Stuart Yasgur: I'm Stuart Yasgur and this is Economic Architecture, the podcast.

Stuart Yasgur: For those of you who've been with us since the beginning, from our conversations with Mark Brown on making communities more climate resilient through actionable changes like fireproof fences to our episode six conversation with Dave Winnacker on wildfire mitigation and implementing accessible actionable regulations like Zone Zero--many of our conversations thus far have looked at the structural innovations at the local and national levels, spreading awareness about wildfire risk.

Stuart Yasgur: But the necessity of responding urgently and accurately to the many places fires can strike is another crucial element of mitigating the impacts of fire damage.

Lori Moore-Merrell: *Rather than having to play a guessing game perhaps or using the best model we have, how about us having the right model, not just the best we've got?*

Stuart Yasgur: There are many risks we ignore when it comes to fire, like the physical distance between buildings to help limit the speed at which fire spreads to the materials used to build a structure.

But how can we better calculate which variables need to be prioritized to make homes as fireproof as possible? And how do we better educate ourselves on these threats to understand our own risks and act faster?

Lori Moore-Merrell: I often say, you know, it's not a matter of if, it's a matter of when, and that's what was said about the Palisades. That's what was said about many of the communities in California and Colorado and New Mexico. It's not a matter of if, it's when. Because we have to think forward and get in front of fire.

Lori Moore-Merrell: This is why we must talk about the risk environment that is not just the built environment, but what else is happening that's changing the dynamic and that “what else” is the climate. We are watching fundamental shifts in climate. Extreme heat, long periods of drought.

Stuart Yasgur: I sat down with the incredible Lori Moore-Merrell. She is the former United States Fire Administrator.

She helped me understand both the importance of assessing the risk of fire threat in your home and your community, and the many structural considerations like implementing certain regulatory codes that are vital to improving our risks from these variables. And finally, how we build our homes and our communities in safer ways.

Lori Moore-Merrell: So, my former role, I was the United States Fire Administrator. Now a lot of people don't know what that is or that we even have a fire administrator. So don't feel left out there. I encountered that quite often.

Lori Moore-Merrell: The Fire administration was created by a piece of legislation that came about in 1974. Now the legislation was called the Fire Prevention and Control Act, and that act was based on a report that was released in 1973 called the America Burning Report. And the America Burning Report was really put in place to document the fire, death and the impact of fire on the economy at the time.

Lori Moore-Merrell: It was recording up to 12,000 deaths from fire a year in this nation. And so, it led to this piece of legislation that really sought to change that. So, the legislation established United States Fire Administration with a mission to really attack the fire problem and the fire problem then from four different arenas.

Lori Moore-Merrell: If you ever see the US Fire Administration, maybe you can look it up and see the logo. It's an eagle with four stars above it, and the four stars are: for training, for research, for data, and for community risk reduction. And so those four stars are still as applicable today.

Lori Moore-Merrell: Here we are 50, 51 years later as they were back then. And so that was the mission and that still is today the mission of the US Fire Administration. And that's what I did within my tenure there as the US Fire Administrator. That just came to a close in January of this year.

Stuart Yasgur: It's so interesting to learn the history of it and where it's come from. When you say fire, I think people have very different pictures of what that means. Is this the fire that happens in my kitchen or is this the fire that happens in the woods? How do we think about that?

Lori Moore-Merrell: Oh, I love that question. We really have to put fire in context, don't we? So, is it the kitchen fire? Is it your house? Is it wildfire or is it lithium-ion battery fires? So, we really have fire in all arenas today and far too much of it.

Lori Moore-Merrell: Lithium-ion batteries. If you own a scooter, a hoverboard, any kind of micro mobility thing and you are charging it in your house, please don't if find a place outside to charge your products.

And certainly, if you're charging them don't get an aftermarket charger because typically if you go cheap. You are going to overheat those batteries and it's going to put them into something called thermal runaway. And once they're in thermal runaway, you may have about 20 seconds before you get a full explosion.

Lori Moore-Merrell: And depending on how fully charged that battery is, how big that explosion is going to be. If it's blocking a door because you're charging it in your laundry room, going out to the garage, guess what's going to happen? You're not getting out that door. If you're charging it in your bedroom next to your bed, you're not getting out of that room because that is, the 20 seconds is not enough time for you to escape if something is exploding.

