FIRE RESILIENT DEVELOPMENT:

HOW SCIENCE-INFORMED COMMUNITY PLANNING CAN CONTRIBUTE TO HOUSING AFFORDABILITY IN CALIFORNIA

Authors
Scott Farley, Head of Research and Development, XyloPlan
Dave Winnacker, Fire Chief (Ret.), XyloPlan

For decades, California has faced a deepening housing crisis. While increasing housing availability and affordability have long been statewide priorities, climate change-driven wildfire losses and resulting market forces are rapidly contributing to a decline in the supply of existing housing units and constraining the construction of new developments.

While there may be good reasons to limit new development in the wildland-urban interface (WUI), such as the preservation of recreational opportunities or cultural, historic, or natural resources, we argue that wildfire risk is rarely a reason not to build in a particular area.. Thoughtfully designed, master-planned communities engineered to meet local wildfire conditions, with housing units built to modern ignition-resistant building standards, can be both highly resilient to wildfire exposure and reduce regional wildfire risk. In this position paper, we discuss the role of science-driven planning and development in wildfire adaptation at the parcel, neighborhood, and regional scales and outline a path to limiting wildfire-caused losses while increasing housing availability and affordability. Subsequently, we envision associated improvements to the availability of accurately priced insurance products throughout the western United States.

Introduction

By almost any metric, wildfire activity in California is increasing. Fires are becoming bigger, more frequent, and more intense, and there are an increasing number of fast-moving, wind-driven fires adjacent to communities, which can result in large-scale urban loss[1]. These climate-change-driven trends mirror fire activity in much of the rest of the western United States, where both fire activity and structure losses are increasing.

The increasing frequency of disaster fires is having direct consequences on the housing economics in California and other Western states. Wildfire-caused structure losses directly reduce the number of housing units in already housing-limited communities[3] and exacerbate long-standing housing shortages[1]. Moreover, wildfire losses are increasingly causing admitted insurance markets[2] to reduce or eliminate coverage in high-risk areas. Resulting impacts to property sales, home values[3], and long-term mortgage markets[4] are creating an unstable home insurance market that is unable to effectively select and price home insurance.

Developers are often hesitant to construct new developments in high wildfire risk locations due to potential lack of insurability[4] and community calls to limit development in fire-prone areas[5] over concerns that new construction will increase the regional risk of wildfire losses through structure-to-structure fire spread. In the recent Los Angeles fires, the ignition of structures at the vegetative edge triggered an urban conflagration that spread for miles into the community, destroying tens of thousands of homes. New developments adjacent to highly flammable wildland vegetation are generally considered highly vulnerable to wildfire, through direct exposure to flames and embers from wildland fuels and indirect exposure to adjacent burning structures through cascading ignitions.

Risk Mitigation in a Fire-Prone Environment

California's ecosystems are fire-adapted and fire-dependent. Fire is not only inevitable on these landscapes, but required for healthy ecosystem regeneration and function[6]. There is strong evidence of frequent, low-severity wildfires across the state prior to European settlement. These fires reduced fuel loads, provided opportunities for seedling regeneration, and created natural disturbances that promoted healthy forest growth. Because contemporary fire suppression policies have limited the size and frequency of fires in much of the state, accumulated fuels and increased vapor pressure deficits drive extreme fire behavior. Despite the use of aggressive suppression tactics with modern firefighting equipment and advanced alerting systems, fires will continue to burn throughout California.

Many of California's communities are located in or adjacent to wildland fuels. Nearly 45% of the homes built in California between 1990 and 2020 were built in the WUI[9] and more than 80% of the state's wildfire losses have been in this area. Because to California's long-standing housing shortages, integrated social, economic, and political factors operating at both the state and local levels often push new housing into as-yet undeveloped areas[14,15,16] likely to be exposed to wildfires.

However, there is strong experimental, theoretical, and observational evidence that homes designed to meet modern WUI building codes and standards, in fire adapted neighborhoods incorporating the thoughtful placement of low to non-combustible features such as parks, trails, roads, golf courses, water features, vineyards, and orchards, are quite resilient to fire exposure[19].

