

## Wi-Fi vs. Sci-Fi: Realities, Barriers, Boundaries

Electronic Frontier Foundation  
<http://www.eff.org>

### Contacts:

Lee Tien, Senior Staff Attorney, 415.436.9333 x102, [tien@eff.org](mailto:tien@eff.org)  
Annalee Newitz, Media Coordinator/Policy Analyst, 415.436.9333 x131, [annalee@eff.org](mailto:annalee@eff.org)

The future of Wi-Fi lies in its openness. EFF believes the public will reap the benefits of this promising new technology only if we craft regulations that encourage individuals and organizations to build open Wi-Fi networks. Also, as Wi-Fi evolves into a multi-use technology, we cannot over-regulate its applications or we risk limiting the economic growth of the wireless industry.

**Wi-Fi networks will democratize access to the Internet.** The biggest cost in providing wired Internet access comes in the “last mile,” which usually means the last bit of wire that stretches between a service provider and its customers. Wi-Fi eliminates the expense of the last mile, thus making it more cost-effective for residents of low-income neighborhoods to provide their families with Internet access (Pittsburgh United Way provides Wi-Fi for housing projects). Schools, non-profit organizations and other public service groups will also benefit from the reduced cost of providing Internet access to their constituencies.

**Open Wi-Fi networks will nourish free speech.** An open Wi-Fi network is run by an individual or group who have decided to allow anyone to use their network. Many service providers, such as Seattle-based Speakeasy.net, explicitly encourage their customers to set up open Wi-Fi networks. Local Wi-Fi groups, such as New York City Wireless and the Bay Area Wireless User Group, have set up open Wi-Fi networks in parks and cafes as a public service. Open Wi-Fi networks promote the democratization of access. They also serve a First Amendment function, providing a way for people to engage in anonymous free speech by communicating through a publicly-available, anonymous network rather than from an easily-identified computer.

**We need to rethink Shannon's Law.** One of the biggest issues for regulators is how to allocate and police spectrum uses. Often, Shannon's Law is cited in debates over whether spectrum should be treated as a limited resource – Shannon's Law states that there are only so many bits that can be sent over a bandwidth-limited channel. Certainly this is true, and the FCC's traditional approach to this has been the current command-and-control system of exclusive use allocations bounded in space and spectrum. But as Cognitive Radio advocates (such as David Reed) have shown, this approach has the effect of exacerbating spectrum scarcity, not easing it. The Commission's actions in the wake of the Spectrum Policy Task Force report tacitly acknowledge this. Computer-controlled wireless devices have the ability to change frequency, power-levels and antenna characteristics in real-time, to adjust to the spectrum environment around them. If the regulatory framework allows it, these devices could cooperate to limit signal dispersion such that only the number of non-intentional recipients of any signal is limited, effectively allowing users to share the same spectrum. These technologies have the power to make Shannon's Law a strictly local affair, dictating the maximum information density of spectrum in a very narrow slice of geography, which could ease scarcity to imperceptibility. The proper role of the Commission today is to hasten this outcome through regulations that sunset command-and-control in favor of flexible, cooperative use.