

# LIGHTS OUT



A Cyberattack

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A Nation Unprepared

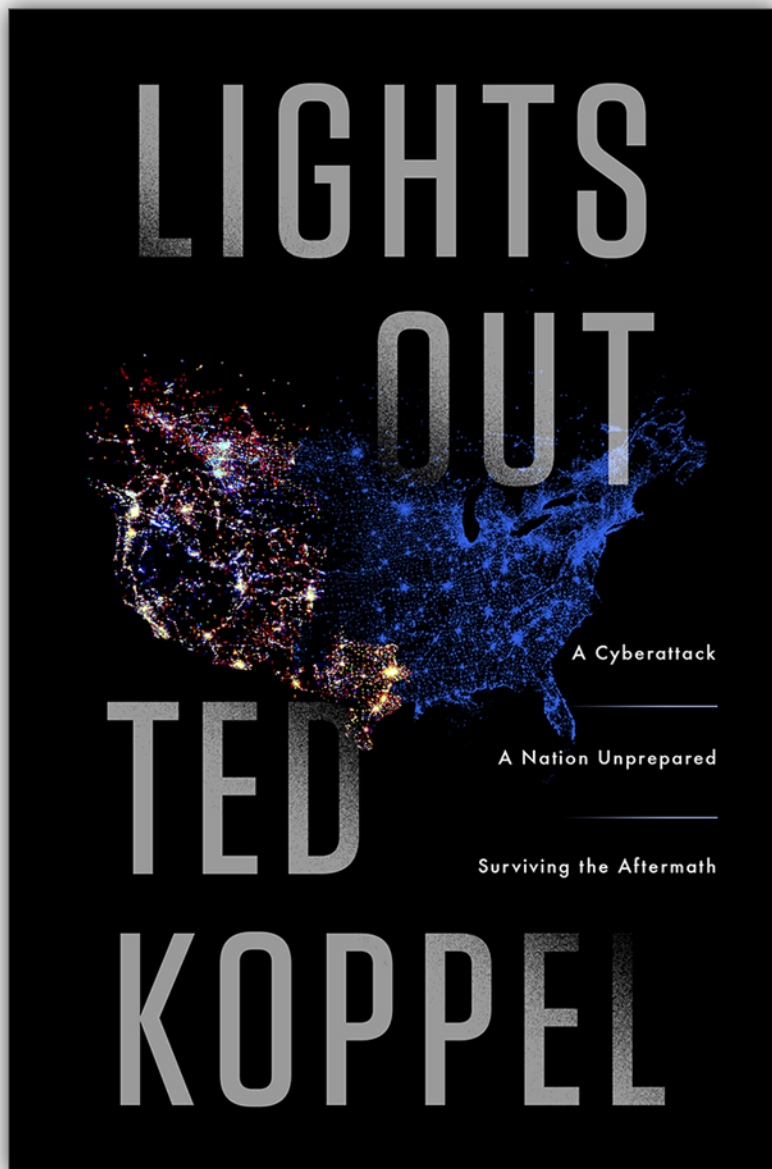
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Surviving the Aftermath

# TED KOPPEL

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There are plans. Of course there are plans—dozens of them, possibly hundreds.

As we've seen, for all the warnings from within the government and from high-ranking members of the military and intelligence establishments, and despite the known vulnerabilities of the transformers critical to the viability of the grid, there remains a determination within the power industry and among some government officials to stress the grid's resilience. They

invariably cite as evidence the manner in which electric power has been restored in the wake of one natural disaster after another. Absent a crippling example to the contrary, the presumed consequences of a cyberattack on a power grid are bundled into the same general category as blizzards, floods, hurricanes, and earthquakes.

On one level, this is understandable and even prudent. Experience is a more compelling instructor than speculation. Indeed, negative experience, such as that accumulated by the Federal Emergency Management Agency during the aftermath of Hurricane Katrina in New Orleans, can be especially instructive. FEMA is a far better-led organization today than it was in 2005. That's the good news. FEMA is, after all, the agency within the Department of Homeland Security that will bear the heaviest and most immediate burden of recovery, no matter what happens or why. A cyberattack may be different from anything FEMA has previously dealt with, but it is not unreasonable for the agency to focus on the experience it has gained from natural disasters.

