

Webinar

Resilient Retrofits

Date: May 13, 2022

00:00:02 --> 00:00:05: Hello welcome welcome. We're going to give everyone a few
 00:00:05 --> 00:00:08: minutes to join us here today to talk about resilient
 00:00:08 --> 00:00:12: retrofits in our existing buildings and physical climate risk.
 00:00:14 --> 00:00:16: My name is Clay Haynes, I am the founder of
 00:00:16 --> 00:00:21: public square and adaptive reuse real estate development
 00:00:21 --> 00:00:24: company based
 00:00:21 --> 00:00:24: in Nashville, TN. It's my honor to be your moderator
 00:00:24 --> 00:00:24: today.
 00:00:26 --> 00:00:29: So why are we here? The built environment that we
 00:00:29 --> 00:00:33: see today will represent 2/3 of the building stock in
 00:00:33 --> 00:00:37: 2040. Extreme weather events are becoming increasingly
 00:00:37 --> 00:00:41: common and most
 00:00:37 --> 00:00:41: buildings are not prepared for the risks that they face
 00:00:41 --> 00:00:45: here in Nashville. We've had multiple flood events,
 00:00:45 --> 00:00:49: tornadoes, and
 00:00:45 --> 00:00:49: each summer we deal with rising extreme heat. A number
 00:00:49 --> 00:00:54: of challenges exist for retrofitting buildings for climate
 00:00:54 --> 00:00:56: change, including
 00:00:54 --> 00:00:56: design complexity cost.
 00:00:56 --> 00:00:58: Policy and social equity.
 00:01:00 --> 00:01:04: A resilient retrofits report was published earlier this month to
 00:01:04 --> 00:01:08: help us begin to address the necessary climate upgrades for
 00:01:08 --> 00:01:12: existing buildings. This in-depth 55 page report draws upon
 00:01:12 --> 00:01:16: the
 00:01:12 --> 00:01:16: work of the UI resilient land use cohort and technical
 00:01:16 --> 00:01:21: assistance panels in New York, Nashville, and Houston. It
 00:01:21 --> 00:01:25: communicates
 00:01:21 --> 00:01:25: the design, financing and policy strategies that we can use
 00:01:25 --> 00:01:29: to prepare buildings for the physical climate risks we face.
 00:01:30 --> 00:01:33: So thanks for joining us. I'm honored to introduce our

00:01:33 --> 00:01:34: All Star panel.

00:01:36 --> 00:01:41: Starting with Danielle Horton, founder and CEO of Verdina Partners,

00:01:41 --> 00:01:44: she is an architect, LEED Fellow and has two decades

00:01:45 --> 00:01:47: of experience in corporate sustainability.

00:01:48 --> 00:01:53: Next is Ibi amonti. He's a structural engineer and leads.

00:01:54 --> 00:01:57: The risk and resilience team are which has offices in

00:01:57 --> 00:02:00: more than 30 countries around the world and then finally

00:02:00 --> 00:02:04: Mary Witucki is a regional outreach and program lead for

00:02:04 --> 00:02:08: FEMA where she facilitates mitigation and community engagement planning.

00:02:09 --> 00:02:13: A few housekeeping items before we get started, we've allotted

00:02:13 --> 00:02:16: about 1/2 hour for the panelists presentations and then the

00:02:16 --> 00:02:19: remainder of the program for panel discussion. If you have

00:02:19 --> 00:02:22: any questions for the panelists, please use the chat Q&A

00:02:22 --> 00:02:25: function to send those our way. We'd love to have

00:02:25 --> 00:02:28: those. Also, a link to this report, as well as

00:02:28 --> 00:02:31: a recording of today's presentation will be emailed to everyone

00:02:31 --> 00:02:33: who's registered for today's event.

00:02:34 --> 00:02:38: So with that I will hand it off to Danielle,

00:02:38 --> 00:02:40: our first fantastic speaker.

00:02:41 --> 00:02:42: Thank you, Danielle.

00:02:42 --> 00:02:45: Thank you so much, glaze, an honor to be here

00:02:45 --> 00:02:47: today. So I think as we saw from some of

00:02:47 --> 00:02:50: placemarks you know climate risks and extreme weather events are

00:02:50 --> 00:02:53: here. You know this is not a future thing, this

00:02:53 --> 00:02:56: is something that's affecting us right now. You know a

00:02:56 --> 00:02:59: lot of this information about climate risks are going to

00:02:59 --> 00:03:02: become more and more transparent and it's going to continue.

00:03:02 --> 00:03:05: You know it's going to. It's already having an increasing

00:03:05 --> 00:03:08: pact on building values. It's going to become a competitive

00:03:08 --> 00:03:11: advantage, and so it's really important that as we understand

00:03:11 --> 00:03:13: those risks that we take.

00:03:13 --> 00:03:16: Steps right to mitigate those risks and retrofit our our

00:03:16 --> 00:03:19: properties to be more resilient so at the same time

00:03:19 --> 00:03:22: that we need to focus on, you know, climate change

00:03:22 --> 00:03:25: mitigation in terms of like working on efforts to reduce

00:03:25 --> 00:03:28: emissions that cause climate change, we need to take action

00:03:28 --> 00:03:32: to manage the risks of climate, the climate changing paths

00:03:32 --> 00:03:36: from an adaptation perspective. You know, climate risks are investment

00:03:36 --> 00:03:39: risks and it's really important that we take steps to

00:03:39 --> 00:03:41: to address them. We can go to the next slide.

00:03:43 --> 00:03:46: So when you think about a resiliency program road map,

00:03:46 --> 00:03:50: we verdani partners, we implement residency program for for large

00:03:50 --> 00:03:53: real estate portfolios where working on like over almost 5000

00:03:53 --> 00:03:57: properties nationally and internationally. And when you think about the

00:03:57 --> 00:04:01: steps that have to happen before you actually start implementing

00:04:01 --> 00:04:05: those resiliency strategies, typically on year one, you're looking at

00:04:05 --> 00:04:09: your goals strategies, who is responsible and budgeting to actually

00:04:09 --> 00:04:12: perform those risk assessments. Then year two. You typically will

00:04:12 --> 00:04:13: perform.

00:04:13 --> 00:04:16: Those settlements you understand risks and then then you identify

00:04:17 --> 00:04:19: a high risk properties. Those are the ones where you

00:04:19 --> 00:04:22: might do a deeper level of assessment on site where

00:04:22 --> 00:04:26: you're going to like really identify those risks, and then

00:04:26 --> 00:04:29: you budget like evaluate those things and then you are

00:04:29 --> 00:04:31: going to budget to be able to invest in those

00:04:31 --> 00:04:34: certification strategies, right? So when you look at like by

00:04:35 --> 00:04:37: the you know to even get to the retrofit process

00:04:37 --> 00:04:40: like in my take like three or four years so

00:04:40 --> 00:04:43: not that this can't happen faster, but typically this is

00:04:43 --> 00:04:45: what we're seeing in the real estate sector.

00:04:45 --> 00:04:48: And so after that you know like to actually implement

00:04:48 --> 00:04:52: those strategies and then do public private partnerships. Because it's

00:04:52 --> 00:04:55: not just about protecting your property, you have to look

00:04:55 --> 00:04:58: at the entire region protecting the entire region next.

00:05:00 --> 00:05:03: So when you think about some of the key categories

00:05:03 --> 00:05:06: for, you know addressing resiliency risks you know according to

00:05:06 --> 00:05:10: grasp and the task force for climate related filing financial

00:05:10 --> 00:05:14: disclosures. CFD, there's some of the key categories include physical

00:05:14 --> 00:05:17: social transition risk. So physical risk when you're looking at

00:05:17 --> 00:05:21: reducing disruptions to building operations right from other events. But

00:05:21 --> 00:05:24: then you have to think about not only protecting property,
00:05:25 --> 00:05:28: but protecting people. So the social risks you know, like
00:05:28 --> 00:05:30: we have to think about protecting buildings.
00:05:30 --> 00:05:34: An occupant health and then transition risks. So when you
00:05:34 --> 00:05:37: think about like our efforts to decarbonize right to food,
00:05:37 --> 00:05:41: transition away from fossil fuels. If your buildings are heavily
00:05:41 --> 00:05:44: reliant on natural gas, that's a transition risks. So it's
00:05:44 --> 00:05:49: really important to understand the physical, social and
transition risks
00:05:49 --> 00:05:49: next.
00:05:51 --> 00:05:54: And so when we think about a strategic approach to
00:05:54 --> 00:05:58: implementing every single program, when you're thinking
about assessing risk
00:05:58 --> 00:06:01: and vulnerability, you have to do that at the entire
00:06:01 --> 00:06:05: lifecycle, including your existing assets. You know from new
acquisitions,
00:06:05 --> 00:06:08: new developments and lower Asian nation. So the equity and
00:06:09 --> 00:06:12: the debt side you know budgeting should perform those
assessments.
00:06:12 --> 00:06:15: Making a plan so like we implement resiliency plans that
00:06:15 --> 00:06:19: has goals and targets. And what are these different mitigation
00:06:19 --> 00:06:21: strategies for different types of risks, right?
00:06:21 --> 00:06:25: Incorporating those that process into the annual budgets,
updating your
00:06:25 --> 00:06:29: emergency level plans, checking that you have proper
insurance coverage,
00:06:29 --> 00:06:33: and then you know implementing those strategies, educating
stakeholders and
00:06:34 --> 00:06:37: emergency preparedness, reporting on your progress is
going to be
00:06:37 --> 00:06:41: more and more requirements for transparency. Once you
understand those
00:06:41 --> 00:06:44: risks that you also like disclosed them, and then you
00:06:44 --> 00:06:48: know once you implement those, hopefully negotiating lower
insurance rates,
00:06:48 --> 00:06:49: it can go next.
00:06:50 --> 00:06:53: So when you're looking at that the planning side, you
00:06:53 --> 00:06:56: know you'll have to look at, you know, protecting building
00:06:56 --> 00:07:00: sites, structure systems, operations, and people like flood
proofing your
00:07:00 --> 00:07:04: building and enhancing structural elements. I mean, when is
actually
00:07:04 --> 00:07:07: when we we calculate like OK, where are the most
00:07:07 --> 00:07:10: climate risks coming from and when is actually where we

