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Fact Sheet

**Myth vs. Facts: A Response to Broadcast Industry
Misinformation Concerning Possible Interference from
“Smart” Wi-Fi Devices Using Vacant TV Channels**

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Background: The broadcast industry’s digital TV (DTV) transition involves the future use of two different sets of frequencies (channels): channels 2-to-51 and channels 52-to-69. Channels 52-to-69 are all to be cleared of broadcasting at the end of DTV transition and reallocated for public safety agencies and for auction to commercial wireless services. Recently passed Congressional legislation proposing a fixed deadline for the DTV transition only addressed the future of channels 52-69. Channels 2-to-51 will remain allocated to DTV. But because an average of only seven full-power local TV stations operate in each of the nation’s 210 local TV markets, many of these channels will remain unassigned and unused after the DTV transition. These unused channels – often called “white space” – vary market-by-market, so any wireless device certified by the FCC to use these fallow airwaves would need some form of intelligence in order to avoid interfering with a licensed channel.

In 2003, under Chairman Powell, the FCC initiated a rulemaking (Docket 04-186) to allow a new generation of unlicensed wireless devices to use the unused TV channels within channels 2-to-51. The FCC recognized that new “smart radio” technologies would allow the unused TV channels to be used for broadband wireless services without interfering with local TV stations operating on nearby licensed channels. It also recognized that reallocating the unused broadcast spectrum would facilitate rural broadband Internet access, pervasive communications within the home and workplace, and supplemental public safety services. High-tech companies, wireless Internet service providers and consumer groups were highly supportive of this so-called “TV white spaces” rulemaking. Broadcasters, including their vendors, were opposed.¹

¹ For an example of the broadcast industry’s arguments, see MSTV’s video at www.mstv.org/static.html and FCC filing at http://gulfoss2.fcc.gov/prod/ecfs/retrieve.cgi?native_or_pdf=pdf&id_document=6517615193

Despite significant broadcast industry opposition, on October 26, 2005, the House Commerce Committee passed an amendment (the “TV white spaces amendment”) to its DTV legislation calling on the FCC to finish its TV white spaces rulemaking. However, just before the final bill came up for a vote in the entire House on December 19, 2005, this provision was stripped from the bill on procedural grounds. Separate legislation to deal with non-budget issues associated with the DTV transition, of which digital must-carry has gotten the most coverage in the press, is expected to be introduced shortly. This myth-fact sheet responds to the broadcast industry’s ongoing arguments to Congress opposing the completion of the FCC’s TV white spaces rulemaking.

Myth #1: The FCC is proposing to allow unlicensed broadband networks and devices to operate on frequencies (channels) licensed to local TV stations.

Fact: The FCC took an extremely conservative approach by proposing that unlicensed devices will be restricted to the unassigned and unused channels (“white space”) in the broadcast TV band. No local TV stations or other broadcast licensees operate on these frequencies—and broadcasters have no more legal right to use them than a homeowner who occupies a lot next to an adjacent publicly-owned lot. The homeowner may covet the lot and believe that development on it will diminish the value of his own lot. But he cannot prevent the government from allowing another to build on it. While there is additional “white space” in the TV band, the FCC has not proposed making it available. This includes various types of “underlay” and “overlay” rights to share access to licensed channels, such as unused capacity within a licensee’s grade B contour (the geographic area covered by a local TV station).

Myth #2: There is no proven and practical technology to avoid interference to TV viewers and to licensed operators in each local TV market.

Fact: The FCC has gone to great lengths to make sure that viewers are protected are from harmful interference, which in fact is required by law. For example, it has proposed that only “smart” radios will be certified to operate in the TV band. All devices must have the capability to definitively and unambiguously establish that a TV band channel is not occupied at their location before they transmit. If a channel is in use, the device must avoid transmitting. They can do this a number of ways. The FCC mentions three:

- 1) **Listen-Before-Talk.** The unlicensed device senses the presence of a TV signal in order to select channels not in use. This approach, generally favored by the high-tech industry, has already been adopted by the International Telecommunications Union (ITU) and the FCC in the 5 GHz band so that unlicensed devices can avoid channels used by military radar, which are much harder to detect than TV signals.
- 2) **Database Plus Geolocation.** The unlicensed device determines its location and then consults a broadcast database to determine whether a particular TV channel is occupied. For example, an unlicensed device might contain a Global Positioning System (GPS) receiver, and use its position to verify that it was a minimum distance from a TV transmitter.

- 3) **Location Beacon.** The unlicensed device receives a locally transmitted signal (“beacon”) that identifies which TV channels may be used in the local area for unlicensed use. For example, a specialized beacon in a given TV market would directly identify which channels were unoccupied – and devices would back off.

In addition to the FCC’s proposals, there have been other proposals to deal with the broadcasters’ concerns. Some of these – along with a detailed response to the broadcast industry interference claims – were filed in the FCC’s Docket 04-186 by a prestigious group of leading academic, corporate and former FCC staff engineers.²

Myth #3: The broadcasters’ motive for opposing the FCC’s proposal to open empty TV channels in each market for license-exempt broadband networks is to prevent interference to their existing services rather than warehousing the spectrum for their own, future use.