This approach falters, however, when relevant federal agencies fail to provide for (or in some cases even contemplate) the difference in magnitude between the effects on the grid of any recorded natural disaster and the potential effects of a massive cyberattack. For one thing, the affected area could be much greater. Even the partial blackout of a grid could leave half a dozen or more states without electricity. Also, unless one credits the Old Testament-style intervention of an angry deity, storms do not deliberately target a system's critical weaknesses. Cyberattacks do, and if we assume that the attackers are predisposed to inflict maximum damage, they will try to conceal what they

are doing. Stuxnet succeeded in spinning those Iranian centrifuges into a self-destructive mode over an extended period of time, precisely because Iranian engineers were misled into believing that everything was functioning normally, even as the damage was being inflicted.

The associate administrator for response and recovery at FEMA came to the agency from the Coast Guard, from which he retired with the rank of rear admiral. When we talked in September 2014, Joe Nimmich was reluctant to accept my premise of a wide-ranging, weeks-long electric power outage affecting millions of people. Still, if it did happen, he insisted, the federal government would be ready to deal with it. He was confident that electric power sufficient to avoid a catastrophe could be restored quickly. “I’ve planned for a million people being homeless, I’ve planned for tens of thousands of people being deceased. I think very easily we can convert those plans.” Nimmich was describing a scenario in which Southern California is hit by a catastrophic earthquake. “When we look at the plan . . . we’re talking about activating seventy thousand troops.” He referenced Title X, the legal basis for the roles and missions of the armed forces, saying that he had planned for “the National Guard to keep law and order, and the Title X forces to be able to go in and actually help people move.” Relocation was central to Nimmich’s plan. “The plan is, you start moving people east. You take them out of Los Angeles, put them in hotel rooms in Nevada.”

A cursory online check revealed 124,270 hotel rooms throughout Nevada. Assuming that they could all be emptied out before the evacuees were brought in, this would suggest about eight people per room. Granted, that is a quibble. In the face of such a

catastrophe, people would open their homes, convention centers and basketball arenas would be adapted, and hundreds of thousands of refugees would be transported to other states. Somehow, shelter would be found.

The aftermath of a massive earthquake, though, bears very few similarities to the loss of a power grid to cyberattack. Where FEMA's presumed 9.0 earthquake would leave a city in rubble, with thousands of dead and injured, even the most massive cyberattack would inflict very little immediate physical damage. Following a serious earthquake, the need for evacuation would be unambiguous. Even buildings that appeared undamaged and infrastructure that had not been destroyed could be severely compromised. There would be the constant danger of further collapses. Sheltering in place would not be an option. Returning to the devastated region could be a matter of years.

On the other hand, in the case of a power grid going down, urging people to stay in their homes may be exactly the right thing to do, at least in the immediate aftermath. Buildings would be essentially undamaged and bridges, roads, and tunnels untouched, leaving routes open for resupply convoys and voluntary evacuation for those who choose to leave. There would be the immediate crises of people injured in the unaccustomed darkness and patients suddenly deprived of life-supporting equipment, but none of these emergencies would be alleviated by mandatory evacuation, especially if neither the duration nor the scale of the electrical outage was known. What I was describing to Nimmich was, in terms of immediate impact, far less than that of an earthquake, but potentially extending over a far greater geographic area and involving many millions more.

I put the center of this hypothetical disaster in Manhattan.

Nimmich was undeterred. “If, in fact, for some reason this is going to be a long duration, we are going to start an orderly movement of people out of Manhattan. And whether you bring buses in or you use trains, you’re going to have to move them out of the area. You know, you’re giving me two alternatives: we either find some way to restore the power or we move people to where they’re no longer in a life-threatening situation.”

“You’re going to move five or six million people?”

“Sure.”

Spoken with the confidence of a rear admiral. To Nimmich, there is no clear answer nor is there a specific plan, and there is no plan, he patiently explained, because “the dire straits you have articulated [are] not what we have gotten from the experts that we work with.” Which is yet another way of saying, “We haven’t planned for it, because we don’t think it’s going to happen.”

Joe Nimmich’s boss is the administrator of FEMA, Craig Fugate. Far from being a skeptic, Fugate believes that “large regions of the United States could go dark” in the very possible event of a cyberattack against the grid. I quoted Fugate in an earlier chapter on the vulnerability and unavailability of those large power transformers so critical to the grid.

As for his deputy’s mass evacuation plan for Manhattan, Fugate was dismissive.

“Can’t move ’em fast enough,” he told me.

“You can’t move that many people that fast,” I echoed, “and anyway, where are you going to move them?”

