**Private Alternatives: Community Mesh Internet During COVID-19**

Today, we face a crisis that is shifting our understanding of the tradeoffs between privacy, public health, personal well-being, and civil rights. Lack of home internet leaves people dependent on insecure technologies and Wi-Fi. During COVID-19, these individuals must access internet in venues where social distancing is harder and productivity lower, and where people must share scarce resources [15] without well-established norms for communal participation. Equally relevant is the fact that people without home internet access tend, for identity-based reasons (e.g., race, history of incarceration) to be more vulnerable to public surveillance. Infringements on privacy increase during health crises [12], making any internet participation more risky, particularly shared public access.

We face challenges just bringing essential internet to individuals without means to afford it, *but these challenges are more urgent in a pandemic*. Addressing them might demand eschewing big internet service providers (ISPs) in favor of local solutions to provide internet that is secure (private), safe (socially distanced), and community grown (trusted).

Community *mesh networks* are built on local node topology that more efficiently connect clients to a host (e.g., internet exchange). The University of Maryland, Baltimore County (UMBC), and Digital Harbor Foundation have received a collaborative RAPID grant from the National Science Foundation in support of Project Waves to introduce and research the impact of mesh networks connecting low-income homes in Baltimore and meeting this urgent need.

**Mesh networks vs ISPs**

In 2019, roughly four in ten low-income US adults lacked home broadband internet [4]. In the midst of COVID, Baltimore schools connected thousands of homes through Comcast’s Internet Essentials, only to find that they must foot the bill several months in [5, 11]. While ISPs have had an important (albeit overstated [22]) role in bringing internet to low-income families, the digital divide is narrowing [29] maybe in no small part due to efforts by communities responding with agility.

Project Waves can prioritize digital access gaps on three critical dimensions, while addressing immediate concerns produced by COVID: (1) provide *secure* access that is free from surveillance of ISPs (2) allow people to stay *safe* at home and social distance, (3) and build *trust* that allows communities to take greater ownership of technology and, in so doing, normalize its use [13]. Below we elaborate on these three dimensions.

**Secure Internet**

*Constrained Access and Reliance on Public Infrastructure*

COVID is drawing *more* people to insecure internet in search of unemployment, health, and social benefits. Notably, these people might also struggle to access privacy settings at public library kiosks which they rely on for many things [17]. Those who have a less permanent relationship with their technology might be forced to save things in surprising places or engage
in routine behaviors that put them at risk. Project Waves’ emphasis on secure, home internet limits exposure to unsecure practices and Wi-Fi.

**Discrimination**
At a time when there is protest, efforts by the police to monitor and even hack individuals’ phones [23] put at risk those who are already vulnerable to government profiling [8] and policing [9]. These privacy violations exacerbate discrimination and have lasting impacts on communities and families. For those whose identity puts them at increased risk of discrimination as a matter of course, experience with surveillance offline has chilling effects online [16]. Having home internet without oversight by big providers may be a crucial safeguard for participation. Because they can be ISP-free, mesh networks create a secure place for individuals to explore identity and participate in social justice. Local community networks enforce net neutrality, protecting individuals from traffic monitoring [26] and throttling of more secure communication platforms.

**Safe**

**Health and well-being**
Low-income workers are less likely to be able to social distance [7] and are at higher risk for COVID [28]. They may be more dependent on secure online community spaces to explore and conceal identity [1] and for safe self-disclosure that is critical to well-being [18]. They may also be more at risk for surveillance, particularly during protest, and require private home internet to keep them safe. Mesh networks provide home internet that allows individuals to socially distance for remote school and other activities, like applying for unemployment, which may be impossible on smartphones, given the poor mobile performance of some of the most popular federal sites [19].

**Trusted**

**Community Integration**
Project Waves connects communities to relevant resources through trusted relationships, whether information about service, privacy, or education; and has the potential to help communities normalize access.

Although providing internet access becomes more urgent during disasters, communities also rely on offline networks to rebuild [20, 24]. Project Waves creates and reinforces community connections through installment and education [14]. Additionally, research suggests it is insufficient to merely introduce a technology to under-resourced communities without consideration for those whom you are designing for and their culture and contexts of use [2, 3]. We can extrapolate the potential for involvement by community advocacy groups to help in overcoming “second-level digital divides” [10].

**Conclusions**
We are not alone in this vision. Worldwide, activists are finding lasting alternatives to traditional ISPs in anticipation of future health and climate disasters [25, 27]. The world is realizing that we
need to address digital divides, and crises seem to galvanize change. A competition run by the NYC Economic Development Corporation is funding grassroots internet infrastructures to support communities in the next wave of superstorms like Sandy [6]. Even with stable internet, during COVID, reliance on providers who are overwhelmed is causing significant reduction in access speeds [21].

The digital divide is a profound concern and overcoming it (even in the absence of crisis) undoubtedly furthers human rights. COVID represents a unique opportunity to address systemic issues we have described, including those exacerbated by COVID, which are the result of structural inequality. By introducing more trusted, safe, and secure internet access to communities in greatest need, Project Waves can combat crisis and social and economic injustice through key infrastructure—the lack of which has negatively affected both of these areas.

REFERENCES


[28] Williams, V. Disproportionately black counties account for over half of coronavirus cases in the U.S. and nearly 60% of deaths, study finds. Washington Post.