Fact: Broadcasters have a track record of warehousing spectrum, only to claim it later for their own exclusive use. For example, the NAB objected to Low Power FM radio stations gaining access to empty channels in the FM band – persuading Congress to overrule the FCC – and then developed a digital radio technology (IBOC) that allowed them to double their spectrum holdings in the FM band, increase the number of FM channels they could provide by a factor of more than 10:1, and expand their geographic range outside their original contour lines.

The NAB strategy in the TV band has been very similar. New America Foundation estimates that since 1997 broadcasters have acquired \$6 billion worth of TV band white space by expanding outside their original grade B contour.³ After the DTV transition, when more space is available, future requests for expanded contours are expected. In addition, in 2000 broadcasters won exclusive rights to use licensed portable video devices in unused TV channels. In other words, the NAB strategy has been to hold up others from using the unused channels, then claim to the FCC and Congress that only by giving it to them can the spectrum be utilized without interference. Regardless of the merits of the broadcasters’ technical arguments, the spectrum windfall they can receive from making them should be self-evident.⁴

Myth #4: The broadcast industry’s technical claims about interference are respected by leading, independent engineers and have proved accurate in the past.

Fact: NAB engineers have a track record of filing self-serving comments that are disputed by highly respected independent engineers. For example, after the FCC determined that

² See New America Foundation, et al., Technical Reply Comments, FCC Docket 04-186, In the Matter of Unlicensed Operation in the TV Broadcast Bands, January 31, 2005. Available at: http://www.newamerica.net/Download_Docs/pdfs/Doc_File_2202_1.pdf. These comments were updated and recast for a more general audience in Michael J. Marcus, Paul Kolodzy and Andrew Lippman, “Reclaiming the Vast Wasteland: Why Unlicensed Use of the White Space in the TV Bands Will Not Cause Interference to DTV Viewers,” New America Foundation, Wireless Future Program Issue Brief #17.

³ See “Appendix D: Valuation of Guard Band Spectrum Acquired by Broadcasters (1997-2004)” in J.H. Snider, *Speak Softly and Carry a Big Stick: How Local TV Broadcasters Exert Political Power* (New York: iUniverse, 2005).

⁴ The history of this sad saga of broadcast industry spectrum holdups followed by spectrum windfalls is described in “Appendix C: Chronology of America’s Advanced TV Industrial Policy” in *Ibid*.

community Low Power FM (LPFM) stations should be allowed to operate on the unused FM channels, which serve as guard bands between high-power licensees the NAB sponsored engineering studies demonstrating that there would be intolerable interference. This persuaded Congress to overrule the FCC and bar LPFM. But the FCC was never able to replicate the NAB's findings – and a \$2 million FCC-financed MITRE study later refuted them. Moreover, the FM radio broadcasters' new digital channels will create far more interference to existing broadcasters than LPFM. The new digital channels are located immediately adjacent to each incumbent radio broadcaster's existing channel.

Myth #5: The broadcast industry's interference scenarios are based on typical conditions rather than extreme, worst case conditions.

Fact: If spectrum allocations were based on the type of worst case scenarios the broadcasters have proposed, there would be no digital TV, no digital radio, no unlicensed consumer devices (such as WiFi and cordless phones, of which there are hundreds of millions) and practically no innovation in spectrum utilization. This type of problem is also endemic to real estate development, where almost any type of development—even one with huge benefit for the overall community—may offer some type of minor annoyance to nearby property owners. Similarly, almost all new radio technologies create some type of interference in some type of situation to some incumbent user.

Like a local real estate planning commission, the FCC's task is to maximize overall consumer welfare from use of spectrum rather than take an absolutist view that any conceivable harm to incumbents in a worst case scenario is grounds to prevent development. Indeed, that's why the Communications Act directs the FCC to protect licensed services against "harmful" interference – and not interference per se. For example, the FCC recently faced this issue in the allocation of terrestrial rights to reuse satellite spectrum. It turns out that the spectrum used to send signals from satellite dishes to earth stations can be reused if the signal's angle of arrival is changed to be terrestrial and pointed away from the satellite dish pointing to the sky. The FCC estimated that in a tiny fraction of situations this could cause interference to incumbent users. But it decided that this level of interference was worth accepting because of the huge social value to be gained from opening up these frequencies to terrestrial as well as satellite service. Likewise, as noted above, the Pentagon has accepted the possibility of occasional or minor interference with military radar in the 5 GHz band in order to allow WiFi and other license-exempt broadband networks to share the band using "smart" radio technology.

Myth #6: The broadcast industry has revealed the technical conditions under which it has conducted its interference studies so that independent researchers can attempt to replicate them.

Fact: The broadcast industry has made claims about interference in such a way that no independent third party can verify them and assess their general applicability. Until the broadcast industry publicly releases detailed technical information about its studies, claims about their general applicability should be treated with utmost skepticism. And if it happens that the broadcasters have indeed identified a flaw in the FCC's rules, it is quite possible that a minor technical modification might address it.