

What Happens to the Internet After a Disaster?

By *Ingrid Burrington*



Photo: Hector Retamal/AFP/Getty Images

In a networked world, stage one of disaster recovery is, well, recovering the network. In the immediate aftermath of Hurricane Maria, a familiar narrative arc unfolded across my Twitter timeline: outrage at the absence of media coverage and the scarcity of information about the state of Puerto Rico, reports

of repeated failed efforts to reach loved ones via phone, verification or debunking of stills from disaster movies claiming to be from the island, and a slow drip of actual news from the few people on the ground with a decent signal. That now-familiar moment when no one knows exactly how bad things are, only that they're bad enough that *even communicating how bad they are* is a challenge. It's often easy to imagine the internet as a frivolous amenity. But when the most important thing is to communicate your plight to authorities, relief workers, and the outside world, reconnecting to the internet can become as important as food or clean drinking water — especially because you might not be able to get the latter without the former.

Just ask people who lived through Hurricane Sandy in places like the Lower East Side, the Rockaways, and Midland Beach. Five years ago, in the days and sometimes weeks following the storm, residents of New York's low-lying neighborhoods huddled around ad hoc phone-charging stations, and volunteers climbed dozens of stairs to check on elderly, sometimes bedridden public-housing residents unable to contact loved ones or call 911. In some neighborhoods, repairs to crucial telecommunications infrastructure took far longer than it did in the case of, say, Goldman Sachs.

That experience has led New York City, and some dedicated activists and neighborhood residents, to establish communication alternatives to Verizon and Time Warner for use both during and independent of any emergencies. Under the auspices of RISE: NYC, a competition run by the New York City Economic Development Corporation, with funding from the Department of Housing and Urban Development, neighborhoods at risk of flooding in the next superstorm are setting up their own infrastructure. Rather than wait for their primary — usually corporate-owned — connections to come back online, neighborhoods can own alternative communication channels. Despite the challenges of working with top-down federal funding to build bottom-up community networks, five years after Sandy these initiatives are building a model of emergency preparedness grounded as much in weaving stronger social fabric as they are in technical innovations.

The first challenge to communications in a major storm is, of course, power outages. Cell towers don't do much when you can't turn them on. The other challenge is damage to the network infrastructure itself — things like dead cable switches in flooded buildings, towers knocked out or literally over, or underground cable vaults flooded. In these situations, the advantage of localized community networks is that they can still provide basic neighbor-to-neighbor communication without an internet connection — useful for tasks like assessing and coordinating local relief efforts — and, if the local network can

reconnect to the internet, provide Wi-Fi coverage to a neighborhood while individual buildings get back online.

But building local communications networks can have benefits beyond recovery after a disaster. In 2011, well before Sandy hit New York, a local youth-development nonprofit called Red Hook Initiative set up a local mesh network (a system of interconnected wireless routers) called Red Hook WiFi in collaboration with the New America Foundation's Open Technology Institute. After Sandy, it quickly became a crucial communications resource, and, after the installation of a satellite uplink in Coffey Park by a group called Information Technology Disaster Resource Center, a tool for distributing free internet access in the neighborhood.

Today, as part of RHI's RISE grant, RHI's Digital Stewards program continues to employ Red Hook youth, training them to build out and maintain the Wi-Fi network both as a form of professional development (former Digital Stewards have gone on to work for local ISPs and wireless-services companies) and as a way to increase neighborhood resiliency. As Dabriah Alston, the program director for Red Hook Wifi noted, "When all is said and done, we want people from the community to be called when the network goes down."

After working with RHI, New America launched a new program called Resilient Communities and received a RISE grant to partner with five community organizations in Harlem, Hunts Point, Gowanus, the Lower East Side, and the Rockaways. They're using much of the same tech initially prototyped in Red Hook, largely for the same reasons it was chosen there: It's relatively cheap off-the-shelf equipment (Ubiquiti and TP-Link routers) running open-source software, which means it's free and can be modified to suit the local network's needs.

Resilient Communities' explicitly political, community-focused approach — the curriculum is documented in brightly colored zines, and training materials are as likely to reference Grace Lee Boggs as the fundamentals of TCP/IP — has been important in building partnerships with organizations like their South Bronx partner the Point, who view the Wi-Fi network as furthering its mission areas of arts and culture, environmental justice, and youth and community development. "The only way to be free is to be self-empowered," explained Yamil Lora, a longtime the Point employee and one of the lead coordinators of the Hunts Point Community Wifi project. "Being in a situation where you have to ask some company to come fix a problem for you — that's a state of poverty."