Lori Moore-Merrell: So, this is our new environment. These are the products that we now have in our home. And if you're an EV driver, an electric vehicle driver, good, that's fantastic.

However, if you are using or plugged in an extension cord to charge your vehicle, please stop. Because these are the kinds of things and behaviors that are going to cause that battery to improperly charge potentially causing, again, a chemical reaction called a thermal runaway.

Lori Moore-Merrell: And once you do that, now it can ignite. Your car, not only your car in your garage, blow off the garage door. We've seen all kinds of videos like this that ignite your home. And so, these are the kinds of risks that we now have in our home that everyone must be alert because putting fire in these contexts matters.

Lori Moore-Merrell: And there's something to learn to really mitigate or manage your risk in each of these environments, depending on where you live.

Lori Moore-Merrell: And so, the problem is really resurging. And I've seen data recently that say, okay, the fire incidents are down, but the severity of the fires that happen are much worse. And so, we really must think about that. So, what is the context? It really is about your home.

Lori Moore-Merrell: The folks who die from fire die in their home. So almost 75% of the deaths that happen that are fire related are in your home. And so,

this tells us that we are having, issues today with how our construction what are our building materials? What are we bringing into the home that makes the fire so fast? You can't get out in time.

Lori Moore-Merrell: And so, you can just look at the news and you'll see that we're talking more and more about fast fire, so it is in the home, but we're also talking about wildfire. We just saw what we call a community conflagration that happened in January of this year. That was a wildfire-initiated community conflagration, and these are words we haven't used since the 1800s for talking about the great Chicago fire and the fire that happened in L.A.

Lori Moore-Merrell: The fuel from that fire was more of the structures themselves. The structures became the fuel that then fed the fire. And so, we saw this heavy fuel load and what happened with the disaster in January. So that's another context around fire. And then I mentioned lithium-ion batteries. Because we have this need for continued electrification, we have a need for it to be green, right?

Lori Moore-Merrell: We want to be energy efficient and try to reduce our carbon footprint, all of those things. So, lithium ions had a huge role in that. So we need that to be present, but we need it to be safe. And what we're learning is that lithium-ion battery packs, particularly if they've been damaged or put in water or for whatever reason they have, dents or overcharged, then they can go into runaway and they become the source of the fire and they bring their own fuel load.

I talked about the houses, it being a fuel load. This is a chemical reaction, and it brings its own energy. And so, these are very different fires and have fundamentally changed the way we are looking at fighting fire today, because you can't just extinguish those--the same way you do a burning couch or a burning home or other more organic materials. And so, we really have to put fire today in these three contexts and talk about it more openly because the risk to people from fire continue to escalate.

Stuart Yasgur: It's really interesting to hear and just the breadth of different contexts we're looking at and that you were looking at in one office. I think especially the fires that happened in January in Los Angeles, were so devastating and so shocking because of their speed, and the magnitude with which it happened.

Stuart Yasgur: There's a lot of concern about the existence of wildfire. But I think also helping us recognize the difference between wildfires, which may

need to exist because of a natural part of the system for wet wildlands to burn and to replenish.

Stuart Yasgur: And to separate that out from the risk from wildfires, which may be really affected by things that are under our control. Some of the things you already mentioned, the building materials, how we build, where we build, what we do in between the buildings, what we do between where we're building. And also, to help us recognize that when so many of us think about fire, we think about the rescue moment with the fire engines, the firefighters coming as opposed to the risk moment.

Stuart Yasgur: And how we make those choices will result in either a higher or lower risk. How do you start to think about the importance of risk as it relates to fire?

Lori Moore-Merrell: Oh my goodness. We literally over the past years, have built homes and communities right in the path of fire. And what I mean by that is. We have cleared lands that have historically burned and you mentioned that: fire, good fire.

Lori Moore-Merrell: There is good fire because good fire that was on the lands in the forest that helped perpetuate some of the vegetation, some of the trees, some of the vegetation depend on fire to perpetuate and with that kind of fire taken away because we've gone into full on suppression.

