insights

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Disaster Resiliency Planning in the Private Sector

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Hurricane Beryl made recent news for its disastrous consequences for residents in Texas, including heavy rain, flash flooding, and winds reaching up to 100 miles per hour in certain areas. In addition, 2.7 million homes and businesses in Texas lost power as a result of the storm. *Storm Beryl Kills Three, Knocks out Power for 2.7 Million in Texas*, Reuters (July 9, 2024). Beyond these immediate impacts, Hurricane Beryl also triggered significant inland impacts and "spawn[ed] at least 65 tornadoes from the Texas coast to upstate New York from July 8–10." *Hurricane Beryl Recap*, Weather.com (July 22, 2024). In Texas alone, this hurricane is estimated to have cost approximately $6.0 billion and has resulted in 37 deaths. *U.S. Billion-Dollar Weather and Climate Disasters: Texas Summary*, NOAA (2024). Although leaders predicted a highly active hurricane season earlier this year, Texas citizens still underwent days without power, delayed disbursement of federal and state resources, and severe damage to infrastructure, as evident from the significant financial loss. *See NOAA Predicts Above-Normal 2024 Atlantic Hurricane Season*, NOAA (May 23, 2024); Stella Chavez, *Angry Houston Residents Still Want Answers After Hurricane Beryl Power Failure*, NPR (July 19, 2024); Jasper Scherer, *Biden Blames Texas Officials for Delayed Federal Response to Beryl*, ABC13 (July 10, 2024). Many states commonly experience reoccurring, severe weather events during certain seasons, and the public has criticized government leaders for lack of preparedness and responsiveness to weather catastrophes. *See, e.g.*, Scott Rodd, *Newsom Misled the Public About Wildfire Prevention Efforts Ahead of Worst Fire Season on Record*, CapRadio (June 23, 2021); Germain Bienvenu, *Hurricane Katrina Impact on Politics*, LSU Libr. (Jan. 31, 2024) (describing critiques of federal, state, and local governments' responses to Hurricane Katrina). The widespread impacts of states' recent storms provide just one example of the stark consequences of inadequate planning for these types of reoccurring natural disasters.

These reoccurring storms with cascading impacts are not isolated events; as evident from recent research, these types of reoccurring and cascading natural disasters are increasing in frequency and can no longer be ignored. Scholars suggest that severe effects of these natural disasters will only grow as the effects of climate change become more pronounced. *See* Camilo Mora, *Broad Threat to Humanity from Cumulative Climate Hazards Intensified by Greenhouse Gas Emissions*, 8 Nature Climate Change 1062 (2018). In a recent study, it is estimated that "[b]y 2100, the world's population will be exposed concurrently to the equivalent of the largest magnitude in one of these hazards if emissions are aggressively reduced, or three if they are not, with some tropical coastal areas facing up to six simultaneous hazards." *Id.* Other examples across the country—such as California heat waves and drought, followed by record-breaking damages from wildfires, or Florida's stronger hurricanes and heightened sea levels, followed by increased health-related issues—provide further evidence of the growing need to be prepared for and adequately respond to concurrent and consecutive disasters. *See* Jeff Berardelli, *Climate Change Will Bring Multiple Disasters at Once, Study Warns*, CBS News (Nov. 19, 2018).

While many fear the ongoing increase in prevalence of severe and interconnected natural disasters, the costs associated with these natural disasters are creating worrisome annual financial losses. The National Oceanic and Atmospheric Administration (NOAA) has sought to estimate the annual losses from billion-dollar disasters, adjusted for inflation. In the first seven months of 2024, for example, NOAA estimates that "there have been 19 confirmed weather/climate disaster events with losses exceeding $1 billion each to affect United States. These events included 15 severe storm events, 1 tropical cyclone event, 1 wildfire event, and 2 winter storm events." *U.S. Billion-Dollar Weather and Climate Disasters: Overview*, NOAA (2024). In terms of which disasters have led to the most financial loss, "from 1980 to 2024 . . . [t]ropical cyclones have caused the most damage ($1,412.1 billion, CPI-adjusted) and also have the highest average event cost ($22.8 billion per event, CPI-adjusted). Drought ($360.8 billion, CPI-adjusted), severe storms ($499.0

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billion, CPI-adjusted) and inland flooding ($200.6 billion, CPI-adjusted) have also caused considerable damage based on the list of billion-dollar events." *U.S. Billion-Dollar Weather and Climate Disasters: Summary Stats*, NOAA (2024). As the impacts of climate change continue to grow, and as natural disaster issues become more complex as they compound, experts fear that these billion-dollar natural disaster events will increase along with it. Bridget Johnson, *Are We Truly Ready for Disaster on Top of Disaster?*, CNN (June 20, 2024). With these increasing costs, private and public safety as well as assets are clearly at risk from multiple natural hazards, raising the potential for damage and disruption to operations.

As evident from the significant impact from these recent events, including substantial financial losses, communities must remain resilient in the face of these uncertainties and adapt their disaster protocol to address disasters with cascading impacts. In a disaster, the federal and state governments seeking relief look to the Stafford Act, 42 U.S.C. § 5121 *et seq*. (as amended by the 2002 Homeland Security Act; 2006 Post-Katrina Emergency Management Reform Act), including Federal Emergency Management Agency's (FEMA) implementation of the National Disaster Response and Recovery Framework. Traditional disaster planning has been overly focused on recovery from a single event, rather than anticipating a complex series of events. This approach is no longer sufficient. And while all levels of government (i.e., federal, state, and local governments) have been pressured to improve their responses to these events, resilience demands that all stakeholders come together, including the private sector, to encourage stronger disaster response efforts. As these natural disasters become more costly and affect more people, self-reliance demands that the private sector also must be resilient and a stronger partner in planning and preparedness, response, and recovery.