“Yep,” said Fugate. The very agencies that would bear responsibility for dealing with the aftermath of a cyberattack on

the grid have yet to find common ground on even the most fundamental questions.

In Washington, where plain answers to blunt questions are a rarity among people still in government service, an interview with Craig Fugate is a refreshing change. His former boss, the previous secretary of homeland security, Janet Napolitano, described him as a particularly focused individual. “Craig,” she said, “has only two interests: University of Florida football and disaster relief.”

What, I asked Fugate, would he say if President Obama came to him and wanted to know the plan in the event of a prolonged and widespread power outage?

“We’re not a country that can go without power for a long period of time without loss of life. Our systems, from water treatment to hospitals to traffic control to all these things that we expect every day, our ability to operate without electricity is minimal.” The FEMA administrator expressed a frustration likely common among senior government bureaucrats: “I’ve got to deal with the consequences” despite not “really hav[ing] any say on the front end as to why we got in this situation.”

It’s worth noting that when I interviewed Craig Fugate we were alone in his office. In Washington these days, that is a rarity. Most senior government officials are so worried about the consequences of what they say appearing in public that they like to have at least a public affairs officer present during an interview, to modify or mitigate any controversial answers. Not Craig Fugate (or, to be fair, Joe Nimmich).

So what, I asked FEMA’s administrator, is the plan for a prolonged, widespread power outage? For the first couple of days,



he explained, the primary burden would be on state and local governments, but if the electricity remained out for weeks or more, it would be FEMA trying to fill in the gaps. “The plan would be to support the states to keep security, to maximize what power we do have to come back online, to look at what it will take to keep food and other critical systems like water systems up and running with generators and fuel. To prioritize where we’re going to start rebuilding our economy.” Fugate warned that there’s a limit to how much FEMA can do, but he’s confident in prioritizing certain objectives. “Keep the water on,” he said. “That means we need to have enough power to pump, treat, and distribute water through the system. You have to keep the water system up, and you’ve gotta then focus on the water treatment system. Backing up sewage is just about as bad. Those two pieces will buy you enough time to look at what your alternatives are. Basically, people have to drink water, they have to eat, that waste has to go somewhere, they need medical care, they need a safe environment. There has to be order of law there.”

Fugate is not a man to mince words. There is traditional disaster response work, which is about reestablishing normalcy very quickly. Then there is uncharted territory, he acknowledged, “where normalcy [wouldn’t] get established quickly. We [would be] trying to hang on and keep as many people [as possible] from dying until the system comes back.” That’s not the sort of message that would inspire widespread confidence in a concerned public, but it has the ring of authenticity to it.

## State of Emergency

The basic tools of government are extortion and bribes.

—CRAIG FUGATE, FEMA ADMINISTRATOR

In the event of a regional crisis, the first lines of authority run through state capitols. It's up to the governor of any given state to mobilize the National Guard, up to the governor to order an evacuation, up to the governor to request federal assistance. The day may come when a cyberattack has such wide-ranging consequences that it will have to be treated as a hostile act against the United States. It will be, quite literally, an act of war. Until that time, however, the federal government tends to wait until the states request assistance.

Governor Andrew Cuomo of New York would likely first turn to his state commissioner of homeland security and emergency services, who was Jerome Hauer back in 2014, when I interviewed him; Hauer left the post early in 2015. In the late 1990s, when he served as New York City mayor Rudy Giuliani's

director of emergency management, Hauer had been a frequent guest on my program *Nightline*. He was then, and remains, an outspoken and colorful figure. When he welcomed me to his Third Avenue office in Manhattan on October 24, 2014, he was wearing a shoulder holster holding a Heckler and Koch pistol. On the same date exactly a year earlier, Hauer had unnerved a delegation of Swedish security professionals by using the laser on his pistol as a pointer during a presentation.

Hauer wasted no time in expressing his lack of confidence in the federal government's understanding of the power grids, and his conviction that a cyberattack on a control station would have devastating consequences. "If somebody gets into the network, then the ability to reroute is gone. The ability to actually monitor is gone. The ability to black out a control station leaves them [the power companies] helpless."

"Your job," I said, "is to tell New Yorkers what the plan is if the power goes out throughout the state. What's the plan?"

"Well," said New York State's commissioner of homeland security and emergency services, undermining whatever might be left of Admiral Nimmich's proposal, "we're never going to evacuate New York City. What we'd do is set up shelters for people to basically reside in. One of the biggest problems in a city like New York is the high-rise buildings. When power goes out we have hundreds and hundreds of people stuck in elevators. I can't tell you how many calls the fire department gets during a blackout."