Lori Moore-Merrell: We suppress every fire, but some of that is because we've now cleared those fire prone lands and put communities there. Now, just because we cleared the trees doesn't mean that geography is any less fire prone, and that's where we've missed the mark because somehow people think that, “okay, now that community is safe and we don't have to build a code.”

Lori Moore-Merrell: There are things in science that we know we need to do. One of 'em is building codes. We have the science. It's unquestionable that we need to build a code if you're going to be in a hazard environment. And so, this land where we've built and we've allowed communities to be put in these places, not built to the code for fire.

Lori Moore-Merrell: And that means they've got combustible materials in there. Not just in their siding, but on their roof perhaps. They've got risks that are built in and combustibles around their home. And so, these things just can't be. And so, this is why I say we've increased our own risk. We continue to do that.

Lori Moore-Merrell: And what we need to do is to think forward in that we must now back out of this problem because we are not going to change that risk profile with new construction going forward. We've got enough existing construction or existing homes, existing businesses that are in trouble and they are in risk areas.

Lori Moore-Merrell: It's not a matter of if, it's a matter of when, and that's what was said about the Palisades. That's what was said about many of the communities in California and Colorado and New Mexico. It's not a matter of if it's when, because we have to think forward and get in front of fire.

We continue to talk about risk and we continue to talk about the fact that we don't have enough firefighters in this nation to stay in response mode. I can tell you that we'll go back to the Palisades in the Eaton fire. Those were the two biggest ones in California that where there was life lost and there were over 9,000 firefighters.

Lori Moore-Merrell: At the height there was over 11,000 firefighters fighting those fires. And that sounds astronomical. There are some states that don't have that many. And so when we see those forces that are out there and they're fighting and they're overwhelmed and outpaced by this fire, we know that something has changed, fundamentally changed.

Lori Moore-Merrell: And what else is happening that's changing the dynamic and that what else is the climate? We are watching fundamental shifts in climate. Extreme heat, long periods of drought, you might have some rain that causes some growth and vegetation, it greens up. But as soon as the drought hits all that lovely vegetation dries and it now becomes what we refer to as fast fuel, which means if there's an ignition, that's going to feed fire very quickly.

Lori Moore-Merrell: And so we need people to understand the difference in the area you live and the property that you have built, that you believe is an asset. But because of risk and unmitigated risk, right? Unmanaged risk, that very asset that you claim can become the fuel for peril. It can become the very fuel that takes it out and causes disaster. And so we really have to have the shift in our paradigm of how we think about risk, particularly in our own individual space, in our own homes.

Stuart Yasgur: And I think, you know, if you look at the frequency and the magnitude of these, especially the wildfires and that the impacts they're having and the effects that those have on people's lives the trends all suggest a common direction, right? This is getting much more severe. So the specter of the risk, I

think is real and visceral, I think it's also important for people to recognize, the possibilities for mitigation and the effect that really effective mitigation can have in decreasing that risk. Can you share a little bit about that so people can understand also the possibilities for taking action here?

Lori Moore-Merrell: Oh, absolutely. And that's what we want. It's not like there's no hope here uh, but hope's not a strategy, so we have to take action and so we really need people to take a look at their home, know where you live, first of all, and there are maps that you can find. The United States Fire Administration. We develop maps and you can go and just take a look for us. Fire Administration ember cast maps, or wildland urban interface, or WUI sometimes we say WUI maps, and you'll be able to actually put in your address and see if you live in an interface area.

Lori Moore-Merrell: Or if you live in an area that may have ember cast. Ember Cast became this new verbiage that we used to describe what happened in LA because it wasn't just the radiant fire spread from structure to structure. It was really this big embers from the structures that were burning, that were being cast in the wind 1, 2, 3 miles away and igniting other homes that far away.

Lori Moore-Merrell: The other thing I want people to think about is. What kind of building materials are your house made from? Is it combustible material? What do you have in your roof? What kind of roof do you have? Do you have vents that are covered up by some sort of metal mesh? So embers cannot get in through your exterior facing vents?

Lori Moore-Merrell: What about what's around your home within five feet, 10 feet? And maybe you've heard of Zone Zero that was in the news a lot after the California fires, and that's the first five feet around your home. And that is really to be non-combustible.

