State of California
Office of the Attorney General

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Best Practices for Analyzing and Mitigating Wildfire Impacts of Development Projects Under the California Environmental Quality Act

I. Introduction

Wildfires are part of California's present, and with the effects of climate change, an increasing part of our future. Development in fire-prone areas increases the likelihood that more destructive fires will ignite, fire-fighting resources will be taxed, more habitat and people will be put in harm's way or displaced, and more structures will burn. It is therefore imperative that local jurisdictions making decisions to approve new developments carefully consider wildfire impacts as part of the environmental review process, plan where best to place new development, and mitigate wildfire impacts to the extent feasible.

This guidance is designed to help lead agencies[1] comply with the California Environmental Quality Act, Public Resources Code, section 21000 et seq. (CEQA), when considering whether to approve projects in wildfire-prone areas. These areas are often in the wildland-urban interface, generally defined as the area where the built environment meets or intermingles with the natural environment.[2] The California Department of Forestry and Fire Protection (CAL FIRE) has classified lands based on fire hazard, the highest being those classified as high or very high fire hazard severity zones. It has also identified areas where the State (as opposed to a local agency) has responsibility for fire-fighting.[3] Particularly in these high-risk areas, but also throughout the

[1] Lead agencies are any public agencies with "principal responsibility for carrying out or approving a project which may have a significant effect upon the environment." (Pub. Resources Code, § 21067.)

[2] CAL FIRE has published an instructive map on the wildland-urban interface in California: https://frap.fire.ca.gov/media/10300/wui_19_ada.pdf. The wildland-urban interface is defined differently by different agencies for different purposes, but the most widely used definition for wildfire purposes include the intermix and interface areas mapped by Radeloff et al. 2005, 2018. See Volker C. Radeloff, et al., *Rapid Growth of the US Wildland-Urban Interface Raises Wildfire Risk.* PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES USA, 115(13):3314-3319 (2018), available at https://www.pnas.org/doi/10.1073/pnas.1718850115.

[3] See https://osfm.fire.ca.gov/divisions/community-wildfire-preparedness-and-mitigation/wildland-hazards-building-codes/fire-hazard-severity-zones-maps/. Note that areas mapped by CAL FIRE as high or very high fire hazard are not always coextensive with the wildland-urban interface. In addition, CAL FIRE's maps are currently in the process of being updated and lead agencies should consult with CAL

wildland-urban interface, wildfire risks must be considered during the environmental review process for individual development projects.

This guidance provides suggestions for how best to comply with CEQA when analyzing and mitigating a proposed project's impacts on wildfire ignition risk, emergency access, and evacuation.[4] This guidance is aimed at proposed development projects, such as residential, recreational, or commercial developments.[5] The extent to which it applies will inherently vary by project, based on project design and location. This document does not impose additional requirements on local governments or alter any applicable laws or regulations. Rather, it is intended to provide guidance on some of the issues, alternatives, and mitigation measures that should be considered during the environmental review process. This guidance is based on the Office of the Attorney General's experience reviewing, commenting on, and litigating CEQA documents for projects in high wildfire prone areas, and is intended to assist lead agencies with their planning and approval of future projects. The guidance reflects current requirements and conditions and may need to be updated as changes occur.

II. Background

Although wildfires are and have been an important natural process throughout California's history, recent changes in fire frequency, intensity, and location are posing increasing threats to the residents and environment of California. More acres of California have burned in the past decade than in the previous 90 years[6] and eight of the State's ten largest fires since 1932 have occurred in the last decade.[7] While lightning is a common cause of some of the State's largest

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FIRE before relying on the classifications listed on this map. CAL FIRE's list of state responsibility areas (defined as areas where the State of California, as opposed to a local agency, is financially responsible for prevention and suppression of wildfires) can be found at: https://calfire-forestry.maps.arcgis.com/apps/webappviewer/index.html?id=468717e399fa4238ad86861638765ce1. Each county should have a map of the very high or high fire hazard severity zones in its jurisdiction, and they are also included on the CAL FIRE zone map: https://egis.fire.ca.gov/FHSZ/.

[4] Readers who want to determine their legal obligations under CEQA should consult their own attorney for legal advice.

[5] This guidance is not intended to apply to state and local agency fire management activities, such as prescribed burns, approval of vegetation management plans to reduce wildfire risk, and review of timber harvesting plans.

[6] CAL FIRE, Top 20 Largest California Wildfires (Jan. 13, 2022), available at https://www.fire.ca.gov/media/4jandlhh/top20_acres.pdf. See also Hugh D. Safford et al., *The 2020 California Fire Season: A Year Like No Other, a Return to the Past or a Harbinger of the Future?* (Apr. 17, 2022) GLOBAL ECOLOGY AND BIOGEOGRAPHY, available at https://onlinelibrary.wiley.com/doi/10.1111/geb.13498?af=R.