00:07:10 --> 00:07:12: get the most damages. When you think about you, know
00:07:12 --> 00:07:16: your backup systems like before, you're thinking about 24
hours,
00:07:16 --> 00:07:18: but now you have to be thinking about two weeks,
00:07:18 --> 00:07:21: right? If there's a major event that like.
00:07:21 --> 00:07:24: Would be great, goes down and then obviously like
enhancing
00:07:24 --> 00:07:28: operational friends, emergency planning and locating your
vulnerable populations to
00:07:28 --> 00:07:31: make sure that they are also protected. You can go
00:07:31 --> 00:07:32: to the next.
00:07:34 --> 00:07:37: So there's a lot of like top resiliency level solutions,
00:07:37 --> 00:07:41: right? These are some of the things that you would
00:07:41 --> 00:07:44: when you're looking at doing a resiliency retrofit that you
00:07:44 --> 00:07:48: would do to kind of implement those strategies so from
00:07:48 --> 00:07:52: likewise you mentioned flood proofing your building, like
where do
00:07:52 --> 00:07:56: you have temporary flood barriers? Or like by elevating your
00:07:56 --> 00:08:01: equipment to high ground, enhancing your structural
elements because the
00:08:01 --> 00:08:04: events are getting more stronger, like integrating.
00:08:04 --> 00:08:07: Hazard resilient landscape design. So there's a lot of
different
00:08:07 --> 00:08:08: strategies you can go to the next one.
00:08:10 --> 00:08:14: So when you think about public private partnerships, right?
Because
00:08:14 --> 00:08:17: if you even if you protect your building or elevated
00:08:17 --> 00:08:21: mechanical systems, if the entire region gets flooded, you're
still.
00:08:21 --> 00:08:24: That's still gonna be a problem. So I think we
00:08:24 --> 00:08:26: need to see a lot more cities that are in
00:08:26 --> 00:08:30: coastal areas doing these initiatives, but it's great to see
00:08:30 --> 00:08:33: places like New York with the Dryline project or Boston
00:08:33 --> 00:08:36: that has Boston ready program Hoboken. You can see, like
00:08:36 --> 00:08:39: you know on the map like before and after they
00:08:39 --> 00:08:41: implement some of the original.
00:08:41 --> 00:08:44: Kind of some of the regional strategies to protect the
00:08:44 --> 00:08:47: whole region, so it's really important that you do, and
00:08:47 --> 00:08:50: you're going to have to work together. Private and public
00:08:50 --> 00:08:53: sector. You can go to the next one, so this
00:08:53 --> 00:08:56: is just an example, right even after you do implement
00:08:56 --> 00:09:00: those strategies like elevating your mechanical systems and
protecting, you
00:09:00 --> 00:09:02: know at the property level you also need to work

00:09:03 --> 00:09:06: on public private partnerships to protect the entire region as
00:09:06 --> 00:09:06: well.
00:09:08 --> 00:09:09: You can go to the next one.
00:09:11 --> 00:09:14: So just an example of like seeing this in action
00:09:14 --> 00:09:17: as a case study. So for one of our clients
00:09:17 --> 00:09:20: we have. You know we have done their risk assessments
00:09:20 --> 00:09:24: and we identify that some of their properties, for example
00:09:24 --> 00:09:27: in in Houston, were, you know, a high risk for
00:09:27 --> 00:09:31: flood. So we did install like flood barriers we had
00:09:31 --> 00:09:35: dewatering pumps on site. So when Hurricane Harvey hit, the
00:09:35 --> 00:09:39: region suffered \$125 billion in damages and because we had
00:09:39 --> 00:09:41: staked we had taken steps to be prepared.
00:09:42 --> 00:09:44: To implement those risks, we had zero insurance claims, so
00:09:44 --> 00:09:46: I think you know it makes a lot of sense.
00:09:46 --> 00:09:49: Can you imagine how much money right to deal with
00:09:49 --> 00:09:51: the hassles of like dealing with mold and all the
00:09:51 --> 00:09:54: issues that come with like flood or these risks? So
00:09:54 --> 00:09:57: it's really important to take steps and you should be
00:09:57 --> 00:09:59: able to negotiate lower insurance claims when you save. My
00:09:59 --> 00:10:02: building is high resilience and it's ready. You can go
00:10:02 --> 00:10:03: to the next one.
00:10:05 --> 00:10:07: So another sample. This is like one of our one
00:10:07 --> 00:10:10: of our clients buildings in Boston. As you can see
00:10:10 --> 00:10:13: they had their surrounded by water and three sides, so
00:10:14 --> 00:10:17: they're high risk for flooding, so they obviously identify that
00:10:17 --> 00:10:20: that was a risk. One of the things that they
00:10:20 --> 00:10:23: did that as a mitigation strategy for flood was they
00:10:23 --> 00:10:27: installed as like aquafest a flood wall, and these systems
00:10:27 --> 00:10:30: can be quickly deployed so they train the building staff
00:10:30 --> 00:10:33: to be able like they can deploy the rapid deployment.
00:10:33 --> 00:10:35: They can deploy this and like.
00:10:35 --> 00:10:38: Within 8 hours of a pending flooding event so they
00:10:38 --> 00:10:41: trained the entire staff to do that and it blocks
00:10:41 --> 00:10:44: not only water but the breeze, so they're very effective,
00:10:44 --> 00:10:47: so like you do a emergency training and these can
00:10:47 --> 00:10:49: go up to 9 feet. Or in our case we
00:10:49 --> 00:10:52: just needed a four feet one, but you can see
00:10:52 --> 00:10:55: there's there's solutions that can be easily deployed and we
00:10:55 --> 00:10:57: can go to the next slide.
00:10:59 --> 00:11:02: So you know these are solutions for the commercial sector,
00:11:02 --> 00:11:05: but when you think about like you know, you're ohh
00:11:05 --> 00:11:08: our own homes as well. There are systems like 45

00:11:08 --> 00:11:13: homes, 45 rooms. Is that nationally recognized residency building methods?

00:11:13 --> 00:11:16: So they basically you know it's a different strategies or

00:11:16 --> 00:11:20: certifications to ensure like for home safety. So like they

00:11:20 --> 00:11:24: they basically have there's different things that you can do

00:11:24 --> 00:11:27: to kind of fortify and reinforce their home against wind

00:11:27 --> 00:11:30: damage and tornadoes. And so like, they're.

00:11:30 --> 00:11:33: Their standards range from zero to 3% of a hard

00:11:33 --> 00:11:37: cost, and retrofit generally costs 18 to \$0.24 per square

00:11:37 --> 00:11:41: foot. So for example, like in Mississippi cost like 3

00:11:41 --> 00:11:44: to 5000, more per like you know less than 2000

00:11:45 --> 00:11:48: square feet home to to build to 45 gold and

00:11:48 --> 00:11:51: they and also like The thing is they they see

00:11:51 --> 00:11:54: an increase in resale value and in and they can

00:11:54 --> 00:11:59: actually qualify for lower insurance rates. So hopefully we'll see

00:11:59 --> 00:12:00: those.

00:12:00 --> 00:12:03: Kinds of things happen on the commercial sector as well,

00:12:03 --> 00:12:06: where if you implement those strategies, you should see higher

00:12:06 --> 00:12:09: value and lower insurance premiums as well. You can go

00:12:09 --> 00:12:10: to the next slide.

00:12:11 --> 00:12:14: So like to wrap up, I think I sing as

00:12:14 --> 00:12:17: we saw from those case studies and those examples you

00:12:17 --> 00:12:22: know for every dollar invested in climate resiliency infrastructure, \$6

00:12:22 --> 00:12:24: or saved. This is for the.

00:12:25 --> 00:12:28: And also the estimated cost of meeting the toughest 1.5

00:12:28 --> 00:12:32: degrees climate target is about point \$5 trillion over the

00:12:32 --> 00:12:35: next 30 years. But it will save the world \$30

00:12:35 --> 00:12:38: trillion in damages. So like it makes a lot of

00:12:38 --> 00:12:42: sense that we understand those risks and we take steps

00:12:42 --> 00:12:45: to address them because the cost of inaction is going

00:12:45 --> 00:12:48: to be a lot higher. So it's really important that

00:12:48 --> 00:12:52: we actually take action investing strategies to, you know, to

00:12:53 --> 00:12:54: to prepare and be resilient.

00:12:54 --> 00:12:58: Against those climate risks, I thank you now. I'll pass

00:12:58 --> 00:12:59: it on to Evie.