Example: Rancho Santa Fe, California which incorporated fire-adapted features and withstood wildfire exposure.

Communities with new structures built to the California Building Code Chapter 7A standard[20] or the International WUI Code, those with extended defensible space around the community and defensible space around individual buildings, and those with effectively designed landscape elements, survive at much higher rates than older buildings with a combination of parcel- and community-level vulnerabilities[21,22,23].

Risk mitigation measures are most effective when applied in a systematic, layered approach. Randomly located, independent risk reduction activities leave gaps that can result in contiguous vegetative and structural fuel corridors, limiting overall effectiveness and setting conditions for structure-to-structure fire spread. Further, while defensible space and home hardening are effective in preventing structure ignition from vegetative fuels and embers, they are not designed to protect against the heat fluxes produced by adjacent burning buildings. In dense neighborhoods, urban conflagration can result even when defensible space and home hardening are undertaken, because wildfire mitigations and construction features are not designed to withstand the increased heat fluxes associated with adjacent structure fires. Therefore, it is crucial that communities undertake comprehensive and complementary risk mitigation strategies that minimize the likelihood of initial structure ignition and subsequent urban conflagration initiation.

The Master Planned Development as a Blank Slate for Effective Mitigation

In existing developments, the comprehensive and strategic implementation of systematic wildfire adaptation measures is challenging due to fragmented land ownership, limited financial resources and resident motivation, and inadequate communication between stakeholders. Furthermore, existing communities have limited capabilities to install new design features or change the location of existing features; it's not easy to reposition a park in a 100-year-old community.

In contrast, new, thoughtfully planned developments provide a blank slate where wildfire risk mitigations can be implemented from the ground up. Using readily available fire behavior modeling and weather history, effective planning can site key mitigation features and low-combustibility community amenities in locations that are not only desirable for resident use but also disrupt the vegetation-to-structure transition points that propagate fire into the community. Furthermore, the interior and perimeter vegetation planting locations, types, and arrangement can be selected to reduce fire behavior across the site, decreasing the risk of high-severity fire encroaching into the development and minimizing the consequences of ember-caused spot fires adjacent to homes. Finally, newly established homeowners associations (HOAs) and legal methods (such as Covenants, Conditions & Restrictions, CC&Rs) can provide ongoing funding and inspection mandates for a systematic approach to education and enforcement of defensible space throughout the community.

Most communities, master-planned or not, incorporate recreational and commercial amenities. Traditionally, little consideration is given to the location of these landscape features in relation to fire resilience. However, if sited properly, these low-combustibility or non-burnable features can serve dual purpose. For example, features such as dog parks, sports fields, orchards, parking lots, commercial districts, and maintenance yards can be strategically located along the edge of the development, at those points of entry where the fire is most likely to enter the development, reducing the likelihood that high severity fire will come into direct contact with tightly space homes. In conjunction with a system of roads or trails that reduces fuel continuity on the periphery of the community and a network of traditional fuel modifications that reduces fuel volume upwind, these amenities can significantly reduce fire behavior as it reaches the community by sheltering the interior homes.

To meet density requirements, new developments often must site buildings with structure separation distances that could support structure-to-structure fire spread, particularly when they are designed to increase the supply of affordable or non-luxury housing. However, with a systematic approach to design, master planned communities can create compartmentalized blocks separated by low-combustibility vegetation and amenities. This approach to interior compartmentalization limits fire spread to discrete blocks and reduces the overall potential for conflagration and structure loss in the community.

As indicated by recent disaster fires, existing communities tend to lack the depth and breadth of wildfire mitigation measures, including home hardening, defensible space, and landscape fuel mitigations needed to withstand wildfire exposures. Retrofitting these communities is expensive and can be very challenging to achieve sufficient community cohesion to achieve success on a large scale. Further, these communities are often designed without compartmentalization or other features to limit structural fuel continuity, creating conditions conducive to large-scale structure-to-structure fire spread cascades.

Science-Informed Fire Resilient Design

Recent advances in wildfire modeling present opportunities to integrate fire science and data-informed mitigation strategies into the planning process. While there are still gaps in the scientific understanding of the timing and mechanisms of fire spread within the built environment, new models of fire behavior in the built environment have been shown to be highly predictive in identifying the combinations of building and landscape features responsible for large-scale structural losses[26].

