

# Universal Community Access from Thin Air?

BY MICHAEL CALABRESE AND MATT BARRANCA

More than ever, community leaders are looking to the heavens in their attempts to bring affordable broadband Internet access to their communities. This sky gazing is not a faith-based initiative, but rather a growing trend to tap the power of the public airwaves to provide inexpensive high-speed wireless Internet access.

The trend, of course, started with the rise of Wi-Fi technology, which allows users to send data wirelessly at short distances at connection speeds as high as 54 Mbps. Inexpensive wireless routers, available at any Wal-Mart, allow users to share bandwidth by accessing the unlicensed frequency bands—the small portion of the electromagnetic spectrum that is free and open to citizen access. With amazing success, more than 2,500 Wireless ISPs (WISPs) and nonprofit Community Access Networks (CANs) are using modified Wi-Fi equipment and the unlicensed bands to provide broadband access to entire communities.

The success of these efforts relies on free access to the small portion of the public airwaves that does not require an FCC license—the unlicensed bands at 900 MHz, 2.4 GHz, and at 5.7 and 5.8 GHz. Within this small sliver of the spectrum—once considered “junk bands” because they are shared with garage door openers, cordless phones, microwave ovens, and thousands of other such devices—countless community networks are reaching underserved populations and thousands of U.S. schools are using wireless local area networks to connect classrooms.

This activity is great news for communities, but the success of unlicensed spectrum to provide last-mile connectivity reinforces the reality that the vast majority of the spectrum is off-limits to citizens for direct access. The truth is that much of the spectrum represents an enormous untapped public resource that could be used by communities to solve broadband Internet access problems quickly, efficiently and for themselves. The New America Foundation recently published the *Citizen's Guide to the Airwaves* (see images) to illustrate how the

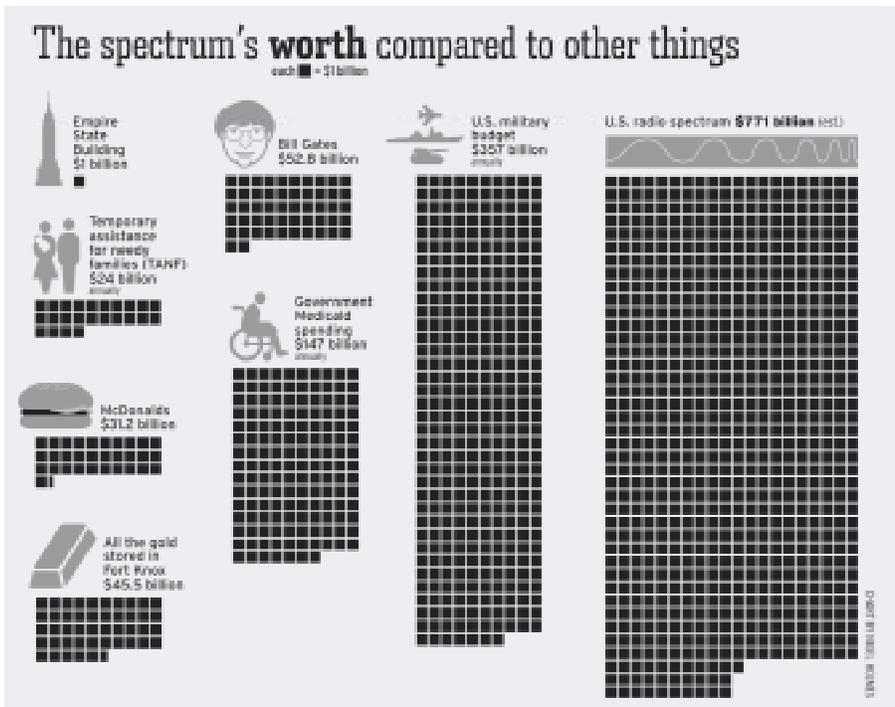
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spectrum is allocated, and to demonstrate the untapped potential of the public airwaves.

Just as the Federal Communications Commission sets rules for media ownership, it also decides which frequencies can be used by whom and for what purpose. Currently, the most useful block of spectrum is allocated, free of charge, to the exclusive use of television broadcasters. The low-frequency, broadcast spectrum is supremely valuable because at low frequencies, signals are able to cut through trees, walls and other obstacles than the higher frequency bands used by cell phones, satellite TV and most other of wireless devices. The New America Foundation estimates that the 67 channels of spectrum allocated to local and

network TV broadcasters in each market are worth more than \$200 billion. In a confidential memo, media analyst Tom Wolzien told the National Association of Broadcasters that its spectrum was worth \$367 billion. Yet, for over 50 years, the FCC has granted TV broadcasters exclusive access to these bands free of charge, requiring only minimal public interest obligations taking the form of heavily marketed children's programming, 10 and 15-second public service announcements, and many news shows of questionable “educational” content.

To measure how these valuable bands are being used, the New America Foundation surveyed the spectrum above our offices in population-dense Washington, DC to find that at any given time, no more than 62 percent of the spectrum is in use. Meanwhile, far removed from this vast wasteland of beachfront spectrum, in the congested unlicensed bands, WISPs and CANs are providing high speed Internet access to communities long ignored by cable and DSL providers. In just one example, the Rockwood Area School District in rural Pennsylvania has built an expansive, wireless wide area network that connects two area schools and provides affordable high speed access to as many as 100 area house-



holds.