00:13:00 --> 00:13:03: Thank you Danielle so much and and that's a great

00:13:03 --> 00:13:05: segue to what I'm gonna be talking about in the

00:13:05 --> 00:13:08: next 10 minutes. Just really, the the focus will be

00:13:08 --> 00:13:11: on the business case for resilience and that cost benefit

00:13:11 --> 00:13:15: that Danielle just mentioned. So when organizations

approach us, they're typically asking a number of questions. Here's a select few that we get. Which hazards should I be concerned with and how do we measure their impacts on my assets, people and business? Which physical and operational innovation should my organization and prioritize, and how do I make a business case? We're investing in resilience. So we typically go through a road map to resilience with these organizations, not dissimilar to what Danielle just described. So we start with evaluation of the baseline risk and this could be a qualitative assessment for screening purposes all the way to deep dives and detailed modeling, which I'll describe in a few slides from that. Those insights we can develop resilience strategies. These might be physical interventions or operational measures, and and really, looking at a holistic approach to resilience, including. Organizational resilience actions. The next step on the road map is to develop priorities and areas for investments and this is where the benefit costs analysis comes in that I'll describe in detail in the remaining slides and then finally we can help with implementation, which includes retrofit design, resilience based design for new buildings as well as development of real estate frameworks that guide decision making. So what is risk? I'm just going to drill down a bit more here, so risk is really the likelihood or probability of something bad happening and they can be described in terms of things like downtime and loss revenues. It could be described in terms of damage and repair costs to health and Wellness and well being as well. There are the way to calculate risk is looking at these three different components. An integration of hazard exposure and vulnerability where the hazard is how likely is the hazard event to occur. Could be a hurricane for example. And what is the intensity? So the intensity for a hurricane

00:15:07 --> 00:15:10: would be measured in terms of wind speed, or it
00:15:10 --> 00:15:13: could be measured in terms of precipitation as well that
00:15:13 --> 00:15:17: causes flooding. Exposure is what are the quantities,
locations and
00:15:18 --> 00:15:19: values of exposed.
00:15:19 --> 00:15:23: Assets and people and then finally vulnerability is how
damageable
00:15:23 --> 00:15:26: are those exposed assets and how vulnerable are the
people.
00:15:26 --> 00:15:29: And so integrating all those together gets you to risk.
00:15:29 --> 00:15:32: And I should say that in some cases some of
00:15:32 --> 00:15:35: the climate vendors and data providers that are in the
00:15:35 --> 00:15:38: market right now are really only looking at hazard and
00:15:38 --> 00:15:42: maybe exposure, but not really blending in the vulnerability
piece
00:15:42 --> 00:15:45: and the vulnerability piece is key if you want to
00:15:45 --> 00:15:49: understand how to retrofit these buildings to reduce their
risks.
00:15:51 --> 00:15:54: So I'm gonna kind of share with you a way
00:15:54 --> 00:15:57: that we look at risk assessment. There's different levels as
00:15:57 --> 00:16:00: I mentioned before, all the way from high level screening
00:16:00 --> 00:16:03: assessment on the left side, which is what we're calling
00:16:03 --> 00:16:06: a class one risk assessment. This is something that Arabs
00:16:07 --> 00:16:10: developed to help our clients understand what they're getting
from
00:16:10 --> 00:16:13: the different levels of risk assessment all the way to
00:16:13 --> 00:16:16: class 3/4 on the right side, which is fairly sophisticated
00:16:16 --> 00:16:21: simulations, probabilistic simulations that are virtually
simulating how a natural.
00:16:21 --> 00:16:24: Hazard event may impact not only a building but the
00:16:24 --> 00:16:28: components within or outside of a building and the the
00:16:28 --> 00:16:31: class three and four risk assessment are really key in
00:16:31 --> 00:16:36: understanding and providing insights on what are the specific
components
00:16:36 --> 00:16:39: that might need to be mitigated in a retrofit. So
00:16:39 --> 00:16:42: when we get into which buildings do you need to
00:16:42 --> 00:16:45: retrofit and how it's really getting into the detailed modeling
00:16:46 --> 00:16:48: that unlocks a lot of those insights.
00:16:49 --> 00:16:50: Next slide.
00:16:51 --> 00:16:54: So I'm going to describe how we use the insights
00:16:54 --> 00:16:56: from a A class three and four risk model in
00:16:56 --> 00:17:00: a cost benefit analysis to help answer that business case.
00:17:00 --> 00:17:02: And this is really the monetary part of a business
00:17:02 --> 00:17:06: case. It doesn't bring in things like marketability or reputation

00:17:06 --> 00:17:09: or anything like that, but this is really the dollars
00:17:09 --> 00:17:11: and cents part of it. Next slide. OK, so I'm
00:17:12 --> 00:17:14: going to walk through a framework, so for let's say
00:17:14 --> 00:17:18: you have an existing building and you've decided that you
00:17:18 --> 00:17:20: want to understand if there's a business case to make
00:17:21 --> 00:17:21: a retrofit.
00:17:21 --> 00:17:25: For that particular building, so you're collecting data on the
00:17:25 --> 00:17:29: hazard, the exposure, and the current vulnerability of that
00:17:29 --> 00:17:32: building,
00:17:29 --> 00:17:32: you're building a risk model. You're running some
00:17:33 --> 00:17:37: calculations. Next
00:17:33 --> 00:17:37: slide, and these probabilistic simulations provide insight into
00:17:37 --> 00:17:41: what are
00:17:37 --> 00:17:41: the specific vulnerabilities in a particular building and the
00:17:41 --> 00:17:44: deficiencies,
00:17:41 --> 00:17:44: and then what are the probabilistic losses. So, for example,
00:17:44 --> 00:17:47: what is the likelihood and duration of downtime in this
00:17:47 --> 00:17:51: building? What is the damage looking like in this building
00:17:51 --> 00:17:52: for this particular?
00:17:52 --> 00:17:53: Existing case next slide.
00:17:55 --> 00:17:57: So that's going to inform your retrofit designs so we
00:17:58 --> 00:18:00: can understand from this type of analysis that it's the
00:18:01 --> 00:18:03: facade system that's getting damaged by the wind or it's
00:18:04 --> 00:18:06: components on the roof that are getting damaged by wind
00:18:07 --> 00:18:10: or for flooding. Maybe it's the equipment and the external
00:18:10 --> 00:18:12: yards that are getting damaged so we can use that
00:18:12 --> 00:18:15: to inform various levels of retrofit next slide.
00:18:16 --> 00:18:19: And so you might actually have different options that you're
00:18:20 --> 00:18:23: investigating for those retrofits, something like a light touch,
00:18:23 --> 00:18:26: an
00:18:23 --> 00:18:26: option one all the way through to full renewal of
00:18:26 --> 00:18:28: a building, because it's not just you might not be
00:18:28 --> 00:18:31: just retrofitting a building to address the the risk from
00:18:31 --> 00:18:35: physical hazards. It might be there's deferred maintenance
00:18:35 --> 00:18:37: that's building
00:18:35 --> 00:18:37: up over time, so we're looking at a number of
00:18:37 --> 00:18:41: different options. All of those have different levels of scope,
00:18:41 --> 00:18:44: including increasing amount of investment for each one of
00:18:44 --> 00:18:46: those,
00:18:44 --> 00:18:46: and schedule implications as well.
00:18:47 --> 00:18:50: Next, slide, so each of those retrofit options actually change
00:18:50 --> 00:18:53: the vulnerability I I've mentioned before, the vulnerability is
00:18:53 --> 00:18:57: key
00:18:53 --> 00:18:57: here. It actually improves the vulnerability or decreases the

vulnerability

00:18:57 --> 00:19:01: because we're making retrofits to address the concerns that we

00:19:01 --> 00:19:04: had identified. So now you're bringing that information into the

00:19:04 --> 00:19:07: risk model again. Now you've got a risk model for

00:19:07 --> 00:19:10: the retrofitted building for each of those options, and you're

00:19:10 --> 00:19:13: running through the calculations again, and now you have a

00:19:13 --> 00:19:17: new probabilistic risk assessment, so this should show decrease.

00:19:17 --> 00:19:20: About time, for example, or decreased losses for each of

00:19:20 --> 00:19:21: those options. Next slide.

00:19:23 --> 00:19:26: And so when we reassess those risks, like I said,

00:19:26 --> 00:19:29: we get the reduced risk the retrofit designs themselves also

00:19:29 --> 00:19:31: provide an asset life extension.

00:19:32 --> 00:19:36: Again, the different options might give you different life extensions,

00:19:36 --> 00:19:39: so a full renewal would extend the building life much

00:19:39 --> 00:19:42: longer than maybe a single targeted retrofit, and each of

00:19:42 --> 00:19:45: those also have different impacts as far as phasing and

00:19:45 --> 00:19:48: scheduling. So now we have both the retrofit impacts for

00:19:48 --> 00:19:50: each one of those options we have the retrofit scope,

00:19:51 --> 00:19:53: the dollars and cents, and the scheduling, and we can

00:19:53 --> 00:19:56: put that into a cost benefit engine, which is the

00:19:56 --> 00:19:57: next slide.

00:19:58 --> 00:20:03: And that cost benefit analysis Engine lets us run probabilistic

00:20:03 --> 00:20:08: calculations that provide us benefit cost ratios and payback periods

00:20:08 --> 00:20:12: for each of those options and gives us the residual

00:20:12 --> 00:20:16: risk. So each of those retrofit options result in a

00:20:16 --> 00:20:21: lower risk than the current building has, and then weighing

00:20:21 --> 00:20:25: all that information. We can use that to develop a

00:20:25 --> 00:20:28: prioritization strategy for each building.

00:20:28 --> 00:20:31: Among the options and then across the portfolio, you can

00:20:31 --> 00:20:35: be running this across multiple buildings at once, and typically

00:20:35 --> 00:20:38: we we would start to invest in the ones that

00:20:38 --> 00:20:42: come out with the highest benefit cost ratios and lowest

00:20:42 --> 00:20:43: payback periods.

00:20:44 --> 00:20:44: Next slide.

