Frothly

FR-P-2025-074

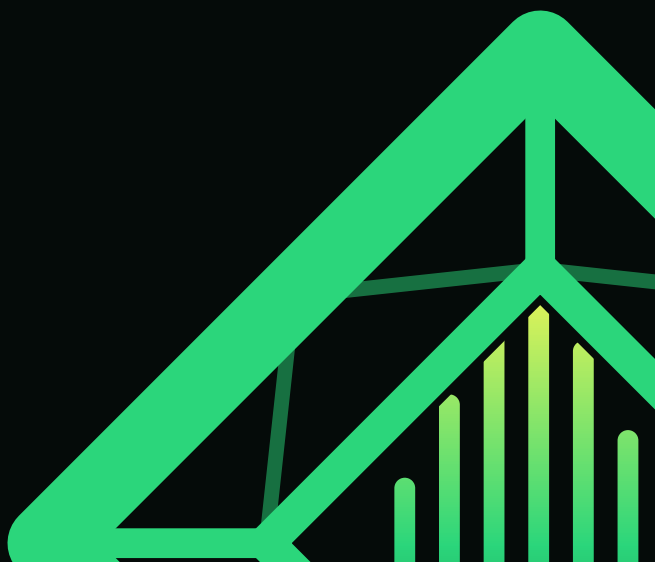
PAPER

Mesh at the Margins

Seventeen years of community networks.

J. Bone

LoTek · Oct 2025



ABSTRACT

The first LoTek network went live in 2008 on a single block in Newark, with a handful of rooftop nodes and a relay mounted under a disused bridge. Seventeen years later, sixty-four communities own and run their own networks.

Using operational data from every LoTek network, we show that community ownership improves uptime, lowers costs and changes how residents use the internet, and we identify the governance choices that determine whether a network lasts.

KEY FINDINGS

01 Community networks outperform the commercial service they replaced: higher uptime, faster median speeds and far more households connected.

02 Most networks last. 71% of LoTek networks were still running fifteen years after launch.

03 Governance predicts survival better than technology. Networks with elected stewards and a maintenance fund were three times as likely to survive ten years.

04 Ownership changes use. Residents of community networks spent more of their time online on local services and with one another.

01

Where it started

In 2008 a small group of residents in Newark, tired of paying for internet service that rarely worked and of being told their neighborhood was not worth upgrading, decided to build their own. They had a few secondhand radios, some borrowed tools and access to the underside of a disused bridge that could see most of the rooftops they wanted to reach.

That relay ran for eleven years before it was replaced. The network it anchored became the first LoTek network, and the model for the sixty-three that followed.

02

Performance

We compared each LoTek network, over its lifetime, with the commercial service available in the same area before the network launched.

TABLE 1 **LoTek networks compared with prior commercial service (medians)**

Measure	LoTek network	Prior commercial service
Uptime	99.2%	97.8%
Median speed	94 Mbps	51 Mbps
Monthly cost per household	$4 maintenance share	$68
Households connected	81%	46%

64 networks, 2008–2025. Commercial figures are for the twelve months before each network launched.

Uptime surprised even us. Community networks have no operations center, but they have something more useful: dozens of residents who notice within minutes when a node goes down and know how to fix it.

03

What makes a network last

FIGURE 1 Share of LoTek networks still operating, by years since launch



Networks that failed rarely failed for technical reasons. They failed when the two or three people who understood them moved away, when a single expensive repair could not be paid for, or when disagreements about rules went unresolved. The networks that survived had made a few governance choices early.

- *Elected stewards.* A small group, chosen by residents and replaced regularly, responsible for maintenance and decisions.
- *A maintenance fund.* A modest monthly contribution from each household, held in reserve for repairs.
- *A training pipeline.* Regular sessions that teach new residents to install and repair nodes, so that knowledge never rests with one person.
- *A legal home.* A cooperative or association that can hold equipment, sign rooftop agreements and outlast any individual member.

Networks with all four were three times as likely as others to survive their first decade.

04

What changes when people own the network

Ownership changed not only how the networks ran but how they were used. Residents of LoTek neighborhoods spent a larger share of their time online on local services: community noticeboards, mutual-aid groups, tenant associations and small local businesses. Several networks host their own servers for exactly these purposes.

Asked to describe their network, residents rarely talked about speed. They talked about it as something that belonged to them, which, for the first time, it did.

05

Recommendations for cities

- Grant community networks access to public rooftops, poles and bridges on the same terms as commercial carriers.
- Offer small start-up grants for equipment and training, rather than large grants for construction.
- Recognize community cooperatives as eligible recipients of broadband funding.

References

Bone, J. (2014). Building Heaven: notes from a rooftop network. *Community Technology Review*, 3, 1–19.

Lawson, M. and Bone, J. (2021). Keeping old radios alive. *Journal of Repair Studies*, 8, 50–66.

Newark Housing Authority (2019). *Rooftop Access Policy for Community Networks.* Newark.

Acknowledgments

With thanks to the stewards of all sixty-four networks, and to Jones, whose years of signal analysis made the early network possible.

About the authors

J. Bone leads LoTek and helped install its first network in Newark in 2008.

HOW TO CITE

J. Bone (2025). *Mesh at the Margins* Seventeen years of community networks. Frothly Paper FR-P-2025-074. San Francisco: Frothly. https://frothly.org/research/mesh-at-the-margins/

Frothly

FR-P-2025-074

Frothly is an independent, not-for-profit research institute studying the systems that increasingly think, remember and decide on our behalf.

We hold no shares, sell no products and accept no funding that comes with conditions on our findings. Everything we publish is free to read.

San Francisco · Vancouver · Newark · Zürich · Chiba

This work is licensed under Creative Commons Attribution 4.0 International.