In the following examples, we utilize the XyloPlan Urban Fire Spread Model (UFSM) to characterize the differences in regional fire activity and associated structural loss outcomes under three different development scenarios involving the construction of a new planned neighborhood. This model incorporates fire spread via convective and radiant heating, embercast, and surface fire spread from both structures and vegetation. This model performed well when retrospectively modeling past fire outcomes, including the 2025 Eaton fire. Perhaps most importantly, it is flexible and highly configurable, enabling iterative development of highly resilient community wildfire mitigation and compartmentalization plans.

In the following figures, we illustrate a hypothetical development in the Inland Empire, in southern California. This modeling exercise is designed to highlight the role science-driven development can play in the community design process, rather than any particular community. A strong, dry west wind fire weather scenario is used to highlight fire spread off an open space into the community.

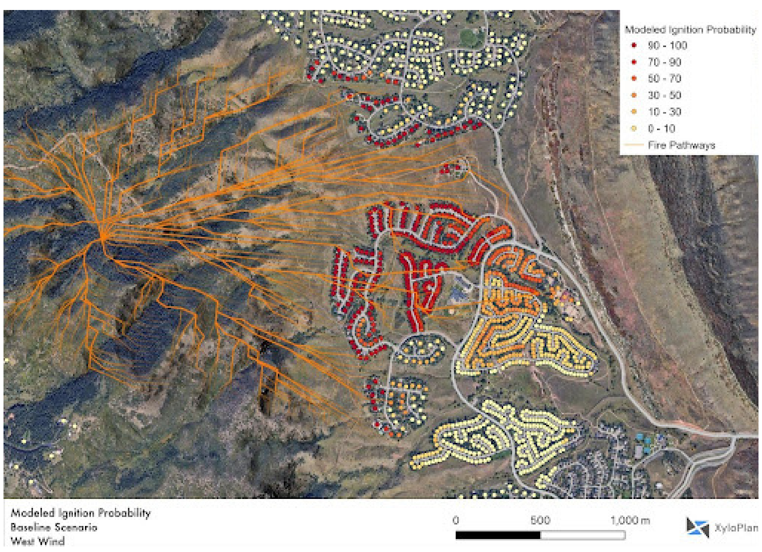
Location
Riverside County, CA

Wind Speed
25 MPH

Wind Direction
West Wind

Duration
3 Hours

Figure 1



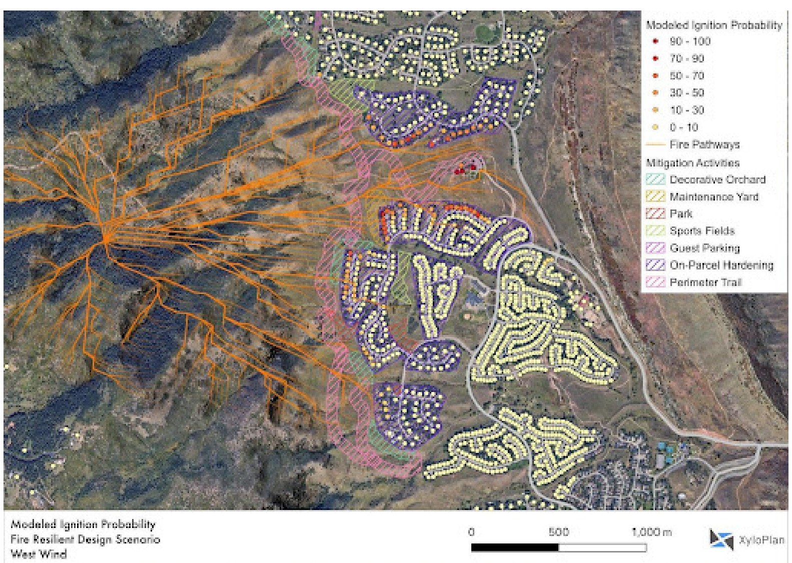
Baseline development scenario with no mitigation design features. This development follows a traditional design where homes have tight structure separation distances, structures have direct connectivity to wildland vegetation, and lack compartmentalization that can limit fire spread within the built environment.

