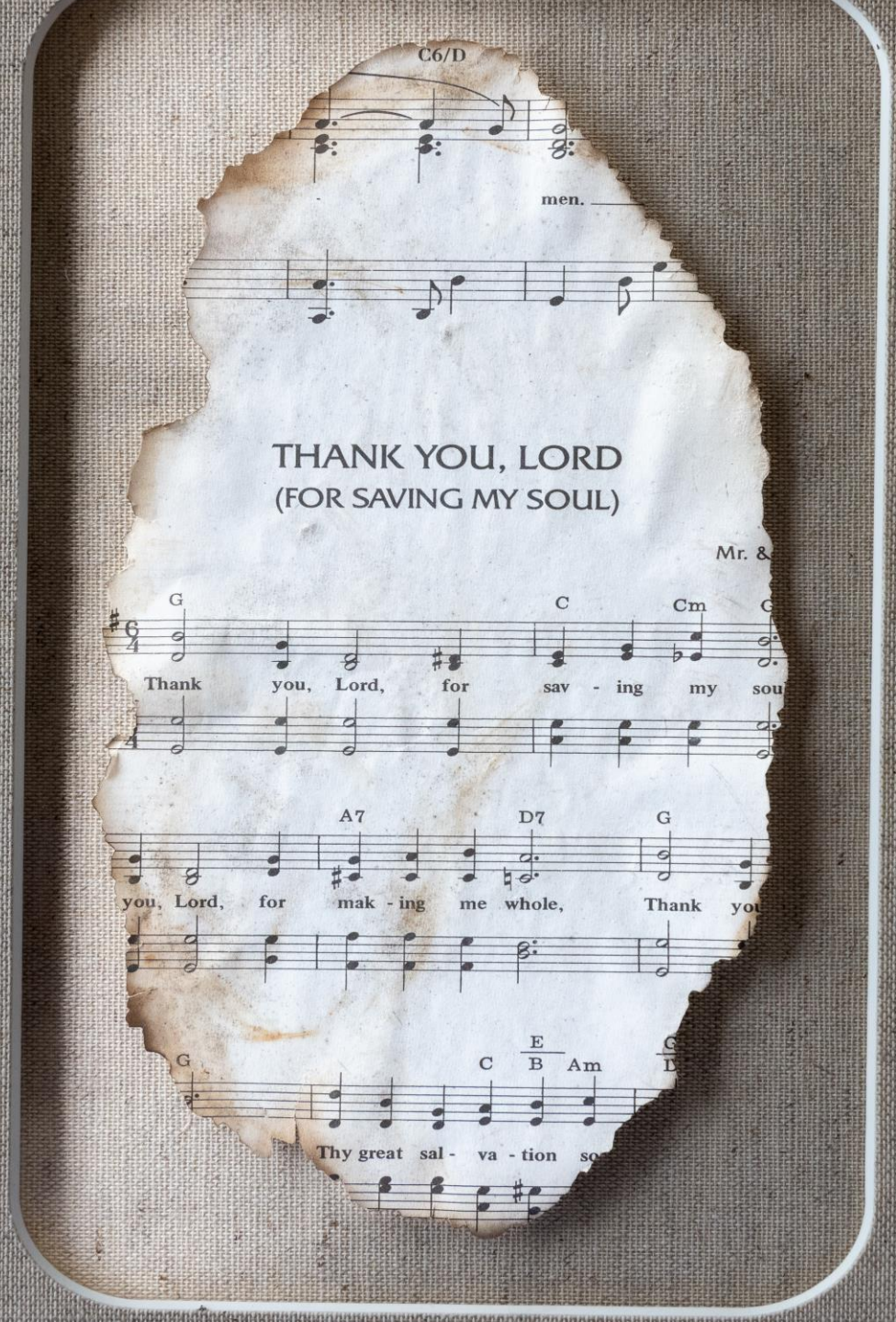
ESCONDIDO, CA

BUILDING A WILDFIRE PREPARED NEIGHBORHOOD

Insurance Institute for Business & Home Safety


Reducing risk, reduces ignitions.
“Wildland-urban fires are a structure ignition problem, not a wildfire problem” Jack Cohen
Reduces the likelihood of conflagration.


SURVIVABILTY
INSURABILITY


C6/D
men.
THANK YOU, LORD
(FOR SAVING MY SOUL)
Mr. &
G
C
Cm
Thank you, Lord, for sav - ing my sou
A7
D7
G
you, Lord, for mak - ing me whole, Thank you
G
C
E
B
Am
Thy great sal - va - tion so



Michael Newman

General Counsel

mnewman@ibhs.org

ibhs.org

IBHS_org