

I am a computer network engineer building the next generation of cutting edge software for community wireless networks. Community wireless networks (CWNs) are my full time job and those of us in the community wireless networking field are eager for new spectrum to be opened up for low power unlicensed operation.

However, I have serious concerns about the proposed rulemaking in the matter of "Unlicensed Operation of the TV Broadcast Bands, Additional Spectrum for Unlicensed Devices Below 900Mhz and in the 3Ghz Band". The rules that are outlined in this document would be of little or no benefit to CWN projects. These rules would eliminate, within the new spectrum, the very benefits of unlicensed spectrum that have allowed CWNs to thrive in the 2.4GHz band.

In order for CWNs to thrive:

Unlicensed spectrum must be open. Rules that give broadcast license holders an override on spectrum use create a barrier to access for communities. Rules that encourage broadcast license holders to sell access to their spectrum (spectrum that they never paid for) rather than sharing it for the public interest create a barrier to access for communities. CWNs thrive because they empower communities to self-organize low cost networks using off the shelf parts. CWNs thrive when creating a network is no more difficult than buying some equipment, configuring it, and turning it on. If communities, in order to access new spectrum, need to enter into complex negotiations with broadcasters, pay sums of money, and then subject their network to arbitrary shutdown, community users will generally opt not to use that spectrum. Spectrum that is regulated in this manner does not solve the community networks problem.

Frequency Modulation (FM) is a great technology because it is extremely resistant to interference and band contention. In FM, which is used by broadcasters and unlicensed data services alike, the transmission with the most strength will always dominate the transmissions with less strength. Unlicensed low power users will always receive interference from high power licensed broadcasters but those broadcasters will not receive interference from the low power users. The FCC should concern itself with ensuring that low power users do not break the law by building radios that are outside of the specified power requirements. If manufacturers stick to the FCC mandated engineering specifications on power requirements (as they do today in the 2.4Ghz band), the issue of interference will not exist.

Any (criminal) manufacturer who is willing to break the FCC rules on power requirements, is probably also willing to break any rules that require conformance to certain control beacons or the transmission of certain identification beacons. The proposed rule making would do nothing to mitigate the effect of criminal manufacturers (who, to my knowledge are entirely theoretical), the only theoretical source of interference for licensed broadcasters in these bands.

Equipment to access unlicensed spectrum must be cheap and off the shelf. Communities can not afford expensive specialized equipment for their infrastructure. The whole reason that CWNs have thrived in the past 4 years is because 802.11b 2.4GHz wireless devices have become cheap commodity hardware. New rulemaking expanding the unlicensed

spectrum MUST allow manufacturers to easily adapt their existing commodity products for use in the new spectrum. Requirements to add special beacons and to conform to special commands from broadcasters will significantly increase the costs of equipment designed for the new spectrum. Under these rules communities will be locked out of using the spectrum.

The needs of CWNs are very different than the needs of traditional commercial digital spectrum users (e.g. mobile phone networks). CWNs require very low entry cost but are willing to trade off some quality. A CWN network is willing to accept a significant amount of interference, indeed highly motivated and creative community programmers are busy at work innovating ways to work around the interference which they must accept. A CWN network does not need to operate at high power levels and does not need to operate on a clean band. This makes sharing spectrum with licensed broadcasters an optimal solution for CWNs, if the rulemaking keeps access open and inexpensive.

I am not in the commercial industry but I can not imagine commercial digital spectrum users, even if they were willing to accept the interference from the broadcaster, having an application for spectrum which can be "turned off" by the licensed broadcaster at any time. So this rule making may not only lock out the community users for which the spectrum sharing is a perfect match, but it will probably also lock out the commercial users as well.

I applaud the efforts of the FCC to open up new spectrum for low power unlicensed use and I encourage the FCC to reconsider the undue restrictions placed in the current proposed rulemaking. While complex regulations are necessary at high power -- at low power, spectrum should be as free and open as possible.