Figure 1 illustrates the modeled risk to a hypothetical legacy community with traditional exurban design principles in Southern California. These communities typically lack passive wildfire risk mitigation measures and rely exclusively on the availability of a timely firefighting response to prevent large-scale structure loss. In this example, the community is characterized by high density, tightly spaced structures with little to no separation from surrounding wildland fuels. This design has little inherent resistance to wildfire and enables a rapid transition from vegetation into the built environment. These conditions are suitable for rapid subsequent firespread within the development.

In this hypothetical fire, the community experiences 448 ±96.3 ignited structures in the first three hours of the simulated wildfire.

In contrast, Figure 2 shows the modeled risk for a community with the same built environment footprint that integrates a holistic and systematically designed risk reduction approach. This approach features a series of layered passive fire mitigation measures that include home hardening and defensible space, strategically-placed fire-resistant amenities, and a perimeter trail system to decouple the community from ground fire. This community is substantially less susceptible to wildfire-initiated urban fire losses. Because of the widespread structural hardening and a robust non-combustible zone on each parcel, each structure is significantly less likely to ignite when exposed to embers. Moreover, low or noncombustible amenities, such as orchards, sports fields, and parks, buffer homes from direct exposure to ground component wildland fire and compartmentalize the built environment, limiting the extent of structure-to-structure fire spread potential.

Figure 2



Fire-resilient community design scenario with systematic mitigation design features. This development integrates the house-out mitigation approach with strategically located low-combustibility amenities and a perimeter trail system.

Not accounting for firefighting response, this community is likely to experience 141 ±30.4 structure ignitions within the first three hours, or about 30% of those in the baseline community.

Table 1
Estimated structure ignitions at each timestep after the modeled ignition.

	90 Minutes	120 Minutes	150 Minutes	180 Minutes
Baseline Design	23 ±3.1	99 ±22	258 ±63.1	448 ±96.3
Fire Resilient Design	0.3 ±0.5	22 ±3.8	81 ±8.4	141 ±30.4
Change	-98.7% ± 13.5%	-77.8% ± 31.4%	-68.6% ± 39.8%	-68.5% ± 38.1%

Table 1 highlights the differences in the timing of fire exposure projected under each of the two design scenarios. In the baseline community, the number of ignited structures increases exponentially as the fire reaches the built environment, reflecting immediate vegetation to structure transition and subsequent rapid urban fire spread among closely-spaced structures and interior landscape elements. While the risk is not eliminated in the fire-adapted design scenario, fire spread is slowed, providing more time for the aggregation of an effective firefighting response and community evacuation.

New Development Can Reduce the Risk to Adjacent Communities

Modeling suggests that fire-adapted developments can serve as durable firebreaks, disrupting fire pathways and buffering existing communities, reducing regional wildfire risk. Although new development in fire-prone areas puts additional structures adjacent to combustible wildland fuels, when planned using SDAP principles, these communities, even when built with high-density, tightly spaced structures, can have substantially lower ignition risks than their existing lower-density counterparts. Designed with the complete suite of mitigations described above, each structure in the community, particularly those along the wildland's edge, is substantially less likely to ignite than structures in existing communities uninformed by SDAP. While low-density, single-family design is often promoted as the most effective way to prevent large-scale wildfire impacts to new developments, clustering, compartmentalization, and the strategic use of non-burnable spaces can enable developers to build with higher densities while limiting the potential for significant fire activity in the built environment. Furthermore, clustering structures into defensible compartments enables firefighters to respond more effectively to an emerging wildfire and limit its growth by focusing on a smaller operational surface area. Furthermore, extended defensible space and robust on-parcel mitigations create conditions for much slower fire growth as the fire approaches the community, enabling more time for fire suppression resources to engage in structure defense and life-safety tasks, such as evacuation.