One hope of community groups, such as the popular, nonprofit networks built by NYCwireless.net and the Bay Area Research Wireless Network ([www.barwn.org](http://www.barwn.org)), is to share access to unused, low-frequency TV bands (and perhaps even with the military, which holds the largest share of prime frequencies, which it uses only in certain places at certain times). These CANs use low-power, smart radios, which have the ability to change their frequencies to avoid interference with the high-powered broadcasters. New “cognitive radio” devices employ a listen-before-talk technology that allows the efficient sharing of underutilized airwaves. But FCC licensees, in any of the bands, are opposed to sharing frequencies with community networks because it could devalue the supposedly temporary spectrum licenses given to them by the FCC, which they aspire to own outright. This is especially true now that the FCC is moving to allow licensees to lease their spectrum allocations.

Unlike any previous technology, unlicensed wireless broadband has allowed communities to address access issues for themselves. But the ability of this technology to make a real impact on rural and urban community access is far from certain. Numerous battles are being waged in the FCC by broadcast, cellular and even educational lobbyists to claim a portion of the spectrum for themselves—discreetly re-appropriating the public airwaves into private property.

Currently, the best bet for universal broadband access is through wireless sharing of the untapped spectrum resource. But without citizen interest in this open access issue, community leaders looking to the sky may one day only find more thin air.

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### For Further Reading on the Airwaves

THE FOLLOWING TITLES ARE AVAILABLE AT  
[www.spectrumpolicy.org](http://www.spectrumpolicy.org)

- ▲ *The Citizen's Guide to the Airwaves*, New America Foundation
- ▲ *Radio Revolution: The Coming Age of Unlicensed Wireless*, by Kevin Werbach
- “Reclaiming the ‘Vast Wasteland’: Unlicensed Sharing of Broadcast Spectrum,” by J.H. Snider and Max Vilimpoc
- ▲ “Breaking the Chains: Unlicensed Spectrum as a Last-Mile Broadband Solution,” by James H. Johnston and J.H. Snider

ALSO SEE:

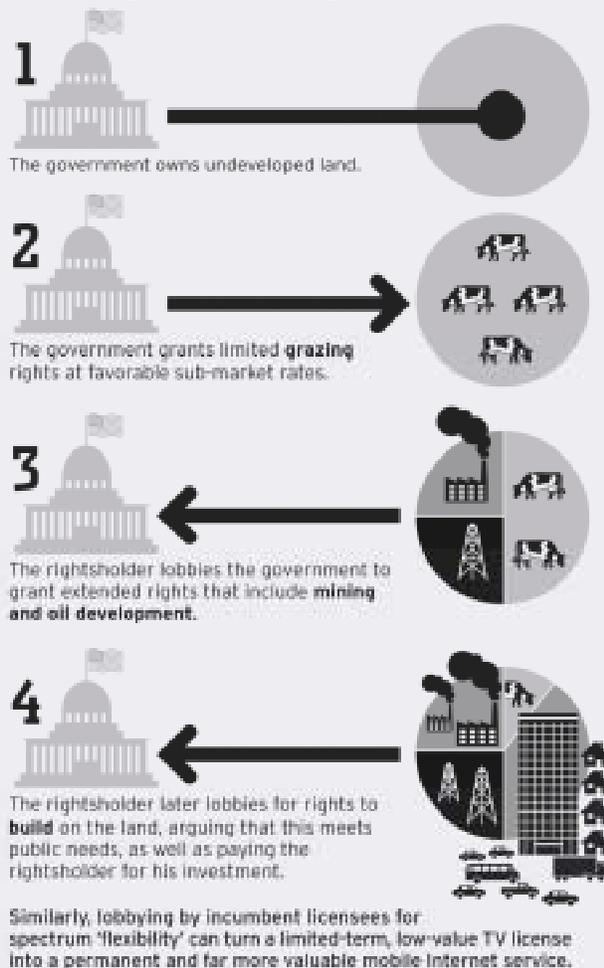
- ▲ *The Future of Ideas: The Fate of the Commons in a Connected World*, by Lawrence Lessig, (New York: Random House, 2001).
- ▲ *The FCC's Spectrum Policy Task Force Report*, available at <http://www.fcc.gov/sptf/reports.html>

COMMUNITY ACCESS NETWORKS:

- ▲ NYCwireless: [www.nycwireless.net](http://www.nycwireless.net)
- ▲ Bay Area Research Wireless Network: [www.barwn.org](http://www.barwn.org)
- ▲ Seattle Wireless: [www.seattlewireless.net](http://www.seattlewireless.net)
- ▲ Austin Wireless: [www.austinwireless.net](http://www.austinwireless.net)

## The politics of spectrum

To help understand how spectrum lobbying works, here's an analogy with federal land grants:



## Actual vs. potential market values

Under the FCC's 75-year-old zoning-and giveaway-allocation process, most licenses specify the service that must be operated at that frequency. Most licensees do not have the flexibility to change the service provided, or to sell or sublease the license, without permission. This is analogous to a vendor who obtains a license to operate a hot dog stand in New York's Central Park. The right to sell hot dogs is a lot less valuable than the right to operate a retail store in the same area.

Similarly, a license to operate a TV station is much less valuable than a license to provide cell phone or wireless Internet services on the same spectrum—licenses that have sold at auction for billions of dollars. As a result, broadcasters and some other incumbent licensees are lobbying for spectrum “flexibility”—new, more valuable license rights that they could even sell or sublease to other companies. Cell phone companies that paid billions at auction for spectrum licenses are among those arguing that such enhanced license rights should be auctioned, not given away.