Lori Moore-Merrell: That's no garbage cans, no children's toys, no beautiful flower bushes no flowers and pots, anything like that can burn or ignite at a heat sufficient enough to ignite your home. So Zone Zero is the first five feet, no combustibles.

Lori Moore-Merrell: And then from there we go 10 feet and we start to talk more about wood sheds or outbuildings or wood fences. If you're in a fire prone land, those you cannot have those vegetation growing on your privacy fence. That is now dry because of the drought. These are exactly the kinds of fuel loads that we saw igniting structures throughout Los Angeles. So no mulch use

stone, right? Use some nice beautiful rocks not mulch around your home. So little things like that people can do that make a real difference.

Lori Moore-Merrell: And one of the other things that I would say to people to watch, if you live and discover you live in a fire prone land, watch and stay alert for red flag warnings. Don't take those for granted. If you hear your weather person say, red flag warning. Then it should mean something to you.

Lori Moore-Merrell: It means if you've got deck furniture that is combustible your beautiful wicker with the nice cushions, bring it in or put it in your garage. Because if there's an ignition that is now fuel and that fuel will ignite your home.

Stuart Yasgur: And I think one of the things you mentioned is also just the extent to which there's information available and I know that you played a real role in helping us create entirely new sources of that kind of information. Could you tell us about how far we've come, and what we should start to look at as we're looking at these kinds of questions?

Lori Moore-Merrell: Absolutely. So let's talk just a minute about the insurance space. If you want a home you're going to need insurance, particularly if you have a mortgage, right?

Lori Moore-Merrell: And so, we all want to have insurance, but the insurance market, because of all of these multi-billion-dollar disasters, is really under threat themselves. Rather than have them leave, we want to help make their risk calculations better.

Lori Moore-Merrell: Because if we can do that, then they know where they can ensure, and they know what the premiums will be, and they can do it accurately. Rather than having to play a guessing game perhaps or using the best model we have, how about us having the right model, not just the best we've got?

Lori Moore-Merrell: And so that's what we've been working on from my tenure, I started it and then it has continued on since I left office. But the fire risk index, now what is that? It is a risk calculation that can be applied to your home and for fire. It must not just be your home, but it's got to be to your neighbor's home. In fact, your community.

Lori Moore-Merrell: So, if you live in a cul-de-sac or if you live in a place where your home is near someone else's and you don't have a lot of great

structural separation, there's not a lot of space between your homes, then it must be applied to all of the homes because of the reasons we've already discussed.

Lori Moore-Merrell: Because your home has become the risk of the fuel that may ignite other homes. And so, this risk index would be applied and it would consider variables like your structural separation, like your roof materials, your siding materials people that live in the home. All of those things that apply risk to the equation.

Lori Moore-Merrell: And so today we are able to model and look at fire spread potential given the fuel load in the forest, right? If we just look at the wildland, we can model vegetation very well and tell you how the fire's gonna burn, we add wind to it, no problem. But for the built environment, once that fire hits the built environment, whether it's in the interface or if there's a grass fire like was in the Marshall Fire in Colorado in 2021 that just ignites the first structure.

Lori Moore-Merrell: Now we need to understand how this fire's going to move through the built environment. What does your home contribute for fuel load? What does your neighbor's home contribute for fuel load? What does the wind matter? How's it going to move between your home and your neighbor's? Where's it going to go? Where's it going to blow the embers?

Lori Moore-Merrell: And today we do not have a solid, robust index to show all of those variables and the weight. Because some of them will be more important than others.

Lori Moore-Merrell: We need to understand the weighting. So I can say to you, it is more important that you change your siding. If you can only afford to do something and not all of it, then change your siding, not your roof. Or I need to say you, you need to, change your roof. And do concrete around your home, but your siding should be okay if you do that right?

Lori Moore-Merrell: So we don't know what is the most important and how to rank that, and that's going to be. Absolutely vital going forward. And it's vital for the insurers to know, it's vital for us to help people help themselves. I don't know a lot of people that don't have limited resources, we have to make choices about the changes we can make in our home. Roofs are expensive, siding windows, oh my goodness. If windows show up to be like really, really important,

Lori Moore-Merrell: So this index will help us understand and better inform what changes you can make and the value of that change then applies to your risk. Index that will be used by your insurer then to adjust whether they can insure and what your premiums will be.