00:20:46 --> 00:20:50: And so we've developed something called a retrofit or resilience

00:20:50 --> 00:20:54: payback calculator that does these calculations and kind of demonstrates

00:20:54 --> 00:20:57: what these payback periods look like. And when we turn
00:20:57 --> 00:21:00: the knobs on, the different factors that go into it
00:21:00 --> 00:21:03: kind of gives organizations an understanding of what.
00:21:05 --> 00:21:07: You know what they can tweak to help understand the
00:21:07 --> 00:21:08: benefit cost.
00:21:09 --> 00:21:11: And if I have time, I'll show you the live
00:21:11 --> 00:21:14: demo. If not, I can do it. Maybe during the
00:21:14 --> 00:21:17: Q&A and then finally this is my last slide we've
00:21:17 --> 00:21:22: developed using the information from cost benefit analysis
and other
00:21:22 --> 00:21:26: risk metrics, we've developed decision making guidelines for
real estate,
00:21:26 --> 00:21:30: so this is an example from the University of British
00:21:30 --> 00:21:34: Columbia in Vancouver where we've developed a real estate
framework
00:21:34 --> 00:21:38: that guides their decision making on new buildings and
triggers
00:21:38 --> 00:21:39: for building.
00:21:39 --> 00:21:43: Retrofit, which is informed by those cost benefit factors and
00:21:43 --> 00:21:48: other risk metrics. And then we've also developed resilience
based
00:21:48 --> 00:21:53: design guidelines for new construction and retrofits and
renewals that
00:21:53 --> 00:21:57: engineers, designers and the owner can implement to
achieve the
00:21:57 --> 00:22:02: criteria and the levels of resilience that they're looking for
00:22:02 --> 00:22:03: in their buildings.
00:22:05 --> 00:22:10: OK so I'm I think I can do the.
00:22:11 --> 00:22:16: The live demo real quick let me share screen.
00:22:19 --> 00:22:21: I'll do this really quickly and hopefully everyone can see
00:22:21 --> 00:22:22: my screen.
00:22:25 --> 00:22:28: And so I'm just going to go through this really
00:22:28 --> 00:22:31: quickly. So basically this is this is an example for
00:22:31 --> 00:22:35: a building that has earthquake hazard, but we can swap
00:22:35 --> 00:22:38: in any type of hazard that we're interested in, so
00:22:38 --> 00:22:43: the hazard changes across different locations. What you're
seeing here
00:22:43 --> 00:22:47: on the right is the resilience payback calculation. So this
00:22:47 --> 00:22:49: is the number of years that the asset is in
00:22:50 --> 00:22:53: service on the bottom. This is the investment in dollars,
00:22:53 --> 00:22:54: so the.
00:22:55 --> 00:22:58: The the Gray line right here is a standard or
00:22:58 --> 00:23:03: existing building and then the pink line is representative of
00:23:03 --> 00:23:07: the building that's been retrofitted, so the difference here in

00:23:07 --> 00:23:11: year one, this investment of \$4 million is how much
00:23:11 --> 00:23:15: you're investing in the retrofit. OK, and then the the
00:23:15 --> 00:23:19: basically the curve of the line is showing the annualized
00:23:19 --> 00:23:23: losses over time, and so for the existing building that
00:23:23 --> 00:23:24: is more vulnerable.
00:23:25 --> 00:23:26: Over time it is.
00:23:27 --> 00:23:30: It is basically getting more and more losses and the
00:23:30 --> 00:23:33: reason it's bent over and not just adding like an
00:23:33 --> 00:23:36: A linear line is that there's basically a net present
00:23:36 --> 00:23:38: value of the dollar. So a dollar you know in
00:23:38 --> 00:23:41: the future is not worth as much as a dollar
00:23:41 --> 00:23:41: today.
00:23:42 --> 00:23:45: And the way the reason the pink line is more
00:23:45 --> 00:23:49: shallow is because it is avoiding the losses that the
00:23:49 --> 00:23:53: standard building is seeing. And when those two lines cross,
00:23:53 --> 00:23:56: that is the payback. So in this case it's six
00:23:56 --> 00:23:59: years for that investment of \$4 million, and the benefit
00:23:59 --> 00:24:03: cost ratio is this value divided by this value at
00:24:03 --> 00:24:05: the end of the asset life. And so the way
00:24:05 --> 00:24:09: these things change over time is I can change things
00:24:09 --> 00:24:12: like what's the cost of downtime. So for my building.
00:24:12 --> 00:24:16: If it's really significant, than you know might have a
00:24:16 --> 00:24:19: lab building or something like that. Then the payback.
Actually
00:24:20 --> 00:24:23: goes down to three years. And then here's the asset
00:24:23 --> 00:24:25: life. So as I go to higher asset life, so
00:24:25 --> 00:24:29: if that retrofit really extends the asset life, you can
00:24:29 --> 00:24:32: see the benefit cost ratio goes up quite a bit.
00:24:34 --> 00:24:38: Here's the resilience premium. This is the retrofit cost, so
00:24:39 --> 00:24:42: if I spend, let's say, too much of my retrofit,
00:24:42 --> 00:24:45: and my asset life is only extended by.
00:24:46 --> 00:24:49: You know a certain amount and my discount rate. This
00:24:49 --> 00:24:51: is a financial measure is.
00:24:52 --> 00:24:53: High.
00:24:54 --> 00:24:56: So I can get whoops, I can get.
00:24:57 --> 00:25:01: More money from investing in something else than the
payback.
00:25:01 --> 00:25:04: Goes down, and at some point you might not even
00:25:04 --> 00:25:07: have a a positive benefit cost ratio. So this is
00:25:07 --> 00:25:10: just showing all the knobs you can turn and kind
00:25:10 --> 00:25:13: of shows what goes into these types of assessments. So
00:25:13 --> 00:25:16: I'll stop sharing my screen and I'm gonna hand it

00:25:16 --> 00:25:17: off to Mary.

00:25:22 --> 00:25:25: Hi thank you Abby. My name is Mary Witucki and

00:25:25 --> 00:25:29: I'm the community education and outreach program lead for the

00:25:29 --> 00:25:34: FEMA Region 9 mitigation Division I helped create Fema's natural

00:25:34 --> 00:25:38: Hazard retrofit program toolkit, which is a guide for local

00:25:38 --> 00:25:43: jurisdictions on designing disaster resilient building retrofit programs in order

00:25:43 --> 00:25:48: to develop the toolkit, we spoke with practitioners from across

00:25:48 --> 00:25:49: the United States to.

00:25:49 --> 00:25:53: Glean best practices and strategies that they have used to

00:25:53 --> 00:25:58: design and implement retrofit programs. Today, we'll cover common challenges

00:25:58 --> 00:26:02: and look at some of the strategies that communities have

00:26:02 --> 00:26:06: used to overcome those challenges and develop successful programs and

00:26:06 --> 00:26:08: policies. Next, slide.

00:26:10 --> 00:26:13: Some of the main challenges we heard about had to

00:26:13 --> 00:26:17: do with funding, especially how to manage funds for programs

00:26:17 --> 00:26:21: versus single projects and how to do this with limited

00:26:21 --> 00:26:26: staff and capacity. Another was understanding community perspectives, understanding what

00:26:27 --> 00:26:30: the community members had the capacity to take on, and

00:26:30 --> 00:26:34: what they were interested in doing to mitigate their risk.

00:26:34 --> 00:26:38: Designing a program simply figuring out where to start and

00:26:38 --> 00:26:40: what aspects to consider.

00:26:40 --> 00:26:45: Communities also struggled with building and maintaining necessary partnerships with

00:26:45 --> 00:26:49: the various stakeholders that are so important to making programs

00:26:49 --> 00:26:51: and policies sustainable.

00:26:51 --> 00:26:55: And we heard about the challenge of communicating and gaining

00:26:55 --> 00:27:00: support, not only politically, but also from community members and

00:27:00 --> 00:27:02: the private sector partners. Next slide.

00:27:05 --> 00:27:08: Managing funds was one of the most common challenges we

00:27:08 --> 00:27:12: heard about from communities and the main piece of advice

00:27:12 --> 00:27:16: we heard was that it gets easier with experience. Experienced

00:27:16 --> 00:27:20: practitioners said that those just starting out should reach out

00:27:21 --> 00:27:24: to those who have done programs for advice and

suggestions.

00:27:24 --> 00:27:28: Talk to other communities and find out how they found

00:27:28 --> 00:27:32: and managed funding. Communities need to consider the cost and

00:27:32 --> 00:27:34: time required to complete projects.

00:27:35 --> 00:27:39: What the funding source requirements are, including environmental reviews or

00:27:39 --> 00:27:43: benefit cost analysis, and how much the team can successfully

00:27:43 --> 00:27:43: manage.

00:27:44 --> 00:27:49: Jurisdictions should build relationships with funding source contacts and communicate

00:27:49 --> 00:27:49: often.

00:27:50 --> 00:27:53: That way they can keep informed and get support when

00:27:53 --> 00:27:54: needed. Next slide.

00:27:58 --> 00:28:03: Experienced practitioners stress the importance of considering the context in

00:28:03 --> 00:28:06: which a program or policy is being implemented and using

00:28:06 --> 00:28:11: that information to inform policy decisions. Program and policymakers should

00:28:11 --> 00:28:16: identify potential barriers communities may face as they seek to

00:28:16 --> 00:28:20: participate in the program, and what constraints have inhibited community

00:28:20 --> 00:28:22: retrofitting in the past.

00:28:23 --> 00:28:28: To help identify potential barriers, policymakers can ask themselves what

00:28:28 --> 00:28:32: do people have the capacity to participate? Will they need

00:28:32 --> 00:28:37: assistance? Are they motivated? What is their degree of desire

00:28:37 --> 00:28:40: for something like this, and do they have the means?

00:28:40 --> 00:28:44: Is this something they can afford? Do they have the

00:28:44 --> 00:28:48: time and on the other side, the East framework applies

00:28:48 --> 00:28:53: for principles of behavior that can encourage action easy, attractive?

00:28:53 --> 00:28:57: Social timely people have a preference for tasks that are

00:28:57 --> 00:29:01: easy to achieve. There should be some benefit or something

00:29:01 --> 00:29:05: that makes the behavior attractive. Showing the behavior of others

00:29:05 --> 00:29:08: influences people to act in a similar way, and the

00:29:09 --> 00:29:13: timing of information can be critical to responsiveness. It's important

00:29:13 --> 00:29:17: to understand the variety of factors and how they overlap

00:29:17 --> 00:29:22: and intersect to affect an individual's position, access and resources.

00:29:22 --> 00:29:23: Next slide.