Modeling suggests that fire-adapted developments can serve as durable firebreaks, disrupting fire pathways and buffering existing communities, reducing regional wildfire risk. Although new development in fire-prone areas puts additional structures adjacent to combustible wildland fuels, when planned using SDAP principles, these communities, even when built with high-density, tightly spaced structures, can have substantially lower ignition risks than their existing lower-density counterparts. Designed with the complete suite of mitigations described above, each structure in the community, particularly those along the wildland's edge, is substantially less likely to ignite than structures in existing communities uninformed by SDAP. While low-density, single-family design is often promoted as the most effective way to prevent large-scale wildfire impacts to new developments, clustering, compartmentalization, and the strategic use of non-burnable spaces can enable developers to build with higher densities while limiting the potential for significant fire activity in the built environment.

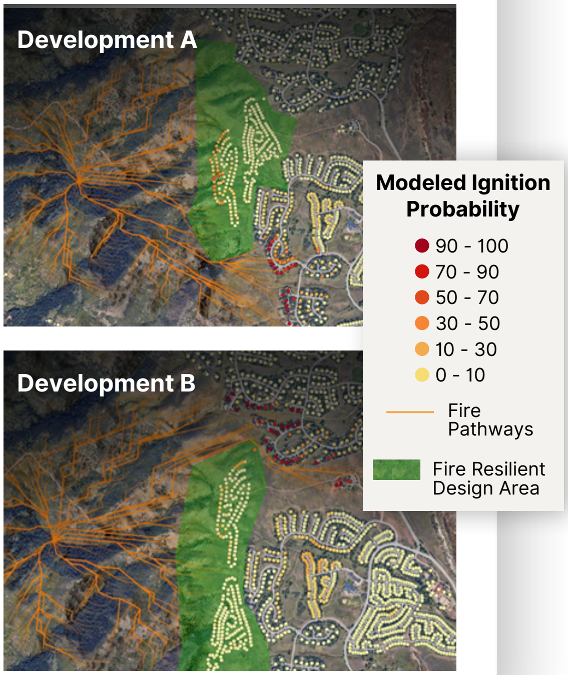
Furthermore, clustering structures into defensible compartments enables firefighters to respond more effectively to an emerging wildfire and limit its growth by focusing on a smaller operational surface area. Furthermore, extended defensible space and robust on-parcel mitigations create conditions for much slower fire growth as the fire approaches the community, enabling more time for fire suppression resources to engage in structure defense and life-safety tasks, such as evacuation.

Figure 3 illustrates the modeled ignition potential for two hypothetical new developments located upwind of the existing, unmitigated community depicted in Figure 2. The two hypothetical master planned communities are designed with vegetation management around the community, the full suite of home hardening and defensible space mitigations on each parcel, and limited continuity to interrupt fire spread should it become initiated. The ignition probabilities for the structures in the new communities are low. On average, structures in these communities have an X% and Y% probability of ignition, respectively, compared to the Z% in the traditional community shown in Figure 2.

Moreover, the addition of resilient developments can reduce the likelihood of structure ignition within the existing development, even when mitigations are not performed in that development. Concretely, Development Plan A (Figure X, top) reduces the ignition probability in the downwind community by X% and Development Plan B (Figure X, bottom) by about Y%. While the strategic location of new development as it related to fire exposure to existing downstream communities, modeling highlights the importance of this factor in designing fire adapted regions that meet both regional housing supply targets and fire resilience objectives.

Figure 3

Modeled ignition probability of two hypothetical new developments on the edge of the existing community designed using DSAP. Note the low ignition probability in the existing portion of the community compared to the baseline scenario, shown in Figure 2.



Risk Reduction and Fire Response Times

While strategically-located community- and parcel-level mitigations at scale directly reduce the likelihood of structure ignition, they primarily function to slow the fire's progression into the built environment. All systems have a failure point, and given enough time to explore every potential vulnerability, fire will find the gaps. This is particularly true when the structures in question are homes, which may accumulate unplanned vulnerabilities such as backyard furniture, play structures, an RV parked near homes, and other things with a degree of combustibility that were not part of the original plan. A fire adapted communities features will buy time, time that will allow a more robust fire response to arrive and take the offensive and defensive actions that alter the fire's outcome. As discussed in our previous position paper, fast-moving fires that reach vulnerabilities at the points of transition to the built environment at a speed that outpaces fire suppression resources are those with the greatest potential for city-scale loss.

