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An Oklahoma Suburb, Tornado-Ready

By KEVIN M. SIMMONSMAY 14, 2015

SHERMAN, Tex. — SOMETIMES it appears as if there is a target hanging over Moore, Okla.: Storms seem to find it. Although the city was spared last week as tornadoes swept nearby, overturning cars and destroying dozens of homes, Moore hasn't always been so lucky.

In 1999, 2003 and 2013, powerful tornadoes struck the area, killing dozens and causing billions of dollars in damage. The 1999 storm had the highest wind speed ever recorded when it hit the nearby town of Bridge Creek. In all, 36 people died. Twenty-four more were killed in 2013 by another extraordinarily powerful tornado, including seven children at Plaza Towers Elementary School in Moore, one of two schools hit in the town.

But tragedy can breed resolve, and last year, Moore adopted a stricter building code for residential construction, becoming perhaps the first municipality in the country to approve rules aimed at significantly enhancing the structural strength of new homes and making them more tornado-resistant.

The new code raised the wind standard to 135 miles per hour from 90, sufficient to withstand most tornadoes. At the time the rules were proposed, the consulting engineer for the city estimated that construction costs would increase by about $1 per square foot. A group of local builders concurred. That would increase the cost of an average Oklahoma home by $2,000.

Not a bad deal, you might say, considering that an average of 64 tornadoes strike Oklahoma every year, behind only the considerably larger state of Texas, with 149, and Kansas, with 93, according to the federal government's Storm Prediction Center. Yet no other city in the state, or the nation, for that matter, appears to have gone as far as

Moore, according to the Insurance Institute for Business and Home Safety. Municipalities generally encourage new housing development, and if less expensive homes make their communities more desirable, the thinking goes, why disrupt the market?

Academic research in the 1970s found that in cases of low-probability hazards with serious consequences, most people ignored the likelihood that the hazards could happen to them. This suggested that people would be unwilling to pay for features that would provide protection against tornadoes.

But research I did with Daniel Sutter, an economics professor at Troy University in Alabama, suggests this belief may be wrong. We found that people were willing to pay more for homes with safety rooms, and to rent lots in mobile home parks with community shelters — features that increase the odds of surviving a deadly storm. Following the 1999 tornado in Moore, some builders there began to strengthen their construction voluntarily, and one of them told me the better construction was responsible for about half of the increase in sales of his homes.

The rationale for better construction extends beyond the dynamics of real estate markets. If reduction in damage exceeds the cost of construction, the new code is good policy. In a new paper published in the journal Weather, Climate, and Society, I, with my co-authors, Paul Kovacs, executive director of the Institute for Catastrophic Loss Reduction, and Greg Kopp, a civil engineering professor at the University of Western Ontario, found that they do.

Oklahoma has suffered by our estimate more than $30 billion in normalized damage from tornadoes over the last 25 years. If that pattern continues, we estimate that Oklahoma can expect $36 billion in future residential damage. Most damage comes from tornadoes rated EF-3 and above, or those with winds speed of at least 136 miles per hour.

The new Moore code is not designed for those winds, but a large tornado does not sustain wind speeds that high for a majority of its path. With this in mind we estimate that the Moore code, applied statewide, could reduce the expected damage from future tornadoes by 30 percent, or $11 billion. If all homes in Oklahoma had been built to the new standard, the increase in cost would have been $3.3 billion. This approach would easily pass a cost-benefit test.

This should not be a surprise. Tougher wind-resistance requirements were adopted in 1996 by Florida after Hurricane Andrew revealed that inadequate construction was widespread in the state. Eight years after adopting the statewide code, Hurricane Charley provided a natural experiment for researchers to study how the new code performed.

The Insurance Institute for Business and Home Safety examined damage from Charley and found that pre-1996 homes were 60 percent more likely to be damaged. And damage to those homes was 40 percent more severe than to homes built in compliance with the new code.

For states that face natural hazards like tornadoes, it makes sense to take precautions that limit damage and increase safety. Evidence is mounting that these decisions can be made on a cost effective basis. The enlightened thinking of city officials in tornado-battered Moore should serve as an example to other communities.

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