[7] Paul Rogers, *Map: 1 of Every 8 acres in California has Burned in the Last 10 Years. Here's Where the Biggest Fires Spread—and are Burning Now*, Mercury News (Sept. 29, 2021), available at https://www.mercurynews.com/2021/09/29/top-10-california-wildfires-megafires-map/. Notably, the large fires of late are not unprecedented in the State's history with similarly large fires occurring specifically during the 1920s. See Jon E. Keeley & Alexandra D. Syphard, *Large California Wildfires: 2020*

fires, in recent years, many of the State's most destructive fires have been caused by human activity, such as downed powerlines or electrical sources associated with residential development or industrial facilities.[8]

Wildfires can have dramatic, adverse ecological impacts. Frequent wildfires can result in habitat loss and fragmentation, shifts in vegetative compositions, reductions in small mammal populations, and accelerated loss of predatory species.[9] Wildfire can also have adverse impacts on erosion and water quality. During active burning, ash and associated contaminants can enter water supplies. Later, after large burns, rainstorms can flush vast amounts of sediment from exposed soils into those same water supplies.[10]

Wildfires also have tragic consequences for California's residents. Since 2010, wildfires have killed nearly 150 people in California[11] and, since 2005, wildfires have destroyed over 97,000 structures,[12] requiring mass evacuations and exacerbating the State's already-pressing need for more housing. In addition, wildfire smoke is unhealthy to breathe and is a public health concern.[13] Further, wildfire losses are not experienced equally. Lower-income households are more likely to lose all of their assets and less likely to have adequate insurance to cover their losses.[14] Meanwhile, the costs of wildfire suppression and resiliency have become significant. In

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Fires in Historical Context (Aug. 25, 2021) FIRE ECOLOGY, available at https://fireecology.springeropen.com/articles/10.1186/s42408-021-00110-7.

[8] See CAL FIRE, Top 20 Largest California Wildfires (Jan. 13, 2022), available at https://www.fire.ca.gov/media/4jandlhh/top20_acres.pdf; CalFire, Top 20 Most Destructive California Wildfires (Jan. 13, 2022), available at https://www.fire.ca.gov/media/t1rdhizr/top20_destruction.pdf.

[9] See Alexandra D. Syphard, et al., *Human Influence on California Fire Regimes.* ECOLOGICAL APPLICATION 17:1388-1402 (2007).

[10] United States Environmental Protection Agency, Wildfires: How do They Affect Our Water Supplies? (Aug. 13, 2019), available at https://www.epa.gov/sciencematters/wildfires-how-do-they-affect-our-water-supplies#:~:text=Vegetation%20that%20holds%20soil%20in,%2C%20rivers%2C%20and%20downstream%20reservoirs.

[11] CAL FIRE, Top Deadliest California Wildfires (Oct. 22, 2021), available at https://www.fire.ca.gov/media/lbfd0m2f/top20_deadliest.pdf.

[12] Headwaters Economics, Wildfires Destroy thousands of structures each year (Nov. 2020, updated Aug. 2022), available at https://headwaterseconomics.org/natural-hazards/structures-destroyed-by-wildfire/.

[13] See Kurtis Alexander, *California Ranks Worst in Nation for Air Pollution Because of Wildfire Smoke*, S.F. Chronicle (June 23, 2022), available at https://www.sfchronicle.com/bayarea/article/california-air-quality-17259687.php. See also Lora Kolodny, *The West Coast Is Suffering from Some of the Worst Air in the World — These Apps Show How Bad it Is*, CNBC (Sept. 13, 2020), available at https://www.cnbc.com/2020/09/12/air-quality-apps-purpleair-airnow-iqair-essential-in-western-us.html; and California Air Resources Board, *Protecting Yourself from Wildfire Smoke*, available at https://ww2.arb.ca.gov/protecting-yourself-wildfire-smoke.

[14] California Council on Science and Technology, The Costs of Wildfire in California (Oct. 2020), at p. 69, available at https://ccst.us/reports/the-costs-of-wildfire-in-california/.

2021, the State invested $1.5 billion in wildfire resiliency efforts, and the 2022-2023 budget includes an additional $1.2 billion to support wildfire and forest resilience.[15] The changing nature of wildfires, under various metrics—frequency, area burned, adverse ecological impacts, the number of Californians displaced—is a worsening crisis that will unfortunately be part of California's future.[16]

As of 2010, about one-third of California's housing units were located within the wildland-urban interface.[17] Residential developments in the wildland-urban interface and other wildfire prone areas can significantly increase the risks of wildfires and the risk to public safety for several reasons. First, introducing more people—via additional development—into a flammable landscape increases the likelihood of: (1) a wildfire igniting due to the increased presence of people; and (2) the ignition becoming a wildfire because of the placement of homes amongst the flammable vegetation.[18] Second, building housing units in the wildland-urban interface puts more people in harm's way.[19] Wildfires, particularly those that impact developments in relatively remote locations, may impede the evacuation of communities and emergency access, making it more difficult to ensure public safety and to limit, control, or extinguish wildfires. Finally, fires in remote locations require significant fire-fighting resources and mobilization of fire-fighters from all over the State—putting a major strain on the State's fire-fighters and the State's budget. Put simply, bringing more people into or near flammable wildlands leads to more frequent, intense, destructive, costly, and dangerous wildfires.[20]

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[15] Gavin Newsom, California State Budget (2022-2023), at p. 61, available at https://www.ebudget.ca.gov/FullBudgetSummary.pdf; California State Budget, Budget Addendum (2021-2022), at p. 3, available at https://www.ebudget.ca.gov/BudgetAddendum.pdf.