It was Hauer who oversaw New York State's response to Hurricane Sandy. Sandy created great hardship for many people, but Hauer, like Janet Napolitano, said that the scale and duration were manageable. "The federal government was terrific,"

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said Hauer. “They brought in millions of meals. They brought in fuel through the Defense Logistics Agency.” There were, Hauer explained, millions of gallons of fuel in underground storage tanks, but gas station operators lacking generators to run their pumps couldn’t retrieve the fuel. It’s another example, albeit a small one, of business owners choosing profit over resiliency, because those generators can cost \$50,000 or more. Following Sandy, needing to get the gas stations up and running again, federal government responders pumped \$14 million worth of fuel into stations along “critical routes” and New York State installed generators in the majority of these stations, free of charge.

Donating fuel and generators to key stations during a short-term, localized crisis is one thing; convincing the owners of gas stations around the country to install backup generators in anticipation of a crisis is quite another. It would seem like a no-brainer, a way for owners to ensure that their pumps will function even when the power is out. But where the bottom line is at stake, small business owners are reluctant to make the investment. In such circumstances, Craig Fugate explained, bureaucrats are left with what he called the basic tools of government, “which are extortion and bribes. Either I give you grant dollars to get you to do something you would not otherwise do, or I tax you to change behavior for what you will not otherwise do.” (Far from being unique to crisis management, this essentially summarizes the entire tax code: for extortion, substitute taxes; for bribes, substitute tax breaks or incentives.)

Aside from fuel, the other government supply initiative Hauer cited was food—those “millions of meals.” The notion of millions of meals can seem confusingly reassuring. New York

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City has a population of eight million people. There are nineteen million people throughout the state. The upstate region, said Hauer, would overall be more self-sufficient in a crisis situation: there are hunters who store their food, and they have deep freezers attached to small generators. Even so, there are only so many hunters, so many freezers, and so many generators.

The city, though; how long could that hold up?

Without federal assistance, Hauer said, New York City “could probably last for two days.” The City of New York has warehoused millions of MREs, or meals ready-to-eat, but with a population of eight million these are nothing more than a stopgap. Any crisis lasting more than a few days would be a struggle. In the case of something as widespread as a grid outage, Hauer explained, New York couldn’t rely on federal assistance, because it would be competing with other states for food. FEMA “only has so many millions” of MREs stockpiled, and the private companies that produce them would be overwhelmed; states would have to “get in line.” Hauer also underscored the importance of knowing one’s constituency. He recounted how, in the wake of Hurricane Sandy, the Red Cross delivered ham sandwiches into certain Orthodox Jewish communities. “I know from experience they don’t have what we need for kosher, which is a big part of the city.” Hauer’s team ordered and distributed upward of a million ready-to-eat kosher meals. There are more than four hundred thousand Orthodox Jews in New York City. Even at the rate of one kosher meal a day per person, that supply of a million meals would be exhausted in less than three days. Nor does that take into account the city’s Muslim population; the more devout, who will only eat food that is considered “halal,”

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will eat food that is kosher. The overall population of Muslims in New York City is over half a million.

The disaster relief industry, at least that segment of it dealing with producing and distributing long-lasting food supplies, has its own operational complexities. Half a country away from the Orthodox Jewish communities of Brooklyn and Lower Manhattan is an unpretentious cinder-block building on the outskirts of Salt Lake City, Utah. It was where I met the owner and founder of the Saratoga Trading Company, Jeff Davis, and its president, Paul Fulton. Their company's retail outlet is The Ready Store; they exude the same cheerful energy as the squirrel mascot over the sign proclaiming FOOD STORAGE—SURVIVAL KITS—MRES—EMERGENCY SUPPLIES on the outside of the building.

We were seated around a small conference table on which Jeff and Paul had put out a sampling of freeze-dried raspberries, blueberries, and pineapple. Davis and Fulton didn't want to get into the financial details of their business, but they claim to be one of the larger companies in the industry. What they were willing to discuss were some of the peculiarities of the business. Disaster, for example, has an immediate, global impact. When the tsunami hit Japan in 2011 and the Fukushima nuclear plant was melting down, the immediate impact was such, Davis told me, that even their U.S. clients had to wait three months for their orders.

