

InfrastructureUSA

Guest on THE INFRA BLOG

Professor Malcolm Bowman, SUNY Stony Brook University Storm Surge Research Group

Conversation with Steve Anderson, Managing Director, InfrastructureUSA

Malcolm Bowman:

Hurricane Sandy & Playing Russian Roulette

New York City's policy is called resilience: if there is a weak spot, fix it. If we flood a power station on the East River, we build a wall around it. If a sewage treatment plant emptying into the harbor backs up, well we put in a big pump and we pump the treated sewage up and out into the river. If a LaGuardia Airport runway floods once in a while, we build a little berm around it and that's called resilience and that's necessary. But it gets to a point where it's not enough. I think of the example, a tree in my backyard fell down and knocked the guttering off the roof. What do I do? I fix it, but during Sandy a whole tree came down and squashed the house, then whether I fix the gutter or not isn't really the point anymore, so I've been overwhelmed by the catastrophe. So how much is enough? And that brings up complex questions of risk assessment, risk management, cost-benefit ratios. How much risk as a society are we willing to take in return for not spending the money on infrastructure perhaps that we should? And we all take risks every day of course, otherwise we wouldn't get out of bed, but we've really been playing Russian Roulette, I think, with New York City's exposure to storm surges, and the bullet's gone off.

Shortsighted Infra Policies

It takes a lot of political will to spend enormous sums of money to build what I call "regional protection" against an event that may only happen once or twice in a human lifetime. So the political system makes it really difficult to justify those kinds of expenses, and the European experience—I mean it took a major catastrophe with large loss of life before an adequate response was made to strengthen those countries' defenses. People often ask me if the Europeans have built storm surge barriers to protect their countries, their cities, from the ravages of major storms, why can't we? Why do we wait for a disaster to happen before we act? And that's an interesting question. If you think of London, they built what they call the Thames River barrier in 1982, which protects the city of London against North Sea storm surges that propagate up the Thames River. But then the city of London is 2000 years old and I think the British have a great sense of history, tradition, and they say, well if our city has lasted 2000 years, we must be doing something right, we better take care of it; we better look into the future, way into the future, and see what we have to do. So that's a sort of traditional way, whereas here in the States we're a young country, we're full of energy, we think we're invincible, so why worry? Let's get on with it. So there's

maybe a different mindset that we don't invest enough in infrastructure. We wait for the bad things to happen and then we scramble around and we scrape together money to fix it.

Strengthening Our Fragile Society

We live in a very sophisticated society but it's become obvious it's very fragile. If you think of, for example, the digital revolution and our reliance on the internet for everything from travel to power distribution systems to just communication. It's so important, it's so essential, but yet it's very, very fragile. It doesn't take much to knock it over, so yes, we are neglecting these critical infrastructure systems. If you look at the water supply system for New York City, there are 2 huge pipes 10 meters in diameter that bring water from Upstate reservoirs, one of them has massive leaks and they cannot be easily traced because it's drilled right through the mountains, it's not on the surface. So the city has really been reliant on one huge water supply system and you just can imagine if there was an earthquake what that would do to the livability of the city; it would be catastrophic. So, over the last 35 years, a huge third tunnel has been drilled through and is nearing completion. Some workmen spent their whole working career building this thing, and so this is a good example of trying to build resilience in the infrastructure. And I think the city has realized you cannot take those kinds of risks with the water supply system.

Extreme Weather

We must be prepared for increasing extremes of weather as time goes by. We're not necessarily going to see more hurricanes, but those that do come along are likely to be more intense. Why? One simple reason is that their energy source is the high temperature surface waters of the tropical Atlantic Ocean, and with rising ocean temperatures that will lead to stronger energy of the hurricanes that do form. Then sea level is expected to rise on the east coast, particularly in the New York region. It's already rising at about 1 foot a century, and that's not due to climate change, that's due to readjustment of the earth's crust since the last ice age. You can think of it as: The earth's crust floats on the mantle. It's a bit like a fresh loaf of bread; you sit on it, it's squashed by the 2 miles of ice. And when the ice goes, it struggles to re-form the way it was, but it doesn't come back exact. It turns out the east coast is going down while the central part of the North American continent is going up, and so if you're at the water's edge, the water coming up or the land going down, it has the same effect. In addition, depending on the rate of melting of the ice cap on Greenland, sea level is expected to rise by perhaps 1 or 2 meters by the end of the century. So the greater message is that we can patch up the infrastructure of New York City. It's called resilience, so we must do that, but this is going to happen over and over again.

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