[16] See California Council on Science and Technology, *The Costs of Wildfire in California* (Oct. 2020), at p. 17, available at https://ccst.us/reports/the-costs-of-wildfire-in-california/.

[17] Community Wildfire Planning Center, Land Use Planning Approaches in the Wildland-Urban Interface (Feb. 2021), at p. 7, available at https://www.communitywildfire.org/wp-content/uploads/2021/02/CWPC_Land-Use-WUI-Report_Final_2021.pdf; see also Heather Anu Kramer, et al., *High Wildfire Damage in Interface Communities in California* (2019) INTERNATIONAL JOURNAL OF WILDLAND FIRE, available at https://www.fs.usda.gov/nrs/pubs/jrnl/2019/nrs_2019_kramer_001.pdf. At the current rate of growth and under current growth patterns, it is anticipated that an additional 645,000 housing units will be developed in areas designated by CAL FIRE as very high fire hazard severity zones by 2050. Next 10, Rebuilding for a Resilient Recovery: Planning in California's Wildland Urban Interface (June 2021), at p. 9, available at https://www.next10.org/publications/rebuilding-resilient.

[18] See Alexandra D. Syphard, *Why Are so Many Structures Burning in California?* (2020) Fremontia, *47*(2), at p. 29; Volker C. Radeloff, et al., *Rapid Growth of the US Wildland-Urban Interface Raises Wildfire Risk.* PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES USA, 115(13):3314-3319 (2018).

[19] See Heather Anu Kramer, et al., *High Wildfire Damage in Interface Communities in California* (2019) International Journal of Wildland Fire, available at https://www.fs.usda.gov/nrs/pubs/jrnl/2019/nrs_2019_kramer_001.pdf; Volker C. Radeloff, et al., *Rapid growth of the US wildland-Urban interface raises wildfire risk.* PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES USA, 115(13):3314-3319 (2018).

[20] See Michael L. Mann, et al., *Incorporating Anthropogenic Influences into Fire Probability Models: Effects of Human Activity and Climate Change on Fire Activity in California* (Apr. 28, 2016) PLOS ONE

III. Wildfire and Land Use Planning

While this guidance is focused on best practices to disclose, analyze, and mitigate wildfire impacts in compliance with CEQA, it is important to note that general planning also provides a critical opportunity for local jurisdictions to think proactively about how to accommodate their housing and development needs while reducing the risks of wildfire.[21] In the last ten years, new legislation has passed requiring local jurisdictions to consider wildfire risks in their general planning processes.[22] The Governor's Office of Planning and Research (OPR) recently published comprehensive guidance to help local agencies comply with these requirements.[23] We encourage local jurisdictions to consult this guidance and to thoughtfully plan for new development given the increasing risk of wildfires throughout the state.[24]

11(4), available at https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0153589; Alexandra D. Syphard, *Why Are so Many Structures Burning in California?* (2020) FREMONTIA, *47*(2), at pp. 28-35, available at https://pubs.er.usgs.gov/publication/70215982; Alexandra D. Syphard, et al., *Land Use Planning and Wildfire: Development Policies Influence Future Probability of Housing Loss* (2013) PLOS ONE, available at https://journals.plos.org/plosone/article/file?id=10.1371/journal.pone.0071708&type=printable; see also Final Statement of Reasons for Regulatory Action re Amendments to the State CEQA Guidelines OAL Notice File No. Z-2018-0116-12 ("Statement of Reasons"), at p. 87, available at https://resources.ca.gov/CNRALegacyFiles/ceqa/docs/2018_CEQA_Final_Statement_of%20Reasons_111218.pdf.

[21] See Alexandra D. Syphard, *Why Are so Many Structures Burning in California?* (2020) FREMONTIA, *47*(2), at p. 33, available at https://pubs.er.usgs.gov/publication/70215982 [concluding that "the most effective strategy at reducing future structure loss would focus on reducing the extent of low-density housing via careful land planning decisions"].

[22] See Sen Bill No. 1241 (2011-2012 Reg. Sess.), amending and/or adding Gov. Code, §§ 65302, subd. (g)(3), 65302.5, subd. (b), and 66474.02) [requiring local jurisdictions within state responsibility areas or very high fire hazard severity zones to address wildfire risk when updating their safety elements and to submit their draft updates to the State Board of Forestry and Fire Protection for review]; Sen. Bill No. 99 (2019-2020 Reg. Sess.), amending Gov. Code, § 65302, subd. (g)(5) [requiring updated safety elements to identify residential developments within hazard areas that do not have at least two evacuation routes]; Assem. Bill No. 747 (2019-2020 Reg. Sess.), adding Gov. Code, § 65302.15 [requiring local jurisdictions to update their safety element to address the capacity of evacuation routes under a range of various emergency scenarios]; Assem. Bill No. 1409 (2020-2021 Reg. Sess.), amending Gov. Code, § 65302.15 [requiring that safety elements identify locations where people can evacuate to].

