

## **A year after Irene, experts say N.J. must strengthen infrastructure before it's too late**

**By Stephen Stirling/The Star-Ledger** *Published: Saturday, August 25, 2012 | Updated: Monday, August 27, 2012*

"If this bridge goes, all the water for Middletown goes," a voice on the video, posted on YouTube, says. It was prophetic. Ten months later, the bridge did go, leaving more than 200,000 customers without potable water for nearly a week. It was likely the most recent casualty of Irene, which a year ago swirled up the East Coast.

The storm displaced thousands of New Jersey residents, killing 12 in the state and led to an estimated \$915 million in insurance claims. When it made landfall in New Jersey early on the morning of Aug. 28, 2011, as a tropical storm, Irene brought with it 65 to 70-mph winds and dumped nearly 10 inches of rain in many places, putting a soggy cap on what would become the wettest month in state history.

Under the wrath of Irene, New Jersey's structural foundation bent and, in some places, cracked. Damage like the water main collapse earlier this summer underscores how vulnerable New Jersey's aging infrastructure is to severe weather, which many climate scientists believe is on the rise.

In places like Fairfield, where flooding has become an annual problem in recent years, officials and residents have become exasperated with the lack of improvements to aid in flood prevention. "We've had one (major flood) every year going on three or four years now. We do everything we can, but we can only do so much," Fairfield Mayor James Gasparini said. "With the money that they're spending to fix these homes and insurance and everything else, they could be fixing the problem".

In the wake of Irene, New Jersey agencies and private utilities spent at least \$235 million on repairs to critical infrastructure, according to state agencies and utility companies, sapping funding intended for much-needed improvement projects and virtually guaranteeing future spikes to water and energy bills.

And, according to experts, if major investments aren't made soon, catastrophic failures of water and power systems and road collapses are going to become increasingly common. "We are definitely very vulnerable," said Qizhong Guo, a professor in Rutgers University's civil engineering department. "Our infrastructure is aging—that alone is going to make things like this happen more often. But add climate change on top of that, with more intense rain and more intense drought, and you're going to see it more and more and more".

### **Successes**

After forming in the eastern Caribbean Aug. 20, Irene tore up the eastern coast of the United States, making landfall in North Carolina, Little Egg Harbor Inlet in New Jersey and Long

Island, causing an estimated \$15.8 billion in damage in 10 states, making it one of the costliest storms in the nation's history, according to the National Weather Service.

In New Jersey, roadways washed away, including a large section of Interstate 287 in Boonton that fell into the swollen Rockaway River. Millions were left without power when falling trees left the state's power grid in tatters. Drainage systems, not designed to handle a storm of Irene's magnitude, backed up, turning entire neighborhoods into lakes.

Despite the damage, repair and recovery efforts by state agencies benefited from lessons learned in past storms, like Tropical Storm Floyd in 1999, officials said. All but one of the 115 portions of the state's highway system that sustained damage have been repaired, according to the state Department of Transportation. And, in many cases, entire sections of roads and highways were replaced in the days and weeks after Irene struck. In addition to the portion of 287 that washed away, parts of Route 29 in Hopewell, Route 23 in Wantage and Route 46 in Roxbury were destroyed by floodwaters. All told, the state Department of Transportation spent about \$10 million to recover from Irene's fury.

Six dams failed during the storm and another 14 were damaged, according to the Department of Environmental Protection. For the most part, repairs have been made where needed, while other low-risk dams were allowed to wash away.

John Moyle, bureau chief of dam safety and flood control for the DEP, said lessons learned after Floyd in 1999 informed the agency's response to Irene. "(Floyd) was one of the first times we had experienced significant damage to our dams," Moyle said. "We spent a lot of time over the last 10-plus years making sure we were prepared to respond if we were impacted by another major storm." Part of those efforts included the creation of a \$100 million low-interest loan program, through which the state lends money to private dam owners for repairs and improvements.

## **Struggles**

But the storm proved too much for the state's private utilities. The state's water and power systems were overwhelmed by the extent and intensity of Irene. It took days to recover, and while services were eventually restored, the utility companies were battered by waves of criticism in the weeks and months that followed.