Furthermore, clustering structures into defensible compartments enables firefighters to respond more effectively to an emerging wildfire and limit its growth by focusing on a smaller operational surface area. Furthermore, extended defensible space and robust on-parcel mitigations create conditions for much slower fire growth as the fire approaches the community, enabling more time for fire suppression resources to engage in structure defense and life-safety tasks, such as evacuation.

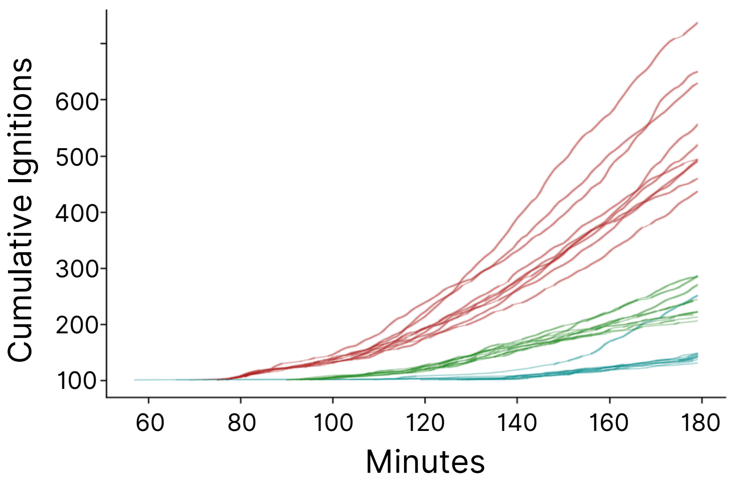


Figure 4

Cumulative Ignitions Over Time

Figure 4 illustrates a comparison of the pace of fire growth in the built environment modeled under a traditional design scenario that does not incorporate wildfire adaptation (blue) and the two proposed new fire-resilient community designs (green and orange).

Careful analysis of regional fire response time can highlight the ways in which a community's risk for fire spread within the built environment interacts with the pace, scale, and capabilities of arriving fire resources. When availability of the effective regional firefighting response exceeds the pace of fire spread, firefighters are likely to interrupt the initiation of a conflagration. Response capabilities vary greatly by region; locations near metropolitan population centers tend to have access to greater firefighting resource density with shorter response times. In contrast, rural communities located further from urban centers generally have access to fewer resources, many of which will take additional time to mobilize and orient due to limited mutual aid agreements and longer travel times. Figure 5 shows an example of the estimated cumulative fire response curves for three locations in California - the Klamath watershed in northern California, the southern Sierra foothills, and western Riverside County.

Risk Reduction and Fire Response Times

While strategically-located community- and parcel-level mitigations at scale directly reduce the likelihood of structure ignition, they primarily function to slow the fire's progression into the built environment. All systems have a failure point, and given enough time to explore every potential vulnerability, fire will find the gaps. This is particularly true when the structures in question are homes, which may accumulate unplanned vulnerabilities such as backyard furniture, play structures, an RV parked near homes, and other things with a degree of combustibility that were not part of the original plan. A fire adapted communities features will buy time, time that will allow a more robust fire response to arrive and take the offensive and defensive actions that alter the fire's outcome. As discussed in our previous position paper, fast-moving fires that reach vulnerabilities at the points of transition to the built environment at a speed that outpaces fire suppression resources are those with the greatest potential for city-scale loss.

References

[1] Balch, Jennifer K., et al. "The Fastest-Growing and Most Destructive Fires in the US (2001 to 2020)." Science, vol. 386, no. 6720, 25 Oct. 2024, pp. 425–31. Science, doi:10.1126/science.adk5737

[2] "Wildfires Destroy Thousands of Structures Each Year." Headwaters Economics, 16 Nov. 2020, updated May 2025, headwaterseconomics.org/natural-hazards/structures-destroyed-by-wildfire

[3] "New California Legislation Aimed at Addressing Housing Shortages and Wildfire Recovery." LightBox Insights, LightBox Holdings, L.P., Mar. 2025, www.lightboxre.com/insight/new-california-legislation-aimed-at-addressing-housing-shortages-and-wildfire-recovery