"And the reason we were at three months," Jeff continued, was not "because we couldn't produce it fast enough; I couldn't get raw goods from the suppliers. . . . It was a problem with everyone." The same market forces were at work across the

industry. There is a limit to how much fresh food is available for processing at any given time. The manufacturers who supply government relief agencies with MREs were having to wait every bit as long for product. They just couldn't get the necessary raw materials.

I had previously explained the premise of this book to Davis and Fulton, and Davis was close to speechless. "Oh, my gosh! . . . That kind of thing is so far beyond . . . The numbers would just . . . It would bury us within days."

Why not just build up the MRE stockpile when supplies are available? It's an issue of shelf life, which for MREs is only five years. "So," explained Fulton, "you look at the MRE manufacturers who are trying to build inventory post the tsunami in Japan; they overbuilt, because when buying of MREs stops, it stops and it stops fast. Having a surplus of MREs means a warehouse full of product that loses value with each passing year. Everybody wants fresh inventory that will last a full five years. So there's no incentive for the MRE manufacturers to build up a massive backlog." The only reason to stockpile would be if they knew for sure that an "emergency will happen in the next five years."

"Good luck," I said.

"Good luck," agreed Fulton.

FEMA and other government relief agencies are in the same boat as manufacturers. Ideally, they would want to buy MREs on short notice, but the industry is incapable of meeting crisis-level demands. Loading up on inventory is another option, but the government is disinclined to spend large sums on contingency planning when there's no immediate crisis brewing, especially given that five-year expiration date. The critical factor,

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then, is the supply chain. There is a limit to how much fresh food is available for processing at any given time. It cannot simply be turned on at a moment's notice. Freeze-dried foods are a longer-lasting option than MREs—properly processed and stored, freeze-dried and dehydrated product can last up to twenty-five years—but Paul Fulton estimated that even a bare-minimum supply of such food would cost at least \$2,000 a person per year.

If Congress was convinced that at some point the government might need to provide emergency food supplies to, say, thirty million people for a year, it could, for \$2,000 a head, provide the basics to keep them alive. Could this be part of a solution? The \$60 billion cost is hardly prohibitive when you consider how many lives would be at stake. It would probably take the industry years to accumulate the necessary raw materials, but in theory, at least, it seems a viable option. In its 2008 findings, you may recall, the EMP commission projected far greater numbers than thirty million at risk. What can be projected with some confidence is that any crisis—whether EMP or cyberattack—that knocked out electricity for more than a couple of weeks over a multistate area would exhaust emergency food supplies in a matter of days.

Ray Kelly served in the New York City Police Department for a total of forty-seven years, twice as commissioner, from 1992 to 1994, and then again from 2002 to 2013. What concerns him is the proliferation of guns and what would happen to the most vulnerable members of society in a city like New York in the face of an extended crisis and prolonged shortages. “People certainly have the potential for trying to take things by force. What happens in an elderly community, where they’re certainly



susceptible to being attacked in terms of taking what they have, the limited resources, least able to defend themselves?”

Government agencies at almost every level try to anticipate problems by holding what are sometimes called “tabletop exercises” or “war games.” Ray Kelly participated in many such exercises. He cannot remember a scenario, though, in which New York City and its surrounding area were assumed to be without electric power for more than five days. Not, he assured me, that he thinks a protracted blackout is unlikely: “There’s a real danger here. And I think we just haven’t done nearly enough. There’s not enough awareness of it, but also government is asleep at the switch.”

There were reports in the wake of Hurricane Katrina that as many as two hundred members of the New Orleans police department were under investigation for deserting their posts. The number of police officers ultimately charged was closer to fifty, but the stresses and challenges facing first responders worried about their own families are not difficult to understand. Rudy Giuliani, mayor of New York City during 9/11, thought the New Orleans example was a reflection of poor training and management. “In a good police department,” he told me, “a well-run police department, New York, Chicago, Boston, Los Angeles, I think most of your cops and most of your firefighters, if anything, are going to come and volunteer for duty.”

Interestingly, his police commissioner, Ray Kelly, who came up through the ranks, starting as a police cadet, didn’t have quite that same level of confidence. “The security implications [of getting first responders to work] are huge. You know, they’re concerned about their families, they’re concerned about their well-being. So over time when you talk about protecting the

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points of distribution, that all implies that government workers are showing up and do their jobs, and you can't guarantee that over a sustained period of time. Their ultimate concern, like most human beings, will be their families' and their own well-being."