Lori Moore-Merrell: So this is not an easy proposition. Because we've not tracked over time building materials for homes. We've not enforced codes. We have not really applied the building codes that we know to apply in many communities because we've said, “okay, we can build faster and cheaper if we don't build a code.” And there are a lot of communities like that.

There's a lot of folks working on this, a lot of really bright people, but the lead on it right now is in the UL Fire Safety Research Institute, and they are working with the Department of Homeland Security, still science and technology to continue to work this problem. But there are a lot of other players at the table because that's how important this is.

Stuart Yasgur: That's remarkable. It boggles the mind to start to imagine all these different data sources being able to be put together. How do we just imagine that timescale wise? Is this the kind of problem we're going to be talking about in 10 years or is this the kindest thing that could be done within a few years’ time and that could be actionable?

Lori Moore-Merrell: So, I think there are a lot of dynamics at play. Yes, for individuals, we want to move them as quickly as possible, but as we've mentioned, not everybody's going to be able to afford to make these changes that they need to make. And so, there'll be a question of, can we apply some technology to their home?

Lori Moore-Merrell: Maybe it's just putting on exterior sprinklers or something else that can get wet down the property or are there other things that can be done or must we stay on the retrofit path to really change. So I think that's one, I think policy makers, whether it is a governor or whether, even mayors or city councils who have the power to put in place a code and hold fast to that code and enforce that code, that's going to matter. And we watched as Governor Newsom do that almost immediately following the Palisades fire. They implemented zone zero and that's, it's it. We need five feet non combustibles. And often you'll hear firefighters talk about defensible space.

Lori Moore-Merrell: That five feet is not only defensible space for them to get in and try to defend your home. So that's one way it's defensible, but it's also defensible that you may need it to be able to get out, right if the fire is

approaching and your homes already ignited. But we need decision makers, policy makers, to enforce, pass them, adopt them and then we need, I think the third piece of that is insurance. We really need the insurers to use their leverage to get action.

Lori Moore-Merrell: If you've got a mortgage, then we've got to figure out how to, harden your home is often what we say. Fire, adapt your home. We can do that. Your home can be fire adapted, and so then you can have insurance and what does that look like from a premium perspective?

Lori Moore-Merrell: And so, we need the insurers to first of all, leverage their capability to get action from individuals and then not walk away from the market, but actually apply insurance to the problem. And so, there's this whole dynamic that I think comes to play from individuals, policymakers, and the insurers.

Stuart Yasgur: And you named one in terms of what California's done in implementing Zone Zero and the transition to Zone Zero, are there other examples of success that people can look to?

Lori Moore-Merrell: Oh yeah, absolutely. We have a wildland urban interface, code WUI, I mentioned that earlier. WUI, if I say WUI, but that's where the built environment meets the forested areas, right? And so, we have a WUI code.

Lori Moore-Merrell: The International Code Council actually has this code, but only two states have adopted it. Go and have a look, if you will. Just look up Maryland, which is a little strange, I know.

And California, those are the two states that have adopted the WUI code. Now, adopting the code is one thing, as I said to you, and those are success stories. We have two states that have done that, and there's about 240 or so cities or municipalities that have done that in other states.

Lori Moore-Merrell: So, it can be done at a municipal level or a state level. But enforcing it is a different matter, right? We really need to have that authority and a lot of that authority was taken away from fire departments and given to building plan agencies or whatever within local government.

Lori Moore-Merrell: When the fire departments were responsible for that, then we had, from a fire perspective, a much more hands-on approach to code enforcement and some of that's gone by the wayside. I can tell you New York is

one of the best, though they still have their fire marshals, their codes enforcement is still in the fire department and it is very effective.

Lori Moore-Merrell: And we've seen some of that play out as a model around the lithium ion battery fire issue where they have reduced greatly the number of lithium ion battery fires they were having from micro mobility and they reduced from the death count they were having about to 18 a year, down to six.

Stuart Yasgur: Wow.