00:29:25 --> 00:29:29: Not knowing where to start was a challenge that several communities we interviewed had to overcome. Their advice was to

00:29:29 --> 00:29:33: reach out to other communities that had completed retrofit programs

00:29:33 --> 00:29:38: and talked to those who have been there. Programs with streamlined focus and singular goals tend to be more successful.

00:29:38 --> 00:29:42: A single goal alleviates complications for both program administrators and

00:29:42 --> 00:29:46: participants. Often programs that want to meet multiple goals.

00:29:46 --> 00:29:51: Require longer timelines or more resources.

00:29:51 --> 00:29:55: Multiple goals should be kept streamlined and simple. It's important

00:29:55 --> 00:29:59: to remember that the design of retrofit programs and policies have real implications for marginalized groups and communities. Programs centered

00:30:00 --> 00:30:04: on ensuring equity will help avoid unintentionally creating additional barriers

00:30:04 --> 00:30:08: that exclude or marginalized those who already have fewer resources

00:30:08 --> 00:30:14: and assistance available to them. Next slide.

00:30:14 --> 00:30:19: Retrofit programs are often administered by small teams in low

00:30:19 --> 00:30:23: capacity departments. They survive by building strong partnerships with other

00:30:23 --> 00:30:26: city departments, community organizations, and private sector businesses. A successful

00:30:26 --> 00:30:29: retrofit program depends on having a local pool of construction

00:30:29 --> 00:30:33: businesses and material suppliers in the private sector to perform

00:30:33 --> 00:30:38: retrofits. Even the best designed programs will fail if the private sector.

00:30:38 --> 00:30:44: Does not have an incentive to perform retrofit projects. It's crucial to establish how contractors and inspectors will be eligible

00:30:44 --> 00:30:48: to participate in the program and to communicate the benefits of participation.

00:30:48 --> 00:30:53: Some program implementation teams consist of only a few staff.

00:30:53 --> 00:30:57: A small team may partner with a mapping expert in

00:30:57 --> 00:30:58: the planning department to identify vulnerable properties or a building

00:30:58 --> 00:31:02:

00:31:02 --> 00:31:07:

00:31:07 --> 00:31:11:

00:31:11 --> 00:31:12:

00:31:12 --> 00:31:14:

00:31:14 --> 00:31:17:

00:31:17 --> 00:31:18:

00:31:18 --> 00:31:21:

00:31:21 --> 00:31:25:

00:31:25 --> 00:31:30: inspector in the permitting department to verify construction standards. Retrofit

00:31:30 --> 00:31:34: programs are truly a team effort, and the more diversified

00:31:34 --> 00:31:38: the personnel available to contribute, the more successful the program

00:31:38 --> 00:31:40: will be. Next slide.

00:31:42 --> 00:31:47: Practitioners found that successful community engagement was critical to the

00:31:47 --> 00:31:52: success and sustainability of their programs. Starting small allows programs

00:31:52 --> 00:31:55: to go through a round of pilot projects that will

00:31:55 --> 00:32:00: inevitably highlight barriers or program components that need adjustment. It

00:32:00 --> 00:32:03: can also give communities time to get used to the

00:32:03 --> 00:32:08: program and administrators time to adjust to growing pains. Administrators

00:32:08 --> 00:32:11: need to work to gain trust in their communities.

00:32:11 --> 00:32:15: Particularly as they start a new program using trusted sources

00:32:15 --> 00:32:19: can help, such as the City Council and community organizations

00:32:19 --> 00:32:21: like Rotary Club.

00:32:21 --> 00:32:26: Many communities with successful retrofit programs receive public interest in

00:32:26 --> 00:32:31: their program with minimal advertising, sometimes relying only on word

00:32:31 --> 00:32:33: of mouth to recruit participants.

00:32:34 --> 00:32:39: High quality customer service helps bring building owners, general contractors

00:32:39 --> 00:32:43: and the public through the program. The most successful programs

00:32:43 --> 00:32:48: are those that have created user-friendly avenues for accessing program

00:32:48 --> 00:32:50: information and staff.

00:32:51 --> 00:32:51: Next slide.

00:32:54 --> 00:32:58: As some keys to successful policies and programs start with humanizing the process and meeting people where they are building

00:32:58 --> 00:33:03: relationships and understanding with people from where they're at. Secondly,

00:33:03 --> 00:33:08: programs that set clear expectations not only for themselves and

00:33:13 --> 00:33:17: their staff, but also for the program, the contractors and

00:33:17 --> 00:33:19: the participants are more successful.

00:33:20 --> 00:33:26: And developing partnerships, such as with contractors and

community organizations
00:33:26 --> 00:33:30: and working with other departments or agencies to gain advice
00:33:30 --> 00:33:36: and support, leads to more sustainable programs. Clear, consistent communication
00:33:36 --> 00:33:40: helps build trust among program participants and gain support from
00:33:40 --> 00:33:45: decision makers. Thank you everyone for your attention and I'll
00:33:45 --> 00:33:46: hand it back over to Clay.
00:33:52 --> 00:33:55: Very wonderful, thank you so much. I wanna I really
00:33:55 --> 00:33:58: like to take a moment to thank Debbie Mary in
00:33:58 --> 00:34:02: Danielle. I will let all of our participants know around
00:34:02 --> 00:34:06: the country here and actually a few international that you
00:34:06 --> 00:34:09: can use the chat function if there are any specific
00:34:09 --> 00:34:12: questions that you would like to ask and I'll just
00:34:12 --> 00:34:16: start it off here. IBL is really interested in the
00:34:16 --> 00:34:19: model that you created in so I'm going to give
00:34:19 --> 00:34:19: this one.
00:34:19 --> 00:34:22: To you, you know first the the the kind of
00:34:22 --> 00:34:26: virtuous cycle that it seems like you've created there. I'm
00:34:26 --> 00:34:29: curious to know if there are any kind of top
00:34:29 --> 00:34:33: line results that you could share in that baseline and
00:34:33 --> 00:34:37: enhance retrofit that you've seen within that model that you
00:34:37 --> 00:34:41: could share. So let's say a building owner can't afford
00:34:41 --> 00:34:45: to go through, or just doesn't have the capacity to
00:34:45 --> 00:34:47: go through an entire building model like.
00:34:47 --> 00:34:48: That
00:34:49 --> 00:34:50: here.
00:34:50 --> 00:34:52: Your perspective on that and any of our other panels
00:34:52 --> 00:34:52: as well.
00:34:53 --> 00:34:56: Yeah, I mean I think it's a good good question
00:34:56 --> 00:34:59: clay. And and there's some things like the cost benefit
00:34:59 --> 00:35:03: workflow and assessment is not necessarily the right
approach for
00:35:03 --> 00:35:06: every single case. In some cases it's kind of a
00:35:06 --> 00:35:10: no brainer. You know that there's some targeted retrofits, for
00:35:10 --> 00:35:13: example, moving equipment up because you know you're in
a
00:35:13 --> 00:35:17: high floodplain that just makes sense. They're cheap, you
just
00:35:17 --> 00:35:20: do it. You don't need to go through this whole
00:35:20 --> 00:35:24: modeling process, but there's some retrofits that get quite
expensive.

00:35:24 --> 00:35:28: Right, you're talking about hundreds of thousands or millions of
00:35:28 --> 00:35:31: dollars where it's not obvious, and in those cases the
00:35:31 --> 00:35:34: cost benefit calculator really helps us understand if it makes
00:35:34 --> 00:35:37: sense or not. And especially when an owner's weighing a
00:35:37 --> 00:35:41: whole different host of options for a particular building, or
00:35:41 --> 00:35:44: if they've got a big portfolio and they only have
00:35:44 --> 00:35:47: the funds obviously to invest in a handful of buildings,
00:35:47 --> 00:35:49: then this really does help that in terms of top
00:35:49 --> 00:35:50: line results.
00:35:51 --> 00:35:55: I've seen the payback calculator show really high payback for
00:35:55 --> 00:35:59: some of the things I just mentioned. For high hazard
00:35:59 --> 00:36:02: areas that are gonna cause a lot of damage and
00:36:02 --> 00:36:06: downtime, and you've got low investment in targeted retrofits,
it's
00:36:06 --> 00:36:10: kind of obvious, right? You'll get the high benefit costs
00:36:10 --> 00:36:13: on the very other end for seismic retrofits, which we
00:36:13 --> 00:36:16: do a lot of when you're looking at those a
00:36:16 --> 00:36:19: lot of times it doesn't pay off. Unfortunately, as what
00:36:19 --> 00:36:23: we're finding, unless you're in a very very hazardous zone.
00:36:23 --> 00:36:26: And your risk of collapse is really high, so I've
00:36:26 --> 00:36:29: seen other other ends where the financial perspective, at
least
00:36:29 --> 00:36:32: when you're looking at from a purely financial and monetary
00:36:33 --> 00:36:36: perspective. The benefit cost analysis doesn't always make
the case,
00:36:36 --> 00:36:39: and that's why I mentioned in my presentation that this
00:36:39 --> 00:36:42: is just looking at the monetary case. There's a number
00:36:42 --> 00:36:45: of other factors that you have to take into account
00:36:45 --> 00:36:48: when you're making a resilient retrofit, which includes things
like
00:36:49 --> 00:36:52: marketability, reputation, other clients that we have to look at
00:36:52 --> 00:36:53: other planning factors.
00:36:53 --> 00:36:57: Not typically making a decision on retrofit just because of
00:36:57 --> 00:36:59: climate change risk for example.
00:37:02 --> 00:37:05: Can I just add something? I think at this important
00:37:05 --> 00:37:08: point too, in terms of the cost, because when we're
00:37:08 --> 00:37:11: looking at doing a portfolio, I assessment for resiliency risks.
00:37:11 --> 00:37:14: I mean there are certain assets when we get the
00:37:14 --> 00:37:17: cost of, like you know, because it's going to cost
00:37:17 --> 00:37:20: millions of dollars to retrofit where some of those assets
00:37:20 --> 00:37:23: might be like slated for this position where it might
00:37:23 --> 00:37:26: be too risky assets. But it's also on the other

00:37:26 --> 00:37:30: side. It's really important to incorporate those risk assessments during

00:37:30 --> 00:37:31: the diligence process.

