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Designing for Resilience

Big Idea: SustainabilityBlog

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Could your business survive a devastating superstorm or a major terrorist attack? Designing for resilience can ensure survival of critical systems in times of crisis.

The term "resilience" has taken hold in the sustainability community over the past several years as a way to talk about responding to the anticipated next phase of environmental, economic, and social change. In this view, change — especially climate change — is not likely to be incremental or predictable. And being prepared demands a strategy that is less focused on mitigating risk than designing for it.

Stephen Flynn, professor of political science at Northeastern University and Senior Research Fellow at the Wharton School's Risk Management and Decision Processes Center, recently spoke at the Volpe National Transportation Center about the need for resilient design in critical infrastructure like bridges, highways, and energy grids. Flynn is an expert on transportation and infrastructure security issues who takes a systems view of risk and resilience. He's agnostic about the sources of risk to infrastructure: they could come from accidents, nature, economic decisions that affect maintenance, or malicious intent.

"It takes years to build most of these things, and they're around for a long time. Waiting until we've identified a threat is too late," he said. "We need to take risks into account at the design stage, and build for resilience."

The focus of any organization concerned with resilience should be on whatever assures the continuity of business operations and the systems in which they're embedded. "9-11 was a real wake-up call," Flynn said, noting that businesses and supply chains were disrupted in ways few had foreseen or prepared for. "Companies that get knocked down and don't get back up quickly enough often see that vulnerability reflected in their market share."

The attributes of a resilient system include *robustness*, or the ability to absorb shocks and continue to operate; *resourcefulness*, being able to manage a crisis as it unfolds; *rapid recovery*, the ability to get services back as quickly as possible; and *adaptability*, being able to learn from experience and incorporate lessons learned to improve resilience.

In many cases, organizations will need incentives to build resilience into their processes, operations, and business models. One key indicator, Flynn suggested, is insurance. The characteristics of projects and businesses the industry will insure "will tell us a lot about risk, what's acceptable, and what's not acceptable. And that's changing. So is the financial world. Even bond rates are beginning to be tied to more resilient infrastructures."

Both companies and governments need to think differently. As climate change ramps up, shocks to the system like Hurricane Katrina and Superstorm Sandy — catastrophic events that were expected to happen only once every century — will become more extreme and more frequent. "The 'one hundred year' model for climate events is obsolete," Flynn warned. "This can open up the conversation, but let's make sure it's the right one."

Conversations could start with an orientation that moves beyond safety towards resilience. By defining a critical system — its components, boundaries, and functions — managers can begin to use "what-if" scenarios to determine which components, or combination of components, are most vulnerable. If a function is critical, it needs more attention; if it isn't, it can take more risk. And "if it's a single point of failure," Flynn said, "you're going to have to exercise more creative muscle."

The author of several books on the subject, Flynn also knows that a certain brand of leadership is needed to bring that kind of creative muscle to bear. In *The Edge of Disaster: Rebuilding a Resilient Nation* (Random House, 2007), he writes:

The presidential scholar James MacGregor Burns has said that transformational leaders are always "relentlessly optimistic." … leadership must always start from a clear-eyed view of how things really are. Only then can we begin to address how we can get from where we are to where we need to be.

A clear understanding of the growing challenges facing business is a good starting point for any conversation about designing for resilience.