[23] Governor's Office of Planning and Research, Fire Hazard Planning Technical Advisory, 2022 Update (Aug. 2022), available at https://opr.ca.gov/docs/20220817-Fire_Hazard_Planning_TA.pdf; and Wildland-Urban Interface Planning Guide: Examples and Best Practices for California Communities (Aug. 2022), available at https://opr.ca.gov/docs/20220817-Complete_WUI_Planning_Guide.pdf.

[24] Local jurisdictions that have complied with their general planning obligations, including incorporating wildfire and evacuation planning considerations into their general plans, may benefit from streamlined CEQA requirements at the project approval level. If a development project is consistent with an updated general plan and an environmental impact report (EIR) was prepared for that plan, the CEQA review for the project may be limited to the parcel-specific impacts of the project or impacts that new information,

IV. Analyzing and Mitigating Wildfire Risk Impacts Under CEQA

A. CEQA's requirements for analyzing wildfire risks

CEQA requires local jurisdictions considering development projects to prepare an environmental impact report (EIR) or a mitigated negative declaration[25] if the project may potentially have a significant impact on the environment and is not otherwise exempt from CEQA.[26] Under CEQA, local jurisdictions may act as lead agencies with responsibility for preparing the EIR (or other CEQA document), or as responsible agencies relying on an EIR prepared by a lead agency. CEQA provides a critical process for local jurisdictions to understand how new developments will exacerbate existing wildfire risks, allowing them to consider project design features, alternatives, and mitigation measures that provide for smarter development and the protection of existing communities.

The CEQA Guidelines[27] require that an EIR include a description of the physical environmental conditions in the vicinity of the project, at the time the notice of preparation is published, or if no notice of preparation is published, at the time environmental analysis is commenced.[28] This "baseline" of existing environmental conditions is generally used to determine the significance of project-related impacts. In the EIR's discussion of the existing environmental conditions, lead agencies should include information about open space areas and habitats within the project area that may be fire prone, as well as a discussion of fire history and fuels on the project site. Including a discussion of existing available water supplies for fire-fighting is also critical. Providing detail about existing environmental conditions at the project site that may exacerbate or minimize wildfire impacts will help ensure that the EIR fully considers the project's impacts on wildfire risk.

The CEQA Guidelines require an analysis of "any significant environmental effects the project might cause or risk exacerbating by bringing development and people into the area affected," including by locating development in wildfire risk areas.[29] The "environmental checklist form" in Appendix G of the CEQA Guidelines, Section XX, directs lead agencies to assess whether

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arising since adoption of the general plan, shows will be more significant than described in the prior EIR. (Pub. Resources Code, § 21083.3; CEQA Guidelines, § 15193).

[25] Where "EIR" is used in this guidance it should also be considered to refer to a mitigated negative declaration.

[26] Pub. Resources Code, § 21067; CEQA Guidelines, §§ 15050 and 15367.

[27] The CEQA Guidelines are found at California Code of Regulations, title 14, section 15000, et seq.

[28] CEQA Guidelines, § 15125.

[29] CEQA Guidelines, § 15126.2.

projects located *in or near* state responsibility areas or lands classified as very high fire hazard severity zones,[30] would:

a) Substantially impair an adopted emergency response plan or emergency evacuation plan;
b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire;
c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment; or
d) Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes.[31]

In addition to the four questions above, Section IX(g) of the checklist broadly directs lead agencies to consider whether a project will "expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires."[32] In answering these questions, lead agencies must consider both on- and off-site impacts.[33]

B. Analyzing a project's impact on wildfire risks

Several variables should be considered in analyzing a project's impact on wildfire risk, including:

- **Project Density:** Project density influences how likely a fire is to start or spread, and how likely it is that the development and its occupants will be in danger when a fire starts. Fire spread and structure loss is more likely to occur in low- to intermediate-density developments.[34] This is because there are more people present to ignite a fire (as compared to undeveloped land), and the development is not concentrated enough

[30] See footnote 1 for more information on state responsibility areas and very high fire hazard severity zones.

[31] CEQA Guidelines, Appendix G, XX.

[32] CEQA Guidelines, Appendix G, IX(g). This Guidance focuses on these key wildfire-related questions in Sections IX(g) and XX of the checklist, but in conducting environmental review, lead agencies must continue to thoroughly address the other questions identified in Section XX and the checklist more generally.

[33] CEQA Guidelines, § 15360 [defining the environment to be considered as "the area in which significant effects would occur either directly or indirectly as a result of the project"].