Extreme weather conditions, serial storms, wildfires, and related events affect the physical, transactional, and legal aspects of the built environment. Physical impacts manifest as structural, corporeal, or earthly damages or modifications. These impacts present very real safety risks to site occupants, such as failing structures and exposure to life-threatening elements and hazardous substances. Physical damages due to catastrophic events may result in significant costs to repair or replace damaged assets and short- or long-term collateral impairment, which may, in turn, constitute a loan default and present a risk of loan acceleration. Moreover, even if there is no damage to the collateral itself, there is a potential for impact on cash flow due to property downtime or permanent loss of use, which again may influence the financing of a project. Transactional influences appear as a loss of value, market desirability, or deal options. For example, industries and land uses that are at risk for such events may become less desirable—even unfinanceable. Insurance may come at a premium, end users may become less prevalent, and deal structures may be more limited or demanding. While contract provisions protecting against force majeure events or an "act of God" defense previously protected certain parties against the impacts of severe weather events, scholars have questioned the use and application of these defenses where extreme weather events have become more "foreseeable." Jim Rossi & J.B. Ruhl, *Adapting Private Law for Climate Change Adaptation*, 76 Vander. L. Rev. 827, 879–90 (2024). While this area of law is still developing, courts have begun to follow suit and narrowed the use of these defenses to protect parties against the contract breaches following the aftermath of severe weather events. *Id.* at 882. Thus, these transactional impacts provide further support for why the private sector must adapt its disaster responses as climate impacts become more severe.

Mitigation efforts taken before natural disasters arise pay great dividends in terms of safety, prevention of property loss, preservation of asset value, and litigation defense. *See Hazard Mitigation Planning*, FEMA (Nov. 28, 2023). Properly developing mitigation measures requires that a party first understand what they are mitigating against. Planning must shift away from the isolated event and be designed to address interconnected, compounding, and consecutive risks. Planning for such mitigation suggests that parties look to a diversity of measures. For example, rather than relying on traditional Stafford Act Response, the mitigation package should include, among other things, private development planning and design.

While not universal, many mitigation measures take the form of familiar engineering and design elements. Developers are already acquainted with stormwater management through the use of landscaped detention basins and water features, the construction of onsite microclimates to enhance development desirability and user amenities, the use of drought-tolerant plants, engineering of water recapture systems, and the reuse of graywater. These measures have been demonstrated to be achievable on successful projects for a single catastrophic event. For example, Hurricane Harvey dumped 50 inches of rain over a several-day period in certain areas. *See* Tom Di Liberto, *Reviewing Hurricane Harvey's Catastrophic Rain and Flooding*, NOAA (Sept. 18, 2017). One development planned for a flood contingency by assisting the local jurisdiction in constructing a community lake, which was engineered based on a disaster scenario and excavated deep enough to accommodate the site's drainage needs in an extreme event. The system proved effective during the hurricane and kept the buildings dry in the wake of downpours and flooding; however, the question is whether the lake could have handled three episodes of Hurricane Harvey in a few weeks. Consecutive events now create this challenge. The notion of managing onsite drainage is basic to development; climate resiliency merely requires that site engineers consider disaster scenarios in designing infrastructure. Notably, resilient design may mean managing more than requirements of local codes, especially in light of a historic tendency to plan for the single event. Designing to code may no longer be effective to protect the asset and may not be protective of tort liability since catastrophic conditions may be considered foreseeable. Traditional mitigation measures, often identified as sustainability features, remain a basis for mitigation measures if engineered for more complex and cumulative events.

In addition to stormwater management, facility operation and proper safety measures also should take the interconnected, compounding, and consecutive disaster scenarios into consideration. For example, a recent study estimates that "[o]f

all major U.S. power outages reported from 2000 to 2023, 80% (1,755) were due to weather. . . . Most weather-related outages were caused by severe weather (58%), winter storms (23%), and tropical cyclones including hurricanes (14%)." Climate Matters, *Weather-Related Power Outages Rising*, Climate Cent. (Apr. 23, 2024). Thus, design engineers must use resilient design and build with regard to the catastrophic events typical of the region, such as preparing for widespread power outages typical for regions with certain natural disasters. It is becoming more common to see installation of independent generators, potentially coupled with redundant power supplies such as propane and solar panels. Installation at the time of construction results in cost savings, can be included in home financing, may reduce insurance, and can be incorporated into the aesthetics.

Resilience and sustainability must be more than words; they must be wholly embraced in the mindset of all stakeholders involved in the creation of the built environment. More than simply managing risk, to be resilient, all parties must look to regional conditions, evaluate their unique contribution to the creation of hazards, and mitigate those hazards in light of disaster scenarios that are compounding and interconnected, through effective planning and engineering to ensure that we are safe. In the future, and likely soon, failing to do so could expose private sector interests to contract and tort liabilities for failing to foresee what has become our foreseeable future of natural disasters.

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