

# Buildings and Resilience

## An Interview with Aris Papadopoulos, Founder and Chair of the Resilience Action Fund

**Q** How has your experience as a survivor of the attacks of Sept. 11, 2001, informed your work?

**A** It was a life-changing event for me, both personally and for my goals in life. It helped me realize that resilience and disaster prevention would become my life's purpose.

I witnessed firsthand that day's events, and some years later I served on the board of CTL Group — the engineering firm that was one of the main investigators of the towers' collapse. I learned several things from that perspective. One is that the original building's design did consider an airplane impact. But the largest plane at the time the towers were designed was a Boeing 707, not the 767 that struck.

The relationship between the magnitude of a hazard and building vulnerability has preoccupied me ever since.

I came to observe afterward that most of our communities are built below today's hazard level, and don't even think of tomorrow's. We systematically gamble with the forces of nature, hence the disasters we experience.

I wanted to do something about it.

Nine years after 9/11, I was introduced to the U.N. head of disaster reduction and became one of the first business people to engage with the U.N. International Strategy for Disaster Reduction, and I served as first chair of its private sector group, now known as ARISE.

Since I retired as CEO of Titan America three years ago, I have dedicated myself to the cause of greater resilience in the built environment.

**Q** You're very involved with groups working on building resilience, including your work as founding chair of the Resilience Action Fund, and you've written a book on the subject. What outcomes do you expect from this work? What inspired you?

**A** I believe that resilience is a social movement, similar to the conservation movement and the more recent climate movement. Publicly, it is just beginning to emerge. Heralding this movement is a milestone international agreement signed by 187 countries in 2015, called the Sendai Framework.

I believe that the Sendai Framework will one day change the way we live, work, and invest. We're coming to realize that "sustainable" needs to be both green and resilient, and that being green and vulnerable is just a mirage.

The nonprofit Resilience Action Fund and its sister nonprofit in the U.K. have a mission to promote awareness, transparency, and education for greater resiliency in our built environment. As that suggests, when it comes to resilience, the public today has a very low level of awareness, transparency, and education.

I believe that social change happens when we're able to affect consumer behavior — like we did with car safety, green products, and organic food.

We're taught to run, evacuate; to stock up, buy batteries, candles, and canned foods; and to defend, apply sandbags, cover our windows, and so on. We're not taught to make the right consumer choices when it comes to building, buying, or remodeling our homes. We're distracted with cosmetics such as countertops and closets, not focusing on what will protect our lives and investment. That is, is the location safe? Is it built to last? Will it withstand the local hazards?

The public is generally unaware that building codes are really escape codes. They're set to give us time to get out, not to save our homes and possessions. When you think of it, a home is a center of wealth for many people, yet the system serves us mostly a hazard-vulnerable home and pacifies us with the label, built to code. Most people don't realize how little comfort that provides until disaster strikes.

For this reason, the first thing I did after I retired was to write the book, *Resilience — The Ultimate Sustainability: Lessons from Failing to Develop a Stronger and Safer Built Environment*. The book uses the United States as a case study of what the rest of the world should not do in developing its built environment. The U.S. needs to change its course too. I wanted to spotlight the construction industry, which most of the public does not understand, and the economic interests that drive us toward greater risk.

The book is the basis for a one-hour documentary, "Built to Last?," that should be released this May. I wanted to ask, "How did we become this vulnerable to start with? Who is responsible?"

**Q** The Florida International University Extreme Events Institute — where you are a Distinguished Expert in Resilience — indicates that it is built on a disaster risk equation:  $EmR/DR/CatR = H + Ex \times V$ . What does this equation mean and how does it inform the institute's priorities?

**A** This equation is the brainchild of institute founder and director Dr. Richard Olson and is an evolution of the equation of disaster risk as a function of the magnitude of the hazard and the degree of vulnerability.

Olson's equation introduces two new concepts. The first, in the earlier part of the equation, is a gradation of risk, emergency risk (EmR), disaster risk (DR), and catastrophe risk (CatR), to distinguish that some risks have much larger consequences. The second, on the other side, includes the notion of exposure, meaning that the number of people and assets exposed to the risk can determine if the event becomes an emergency, disaster, or even worse, a catastrophe. For example, exposure in dense urban areas is much higher than in rural areas. Mother Nature controls the H, the hazards, and humans control the E, exposure, and the vulnerability, V.

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Much of the institute's work aims to quantify the drivers of exposure and vulnerability, the things

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**Aris Papadopoulos** is founder and chair of the Resilience Action Fund ([www.buildingresilient.com](http://www.buildingresilient.com)) and Resilience Action Fund (International). Author of the book, *Resilience — The Ultimate Sustainability: Lessons from Failing to*

*Develop a Stronger and Safer Built Environment*, Papadopoulos is also Distinguished Expert in Resilience at Florida International University's Extreme Events Institute. He was founding chair of the Private Sector Advisory Group of the U.N.

*International Strategy for Disaster Reduction*. Also chair of the board of ST Equipment and Technology, Papadopoulos is retired from Titan America, a U.S. building materials company where he served as CEO for 20 years.

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that we can control, and identify ways that we can reduce them. A good example is the Extreme Events Institute’s Wall of Wind, the only National Science Foundation test facility that can evaluate the ability of homes, buildings, and building products to withstand up to Category 5 hurricanes.

**Q** How can standards advance resilience?

**A** When we talk about standards, I believe we need to distinguish between two dimensions. The first is assuring that the design is able to withstand local hazards, and the second is to assure that the materials and assemblies perform as called for in the design.

Most of the disasters that we’ve experienced are due to designing below the hazard level. This allows certain sectors of the economy to profit by creating risk, while most consumers and taxpayers pay the disastrous consequences. A great example of this is the 100-, 500-, 1,000-year hazard language that has created a terrible wave of disinformation and propagated a false illusion that we can get away by gambling with hazard risk.

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I like to parallel this with the commercial aviation industry, which celebrated 100 years last year. The first quarter century of its history was very dangerous and risky, with a lot of crashes. And until we designed planes that could fly above the weather, we could not have a viable commercial aviation industry.

To date, we still build most homes and communities below the hazard level, hence the magnitude of disasters that we are seeing. It’s not sustainable. We can’t continue doing this.

**Q** What would you like to see happen to advance our approaches to resilience?

**A** Technology is a solution to a lot of the issues we face.

I encourage technical communities to push for best building practices, and greater standardization of them, depending on the hazard and the location.

Resilient buildings have to withstand the maximum hazard of a location. On the Gulf Coast, for example, we shouldn’t be gambling with Category 4 and 5 hurricanes, we should be designing for them, and mainly we’re not. In Miami [Florida], buildings are designed for 175 mph winds. The rest of Florida doesn’t do that. The Gulf Coast doesn’t do that.

Think of the 1960s car industry. Cars were pretty with chrome and tail wings but very unsafe. We pushed the industry, and they said they couldn’t do it and couldn’t afford it; it would be too expensive and people wouldn’t be able to buy cars. Well, guess what? They did it, they created solutions and brought down costs. As consumers, we would not want a car without the safety features that we enjoy today, even if it was cheaper.

We need to do the same thing in the building industry. We need to force innovation, we need to get the industry to move down the cost curve. Whenever you talk about raising the bar, the response is we can’t afford it. That’s because we haven’t tried it, we haven’t worked on it. Let’s try to make resilience affordable, rather than risk-taking affordable.