[4] "California's Next Affordable Housing Crisis Is the Rising Cost of Property Insurance." Los Angeles Times, 11 June 2024, www.latimes.com/opinion/story/2024-06-11/editorial-californias-next-affordable-housing-crisis-is-the-rising-cost-of-property-insurance

[5] California Legislature. Senate Bill 63: Fire Prevention: Vegetation Management, Public Education, Grants, Defensible Space, Fire Hazard Severity Zones. Chapter 382, 2021–2022 Reg. Sess., approved Sept. 28, 2021. California Legislative Information, leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=202120220SB63

[6] Barrett, Kimiko. "Cascading Wildfire Insurance Issues Impact Local and State Budgets." Headwaters Economics, 17 Jan. 2025, headwaterseconomics.org/natural-hazards/wildfire-insurance-local-state-budgets

[7] California Department of Insurance. FAQ for Insurance Commitments in Wildfire-Distressed Areas. Oct. 2024. California Department of Insurance, www.insurance.ca.gov/01-consumers/180-climate-change/upload/California-Department-of-Insurance-FAQ-for-Insurance-Commitments-in-Wildfire-Distressed-Areas.pdf

[8] "Rising Insurance Costs Threaten LA Affordable Housing." CRE Daily, 22 Jan. 2025, www.credaily.com/briefs/rising-insurance-costs-threaten-la-affordable-housing

[9] Christopher, Ben. "Why California Keeps Putting Homes Where Fires Burn." The Independent, 19 Jan. 2025, www.independent.com/2025/01/19/why-california-keeps-putting-homes-where-fires-burn/.

[10] "Why California Keeps Putting Homes Where Fires Burn." CalMatters, 16 Jan. 2025, calmatters.org/housing/2025/01/ca-wui-housing-policy

[11] Greenwald, David. "California's Housing Crisis Worsens Climate Survival and City Functionality." Davis Vanguard, 1 May 2025, davisvanguard.org/2025/05/californias-housing-crisis-impact

[12] Ohanian, Lee E. Common-Sense Policy Reforms for California Housing. Policy Analysis No. 920, Cato Institute, 31 Aug. 2021, www.cato.org/policy-analysis/common-sense-policy-reforms-california-housing.

[13] For example, including transportation, development of new infrastructure, etc. See Biddle, Tony, Tony Bertoia, Stephen P. Greaves, and Peter Stopher. The Costs of Infill versus Greenfield Development: A Review of Recent Literature. 29th Australasian Transport Research Forum, Jan. 2006, gettingaroundsac.blog/wp-content/uploads/2022/09/the_costs_of_infill_versus_greenfield_development_.pdf.

[14] Felt, Emily. Patching the Fabric of the Neighborhood: The Practical Challenges of Infill Housing Development for CDCs. Joint Center for Housing Studies, Harvard University, April 2007

[15] "NIMBYism and Resistance to Higher-Density Housing." San Joaquin Valley Council of Governments, 2022, sjvcogs.org/housing-elements/nimbyism-and-resistance-to-higher-density-housing

References

[16] Kotkin, Joel. "California's Housing Problems Require a Better Solution Than 'Densify, Densify, Densify.'" NewGeography, 18 Feb. 2025, www.newgeography.com/content/008447-california-s-housing-problems-require-a-better-solution-densify-densify-densify

[17] Schwenk, Katya. "How Big Developers Crushed Regulation That Could Have Mitigated LA Fires." Truthout, 13 Jan. 2025, truthout.org/articles/how-big-developers-crushed-regulation-that-could-have-mitigated-la-fires/.

