

Congress of the United States
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Received & Inspected
MAR 07 2016
FCC Mail Room

Tom Wheeler
Chairman, Federal Communications Commission
445 12th Street SW
Washington, DC 20554

Dear Chairman Wheeler:

I received the following proposal to auction a new block of TDD spectrum below 5GHz that would be reserved exclusively for Massive MIMO from a constituent, Tom Marzetta. Tom was a classmate of mine at Gonzaga College High School from 1964-1968, where he was already a very smart individual. He was the originator of Massive MIMO and Group Leader of Large Scale Antenna Systems at Bell Labs. I would like your thoughts on his following proposal:

"The following represents my personal scientific perspective, and does not necessarily reflect the views of either Alcatel-Lucent or of any other party.

Spectrum below 5 GHz will always be the most valuable because of its resilience to blockage and obstructions, ability to function under high mobility conditions, and effective building penetration. Massive MIMO is the only wireless technology that can fully exploit the potential of these frequencies. In its ultimate deployment it could improve spectral efficiency by a factor of fifty or more over fourth-generation (4G) technology.

My perception is that the development of Massive MIMO in the United States is proceeding at a disappointingly slow pace. Two reasons for this are:

- There is no compatibility between Massive MIMO in its large-scale embodiment and today's 4G equipment. Service providers are naturally reluctant to consign their costly 4G infrastructure investments to early retirement.
- Massive MIMO, deployed on a large scale, favors TDD operation rather than FDD operation. (A technicality: TDD – time division duplex – utilizes the same band of frequencies over disjoint time intervals for downlink and uplink transmissions, while FDD - frequency division duplex – utilizes two disjoint frequency bands for downlink and uplink transmissions.) Spectrum is licensed for either FDD or TDD. With the exception of Sprint, the major US service providers including AT&T, T-Mobile, and Verizon have only FDD licenses.

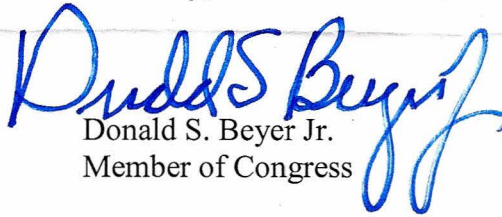
It appears to me that FCC could greatly accelerate the development and deployment of Massive MIMO. I propose an auction of a new block of below 5GHz TDD spectrum that would be

reserved exclusively for Massive MIMO. This extraordinary initiative (extraordinary because FCC typically does not specify the technical details of how spectrum is to be used) would revitalize the telecommunications industry, it would stimulate commerce by enabling a new generation of applications requiring order-of-magnitude higher wireless throughputs, and indirectly it would benefit US defense, since the armed forces prefer to use commercial communications technology where possible.

Best regards,
Tom Marzetta”

Thanks Tom, for considering Tom's input. I am no expert on this issue, but I am happy to pass along Tom's ideas.

Sincerely,

A handwritten signature in blue ink, reading "Donald S. Beyer Jr.", written in a cursive style. The signature is positioned above the printed name and title.

Donald S. Beyer Jr.
Member of Congress