00:37:31 --> 00:37:34: Because, right, you might also not want to acquire an

00:37:34 --> 00:37:37: asset. That's a very high risk, and that's why it's

00:37:38 --> 00:37:41: really important to like. Even like it's gonna as more

00:37:41 --> 00:37:45: information becomes more transparent, it might be even harder to

00:37:45 --> 00:37:48: sell high risk building if they haven't gone through the

00:37:48 --> 00:37:51: process of doing those kind of retrofits.

00:37:54 --> 00:37:58: It's really helpful. I'd like to kind of keep that

00:37:58 --> 00:38:01: thought going, and you know, one of the things that

00:38:01 --> 00:38:04: stood out to me in the presentation is just the

00:38:05 --> 00:38:08: multitude of risks that you know exist and you know

00:38:08 --> 00:38:11: I'd like to hear you know, maybe Mary if you

00:38:11 --> 00:38:14: want to start this off and but from all of

00:38:14 --> 00:38:18: our panelists about how, how, if there are strategies that

00:38:18 --> 00:38:22: building owners can use and adaptive reuse developers.

00:38:22 --> 00:38:27: Been used to address multiple risks right simultaneously and whether

00:38:27 --> 00:38:31: that's wind and fire and seismic, and it's a really

00:38:31 --> 00:38:35: challenging thing to do, but it seems like you know

00:38:35 --> 00:38:39: right now. Most parts of our country and our world

00:38:39 --> 00:38:43: are facing multiple threats and so would love to kind

00:38:43 --> 00:38:47: of talk about that. Those not just in isolation, but.

00:38:50 --> 00:38:53: Yeah, and just as you said it, it is kind

00:38:53 --> 00:38:59: of difficult. There are definitely some retrofitting methods that can

00:38:59 --> 00:39:03: be used together and put together. The kind of what

00:39:03 --> 00:39:07: we were just talking about that then goes into the

00:39:07 --> 00:39:08: cost. It's like.

00:39:10 --> 00:39:15: You know the the challenge is finding an affordable solution

00:39:15 --> 00:39:20: to be able to cover the multiple hazards because there

00:39:20 --> 00:39:25: are very few buildings that exist within a location that

00:39:25 --> 00:39:29: literally is only affected by one hazard, so it is

00:39:29 --> 00:39:35: something that communities look at, and for example there's

00:39:35 --> 00:39:38: a

00:39:35 --> 00:39:38: community up in Washington state who.

00:39:39 --> 00:39:44: As they do their flood retrofits, they take into account

00:39:44 --> 00:39:49: their seismic risk as well, and if they're doing a

00:39:49 --> 00:39:55: more structural retrofitting process than they also take that

00:39:55 --> 00:40:00: time

00:39:55 --> 00:40:00: to do the seismic retrofit as well, because the safer

00:40:00 --> 00:40:02: you can make.

00:40:03 --> 00:40:04: Building our home the better.

00:40:06 --> 00:40:09: Hey can I add something on that so when we

00:40:09 --> 00:40:12: do like for for a large portfolio when we do

00:40:12 --> 00:40:15: like our initial like desktop risk assessments, at least for

00:40:15 --> 00:40:18: Donnie, we do we look at 50 different types of

00:40:18 --> 00:40:22: risks including regional level risks and building level risks because

00:40:22 --> 00:40:25: we need to understand not only those kind of regional

00:40:25 --> 00:40:29: risk like like fire, heat, stress, flood, right sea level

00:40:29 --> 00:40:32: rise, but also building level risks and storms. Some of

00:40:32 --> 00:40:36: those buildings may already have taken some steps to protect

00:40:36 --> 00:40:36: their assets.

00:40:37 --> 00:40:39: So we look at we look at like that multitude

00:40:39 --> 00:40:42: of risks to then identify the buildings that need to

00:40:42 --> 00:40:46: take an extra step to actually implement. You know, go

00:40:46 --> 00:40:49: through a residency retrofit, but it's really important to look

00:40:49 --> 00:40:52: at all of these, and there's a lot of like

00:40:52 --> 00:40:55: open source tools available for free as well. From FEMA,

00:40:55 --> 00:40:58: there's a lot of a lot of tools that at

00:40:58 --> 00:41:01: least you can start to have a better understanding of

00:41:01 --> 00:41:03: some of these types of risks.

00:41:04 --> 00:41:06: And I'll just add Clay as well that and we'll

00:41:06 --> 00:41:09: give you an example. We're looking at a building a

00:41:09 --> 00:41:13: couple of buildings right now in Tennessee that are subject

00:41:13 --> 00:41:16: to lots of different houses, including tornado and seismic. So

00:41:16 --> 00:41:19: a question is well, should we just mitigate for seismic

00:41:20 --> 00:41:23: alone? Should we just mitigate for tornado alone? The nice

00:41:23 --> 00:41:26: thing is that actually the retrofit some of them overlap,

00:41:26 --> 00:41:29: so we'll get a benefit from trying to address with

00:41:29 --> 00:41:32: the same retrofit. Both of those things. So I showed

00:41:32 --> 00:41:34: the cost benefit calculator.

00:41:34 --> 00:41:37: You could do that for one hazard, but obviously if

00:41:37 --> 00:41:41: the same retrofit addresses multiple hazards and you're reducing the

00:41:41 --> 00:41:44: risk for multiple hazards, then the benefit costs just goes

00:41:44 --> 00:41:47: up. So the more hazards you can address with the

00:41:47 --> 00:41:50: same retrofit, the better. The other piece of this that

00:41:50 --> 00:41:53: I didn't really get into is, and I think someone

00:41:53 --> 00:41:56: in the chat asked this is around retrofits for other

00:41:56 --> 00:42:00: purposes like decarbonization and energy efficiency, so that could definitely

00:42:00 --> 00:42:03: be part of the process as well to identify which
00:42:03 --> 00:42:04: buildings are at.
00:42:04 --> 00:42:07: Risk you know for carbon risk, for example, and investment
00:42:07 --> 00:42:10: in those to get more out of the life cycle
00:42:10 --> 00:42:13: in in in those types of buildings would increase your
00:42:13 --> 00:42:14: benefit costs as well.
00:42:17 --> 00:42:20: It's all really helpful. I'd like to kind of take
00:42:20 --> 00:42:24: this and bring it to, you know, maybe a specific
00:42:24 --> 00:42:28: building level and I'm thinking about kind of uptake of
00:42:28 --> 00:42:33: resilient retrofits within different asset classes, and so just
love
00:42:33 --> 00:42:37: to hear our any of our panelists kind of expand
00:42:37 --> 00:42:41: upon some of the points that have already been made
00:42:41 --> 00:42:46: about the value proposition specifically. And if you're seeing
a
00:42:46 --> 00:42:46: specific
00:42:47 --> 00:42:52: I said type that is responding more favorably to.
00:42:53 --> 00:42:54: 2 presenting retrofits.
00:42:55 --> 00:42:57: So maybe, maybe why don't you? Why don't you start
00:42:57 --> 00:42:57: a call?
00:42:57 --> 00:43:01: Yeah, yeah, yeah. So interestingly, the so the approach that
00:43:01 --> 00:43:04: I showed before, which is again not dissimilar to Danielle's
00:43:04 --> 00:43:07: approach, which is like starting with maybe a pre screening
00:43:07 --> 00:43:11: assessment of all the hazards that a portfolio could face
00:43:11 --> 00:43:14: and then kind of drilling down into asset hazard pairs
00:43:14 --> 00:43:16: that might need more of a deep dive and then
00:43:17 --> 00:43:19: moving that into like. Well, what should we do about
00:43:20 --> 00:43:22: this? And so on and so forth. That is pretty
00:43:22 --> 00:43:25: standard across any type of organization. I will say that.
00:43:25 --> 00:43:28: The organizations that we do the most work for are
00:43:29 --> 00:43:33: kind of mission critical organizations like data center
operators that
00:43:33 --> 00:43:36: can't afford any downtime all the way to campuses. So
00:43:36 --> 00:43:39: like university campuses, is a big one where you can
00:43:39 --> 00:43:43: imagine one single event could knock out the entire campus
00:43:43 --> 00:43:46: right? And so basically it's an existential threat to their
00:43:46 --> 00:43:50: entire mission, and so we've got other corporate
organizations that
00:43:50 --> 00:43:54: have similar concerns. They have a downtown campus or an
00:43:54 --> 00:43:56: urban campus where literally one.
00:43:56 --> 00:44:00: Event could knock out their headquarters, so we were
working
00:44:00 --> 00:44:03: with a number of big clients like that also working