[18] McLauchlan, Kendra K., et al. "Fire as a Fundamental Ecological Process: Research Advances and Frontiers." Journal of Ecology, vol. 108, no. 5, 1 Sept. 2020, pp. 2047–2069, doi:10.1111/1365-2745.13403

[19] Syphard, Alexandra D., Avi Bar Massada, Van Butsic, and Jon E. Keeley. "Land Use Planning and Wildfire: Development Policies Influence Future Probability of Housing Loss." PLoS ONE, vol. 8, no. 8, 14 Aug. 2013, article e71708, doi:10.1371/journal.pone.0071708

[20] California Department of Housing and Community Development. 2010 California Building Code, Part 2: Chapter 7A – Materials and Construction Methods for Exterior Wildfire Exposure. California Department of Housing and Community Development, 2010

[21] Knapp, Eric E., et al. "Housing Arrangement and Vegetation Factors Associated with Single-Family Home Survival in the 2018 Camp Fire, California." Fire Ecology, vol. 17, article 25, 4 Oct. 2021, doi:10.1186/s42408-021-00117-0

[22] "California Building Rules May Protect Homes from Wildfires." The Business Journal, published approx. 6 June 2019, www.thebusinessjournal.com/california-building-rules-may-protect-homes-from-wildfires

[23] Federal Emergency Management Agency. Best Practices for Wildfire-Resilient Subdivision Planning. Marshall Fire Mitigation Assessment Team, revised April 2025. FEMA, www.fema.gov/sites/default/files/documents/fema_rsl_marshall-mat-best-practices-for-wildfire-resilient-subdivision-planning_042025.pdf

[24] California Legislative Analyst's Office. Reducing the Destructiveness of Wildfires: Promoting Defensible Space in California. Legislative Analyst's Office Report 4457, 30 Sept. 2021

[25] Caton, Sara E., et al. "Review of Pathways for Building Fire Spread in the Wildland Urban Interface Part I: Exposure Conditions." Fire Technology, vol. 53, 2017, pp. 429–473. https://doi.org/10.1007/s10694-016-0589-z

[26] Chulahwat, Akshat, et al. "Integrated Graph Measures Reveal Survival Likelihood for Buildings in Wildfire Events." Scientific Reports, vol. 12, no. 1, 2022, article 15954. https://doi.org/10.1038/s41598-022-20082-4

[5] [1]https://themortgagepoint.com/2025/03/25/assessing-the-impact-of-l-a-s-wildfires-on-the-housing-market
[2] https://www.frbsf.org/research-and-insights/publications/economic-letter/2024/08/wildfires-and-real-estate-values-in-california
[3] https://www.cfpnet.com › key-statistics-data
[4] http://faculty.haas.berkeley.edu/stanton/pdf/fire.pdf
[6] https://themortgagepoint.com/2025/03/25/assessing-the-impact-of-l-a-s-wildfires-on-the-housing-market
[2] https://www.frbsf.org/research-and-insights/publications/economic-letter/2024/08/wildfires-and-real-estate-values-in-california
[3] https://www.cfpnet.com › key-statistics-data
http://faculty.haas.berkeley.edu/stanton/pdf/fire.pdf

Table 1: Estimated structure ignitions at each timestep after the modeled ignition.

	90 Minutes	120 Minutes	150 Minutes	180 Minutes
Baseline Design	23 ±3.1	99 ±22	258 ±63.1	448 ±96.3
Fire Resilient Design	0.3 ±0.5	22 ±3.8	81 ±8.4	141 ±30.4
Change	-98.7% ± 13.5%	-77.8% ± 31.4%	-68.6% ± 39.8%	-68.5% ± 38.1%

Table 1 highlights the differences in the timing of fire exposure projected under each of the two design scenarios. In the baseline community, the number of ignited structures increases exponentially as the fire reaches the built environment, reflecting immediate vegetation to structure transition and subsequent rapid urban fire spread among closely-spaced structures and interior landscape elements. While the risk is not eliminated in the fire-adapted design scenario, fire spread is slowed, providing more time for the aggregation of an effective firefighting response and community evacuation.

New Development Can Reduce the Risk to Adjacent Communities

The complete implementation of on-parcel and community mitigations, complemented by community-level design choices, is highly effective in reducing the likely consequences of a wildfire event. However,

Modeled ignition probability of two hypothetical new developments on the edge of the existing community designed using DSAP.

90 - 100
70 - 90
50 - 70
30 - 50
10 - 30
0 - 10

Modeled Ignition Probability
90 - 100 70 - 90 50 - 70
30 - 50 10 - 30 0 - 10
Fire Pathways
Fire Resilient Design Area

Fire Pathways
Fire Resilient Design Area