[34] Alexandra D. Syphard, *The Relative Influence of Climate and Housing Development on Current and Projected Future Fire Patterns and Structure Loss Across Three California Landscapes* (2019) GLOBAL ENVIRONMENTAL CHANGE; Alexandra D. Syphard, et al., *Housing Arrangement and Location Determine the Likelihood of Housing Loss Due to Wildfire* (Mar. 28, 2012) PLOS ONE, available at https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0033954.

(as compared to high-density developments) to disrupt fire spread by removing or substantially fragmenting wildland vegetation.[35] "Isolated clusters of development and low housing density mean that homes are embedded within, and more exposed to, a matrix of wildland vegetation."[36] Moreover, fire-fighters may have difficulty accessing more remote and disconnected developments.[37]

- **Project Location in the Landscape:** Project placement in the landscape relative to fire history, topography and wind patterns also influences wildfire risk. Although wildfire ignitions are primarily human-caused in California, wildfire behavior is largely driven by topography, fuel, climatic conditions, and fire weather (such as low humidity and high winds). How a development project is planned within the landscape determines to what extent it will influence fire risk.[38] For example, if a project site is located in a wind corridor, above-ground power lines may become a source of ignition. Similarly, siting residential structures in rugged terrain or on the top of steep hills may increase the wildfire risk. By contrast, if a project site includes landscape features that could prevent or slow the spread of fire, such as a lake or an irrigated golf course, the development may be strategically located so as to capitalize on that feature as a natural fuel break.[39]

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[35] See generally Alexandra D. Syphard, et. al., *Multiple-Scale Relationships between Vegetation, the Wildland-Urban Interface, and Structure Loss to Wildfire in California* (Mar. 12, 2021) MDPI FIRE 2021.

[36] Max A. Moritz, et al., *Learning to Coexist with Wildfire* (2014) NATURE 515(7525), at p. 64; see also Alexandra D. Syphard, et. Al., *Multiple-Scale Relationships between Vegetation, the Wildland-Urban Interface, and Structure Loss to Wildfire in California* (March 12, 2021) MDPI FIRE 2021.

[37] See Alexandra D. Syphard, *Why Are so Many Structures Burning in California?* (2020) FREMONTIA, *47*(2), at p. 31.

[38] See generally Max Moritz, et al., *Building to Coexist with Fire: Community Risk Reduction Measures for New Development in California* (Apr. 2020) University of California Agriculture and Natural Resources, Publication 8680, available at https://escholarship.org/uc/item/6n12m6pn; Alexandra D. Syphard, *Why Are so Many Structures Burning in California?* (2020) FREMONTIA, *47*(2), at pp. 28-35, available at https://pubs.er.usgs.gov/publication/70215982.

[39] See Max Moritz, et al., *Building to Coexist with Fire: Community Risk Reduction Measures for New Development in California* (Apr. 2020) University of California Agriculture and Natural Resources, Publication 8680, at p. 10, available at https://escholarship.org/uc/item/6n12m6pn; see also Conservation Biology Institute, *Paradise Nature-Based Fire Resilience Project Final Report* (June 2020), available at https://d2k78bk4kdhbpr.cloudfront.net/media/reports/files/CBI_Paradise_Final_Report_for_Posting_Online.pdf [An examination of how siting and greenbelts may have protected homes during the Paradise fire]. Siting of a new fire-resistant development between wildlands and existing development may even serve as a protective barrier for the existing development. But there can still be some risk of ember spread if the new development succumbs to fire. See Alexandra D. Syphard, *Why Are so Many Structures Burning in California?* (2020) FREMONTIA, *47*(2), at pp. 28-35, available at https://pubs.er.usgs.gov/publication/70215982; California Council on Science and Technology, The Costs of Wildfire in California (Oct. 2020), at p. 67, available at https://ccst.us/reports/the-costs-of-wildfire-in-california/.

- **Water Supply and Infrastructure**: As part of evaluating a project's wildfire risk impacts, an EIR should analyze the adequacy of water supplies and infrastructure to address fire-fighting within the project site.[40] This analysis should consider the potential loss of water pressure during a fire, which may decrease available water supply[41] and the potential loss of power, which may eliminate the supply.[42]

To understand how a project may exacerbate the risk of wildfire, an EIR should qualitatively assess these variables and also use fire modeling and other spatial and statistical analyses to quantify the risks to the extent feasible. Experts should utilize fire models to account for various siting and design elements, as well as a variety of different fire scenarios. The modeling should include scenarios for fires that start in, near, and far from the project site, as well as extreme weather conditions that exacerbate fire spread.

Lead agencies are encouraged to develop thresholds of significance that either identify an increase in wildfire risk as a significant impact or determine, based on substantial evidence, that some increase in the risk of wildfires is not considered a significant impact. Relevant factors should include the project's impact on ignition risk, the likelihood of fire spread, and the extent of exposure for existing and new residents based on various fire scenarios. Modeling the various scenarios enables local agencies to quantify increased wildfire risks resulting from a project adding more people to wildfire prone areas and to assess the risks according to the threshold of significance.