Lori Moore-Merrell: There's still work to be done, but their enforcement, their public education, these things work! We know they work. We watched it work back in the seventies when we were first putting in building codes and when we were talking about fire alarms, and we were talking about interior sprinklers, which are very important residential sprinklers, by the way. And that's in part of this code. So, these things work.

Stuart Yasgur: Building on that, when people see the problem, they start to understand the problem. What can they do? Where are the opportunities for action?

Lori Moore-Merrell: I want them to think in their home, first of all. If we talk about it, where we started that, most people die in their home and that applies to wildfire too. A lot of people who died did not evacuate. Maybe they weren't able to evacuate. you know.

There's a whole host of variables that could have surrounded the “why.” But we need to think about if you have a fire approaching, pay attention to the alerts and warnings and pay attention to any evacuation. It is not like you have time. If they have given an order, there is no time left. It's immediate. It's not like I got time to pack up.

Lori Moore-Merrell: No, you should be packed with a ready, set, go mindset and “ready set” is not after there's an ignition—"ready set” is right now. Get ready, have a go bag prepared set is once we have an ignition, right now, you've been alerted, okay, something's happening. And then go, time is go. It's not now. Oh, I got to go grab, my charger. No, go.

Lori Moore-Merrell: Especially if you're in a fire prone land, the other thing is to look around your home. I started by saying the frequency of fires have perhaps gone down, but the severity is much worse. So, when we have a fire, because of the contents on our homes, they are incredibly fast. The time for

firefighters to intervene, it used to be three, four. Minutes from the time that there was an ignition until you really started to see fire spread, because the fabrics that we had in our home were, heavy cottons.

Lori Moore-Merrell: You had heavy woods. These things don't burn fast, and so these organic materials now are gone and we've replaced them with synthetics, foams, lightweight plastics, and things that really burn fast. And so we've reduced that time for interaction, what we used to call fire spreading beyond the room of origin is how we would speak about that.

Lori Moore-Merrell: So, if your fire starts, from a cooking, situation, or it spreads to the drapes nearby or whatever, or if it's something that was thrown away, maybe a candle ignited a curtain wherever it started. Once it moves beyond that room. Then we would consider that whole room imploding or called a flashover. Okay? That's the terminology.

Lori Moore-Merrell: That means everything in that room ignited, and now it's going to spread beyond that room. Well, that's a dynamic that is significant for the fire service because the fire is now much more dangerous. Well, if things are burning faster, you're going to reach that flashover point faster, which means if you're in that room with the ignition, your time for escape is now much shorter.

Stuart Yasgur: You've given us a different set of lenses to look at our environment through, right? Like the same things that are our assets, our homes, the place we live, our community. Greenery outside that's close to our home's personal property, like our phones or our laptops or our cars, our mobility devices. They have their benefits, but also a different dimension of risk that we're used to associating with them.

Stuart Yasgur: And now as we start to see that clearly, it also points us to the specific actions we might need to take to mitigate that risk in each of those cases to be responsible in preventing the damage that may come from fire.

Lori Moore-Merrell: Absolutely. You know, and just understanding it is half the battle, isn't it? Awareness, understanding, and now action. And sometimes I'll say, it's knowledge, it's enlightenment, now action: KEA. And I think that those are the really the key steps around fire that everyone should be aware.

Stuart Yasgur: Thank you so much for joining us. I've learned a lot. I really appreciate your taking the time.

Lori Moore-Merrell: Well, thank you so much and thanks for the focus on this subject and everyone be fire safe.

Stuart Yasgur: As you heard in our conversation, Lori brings a hopeful and actionable approach towards the ways we can mitigate the potential damage from fire. One of the things that strikes me about the conversation with Lori is that she really underscores the point that while fire is inevitable, the risk from fire doesn't have to be.

Stuart Yasgur: And this prompts us to look at things through a new lens. It helps us see the risks that are around us, for example. That beautiful garden in the front of your house, the wooden fence, the electric car, all of these are assets in our lives.

Stuart Yasgur: But when we look at it through this lens, we can also see. That if we don't treat them properly, they can contribute to the risk of fire. They can become fuel for the fire.

Stuart Yasgur: At the same time, she also helps us maintain a focus on the fact that there are very concrete, actionable steps we can take that meaningfully reduce the risk from fire, and help protect our homes, making us all safer.