



## It Seems to Us

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# Spectrum Pressure

*“On June 14 the White House released a Presidential Memorandum that represents the next stage in making more radio spectrum available for commercial wireless broadband technologies. There are serious implications for incumbent users of spectrum between 400 MHz and 6 GHz — including radio amateurs.”*

Ensuring that every American has access to broadband capability is a longstanding objective of the federal government, and for good reason. Today, broadband access to the Internet is as essential to economic development as electricity. But unlike electricity, it can be — and increasingly is — delivered without wires.

Unless you're Rip Van Winkle you know there is a revolution underway in mobile wireless broadband. Most users of smartphones, tablets and other mobile devices that connect to the Internet don't think of them as radio transceivers, but in fact that's what they are — and they won't work without access to the radio spectrum.

Early projections of future spectrum needs for mobile services were based on the assumption that most of the traffic would be telephone calls. Today's reality is that mobile subscribers demand almost everything that can be communicated in digital form, regardless of how much bandwidth it takes. In a speech delivered on June 14 FCC Wireless Telecommunications Bureau Chief Ruth Milkman noted that US mobile data traffic grew by more than 1200% from 2009 to 2013 and that Cisco predicts it will grow nine-fold by 2017.

Even if the radio spectrum were devoid of existing users there would be limits to how much of it could be used effectively for mobile broadband. The lower frequency limit is determined by how small an efficient antenna can be made that will fit inside a mobile device, the upper limit by how much a signal at that frequency will be attenuated by walls, foliage and other obstacles. Depending on whom you talk to the lower limit is somewhere between 400 and 600 MHz and the upper limit is somewhere between 4 and 6 GHz.

But of course, this is not virgin spectrum. It has been fully allocated for decades, much of it to multiple radio services (including ours) that already share on a geographic or other basis. In addition, wireless broadband is not the only application for which more spectrum access is being sought in this frequency range.

The spectrum managers at the National Telecommunications and Information Administration (NTIA) and the FCC have been grappling all along with how to accommodate more users without imposing excessive costs and restrictions on the incumbents. (NTIA manages federal government use of the radio spectrum much as the FCC manages nonfederal use.) Congress gave them added impetus with a provision in the American Recovery and Reinvestment Act of 2009 that required the development of a National Broadband Plan. On June 28, 2010 President Obama followed up with a Presidential Memorandum directing NTIA and FCC to make 500 megahertz of spectrum available for wireless broadband use within 10 years. Later that year, as discussed on this page in the January 2011 issue of QST, NTIA released its initial plan for doing so.

The new Presidential Memorandum establishes a Spectrum Policy Team that is to work with NTIA to identify ways to give federal agencies "...greater incentive to share or relinquish spectrum, while protecting the mission capabilities of existing and future systems that rely on spectrum use." Among other things, NTIA is directed to take steps to minimize new frequency assignments for federal use

between 400 MHz and 6 GHz and to conduct a pilot program for real-time monitoring of spectrum usage "...to determine whether a comprehensive monitoring program in major metropolitan areas could disclose opportunities for more efficient spectrum access, including via sharing."

While the executive branch cannot issue directives to an independent agency, the FCC is "strongly encouraged" to "enable innovative and flexible commercial uses of spectrum, including broadband, to be deployed as rapidly as possible" and to develop a program of performance criteria for radio receivers "such that emission levels resulting from reasonable use of adjacent spectrum will not endanger the functioning of the receiver." Among the steps toward rapid deployment that the FCC is urged to consider — and that could have implications for the Amateur Radio Service — are:

- identifying spectrum allocated for nonfederal uses that can be made available for licensed and unlicensed wireless broadband services and devices, and other innovative and flexible uses of spectrum, while fairly accommodating the rights and reasonable expectations of incumbent users; and
- identifying spectrum allocated for nonfederal uses that can be made available to agencies, on a shared or exclusive basis, particularly where necessary to accommodate agencies seeking to relocate systems out of bands that could be made available for licensed services or unlicensed devices.

So, what does all this mean for us? Except for 2390-2417 MHz, all of our allocations between 400 MHz and 6 GHz are on a secondary basis — mostly to military radiolocation (radar) and other federal users. Pressure on them is pressure on us, either directly (because we're already sharing with them) or indirectly (as they are relocated out of a band and must be reaccommodated elsewhere). An FCC proceeding considering the expansion of unlicensed broadband use into the 5850-5925 MHz band is already underway.

The NTIA priority list of bands for possible "repurposing" for non-federal/federal shared use shows 3100-3500 MHz, which includes our 3300-3500 MHz allocation, as the fifth of six bands — in other words, NTIA would prefer that four other bands be considered first. However, in its July 2012 report entitled "Realizing the Full Potential of Government-Held Spectrum to Spur Economic Growth" the President's Council of Advisors on Science and Technology strongly recommended that "spectrum from 2700 to 3700 MHz be prioritized as the basis for the Nation's first spectrum superhighway."

Given the great emphasis on sharing in the Presidential Memorandum we can expect this to be a major pressure point in the months ahead.