Some EIRs have concluded that the conversion of some wildland vegetation into paved development reduces or does not increase wildfire risk. This conclusion is contrary to existing evidence and the well-accepted understanding that the fundamental driver of increased wildfire risk is the introduction of people into a flammable landscape.[43] Accordingly, the conversion of vegetation into developed land does not obviate the need for lead agencies to carefully consider and model how the addition of development into wildfire prone areas contributes to the risk of wildfire.

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[40] See Max Moritz, et al., *Building to Coexist with Fire: Community Risk Reduction Measures for New Development in California* (Apr. 2020) University of California Agriculture and Natural Resources, Publication 8680, at p. 19 and Appendix B, available at https://escholarship.org/uc/item/6n12m6pn.

[41] See Max Moritz, et al., *Building to Coexist with Fire: Community Risk Reduction Measures for New Development in California* (Apr. 2020), at p. 19, University of California Agriculture and Natural Resources, Publication 8680, available at https://escholarship.org/uc/item/6n12m6pn.

[42] See Alexandra D. Syphard, *Nexus Between Wildfire, Climate Change and Population Growth in California* (2020) FREMONTIA, *47*(2), at p. 26.

[43] See Heather Anu Kramer, et al., *High Wildfire Damage in Interface Communities in California* (2019) INTERNATIONAL JOURNAL OF WILDLAND FIRE, available at https://www.fs.usda.gov/nrs/pubs/jrnl/2019/nrs_2019_kramer_001.pdf; see also Exhibit A to the Final Statement of Reasons for Regulatory Action re Amendments to the State CEQA Guidelines, OAL Notice File No. Z-2018-0116-12, at p. 212, available at https://resources.ca.gov/CNRALegacyFiles/ceqa/docs/2018_CEQA_ExA_FSOR.pdf.

C. Analyzing the project's impact on evacuation and emergency access

The addition of new development into high wildfire risk or adjacent areas may impact the evacuation of project residents, as well as the existing population (e.g., residents, workers, students, visitors, and possibly livestock) in the area and the ability of emergency responders to simultaneously access the area to fight wildfire. This can, in turn, impact the risk and extent of large-scale fire spread and community safety within and around the new development. The EIR should evaluate these impacts both during construction and over the life of the project. The required analysis is relative to a project's impacts and risks; e.g., a higher density infill project within an already developed area would likely not require the same level of analysis as a new low-density development within the wildland-urban interface and surrounded largely by open space.[44]

For projects located in high wildfire risk areas that present an increased risk of ignition and/or evacuation impacts, evacuation modeling and planning should be considered and developed at the time of project review and approval—when there is greater flexibility to modify a project's design, density, siting, and configuration to address wildfire considerations—rather than deferred to a later stage of the development process. Lead agencies will be best-positioned to ensure proposed development projects facilitate emergency access and ease constraints on evacuation with this information in hand prior to project approval. The ultimate objective is to allow for informed decision-making that minimizes the environmental and public safety hazards associated with new developments that increase the risk of ignition and impede evacuation in high wildfire prone areas.

Evacuation modeling and analysis should include the following:

- Evaluation of the capacity of roadways to accommodate project and community evacuation and simultaneous emergency access.
- Assessment of the timing for evacuation.
- Identification of alternative plans for evacuation depending upon the location and dynamics of the emergency.
- Evaluation of the project's impacts on existing evacuation plans.
- Consideration of the adequacy of emergency access, including the project's proximity to existing fire services and the capacity of existing services.
- Traffic modeling to quantify travel times under various likely scenarios.

[44] See Max Moritz, et al., *Building to Coexist with Fire: Community Risk Reduction Measures for New Development in California* (Apr. 2020), University of California Agriculture and Natural Resources, Publication 8680, at p. 5, available at https://escholarship.org/uc/item/6n12m6pn [describing the benefits of infill development].

In considering these evacuation and emergency access impacts, lead agencies may use existing resources and analyses, but such resources and analyses should be augmented when necessary. For example, agencies should:

- Utilize information from the EIR's analysis of traffic/transportation impacts, but they should not limit themselves to that information, which may not reflect the impact of emergency conditions on travel times.
- Consult with local fire officials and ensure that assumptions and conclusions regarding evacuation risk are substantiated with sound facts. Emergency conditions may not allow for ideal evacuation scenarios—staggered, staged, or targeted evacuation in response to a wildfire may sometimes be possible, but human behavior is difficult to predict and wildfires can be erratic, unpredictable, and fast-moving.[45]
- Consider impacts to existing evacuation plans, but recognize that, depending on the scope of an existing evacuation plan, additional analyses or project-specific plans may be needed. Community evacuation plans often identify roles and responsibilities for emergency personnel and evacuation routes, but do not necessarily consider the capacity of roadways, assess the timing for community evacuation, or identify alternative plans for evacuation depending upon the location and dynamics of the emergency.
- Avoid overreliance on community evacuation plans identifying shelter-in-place locations. Sheltering in place, particularly when considered at the community planning stage,[46] can serve as a valuable contingency, but it should not be relied upon in lieu of analyzing and mitigating a project's evacuation impacts.[47]

Local jurisdictions are encouraged to develop thresholds of significance for evacuation times. These thresholds should reflect any existing planning objectives for evacuation, as well as

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[45] See FEMA and U.S. Fire Administration, *Wildland Urban Interface: A Look at Issues and Resolutions* (June 2022), available at https://www.usfa.fema.gov/downloads/pdf/publications/wui-issues-resolutions-report.pdf.