New Jersey American Water's Canoe Brook Treatment Plant in Essex County, nearly a century old, flooded and was shut down, cutting off water to seven neighboring municipalities. The company spent \$75 million to replace the facility with a new plant on higher ground, which recently opened.

The utility felt the effect of the storm again in June when its bridge collapsed. The structure, which carries mains that provide water to most of Monmouth County, was damaged when it was submerged in floodwaters from the nearby Swimming River. When it fell at the height of an early summer heat wave, it cut off the water supply to about 200,000 people for nearly a week.

In the weeks after Irene, the company says, it had hired an engineering firm to inspect the bridge several times, but repairs had only started in earnest shortly before the collapse. "We're accountable for our assets and for providing service to our customers. We take action where it's needed," Schaeffer said. "In this instance, the bridge suffered some damage as a result of a storm. We did an evaluation, an investigation. We shared that information (with the state Office of Emergency Management) and proceeded to develop a plan to repair it. I don't think it's indicative of the overall condition of our critical assets".

An investigation by the state Board of Public Utilities into the collapse is under way, the results of which will be released this fall.

In its immediate wake, Irene also toppled thousands of trees, already on loose footing due to saturated ground from heavy rains in the weeks prior, shredding the state's power lines and turning the lights off in at least 1.65 million New Jersey homes and businesses. Repairs to the electrical systems of New Jersey's three largest energy suppliers—Jersey Central Power & Light, PSE&G and Atlantic City Electric—took days and cost more than \$140 million.

Some JCP&L customers were without power for more than a week, and the company's response was highly criticized. An investigative report by the Board of Public Utilities into the response of the energy companies is expected to be released soon.

A JCP&L spokesman said the utility is making a renewed effort with customer outreach, after many were literally and figuratively left in the dark about when the lights would come back on. "We now do daily conference calls with mayors, county freeholders and other stakeholders to provide updates," said Ron Morano, a spokesman for JCP&L. "The use of social media has become critical. We communicate with customers on Twitter, on Facebook. And we have a brand new interactive power outage map, that customers can get on their phones, where they can get real-time information on where there are outages and how long repairs are expected to take".

JCP&L plans to implement \$200 million in infrastructure improvements by the end of this year, a sharp increase from an average of \$160 million it has spent annually in the last decade. But the massive bill will likely be passed on to the customers. PSE&G and Atlantic City Electric have already expressed their intentions to recoup repair costs through rate hikes, and JCP&L and American Water could soon follow suit.

## **The Future**

Experts say long-term threats to the state's water, power and transportation systems loom. And many climate scientists believe severe weather will only get worse, and more frequent. It leaves New Jersey with a growing set of problems. One that, for now, it doesn't have the money it needs to fix.

In 2007, the New Jersey chapter of the American Society of Civil Engineers gave New Jersey's critical infrastructure a grade of C- and said billions of dollars in investments were needed over the next several decades in virtually every system the Garden State relies on.

The North Jersey Transportation Planning Authority says more than \$56.9 billion will be needed to simply maintain New Jersey's roads, rails and public transportation systems through 2035. With improvements to account for New Jersey's growing population and environmental changes, that number balloons to more than \$123 billion.

The American Society of Civil Engineers says nearly \$22 billion is needed to upgrade the state's drinking and wastewater systems.

Guo, the civil engineer at Rutgers, said the state is littered with leaking, collapsed or clogged pipes—some of which are a century old—that were only built to handle a one or two-year storm. Irene and Floyd, by comparison, were considered once-in-a-century storms. "We're going to start seeing more intense rainfall. That creates more runoff, more water coming in and many of the pipes are already cracked or clogged or have even suffered collapses," Guo said. "So where there are these older systems, it's going to create more flooding".

But right now, the funding for improvements simply isn't there. "We have stacks and stacks and stacks of projects—improvements, ready willing and able to go," said Matthew Holt, the chairman of the North Jersey Transportation Planning Authority. "We can continue to add to the pile, but we already have a very deep pipeline of projects. They're simply unfunded".

But not investing, experts and local officials said, could prove even more costly. "We've been studying this thing for 100 years. We've studied it to death," Gasparini, the Fairfield mayor, said. "With the millions or billions of dollars that have been spent here after floods, you could have fixed the problem and never have to worry about it again. Money is being thrown away every time there is a flood".

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