00:44:03 --> 00:44:07: for real estate developers who have scattered assets to try
00:44:07 --> 00:44:10: and help them understand. OK, out of all the assets
00:44:10 --> 00:44:13: I've got in My Portfolio, which ones do I need
00:44:13 --> 00:44:16: to drill down on and really understand how to make
00:44:16 --> 00:44:20: our entire portfolio more resilient so I would say generally
00:44:20 --> 00:44:24: the same approach works for everyone. It's just that some
00:44:24 --> 00:44:26: are more incentivized to.
00:44:26 --> 00:44:28: Go through and be proactive and kind of our leading
00:44:29 --> 00:44:30: on the resilience part.
00:44:33 --> 00:44:36: Yeah, and if I can sort of follow on to
00:44:36 --> 00:44:36: that.
00:44:38 --> 00:44:41: In what we saw in our interviews as we were
00:44:41 --> 00:44:45: conducting our interviews for the toolkit was.
00:44:47 --> 00:44:50: Like the the community members.
00:44:52 --> 00:44:56: More more often than some local officials think, have a
00:44:56 --> 00:45:00: greater desire to do something to mitigate their risk. They
00:45:00 --> 00:45:05: might not be sure exactly what their specific risk is.
00:45:05 --> 00:45:08: They might not be sure about how to do it,
00:45:08 --> 00:45:12: but once the community officials kind of got down to
00:45:12 --> 00:45:17: the community member level and started talking to people,
they
00:45:17 --> 00:45:22: found that people are willing to do something. They're quite
00:45:22 --> 00:45:22: a few.
00:45:22 --> 00:45:28: Projects in California where they were looking at doing
building
00:45:28 --> 00:45:33: retrofits so like apartment buildings. You know multi unit
buildings
00:45:33 --> 00:45:38: and the building owners were not as reticent as officials
00:45:38 --> 00:45:43: thought they would be because you're asking someone to put
00:45:43 --> 00:45:45: money into something and.
00:45:46 --> 00:45:48: So they thought that they would be hesitant to do
00:45:48 --> 00:45:52: that, but there were actually many more homeowners and
building
00:45:52 --> 00:45:55: owners willing to do something for their safety than they
00:45:55 --> 00:45:55: they.
00:46:01 --> 00:46:02: Then the only thing to add there.
00:46:06 --> 00:46:09: I think there's so many factors from like an investor
00:46:09 --> 00:46:12: perspective that would affect the buildings that would be
more
00:46:12 --> 00:46:14: willing to do a retrofit. But like I'd say.
00:46:15 --> 00:46:17: I think for office buildings where.
00:46:19 --> 00:46:21: You know, if there's like, for example, like we have
00:46:22 --> 00:46:25: some office properties that have like 5000 tenants, and like

00:46:25 --> 00:46:27: you know those would be very high risk if they
00:46:27 --> 00:46:28: didn't take action.
00:46:29 --> 00:46:33: Where they might have if, depending on the location, they
00:46:33 --> 00:46:36: might have more casual to be able to invest in
00:46:36 --> 00:46:40: those capital improvement projects, but when you think about
like
00:46:40 --> 00:46:44: an industrial asset that's like you know triple net property
00:46:44 --> 00:46:48: with where like full tenant control, there's more like I'd
00:46:48 --> 00:46:48: say.
00:46:49 --> 00:46:49: Umm?
00:46:51 --> 00:46:53: There's it's hard in terms of like who makes a
00:46:53 --> 00:46:57: retrofit who benefits from it. I think would be harder,
00:46:57 --> 00:46:59: like I, I feel like we're probably going to see
00:47:00 --> 00:47:03: some asset types kind of lead. I think we're seeing
00:47:03 --> 00:47:06: more. We're seeing more progress on that. Like you know,
00:47:06 --> 00:47:09: for high rise office spaces then we are maybe like
00:47:09 --> 00:47:13: for like for example in certain industrial facilities. Because of
00:47:13 --> 00:47:16: that I think so. The investment structure, like who is
00:47:16 --> 00:47:19: responsible? I think it will. It will be a factor
00:47:19 --> 00:47:21: in terms of like who do we see leading the
00:47:22 --> 00:47:23: efforts in terms of like.
00:47:23 --> 00:47:25: Making those retrofits a reality.
00:47:27 --> 00:47:30: Fantastic, well we have a lot of questions from our
00:47:30 --> 00:47:33: audience today so I'm gonna try to get through as
00:47:33 --> 00:47:36: many of these as I can. Thank you for everyone
00:47:36 --> 00:47:40: who submitted questions. Please keep those coming one that
is
00:47:40 --> 00:47:43: specific for you. Mary that says curious if you spoke
00:47:43 --> 00:47:47: to property owners of historic buildings which must retain
historic
00:47:47 --> 00:47:51: elements of the building while adapting their buildings for
future
00:47:51 --> 00:47:52: natural disasters.
00:47:53 --> 00:47:57: Yes we did, and that was definitely a challenge that
00:47:57 --> 00:48:02: we heard of, especially since one community in particular
was
00:48:02 --> 00:48:07: working with FEMA and FEMA requires an environmental
and historic
00:48:07 --> 00:48:12: preservation review. So with historic buildings, you can't
change anything
00:48:12 --> 00:48:16: about the look of the outside of the building.
00:48:17 --> 00:48:21: And so these communities that were work that you know
00:48:21 --> 00:48:25: had some historic buildings in their building stock had to
00:48:25 --> 00:48:29: go through a process of, you know, taking pictures of

00:48:29 --> 00:48:33: what a retrofit you know, like a seismic retrofit on
00:48:33 --> 00:48:37: a building would look like, proving that it wouldn't be
00:48:38 --> 00:48:42: seen from the outside of the building. Things like that.
00:48:42 --> 00:48:44: So it's definitely a challenge.
00:48:46 --> 00:48:50: But there there is a a process there. There were
00:48:50 --> 00:48:53: communities who figured out sort of a roundabout way of
00:48:53 --> 00:48:56: doing it. It takes a long time, but they were
00:48:57 --> 00:48:57: able to do it.
00:49:01 --> 00:49:04: Wonderful, I do want to make sure that you know
00:49:04 --> 00:49:07: we we acknowledge the equity in this process and so
00:49:07 --> 00:49:11: I've got a question just relative to that. I mean,
00:49:11 --> 00:49:14: you know, we know the properties that serve people of
00:49:14 --> 00:49:19: color and low income households. They are higher exposure
to
00:49:19 --> 00:49:23: climate risk. That's just a fact. And these communities also
00:49:23 --> 00:49:26: face higher barriers to access in capital. And so how
00:49:26 --> 00:49:28: do we ensure that the equity.
00:49:29 --> 00:49:31: Is baked into this process.
00:49:32 --> 00:49:34: And I'll open it up to you.
00:49:35 --> 00:49:38: Maybe Mary goes first, like I can fall on.
00:49:38 --> 00:49:42: Yeah yeah, I can hop in real quick. Something that
00:49:42 --> 00:49:46: we saw is definitely taking that like even even having
00:49:46 --> 00:49:50: it in your mind as you start these processes from
00:49:50 --> 00:49:55: the very beginning helps because just by being aware you
00:49:55 --> 00:49:58: start to look for how to take all of that
00:49:58 --> 00:50:03: into account. There were communities who before they
jumped into
00:50:03 --> 00:50:07: their retrofit program. I did. You know, assessments on their
00:50:08 --> 00:50:08: community.
00:50:08 --> 00:50:13: To find out exactly what their community demographics were
and
00:50:13 --> 00:50:18: what sort of barriers the community members might have in
00:50:18 --> 00:50:19: retrofitting.
00:50:20 --> 00:50:21: Umm?
00:50:22 --> 00:50:22: And.
00:50:23 --> 00:50:27: So like taking those steps early on helps to include
00:50:27 --> 00:50:29: it throughout the process.
00:50:35 --> 00:50:38: Maybe did you have anything else that you wanted to
00:50:38 --> 00:50:39: add relative to equity in the process?
00:50:40 --> 00:50:44: Yeah, again, going back to the cost benefit, the traditional
00:50:44 --> 00:50:48: cost benefit analysis is looking at value at risk. So
00:50:48 --> 00:50:52: the example that we use and this disproportionately impacts low

00:50:52 --> 00:50:56: income populations, the example that we use is. Let's say
00:50:56 --> 00:51:00: you've got two communities at risk of like sea level
00:51:00 --> 00:51:04: rise and you're looking to build a seawall to protect
00:51:04 --> 00:51:06: them. The cost benefit.
00:51:06 --> 00:51:09: Analysis would actually favor the richer community because
the value
00:51:09 --> 00:51:12: at risk is higher and so your benefit cost goes
00:51:12 --> 00:51:14: up. That's we can't do it that way, so we're
00:51:14 --> 00:51:18: actually there's a lot of literature about this, and Eric
00:51:18 --> 00:51:20: has been developing some stuff looking at how you can
00:51:20 --> 00:51:24: integrate social equity into the traditional cost benefit analysis
by
00:51:24 --> 00:51:27: looking at things like median incomes in a population that
00:51:27 --> 00:51:30: waits the certain benefit costs, and so that kind of
00:51:30 --> 00:51:33: makes it more on a level playing field and really
00:51:33 --> 00:51:36: kind of gives an apples to apples comparison, so I
00:51:36 --> 00:51:37: think it's really important.
00:51:37 --> 00:51:40: The note that the dollar, let's say, goes a lot
00:51:40 --> 00:51:43: farther in a low income population than a richer population
00:51:43 --> 00:51:46: that needs to be integrated into our traditional workflows.
00:51:52 --> 00:51:56: Danielle, I would love to hear you. There's a lot
00:51:56 --> 00:51:58: of questions in the chat and I would love to
00:51:59 --> 00:52:02: hear you talk about the role of insurance in this
00:52:02 --> 00:52:06: process. And you know, pretend you're pitching one of
pitching
00:52:06 --> 00:52:09: a client that just says, well, gosh, isn't that what
00:52:09 --> 00:52:13: insurance is for and they've already calculated this risk? I'm
00:52:13 --> 00:52:16: sure you've heard that I would like to just hear
00:52:16 --> 00:52:20: how you respond to a skeptic that's profitable. One tells
00:52:20 --> 00:52:22: you, like that's what's insurance.
00:52:23 --> 00:52:26: Yeah, I mean there's a lot of there's a lot
00:52:26 --> 00:52:30: of regions where insurance companies will not touch those
types,
00:52:30 --> 00:52:33: like there's places in high fire risk or high flood
00:52:33 --> 00:52:37: risks. There's no insurance companies. I mean, they'll say
female
00:52:37 --> 00:52:40: will cover me that nobody wants to ensure those properties.
00:52:40 --> 00:52:43: So like and I think for us when we're developing
00:52:43 --> 00:52:47: our risk assessment, we actually met with several major
insurance
00:52:47 --> 00:52:51: companies to understand. OK, if eventually as we implement
those
00:52:51 --> 00:52:54: risks, this property will become like a.
00:52:54 --> 00:52:58: High resilience, would we consider negotiating a lower

insurance rate

00:52:58 --> 00:53:00: so we actually talked to them OK? What kinds of

00:53:00 --> 00:53:04: questions should be incorporating to our risk assessment and some

00:53:04 --> 00:53:07: of the things they said you know, like compliance with

00:53:07 --> 00:53:10: buildings, latest structural codes or like some of the even

00:53:10 --> 00:53:13: fire codes would help. So like we, we did talk

00:53:13 --> 00:53:16: to them about that. I feel like. Also they you

00:53:16 --> 00:53:18: know when I met with them and see what kind

00:53:18 --> 00:53:21: of process do you use. Even evaluate the risks now

00:53:21 --> 00:53:23: to come up with your insurance rates. And I I

00:53:23 --> 00:53:25: think it's gotten better now.