[46] FEMA, *Planning Considerations: Evacuation and Shelter-in-Place* (July 2019), available at https://www.fema.gov/sites/default/files/2020-07/planning -considerations-evacuation-and-shelter-in-place.pdf. The distinction between temporary shelter-in-place locations and buildings designed or retrofitted for longer term shelter-in-place should also be considered. See Max Moritz, et al., *Building to Coexist with Fire: Community Risk Reduction Measures for New Development in California* (Apr. 2020) University of California Agriculture and Natural Resources, Publication 8680, at p. 17, available at https://escholarship.org/uc/item/6n12m6pn [discussing the difference between "safety zones"—areas with little flammable vegetations, such as golf courses—versus buildings that are designed to provide protection from heat and embers while the front of a fire passes, typically for a duration of at least 30-60 minutes].

[47] See Mejia, *Pepperdine University Defends 'Shelter in Place' Decision During Woolsey Fire*, Los Angeles Times (Nov. 13, 2018), available at https://www.latimes.com/local/lanow/la-me-ln-pepperdine-shelter-20181113-story.html; Chandler, *Am I Going to Stay in the Parking Lot . . . While the Fires Burn Around Me?*, Record Searchlight (Dec. 12, 2019), available at https://www.redding.com/in-depth/news/2019/04/25/california-wildfire-shelter-place-plans-questioned-evacuation-preparation/3427075002/.

informed expert analysis of safe and reasonable evacuation times given the existing and proposed development. Local jurisdictions should consider whether any increase in evacuation times for the local community would be a significant impact. A conclusion that an increase in evacuation times is a less than significant impact should be based on a threshold of significance that reflects community-wide goals and standards.

In establishing thresholds, local jurisdictions should consider referring to successful evacuations from prior emergencies within their community or similarly situated communities. The thresholds should include, but not be limited to, whether the project creates an inconsistency with: (1) an adopted emergency operations or evacuation plan; (2) a safety element that has been updated per the requirements in Government Code sections 65302(g)(5) and 65302.15 to integrate wildfire and evacuation concerns; or (3) recommendations developed by the California Board of Forestry and Fire Protection regarding the safety of subdivisions pursuant to Public Resources Code section 4290.5.

D. Mitigating wildfire risk, evacuation, and emergency access impacts

If a project presents significant increased wildfire risks and/or evacuation and access impacts, CEQA requires the lead agency to consider and adopt feasible alternatives and mitigation measures to avoid or reduce the project's impacts (or make a finding of overriding consideration).[48] Not all project design features or mitigation measures will achieve the same reduction in impacts for every project—the effects and effectiveness of measures will vary geographically and by project. An EIR that baldly concludes that certain project design features or mitigation measures will reduce or eliminate all potential wildfire risks, without first describing those risks, fails to fully analyze the project's impacts. Compressing the analysis of impacts and mitigation deprives decision makers of a full description of the project's adverse impacts and, therefore, fails to equip the decision makers with the necessary information to properly address the impacts by adopting project design features, mitigation measures, or alternatives. To avoid this error and provide for better project design, the project EIR should first analyze the increased wildfire risks and evacuation impacts, and then consider feasible mitigation and alternatives to avoid or reduce those impacts.

Set forth below are some examples of potential mitigation measures and design alternatives that may reduce wildfire risk impacts. This list is not exclusive and a lead agency's adoption of some or all of these mitigation measures for a particular project may not be sufficient to comply with CEQA's requirement to adopt all feasible mitigation measures.

- Increasing housing density and consolidated design, relying on higher density infill developments as much as possible.
- Avoidance and minimization of low-density exurban development patterns or leapfrog-type developments (i.e., those with undeveloped wildland between developed areas).

[48] Pub. Resources Code, § 21081.