There are individuals whose preparedness planning will get them through the initial days and even weeks when food runs out. FEMA, the National Guard, and branches of the federal government are focused on finding a way to keep water flowing—enough, at least, to keep people alive and to dispose of their waste—but maintaining an adequate flow of food into the cities and keeping the very young, the elderly, and the infirm alive will depend in some measure on the season. Winter, when there is no safe source of heat, would take a particularly heavy toll. In an environment of crowded, hungry, freezing people, each passing day would presumably elevate the potential for violence. It requires a degree of advance planning well beyond whatever exists to deal with the consequences of a natural disaster.

We are inclined, as Tom Ridge observed, to be a reactive society. We apply unimaginable amounts of money toward dealing with the aftermath of crises. The most conservative estimates put the financial cost of the wars in Afghanistan and Iraq at around \$1.5 trillion. Most estimates are significantly higher. The Transportation Security Administration, which came into being as a direct consequence of the 9/11 terror attacks, now employs fifty-five thousand people, with an annual budget in excess of \$7 billion. Over the course of the past fourteen years TSA has been funded to the tune of somewhere between \$90 billion and \$100 billion of protection we didn't know we needed

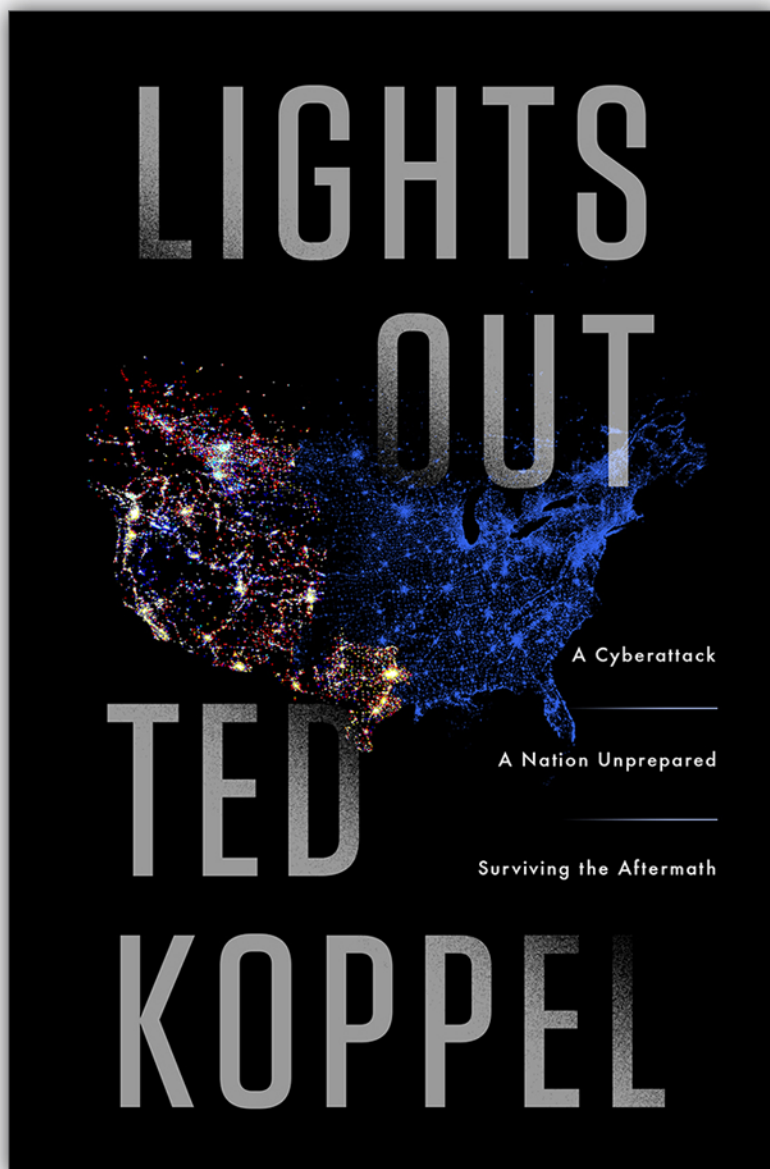
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before 2001. Nor, it seems, has the money been particularly well spent. In early June 2015, the Department of Homeland Security revealed that its teams of undercover investigators were able to smuggle dummy explosives and weapons through TSA checkpoints at airports around the country in 95 percent of cases.

We tend to come up with funding after disaster strikes.

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