

SPECTRUM ISSUES IN FCC'S NATIONAL BROADBAND PLAN

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On March 16, 2010, the U.S. Federal Communications Commission released “Connecting America: The National Broadband Plan.” [1] This plan was required by the American Recovery and Reinvestment Act of 2009, which said the plan should

“analyze mechanisms for ensuring broadband access by all people of the United States; provide a detailed strategy for achieving affordability and maximum usage; and include a plan for use of broadband to advance national purposes such as education, health care, energy, and public safety.” [2]

The plan itself is a 376-page document. The sections most germane to the wireless community are Chapter 5 on spectrum and Chapter 16 on public safety, although there is some relevant information in Chapter 7 on R&D. The whole report was not voted on by the whole Commission. Rather, a two-page companion document was released at the same time with the unanimous approval of the Commission, which acknowledges “each of us may have differing opinions on some of the specific recommendations set forth in the Plan” and states broad goals that had achieved consensus [3].

Chapter 5 has 17 numbered recommendations and a lot of other concepts that are endorsed in passing. Most of these are within the jurisdiction of the FCC, some need Congressional approval, and some need parallel action by the National Telecommunications and Information Administration (NTIA) — the agency that controls use of spectrum by the federal government. In conjunction with the release of the plan, the FCC unveiled the beta version of a new website, Spectrum Dashboard, with improved access to information on both spectrum allocations and licenses [4].

The part of the report that got the most coverage in the popular press was the recommendation to make an additional 500 MHz available for broadband use within the next 10 years with 300 MHz for mobile broadband within five years. CTIA, the major U.S. cellular trade association, had been pressing for 800 MHz, so the promised 500 MHz achieves much of what they had been requesting. The two largest blocks of spectrum that would become available under the plan are 90 MHz, presently allocated for mobile satellite service (MSS), and 120 MHz, presently allocated for broadcast television.

The MSS spectrum already was approved for some terrestrial service, but the original conditions were so complex that there was no operational terrestrial use in populated areas. The TV spectrum change will no doubt be very controversial. The report estimated that the present market value of spectrum for TV broadcasting is only about a tenth of recent auction prices for similar spectrum for fixed and mobile use. It also recognized that only about 10 percent of U.S. households depend solely on over-the-air reception of TV signals. (Of course, with wide availability of broadband in most households this could decrease further.) The primary mechanisms for “recycling” TV spectrum would be to allow multiple stations to share a transmitter on a channel with an 18 Mb/s data stream and to allow existing broadcasters to participate in an auction of their present spectrum in which they would receive the economic benefit of alternative uses. In Europe it is routine for multiple independent video streams to share a common transmitter and digital multiplex stream, but this has been forbidden to date in the United States.

In the unlicensed area the report recommends that within 10 years the FCC create “a new, contiguous nationwide band for unlicensed use.” In doing so it stated

“This would enable innovators to try new ideas to increase spectrum access and efficiency through unlicensed means, and should enable new unlicensed providers to serve rural and unserved communities. Such an approach would represent a departure from the way the FCC has treated most unlicensed operations in the past. Unlicensed operations are typically overlays to licensed bands, with intensive unlicensed use emerging in some bands (e.g., the 2.4

GHz band) over a long period of time. However, targeting bands for unlicensed use could yield important benefits.”

It also recommended that the FCC “complete the final rules for TV white space devices in order to accelerate the introduction of new innovative products and services.” However, the previously mentioned proposals dealing with TV spectrum may minimize the impact of such rules if tighter packing to TV stations eliminates much of the white space between TV transmitters.

Citing work by its U.K. counterpart, Ofcom [5], the report urged the FCC and NTIA to work together to create methods to actually measure spectrum use. Initial measurements and works of many authors suggest that most spectrum is actually idle most of the time. The report recommended annual updating and public availability of the observations that are made. This should ultimately lead to more spectrum availability, although the present ambiguous definition of “harmful interference” could be a limiting factor. (Traditionally, new spectrum use is not allowed if it will cause harmful interference to incumbent users.)

In the R&D area, the report urged the National Science Foundation to work with FCC to develop a wireless testbed “to develop the science to support modern spectrum policy principles, which could guide FCC rulemaking on spectrum matters... (and) permit empirical assessment of radio systems and the complex interactions of spectrum users, which are nearly impossible to assess through simulation or analytical methods.” At present there is no widely accepted approach to determine whether a specific cognitive radio design poses an interference threat to incumbent users. Such an NSF-funded testbed could support work to clarify this issue.

Finally, in the public safety area, the report recommended that the FCC take steps to create a nationwide broadband public safety network with full interoperability among all participants and that this should include a reliable funding mechanism, so the implementation will not be dependent on the funding of thousands of local government entities as in the past. This is a bold step to solve the Tower of Babel problem that has plagued U.S. public safety communications for decades.

Hopefully many of these recommendations will be implemented, but given the contentious nature of U.S. government policy deliberations at the moment, it is difficult to predict what will happen. United States readers are urged to review the whole report and communicate their own viewpoints to both the FCC and their elected leaders.

REFERENCES

- [1] FCC, Connecting America: The National Broadband Plan, March 16, 2010, <http://www.broadband.gov/plan/#read-the-plan>
- [2] American Recovery and Reinvestment Act of 2009, Pub. L. No. 111–15, § 6001(k), <http://thomas.loc.gov/cgi-bin/query/z?c111:H.R.1.enr>
- [3] FCC, Joint Statement on Broadband, March 16, 2010, http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-10-42A1.pdf
- [4] <http://reboot.fcc.gov/reform/systems/spectrum-dashboard>
- [5] Ofcom, Capture of Spectrum Utilisation Information Using Moving Vehicles v (2009), http://www.ofcom.org.uk/research/technology/research/state_use/vehicles/vehicles.pdf

BIOGRAPHY

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