00:53:25 --> 00:53:28: But a lot of insurance companies are not even prepared.

00:53:28 --> 00:53:31: I mean, they're not. They're just using old models, and

00:53:31 --> 00:53:34: they're not really understanding the the latest risks, so I

00:53:34 --> 00:53:37: feel like they have. I mean, there's obviously things that

00:53:37 --> 00:53:41: are happening, but I don't think that the insurance companies

00:53:41 --> 00:53:44: are really, truly prepared to understand these risks and include

00:53:44 --> 00:53:47: that into their models. But I do think that as

00:53:47 --> 00:53:50: we make progress to, you know, if we're making this

00:53:50 --> 00:53:53: major investments, we make the property more resilient that it

00:53:53 --> 00:53:56: should affect your insurance rates. So we need to.

00:53:56 --> 00:53:57: All get more like.

00:53:58 --> 00:54:00: I'd say advanced on that and you know I saw

00:54:00 --> 00:54:03: there was a question about also in terms of like

00:54:03 --> 00:54:07: how the retrofit process when you think about decarbonization all

00:54:07 --> 00:54:10: those together. So one of the things we're doing when

00:54:10 --> 00:54:13: we are even during the due diligence for new acquisitions

00:54:13 --> 00:54:16: process we are, we created something called the Green PCA.

00:54:17 --> 00:54:21: It's a green property condition assessment and we're including resiliency

00:54:21 --> 00:54:25: risk assessment. We're including decarbonization efforts and looking at energy

00:54:25 --> 00:54:27: audits and doing like a really.

00:54:28 --> 00:54:31: More encompassing assessment of that property. So then we can

00:54:31 --> 00:54:35: then incorporate into our underwriting models what it would take

00:54:35 --> 00:54:38: to retrofit that property and do it all at once,

00:54:38 --> 00:54:41: right? If you're retrofitting, maybe you include, you know, fully

00:54:41 --> 00:54:46: electrifying that property by incorporating maybe solar panels, doing the

00:54:46 --> 00:54:49: resiliency retrofit, and and energy efficiency all at once, so

00:54:49 --> 00:54:53: I think it's really important to take that holistic approach

00:54:53 --> 00:54:56: when you're doing retrofits right? Usually the best time is

00:54:56 --> 00:54:58: right after maybe an acquisitions.

00:54:58 --> 00:55:02: Are you doing or some capital improvement projects? So I

00:55:02 --> 00:55:05: just feel like we need to really understand all these

00:55:05 --> 00:55:08: risks and and take that approach to to really make

00:55:08 --> 00:55:13: our buildings right more sustainable, more resilient decarbonized. So I

00:55:13 --> 00:55:16: think that's a really important part of the process.

00:55:17 --> 00:55:20: Like I add on the insurance piece. I agree with

00:55:20 --> 00:55:23: Danielle. I mean I basically you have to realize or

00:55:23 --> 00:55:27: recognize with insurers. They're looking at large portfolios of buildings.

00:55:27 --> 00:55:31: They care about the averages. They don't really care about

00:55:31 --> 00:55:34: individual buildings. So unless you've got like A and I've

00:55:34 --> 00:55:37: seen it cause we've done like a \$500 million asset,

00:55:37 --> 00:55:40: they won't really which we call facultative risk. They don't

00:55:41 --> 00:55:45: really understand the intricacies of individual buildings, and they certainly

00:55:45 --> 00:55:47: won't typically give you a resilience.

00:55:47 --> 00:55:51: Sorry insurance premium reduction because you've made certain measures. That

00:55:51 --> 00:55:55: is the Holy Grail. Connecting resilience with insurance so you

00:55:55 --> 00:55:58: get the payback directly. I don't think we're anywhere near

00:55:58 --> 00:56:02: that, unfortunately. And like Danielle said, they're definitely not looking

00:56:02 --> 00:56:05: at risk at the individual asset level like they should

00:56:05 --> 00:56:08: be. So if you want to protect yourself, you really

00:56:08 --> 00:56:11: need to maybe investing in those resilient retrofits. I would

00:56:11 --> 00:56:14: also say the insurance coverage that you're typically looking at

00:56:14 --> 00:56:17: might cover you for a certain percentage of damage there.

00:56:18 --> 00:56:20: Not gonna really protect you for losses, indirect losses like

00:56:20 --> 00:56:23: downtime and business interruption and those types of things. So

00:56:23 --> 00:56:25: that's something that you need to be aware of.

00:56:27 --> 00:56:28: Ohh, they agree.

00:56:29 --> 00:56:31: If I can follow on that as well.

00:56:32 --> 00:56:37: Some of the programs that we interviewed started because of

00:56:37 --> 00:56:41: this. Just like Danielle said, some areas of the country

00:56:41 --> 00:56:46: insurance companies won't even go there because of how high

00:56:46 --> 00:56:50: their risk is. So like South Carolina and Alabama, the

00:56:50 --> 00:56:55: safe Alabama homes programs were both developed. Because of this

00:56:55 --> 00:57:00: lack of insurance access, so they were retrofitting homes so

00:57:00 --> 00:57:03: that those communities could be safer.

00:57:03 --> 00:57:08: And get some more access to potential insurance.

00:57:12 --> 00:57:15: Alright, I think we have time for maybe one more

00:57:15 --> 00:57:19: quick round of questions here, and so there's a couple

00:57:19 --> 00:57:23: of questions relative to tools that individuals can use that

00:57:23 --> 00:57:27: are maybe online. Whether it's a payback calculator or other

00:57:27 --> 00:57:31: risk assessment calculators. So what's could I'd like to do?

00:57:31 --> 00:57:33: Kind of a quick run through of each of you

00:57:33 --> 00:57:37: if you're looking at a piece of property. There are

00:57:37 --> 00:57:40: a couple of tools that you would just go to

00:57:40 --> 00:57:41: immediately online.

00:57:41 --> 00:57:42: Start to look at risk.

00:57:43 --> 00:57:44: And payback.

00:57:56 --> 00:57:57: There's.

00:57:58 --> 00:58:01: There there's really not. I mean, I think that's the

00:58:01 --> 00:58:03: issue. Well, look if you wanna get into like if

00:58:03 --> 00:58:06: if you wanna look up tools online for resilience, index

00:58:06 --> 00:58:10: indices, for example for particular counties or municipalities

00:58:10 --> 00:58:13: or things

00:58:10 --> 00:58:13: like that. Then certainly they're like FEMA has a resilience.

00:58:13 --> 00:58:16: I think I don't know what they call it. Resilience

00:58:16 --> 00:58:19: index, but if you're looking at specific buildings like there's

00:58:19 --> 00:58:22: tools like flood factor now online, that first St Foundation

00:58:22 --> 00:58:24: is put out there so you can go to your

00:58:24 --> 00:58:28: individual property and understand your flood risk. For

00:58:28 --> 00:58:28: example, there's

00:58:28 --> 00:58:28: other hazards.

00:58:29 --> 00:58:31: It works, but like when you for other hazards. And

00:58:31 --> 00:58:35: really, if you're trying to get an understanding of specifically

00:58:35 --> 00:58:38: at your property, there's not really much out there,

00:58:40 --> 00:58:41: unfortunately.

00:58:40 --> 00:58:41: I don't know if Danielle and Mary.

00:58:42 --> 00:58:44: If if you agree with that or not.

00:58:44 --> 00:58:48: Yeah, just like you said, FEMA has the National Risk

00:58:48 --> 00:58:51: index and you can get to sort of like a

00:58:51 --> 00:58:56: county, maybe community level, but getting like drilling down

00:58:51 --> 00:58:56: more

00:58:56 --> 00:59:01: specifically to a specific property then there isn't so much
00:59:01 --> 00:59:06: sometimes States and counties have their own programs like
California
00:59:06 --> 00:59:07: has a my hazards.
00:59:09 --> 00:59:12: And that's that's kind of like a high level. You
00:59:12 --> 00:59:17: can search your address basically and see what different
hazards
00:59:17 --> 00:59:21: layer on top of your area, like your block and.
00:59:23 --> 00:59:24: Yeah.
00:59:25 --> 00:59:29: It's difficult to find very specific local information.
00:59:32 --> 00:59:35: Well, I want to be respectful of everyone's time and
00:59:35 --> 00:59:39: I wanna thank first and foremost the resilience land use
00:59:39 --> 00:59:43: cohort at ULI for all of the amazing work that
00:59:43 --> 00:59:46: has been done for the report that will be sent
00:59:46 --> 00:59:50: out. And for assembling this panel and for everyone that
00:59:50 --> 00:59:53: has joined us today, I know that this is an
00:59:53 --> 00:59:58: extremely complicated issue that it's very difficult to to wrap
00:59:58 --> 01:00:01: our hands around and just a one hour presentation.
01:00:02 --> 01:00:05: And I'm deeply grateful that everyone is committed an hour
01:00:05 --> 01:00:08: of their day to addressing this. So thank you on
01:00:08 --> 01:00:09: behalf of you a lot.

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