- Decreasing the extent and amount of "edge," or interface area, where development is adjacent to undeveloped wildlands.
- Creation of buffer zones and defensible space within and adjacent to the development, with particular attention to ensuring that vegetation will not touch structures or overhang roofs.[49] It is also important that legal obligations are structured so that defensible space measures are retained over time.[50]
- Siting projects to maximize the role of low-flammability landscape features that may buffer the development from fire spread.
- Undergrounding power lines.
- Limiting development along steep slopes and amidst rugged terrain, so as to decrease exposure to rapid fire spread and increase accessibility for fire-fighting.
- Placement of development close to existing or planned ingress/egress and designated evacuation routes to efficiently evacuate the project population and the existing community population, consistent with evacuation plans, while simultaneously allowing emergency access.
- Placement of projects close to adequate emergency services.
- Construction of additional points of ingress and egress and modification of evacuation routes to minimize or avoid increasing evacuation times or emergency access response times.
- Fire hardening structures and homes—upgrading the building materials and installation techniques to increase the structure's resistance to heat, flames, and embers—beyond what is required in applicable building codes, both for new structures and existing structures in proximity to the new development.
- Requiring fire-hardened communication to the project site including high-speed internet service.
- Enhanced communication to the project population about emergency evacuation plans and evacuation zones.
- Parking limitations to ensure access roads are not clogged with parked vehicles.
- On-site water supply/storage to augment ordinary supplies that may be lost during a wildfire.

In all situations, mitigation measures should be combined and tailored to the specifics of the project, the surrounding landscape, and nearby existing uses. In some contexts, the mitigation measure itself may have an adverse impact that should be evaluated in an EIR. In addition,

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[49] Note, however, that defensible space around homes does not alone tend to account for structural survival. See Alexandra D. Syphard, *Why Are so Many Structures Burning in California?* (2020) FREMONTIA, *47*(2), at p. 32, available at https://pubs.er.usgs.gov/publication/70215982; Alexandra D. Syphard et al., *The Role of Defensible Space for Residential Structure Protection During Wildfires* (Oct. 14, 2014) INTERNATIONAL JOURNAL OF WILDLAND FIRE, available at http://dx.doi.org/10.1071/WF13158.

[50] See Max Moritz, et al., *Building to Coexist with Fire: Community Risk Reduction Measures for New Development in California* (Apr. 2020), at p. 12, University of California Agriculture and Natural Resources, Publication 8680, available at https://escholarship.org/uc/item/6n12m6pn.

mitigation measures may not provide the same level of protection or mitigation in all scenarios.[51] For example, home hardening has been shown to be an extremely effective measure for preventing structure loss during a wildfire. The California Building Code was updated in 2008 to require more advanced fire hardening and homes built to the revised standards were shown to be 40 percent less likely to be destroyed by a wildfire than similarly situated homes built prior to the update.[52] However, home hardening by itself may not be an adequate mitigation measure in all situations. During the Camp Fire, which swept through Paradise in 2018, homes built before and after the 2008 Building Code update were destroyed at roughly equal rates.[53] Home hardening in conformance with the 2008 Building Code alone did not meaningfully effect survivability; rather, proximity to other destroyed structures, the extent of vegetative overstory, and defensive space around homes was more relevant to whether or not a home survived.[54] While home hardening may be a worthy measure, this highlights the importance of combining measures, with an awareness to overall landscape conditions, to maximize public safety and minimize wildfire-related losses. It also demonstrates that defensive measures can improve but do not guarantee survivability, which highlights the continued importance of planning for evacuation and emergency access.

VII. Conclusion

As climate change and housing pressure continue to impact the State's landscape, wildfire risks, and development needs, local agencies need to thoroughly evaluate where and how new development is planned and constructed. With careful forethought during the various planning processes and thoughtful environmental review at the individual project development stage, new development can be designed and positioned to minimize future wildfire risks, enhance fire resiliency of our communities, and protect the health and safety of California's residents and natural resources. While the applicable rules, requirements, and analytical tools to reduce wildfire risk are evolving, this guidance is intended to provide suggestions for how best to comply with CEQA when analyzing and mitigating the wildfire risks of development projects in the wildland-urban interface and other fire prone areas.

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[51] See Alexandra D. Syphard, et. al., *Multiple-Scale Relationships between Vegetation, the Wildland-Urban Interface, and Structure Loss to Wildfire in California* (Mar. 12, 2021), at p. 13, MDPI FIRE 2021 [noting that "the most effective fire risk reduction approach will account for multiple factors at multiple scales and will incorporate simultaneous strategies"].

[52] Patrick W Baylis, et al., *Mandated vs. Voluntary Adaptation to Natural Disasters: the Case of U.S. Wildfires* (Dec. 2021), National Bureau of Economic Research, available at https://www.nber.org/papers/w29621.

[53] Eric E. Knapp, et al., *Housing Arrangement and Vegetation Factors Associated with Single-Family Home Survival in the 2018 Camp Fire, California* (2021) FIRE ECOLOGY 17:25, available at https://fireecology.springeropen.com/track/pdf/10.1186/s42408-021-00117-0.pdf [37 percent of homes built between 1997 and 2008 survived, while 44 percent of homes built between 2008 and 2018 survived].

[54] Eric E. Knapp, et al., *Housing Arrangement and Vegetation Factors Associated with Single-Family Home Survival in the 2018 Camp Fire, California* (2021) FIRE ECOLOGY 17:25, available at https://fireecology.springeropen.com/track/pdf/10.1186/s42408-021-00117-0.pdf.