There is, of course, room for less politically radical and more profit-minded projects. [goTenna](#), the third RISE: NYC telecom grantee, hopes to achieve the vision of bottom-up, person-to-person network infrastructure while raising VC funding. The company emerged out of CEO Daniela Perdomo's experiences as a volunteer during Sandy recovery, watching city and federal agencies flail due to bad comms systems. "Different emergency service units could not communicate with each other — NYPD on one frequency, FEMA on another, it was just chaos. What I noticed was that a lot of civilians were first on the scene." Perdomo saw a business opportunity in making communications infrastructure serving those first-responder civilians. (So did a handful of VCs — according to [Crunchbase](#), the company has received \$16.8 million in funding since its founding in 2012.)

goTenna is a platform for a mobile ad hoc network (MANET), a model of mesh wireless communications often used in bulky, expensive tactical military radios. But goTenna's device is about the size of a extra-thick Sharpie, and costs a little less than \$200 for two antennae. The devices pair with a smartphone, mesh with other local antennae, and transmit communications to an app. It challenges the entire model of mobile communications running across cell towers, moving communication more directly to phone-to-phone (or phone-to-pocket, mesh-to-pocket, mesh-to-phone).

The slick, relatively cheap out-of-the-box proprietary radio platform is arguably a quicker sell than long-term, complex, open-source infrastructure building by RHI and Resilient Communities, but the three grantee organizations generally don't see themselves as competing so much as doing different things that can work well together. goTenna Mesh is great for SMS-style real-time communication; a localized mesh network might be better for a bulletin board or longer-term logistics resource. Ultimately, all three grantees want the same thing: Communities sustaining their own network infrastructure, not just for emergency management, but as a catalyst for changing the ways people think about network infrastructure and as a tool for strengthening social fabric itself.

It's an idealistic goal, complicated by a familiar problem in community activism: The red tape and bureaucracy of federal funding. All grantee projects are supposed to be deployed to small-business owners — who are required by the federal government to provide onerous proof, including tax records. Some businesses lost relevant records in the storm, while others were simply wary of jumping through more tiresome hoops just to put a Wi-Fi router on a rooftop. In Red Hook, Alston called it "Sandy fatigue": "Everyone is coming into the neighborhood [post-Sandy] with something different, but sometimes it's more hassle than help." As a result of this red tape and skepticism, many of the

neighborhood networks don't have quite the reach that the grantees might have hoped for. "I know a guy who owns ten buildings in Hunts Point and he said no. That's like ten nodes [for the Wi-Fi network] and why not? Tax records? That's bullshit," lamented Kevin Nuñez, whose family's automotive business N&M Transmissions has been in Hunts Point for decades and who worked closely with the Point to recruit businesses.

There's also the question of how to maintain these networks once the grant runs out. Despite these challenges, the RISE grantees have been able to sign up businesses to participate —largely through pounding the pavement (goTenna currently has a full-time organizer on staff focused on RISE recruitment), relationship-building brokered by people like Nuñez, who already had strong ties to local businesses, and the best efforts of EDC to streamline the process. Among the RISE grantees, these telecom projects always were a greater challenge: The resiliency of a telecom network requires, well, *a network* of people willing to participate and maintain it in a way that, say, adding a solar panel on a building just doesn't. By design, resilient network infrastructure prioritizes interdependence and cooperation over self-sufficiency — without strong underlying social ties, there is *no* localized network infrastructure. The technical complexities of building a network are a lot easier to overcome than the political complexities of building community, political agency, and governance.

Those complexities can contribute to the dominance of more top-down solutions to network infrastructure rebuilding in a disaster — which also tends to create opportunities for mercenary exploitation of disaster, as seen in the recent editorial by Puerto Rico's Verizon-backed Chamber of Commerce insisting that killing net neutrality would help the island's recovery. Alphabet's implementation of its Project Loon balloon Wi-Fi network over Puerto Rico might not be as explicitly insidious as, say, Facebook's Free Basics, but the ease with which the FCC was able to grant the company an experimental license is a telling reminder of how benevolent disaster support can also serve as a convenient R&D playground for corporations using crisis to eschew regulations.

Perhaps an equally salient measure of the success of these community-network initiatives is not merely the strength of a Wi-Fi signal or the number of nodes in the network, but the depth of the connections built through actually building that network and the connections among the people empowered to claim ownership of it. It's a metric that speaks to resiliency far beyond natural disasters — as Nuñez pointed out to me, the south Bronx has long been a neglected borough, and projects like Hunts Point Community Wifi are building not just useful communications resources for a future emergency, but also

building a community of local business owners and residents organized in the face of equally daunting emergencies of community displacement and government neglect. “If we put the power in the hands of the people, we have a better chance of surviving,” Nuñez said. “I think it’s a pretty revolutionary thing.”

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